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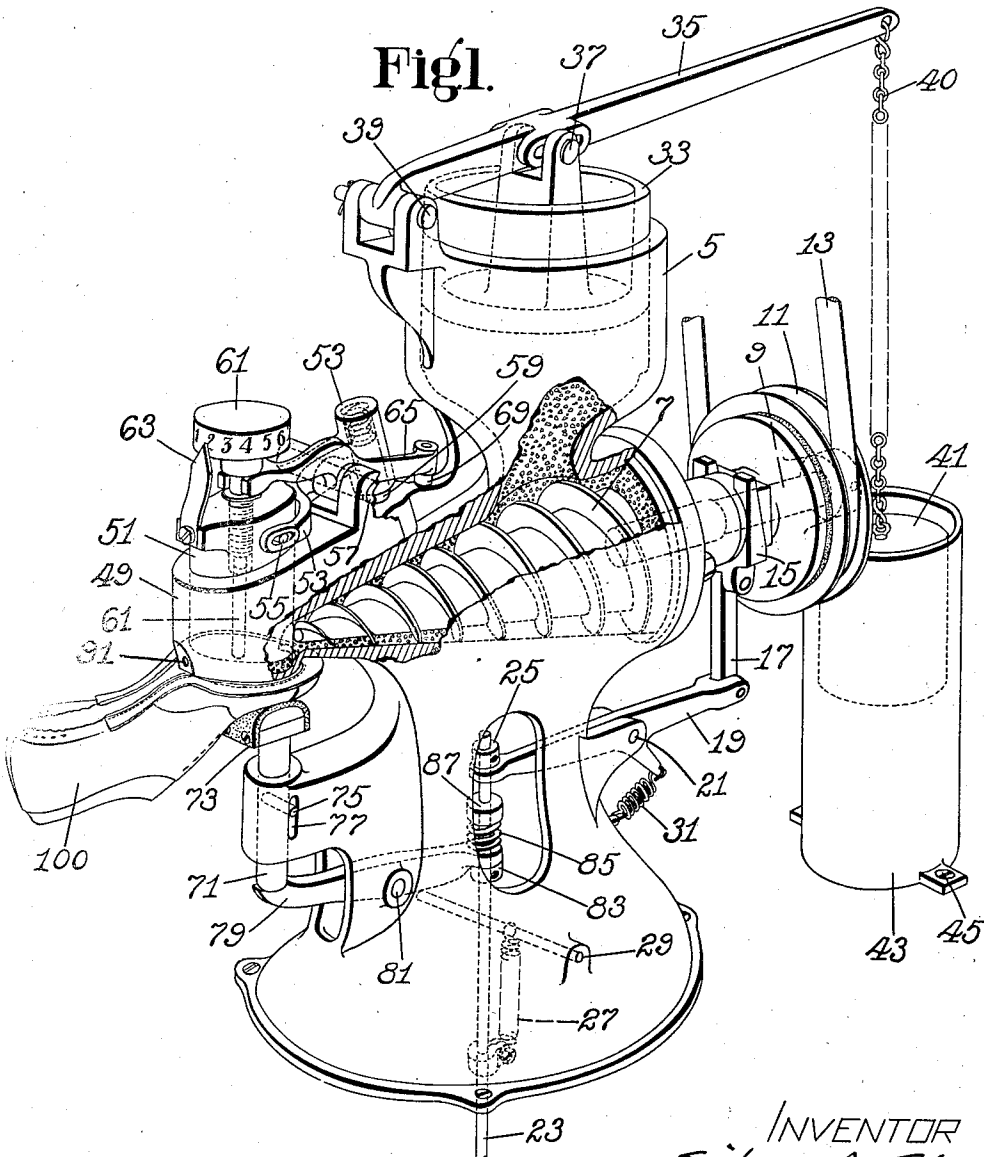
S. J. FINN

