June 25, 1935. T. J. DOYLE 2,005,729

LIQUID APPLYING APPARATUS

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Fig.1.

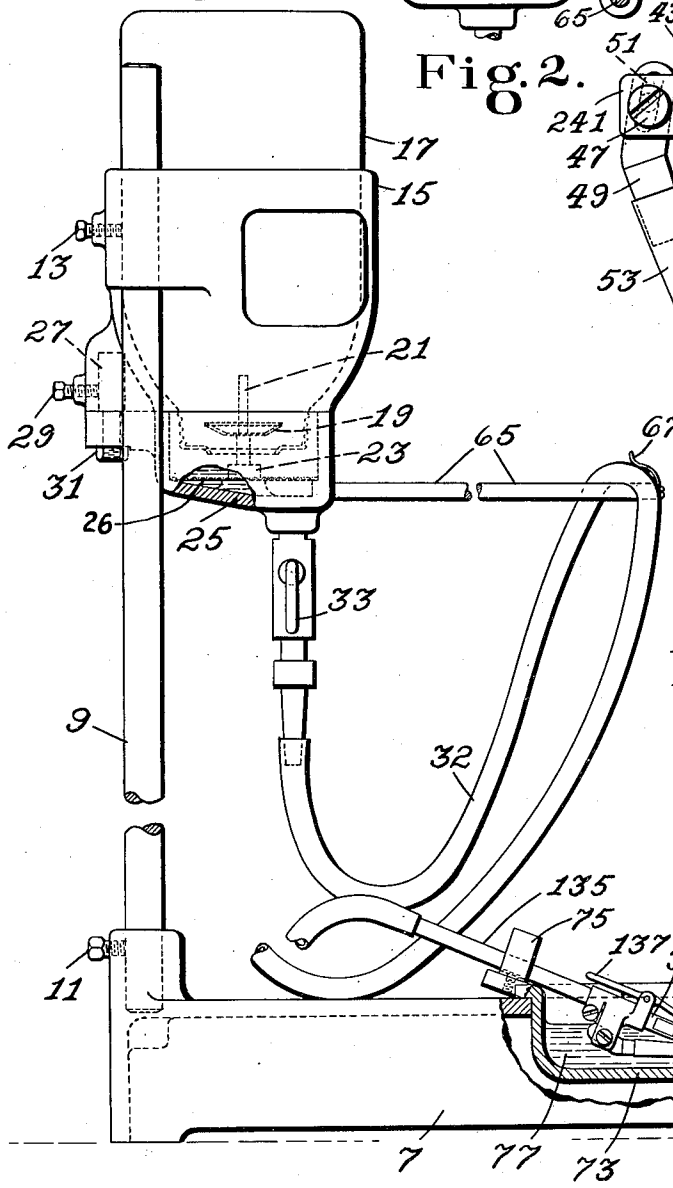


Fig.2.

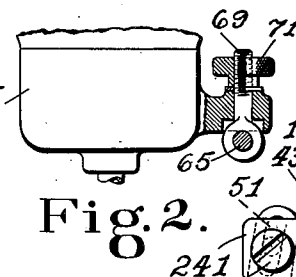


Fig.3.

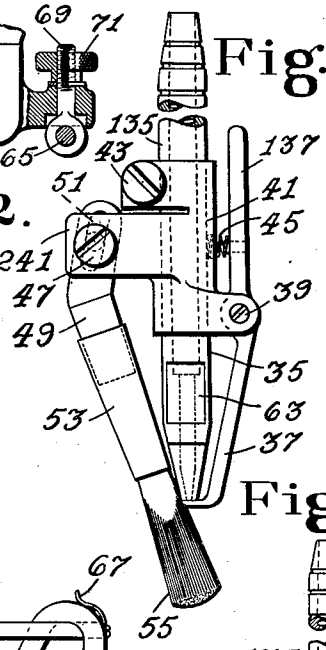


Fig.4.