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BOTTOM FILLING MACHINE

Filed May 22, 1936

2 Sheets-Sheet 1



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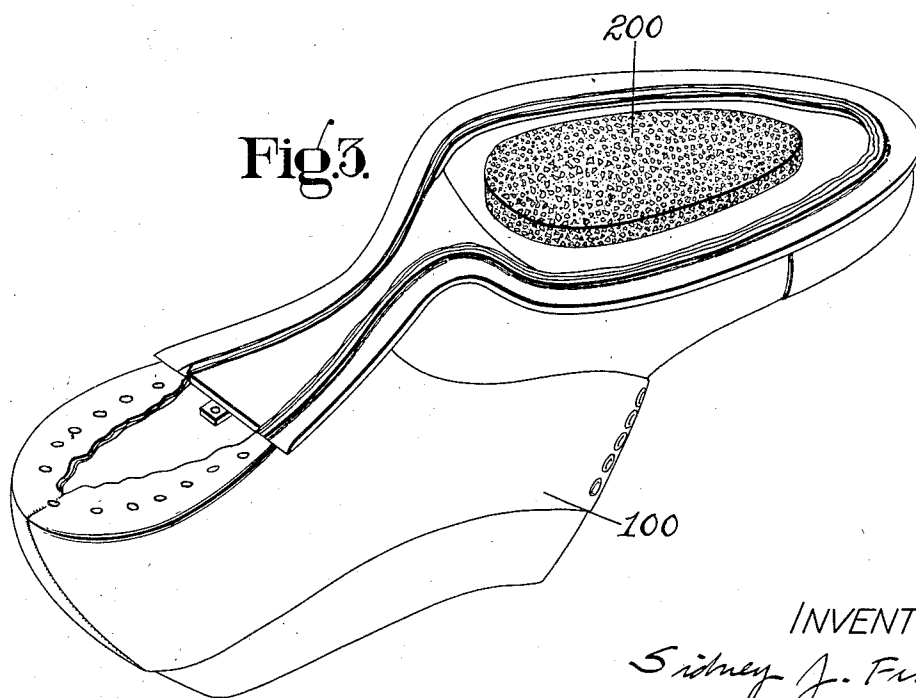
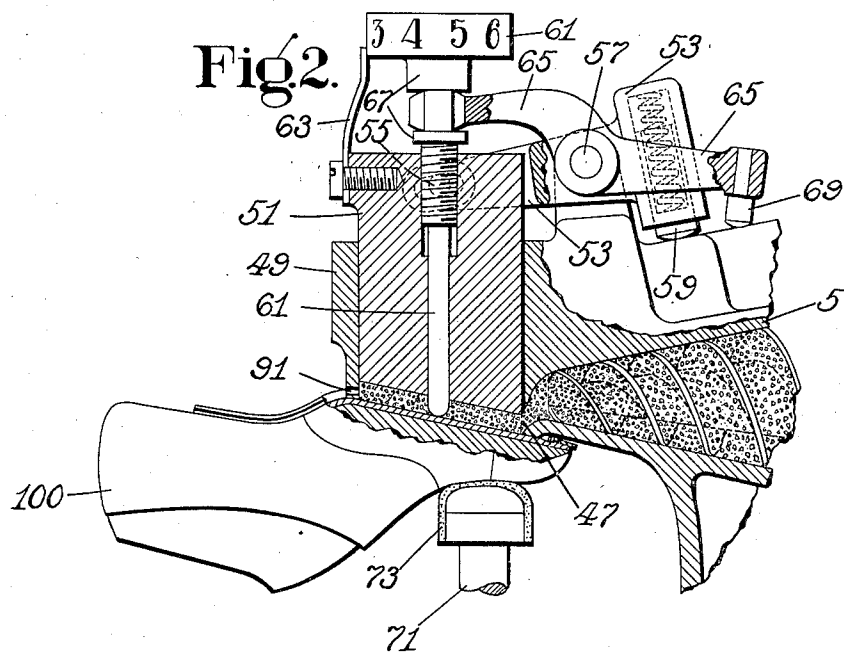
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BOTTOM FILLING MACHINE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,125,156

BOTTOM FILLING MACHINE

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Application May 22, 1936, Serial No. 81,303

16 Claims. (Cl. 12—79.6)

This invention relates to machines for filling shoes and is herein illustrated as embodied in a machine for depositing in a cavity in the bottom of a lasted shoe a filler piece in the form of a sheet of plastic filling material having a predetermined outline.

For convenience the invention will be described in connection with the filling of the cavity in the forepart of the bottom of a Goodyear welt shoe, although it should be understood that neither the particular cavity nor the particular type of shoe is material. In the manufacture of Goodyear welt shoes, it is customary to place in the forepart of the bottom of the shoe, in the cavity defined substantially by the insole, a quantity of plastic filling material to which pressure is subsequently applied to spread it throughout the cavity so that in the finished shoe this cavity, which lies between the insole and the outsole, will be completely filled. The pressure which acts to spread, press and mold the filling material may be applied in various ways, for example by a hand tool or by a suitable machine, before the outsole is pressed on the bottom of the shoe, or it may be applied through the outsole. In any case it is desirable that the filling material should be deposited in sheet form as a filler piece of predetermined outline.

According to one feature of the invention there is provided power-operated means for forcing filling material into a member having a delivery opening of suitable outline, and means for supporting a shoe and for holding it stationary in position to receive upon its bottom a filler piece delivered through the opening. In the illustrated construction the delivery member has a chamber provided with a delivery opening, said chamber being connected with a receptacle for plastic filling material upon which a force-feed mechanism acts, the shoe being placed upon a support which is moved to press the bottom of the shoe firmly against the rim of the delivery opening. There is thus deposited upon the bottom of the shoe a sheetlike piece of filling material having the outline of the delivery opening.

Inasmuch as the cavities in the bottoms of shoes vary in size, means is provided, in accordance with another feature of the invention, for varying the content of the filler piece. In the illustrated construction, means is provided for varying the effective size of the delivery chamber from which the delivery opening leads. As shown, a valve, which controls the flow of filling material from the receptacle to the delivery chamber, has a face which serves also as a wall

or bottom of the chamber, the effective size of the chamber thus varying in accordance with the position occupied by the valve when it is in open position, means being provided for varying the position occupied by the valve when it is open.

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

Referring to the accompanying drawings,

Fig. 1 is a perspective of a machine in which the invention is embodied, a shoe being shown in process of having a shaped filler piece of predetermined outline and thickness deposited in the cavity in its forepart;

Fig. 2 is a view on an enlarged scale and principally in section of the work-engaging parts of the machine, the shoe being shown as in Fig. 1; and

Fig. 3 is a perspective of a shoe in which a filler piece has been deposited.

The machine comprises a receptacle 5 for filling material which commonly consists of ground cork and a plastic binder. In the lower part of the receptacle is a conical chamber the axis of which is substantially horizontal, and in this chamber is located a conical feed screw 7 mounted on a shaft 9. A pulley 11 rotatably mounted on the shaft is continuously driven by a belt 13 from any suitable source of power. The feed screw 7 is normally at rest and may be caused to rotate at any time by means of a friction clutch which may be thrown in to connect it with the pulley 11 by pushing up a forked wedge 15. No further description of the clutch will be given since the details of its construction form no part of the present invention and any suitable clutch may be used. It will be understood, however, that when the forked wedge 15 occupies the upper position in which it is shown, power is being applied to the feed screw to rotate it, and that when the forked wedge is pulled down power is withdrawn and the feed screw comes to rest. The forked wedge 15 is connected by a link 17 with one end of a lever 19 pivoted at 21 to the frame of the machine and having at its other end an eye through which loosely passes the upper part of a treadle rod 23, said rod having adjustably fastened to it above the eye a collar 25 which, when the treadle rod has been pulled down into the position shown by depressing a treadle (not shown), swings the lever in such manner as to push up the forked wedge 15 and thereby throw in the friction clutch. The treadle

rod 23 is pulled up when the treadle is released by a tension spring 27 fastened at its lower end to a collar on the rod 23 and at its upper end to a small horizontal rod 29 carried by the frame. When the treadle has been released and the rod is pulled up by the tension spring 27, a tension spring 31 fast at one end to the frame and at the other to an arm on the lever 19 acts to pull down the forked wedge 15 and throw out the clutch.

The upper part of the receptacle 5 is cylindrical, and into it fits a plunger 33 having a fork at its upper end to receive a lever 35, there being a pin 37 passing through the arms of the fork and through a slot in the lever. This lever is pivoted at one end at 39 to a bracket integral with the receptacle; and from its other end there is suspended by means of a chain 40 a weight 41 which is guided in a cylinder 43 fastened to the bench, upon which the machine rests, by screws one of which is shown at 45. With the construction thus far described the plunger 33 exerts pressure upon the filling material to keep the feed screw supplied at all times with said material; and, when the treadle has been depressed and the parts are in the positions shown, the feed screw acts to force the filling material through an outlet 47 in the small end of the conical chamber which contains the screw.