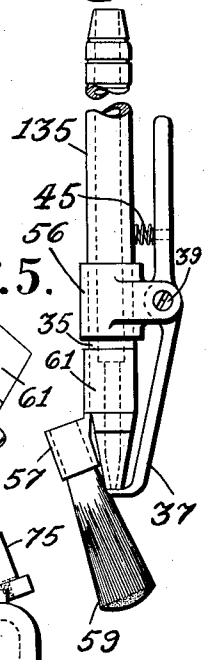


Fig.5.

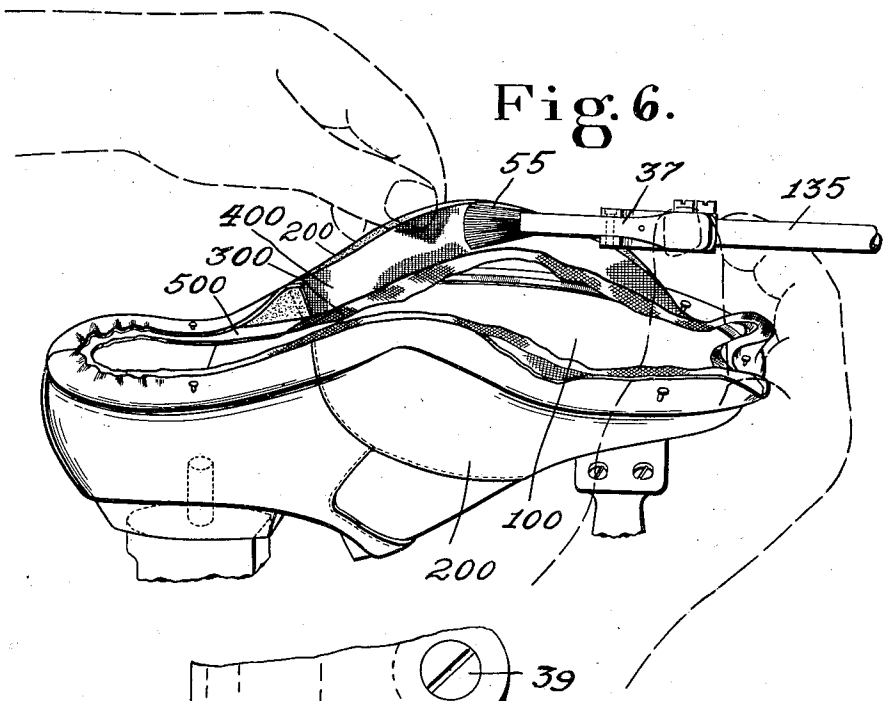
INVENTOR
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Fig. 6.



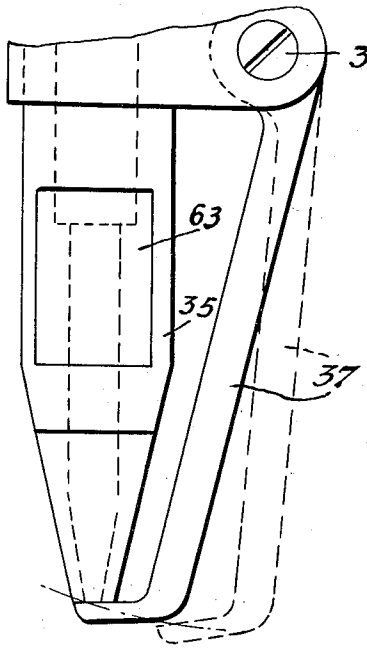


Fig. 7.

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Patented June 25, 1935 2,005,729

UNITED STATES PATENT OFFICE

2,005,729

LIQUID-APPLYING APPARATUS

Thomas J. Doyle, Lynn, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application December 15, 1931, Serial No. 581,194

5 Claims. (Cl. 91—39)

This invention relates to apparatus for applying liquid to an article and is herein illustrated as embodied in an apparatus for applying an adhesive substance such as a latex adhesive to parts of boots and shoes.

In the manufacture of certain kinds of shoes, it is customary to apply rubber latex cement, to the margins of certain parts of the shoe, such as the lining, the doubler, the feather of the insole and various adjacent parts prior to a lasting operation so that, after the shoe has been lasted, these cemented portions will adhere firmly to one another.