This outlet communicates, when permitted to do so, with a delivery member 49 which is integral with the conical casing of the feed screw and has a delivery chamber the cross-section of which has the outline of the filler piece to be deposited in the cavity in the bottom of a shoe, for example the outline of the filler piece 200 shown in Fig. 3. In this chamber fits a valve 51 which, when lowered, closes the outlet of the receptacle. When the valve is raised, as shown, the outlet is opened, and the lower face of the valve serves as a wall which determines the effective depth and consequently the effective capacity of the delivery chamber. The valve 51 is urged at all times to move down, into a position in which it closes the outlet of the receptacle by a forked lever 53, the arms of the fork being slotted to receive pins 55 carried on opposite sides of the valve 51. This lever is pivoted about a rod 57, and, in a socket in its tail, carries a spring-pressed plunger 59 which contacts with the frame of the machine. The valve is normally maintained by the spring plunger in its lower closed position. It is raised by presentation of a shoe to the machine.

To this end, and in order to permit controlled variation of the height to which the valve is raised and consequently controlled variation of the thickness of the filler piece which is deposited in the shoe, a measuring pin 61 extends through the valve and projects below the lower face thereof, said pin having an enlarged portion threaded into a socket in the valve so that, by turning the pin, the extent to which it projects below the lower face of the valve may be varied. At the top of the pin is a head on which is marked a scale any one of the numbers of which may be caused to register with a stationary pointer 63. When the bottom of the shoe is presented to the machine by being forced against the rim of the delivery opening at the bottom of the member 49 in a manner presently to be described and filling material is forced from the receptacle through its outlet into the delivery chamber and upon the bottom of the shoe, the pressure exerted by the filler material tends to raise the valve. Such

raising would change the effective content of the delivery chamber which was previously determined by the extent to which the measuring pin was adjusted to project below the bottom face of the valve 51. In order to prevent such raising of the valve by the pressure of the filling material, a lever 65 fulcrumed on the same rod 57 on which the lever 53 is fulcrumed, has at one end a fork the arms of which are received between enlargements 67 on the pin 61 and has at the other end a headed stop pin 69 which, when the valve is raised by upward pressure of the bottom of a shoe against the bottom of the pin, contacts with the frame of the machine as shown in the drawings.

In order to permit the bottom of a lasted shoe 100 to be forced up against the rim of the delivery opening in the delivery member 49 and held stationary there, the stem 71 of a shoe support, in the form of a toe rest 73 having a cover of rubber or leather, is vertically slidable in a cylindrical bearing in the frame of the machine, said stem carrying a small cross-pin 75 one end of which is received in a vertical slot 77 formed in the bearing member of the stem. Adapted to be moved to raise the shoe support and to permit it to descend is a lever 79 pivoted at 81 to the frame of the machine and having its outer end located beneath the bottom of the pin 71. The inner end of the lever has an eye through which the treadle rod 23 loosely passes, said eye being located between a collar 83 adjustably fastened to the treadle rod and a comparatively heavy coil spring 85 the upper end of which bears against the under side of a second collar 87 also adjustably fastened to the rod 23.

As has been explained above the parts of the machine are shown in the positions they occupy when the treadle is held depressed. When the treadle is released, the tension spring 27 raises the treadle rod 23 so that the collar 25 is spaced somewhat above the eye in the left-hand end of the lever 19, whereupon the spring 31 pulls down the right-hand end of the lever and thereby pulls down the forked wedge member 15 to throw out the clutch. Raising of the treadle rod 23 by the spring 27 also causes the collar 83 to swing up the right-hand end of the lever 79 and thereby permit the shoe support 73 to descend and release the shoe. When, therefore, the machine is at rest, the shoe support 73 is in lowered position, the valve 51 is in lowered position in which the outlet of the receptacle 5 is closed, and the clutch is thrown out. The operator adjusts the measuring pin 61 so that it projects the desired distance below the bottom of the valve 51 to determine the thickness of the filler piece 200 which will later be deposited in the cavity in the bottom of the shoe. This adjustment of the pin also adjusts the position of the stop 69 so that the extent of upward movement of the pin and the valve 51 will be properly limited. The operator then places the shoe bottom side up with the forepart resting on the support 73 and depresses the treadle to pull down the treadle rod 23. During the first part of this downward movement the collar 87, acting through the comparatively heavy spring 85, forces the bottom of the shoe up against the bottom of the measuring pin 61 thereby lifting the valve 51 into the position shown, which opens the outlet of the receptacle, and forcing the bottom of the shoe against the rim of the opening in the delivery chamber of the member 49. During the remainder of the downward movement of the