Rubber latex, however, is a liquid which presents difficulties in handling due to its tendency to coagulate. In particular, coagulation is caused very readily by exposing it to the atmosphere or by rubbing it between opposing faces of two rigid members.

According to one feature of the invention there is provided a receptacle for liquid, a tube leading from the receptacle and having a freely movable portion, a nozzle leading from the tube, a liquid-applying member arranged to receive on the outside thereof liquid which flows from the nozzle and a valve which normally extends over the delivery opening of the nozzle, said valve being manually movable away from said opening to permit the liquid to flow and back again to shut off the flow of liquid by movements of recession and approach without appreciable sliding contact with the end of the nozzle. In the illustrated construction the receptacle for liquid is of the barometric feed type, the tube is a flexible rubber one, the liquid-applying member takes the form of a brush, the nozzle empties upon the outside of the brush and the valve is rigid with a stem which may be swung about a pivot located at one side of the axis of the nozzle in such position that swinging the stem moves the valve from closed to open position and vice versa without sliding contact with the end of the nozzle. With such a construction the latex is protected from the action of the atmosphere; it is delivered directly to the outside of the brush whereby gumming of the bristles is minimized; and it is not rubbed between the end of the nozzle and the valve during the movements of the valve.

In an apparatus of this general type it is desirable that the brush or other liquid-applying member be readily removable and replaceable. To this end, in accordance with another feature of the invention, the holder for the brush or other liquid-applying member and the nozzle are provided with quickly detachable interengaging means so that the brush may be readily replaced at any time by a new one.

These and other features of the invention, including certain details of construction and combinations of parts, will be described as embodied in an illustrated apparatus and pointed out in the appended claims.

Referring to the accompanying drawings,

Fig. 1 is an elevation of an apparatus in which the present invention is embodied;

Fig. 2 is a detail principally in elevation of the adjustable mounting of the rod which supports the slack in the flexible tube;

Fig. 3 is an elevation of the nozzle having mounted thereon one form of brush holder;

Fig. 4 is an elevation of the nozzle having mounted thereon another form of brush holder;

Fig. 5 is a perspective of the brush holder shown in Fig. 4;

Fig. 6 is a perspective of a partly finished shoe to parts of which cement is being applied; and

Fig. 7 is a view on a larger scale of the end of the nozzle and the cooperating valve showing in dash lines the position of the valve when open and indicating by a dot and dash line the path of movement of the valve toward and away from the end of the nozzle.

The illustrated apparatus comprises a base 7 adapted to rest upon a bench. Rising from one end of the base are two supports in the form of rods one of which is shown at 9, fastened in sockets in the base by set screws one of which is shown at 11. Adjustably fastened to the upper portions of the rods by set screws one of which is shown at 13 is a hollow casting 15 adapted to hold an inverted bottle 17 containing a liquid cement, such as rubber latex, said bottle having a valve 19 adapted to be held open, when the bottle is in the position shown, by contact of the lower end of a valve stem 21 with an abutment 23 which rises from the bottom of a receptacle 25. This receptacle has a screen 26 and is adjustably fastened to the lower end of the casting 15 by means of a stud 27 removably held in a socket in the casting by a set screw 29, said stud having a lower end of reduced diameter which passes through a bore in a projecting portion of the receptacle 25 and is threaded to receive a nut 31 by which the stud is held firmly in place in said projecting portion. This construction provides a barometric feed for the latex or other liquid so as to maintain a predetermined quantity of it at all times in the receptacle 25. After the set screws 13 have been loosened the height of the whole liquid supply may be

adjusted; and, after the set screw **29** has been loosened, the receptacle **25** with its attached stud **27** may be removed to be cleaned or replaced.

Extending from the bottom of the receptacle **25** below the level of the screen **26** is an outlet pipe provided with a valve **33**; and leading from the pipe is a tube **32**, herein shown as made of rubber, the outer end of which is freely movable. Leading from the outer end of the rubber tube is a nozzle **35** (Figs. 1 and 3) a portion of which **135** serves as a hand-hold by which the nozzle may be readily manipulated. Extending over the outlet of the nozzle is a valve **37**, the stem with which the valve is integral being pivoted at **39** to an elongated collar **41** held on the nozzle by a pinch-screw **43** which passes through a split lug on the collar. The path of movement of the valve **37** is toward and away from the end of the nozzle **35** along a path indicated by a dot and dash line in Fig. 7. This path is the arc of a circle centered on the pivot **39** and it intersects the outlet face of the nozzle and the valve face. Consequently, the valve cannot slide on the nozzle in closing the coagulation of the latex such as would result from a sliding movement is avoided. The valve **37** has a finger-piece **137** and is held normally closed by a compression spring **45**. Extending from the side of the collar **41** is a forked lug **241**, one fork being provided with a smooth hole to receive the stem of a pinch-screw **47** and the other fork being provided with an alined threaded hole to receive the threaded end of the screw. Located between the forks is a flattened end of a bent member **49** having therein a slot **51** so that the bent member may be held in various adjusted positions. The other end of the bent member **49** has a tapered projecting portion to fit frictionally in a conical socket in one end of a brush-holder **53** in the other end of which a brush **55**, or other liquid-applying member, is fastened. It will be noted that the axis of the brush is at an angle to the axis of the nozzle so that liquid is delivered by the nozzle upon the side surface of the brush. As illustrated, the two axes cross each other so that liquid is applied approximately along a middle line of that side of the brush which is adjacent to the nozzle. With the construction shown, the liquid flows evenly over the outside of the brush in position to be readily transferred to the shoe part or other article to be coated; and the brush may readily be removed and replaced when desired since its holder is frictionally held at the end of the bent member **49**. Moreover, since the nozzle is located outside the brush, instead of in the brush, the clogging of the nozzle by reason of hardening of cement in the brush (for example by coagulation of the latex) is avoided.

The construction shown in Fig. 5 is somewhat different from that just described. The nozzle **35** with its hand-hold **135**, and the valve **37** having its stem pivoted at **39** and acted upon by the compression spring **45** may be like the corresponding parts shown in Fig. 4. The collar **56**, however, is shorter than the corresponding collar **41**, and the mounting of the brush is different. The brush-holder **57** comprises a socket in which the brush **59** is held. The end of the brush-holder remote from the brush is formed as a spring clip having wings **61** adapted to receive between them a flattened portion near the extreme end of the nozzle, said flattened portion being shown in Fig. 4 at **63**. The brush-holder **57** is bent, as shown, so that in this construction, as in that of Fig. 4, the axis of the brush is at an angle to the axis of the nozzle. Because of the spring clip construction, the brush-holder **57** may be readily removed and replaced.

In the use of the apparatus the operator grasps the hand-hold **135** of the nozzle and moves the nozzle and the brush as may be necessary to apply liquid to the work. In order to keep out of the way of the operator any slack in the tube **32**, there is provided a support for such slack in the form of a rod **65** having at its outer end a spring clip **67** to engage any desired locality on the tube. This rod passes through a horizontal bore in the lower end of a vertical stud **69** (Fig. 2) which passes loosely through a vertical bore in a lug on the far side of the receptacle **25**, as seen in Fig. 1, the upper portion of the stud being threaded to receive a nut **71**. When the nut has been loosened, the supporting rod **65** may be swung about the axis of the stud **69** and may also be moved lengthwise through the horizontal bore in the lower end of the stud. When, however, the nut **71** is tightened, the rod is pulled up against the underside of the lug and thus firmly held in adjusted position. In Fig. 6 a portion of the apparatus is shown as being used to apply latex cement to portions of a partly finished shoe.

It will be noted that the delivery end or outlet face of the nozzle and the adjacent operative face of the valve **37** are flat and that the axis of the pivot **39** is transverse to the axis of the nozzle and located at one side thereof so that the outlet face is not tangent to a circle through said axis. Consequently, when the handle **137** of the valve is depressed and released, the valve moves in the arc of a circle which intersects the outlet face of the nozzle and is indicated by a dot and dash line in Fig. 7. It is thus moved away from the nozzle to start the flow of latex and back again to shut off the flow without causing latex to be rubbed between the valve and the end of the nozzle.

The apparatus is particularly well adapted for use in the manufacture of the particular shoe shown, which is disclosed in application Serial No. 576,342, filed November 20, 1931 in the name of George Goddu. This shoe is herein shown in that stage of manufacture in which the assembled upper has been puller over and temporarily fastened by tacks to the insole **100** at the heel and toe ends. The illustrated assembled upper comprises the upper proper **200**, a lining **300**, a doubler **400**, a counter **500** and certain other parts. Before this shoe is side-lasted, it is necessary that cement be applied to the feather of the insole from about the tip line to the heel breast line and also to the margins, between those two lines, of the vamp and other parts of the assembled upper which, in the lasted shoe, will be superposed upon the feather of the insole and upon each other, so that they will adhere firmly to one another and to the insole if they are held in lasted position until the cement sets. In using the apparatus on such a piece of work and assuming that the shoe is held bottom-side-up, as shown, by heel and toe rests, the operator with one hand successively bends out of the way certain parts of the assembled upper to give free access to other parts thereof and to the insole, and with the other hand applies the brush to the parts and opens the valve **37** as may be necessary to insure a proper flow of cement.

In the intervals during which the brush is not in use, for example during the intervals when an operator is placing a shoe upon the supports

in position to be operated upon, it is desirable to provide a receptacle in which the brush may be placed, and preferably a receptacle containing a liquid in which the brush may remain immersed, so that the cement which it carries will not become thick or coagulated as it would tend to become were the brush exposed to the action of the atmosphere. To this end, there is supported by the base 7 a small receptacle 73 to receive the brush when it is not in use, two pairs of spring clips 75 being mounted adjacent to the rim of the receptacle in either pair of which the nozzle may be held in the manner shown in Fig. 1. A supply of a suitable liquid 77, for example water if the cement is rubber latex, will preferably be maintained in this receptacle in which the brush may be immersed to protect it from the air.

Although the invention has been set forth as embodied in a particular apparatus it should be understood that the invention is not limited in the scope of its application to the particular apparatus which has been shown and described.

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

1. An apparatus for applying liquid having in combination a receptacle for liquid, a tube leading from said receptacle, a nozzle leading from said tube, a member adjustably mounted upon the nozzle, a brush holding member, and interengaging friction means formed on said members for attaching them to each other whereby said members may be separated from one another by merely pulling them apart.

2. An apparatus for applying liquid having in combination a receptacle for liquid, a tube leading from said receptacle, a nozzle leading from said tube, a member carried by the nozzle, a brush holding member, and friction means capable of being readily disengaged for attaching the brush holding member to the other member, said means comprising interengaging portions on said members formed respectively as a conical socket and an element which fits the socket.

3. An apparatus for applying liquid having in combination a receptacle for liquid, a tube leading from said receptacle, a nozzle leading from said tube, said nozzle being provided on opposite sides thereof with flat surfaces, a holder, and a brush carried by the holder, said holder being provided with a spring clip having flat-faced wings adapted to receive between them the flat-tended portions of the nozzle.

4. An apparatus for applying rubber latex having, in combination, a receptacle for latex, a tube leading from said receptacle, a nozzle leading from said tube, a brush located to receive latex upon the outside thereof, a manually operable valve normally held in closed position over the delivery opening of the nozzle, and means for mounting the valve for movement in a curved path toward and from and intersecting the outlet face of the nozzle.

5. An apparatus for applying rubber latex having, in combination, a receptacle for latex, a tube leading from said receptacle, a nozzle leading from said tube and having a flat outlet face, a flat faced valve cooperating therewith, a brush located to receive latex upon the outside thereof, a pivot the axis of which extends at an angle to that of the nozzle and is located at one side of the nozzle axis, said valve face intersecting a circle centered on the pivot axis, a stem rigid with the valve and mounted on the pivot, and a spring normally acting to hold the valve in closed position over the delivery opening of the nozzle whereby, when the valve stem is swung in one direction and the other about the pivot, the valve opens and closes the delivery opening of the nozzle by simple movements of recession and approach without sliding contact with the end of the nozzle.

THOMAS J. DOYLE.