treadle rod 23 the spring 85 is compressed, and the collar 25 pulls down the left-hand end of the lever 19 thereby throwing in the clutch to impart rotation to the feed screw 7. Filling material is now fed under pressure from the receptacle through its outlet, into the delivery chamber and upon the bottom of the shoe. The operator permits filling material to flow until a small amount of it is forced through a vent 91 so as to ensure that the delivery chamber has been completely filled. He then releases the treadle whereupon the valve and the shoe descend, and the feed screw 7 ceases its rotation. He then removes the shoe with the filler piece adhering to its bottom as shown in Fig. 3.

The illustrated machine is designed for use with a filling material of the cold type which is plastic and somewhat sticky at ordinary temperatures and which sets by reason of evaporation of a volatile liquid contained in it. The delivery member 49 and valve 51 may be heated if desired, for example by means of electrical heating units, to minimize the tendency of the filling material to stick to them. The machine can be adapted for use with filling material of the thermoplastic type by providing a suitable heating apparatus, for example electrical heating units for the receptacle, the valve 51 and the delivery member 49.

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

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

1. A shoe bottom filling machine having, in combination, a receptacle for filling material, a stationary delivery member connected with said receptacle, said member being provided with a chamber having an opening the outline of which is that of the filler pieces to be placed in the cavities in the bottoms of shoes, means acting to force filling material from the receptacle into the chamber, and a valve movable from a position in which it prevents flow of filling material to the chamber to a position in which it permits such flow through the chamber to the cavity in the bottom of a shoe held against the opening, whereby filler pieces of a uniform outline may be deposited in the cavities in the bottoms of successive shoes.

2. A shoe bottom filling machine having, in combination, a receptacle for filling material, a stationary delivery member connected with said receptacle, said member being provided with a chamber having an opening the outline of which is that of the filler pieces to be placed in the cavities in the bottoms of shoes, means acting to force filling material from the receptacle into the chamber, a valve movable from a position in which it prevents flow of filling material to the chamber to a position in which it permits such flow through the chamber to the cavity in the bottom of a shoe held against the opening, whereby filler pieces of a uniform outline may be deposited in the cavities in the bottoms of successive shoes, and adjustable means for varying the thicknesses of the filler pieces while maintaining their outlines uniform.

3. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery member connected with the receptacle and provided with a chamber having a delivery opening the outline of which has the outline of

the filler pieces to be placed in the bottoms of shoes held in position to close the opening, a valve for controlling flow of filling material from the receptacle to the opening, and means acting when the valve is open to force filling material from the receptacle through the opening and upon the bottom of the shoe.

4. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery member connected with the receptacle and provided with a chamber having a delivery opening the outline of which has the outline of the filler pieces to be placed in the bottoms of shoes held in position to close the opening, a valve for controlling flow of filling material from the receptacle to the opening, means acting when the valve is open to force filling material against the bottom of the shoe, and operator-controlled means for pressing the bottom of the shoe against the rim of the opening in the delivery member.

5. A shoe bottom filling machine having, in combination, a delivery chamber provided with a delivery opening having the outline of the desired filler piece, means including a lever for forcing the rim of the opening into firm contact with the bottom of a shoe, means for forcing filling material into the delivery chamber, and means for varying the effective content of the chamber.

6. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery member connected therewith and provided with a chamber having a delivery opening the outline of which is that of the filler pieces to be placed in the cavities in the bottoms of shoes, and a valve movable in the chamber to open and close the connection between the chamber and the receptacle, one face of the valve forming a wall the position of which determines the effective depth of the chamber and thereby the thicknesses of the filler pieces which will be delivered to the bottoms of shoes presented to the delivery opening.

7. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery member connected therewith and provided with a chamber having a delivery opening the outline of which is that of the filler pieces to be placed in the cavities in the bottoms of shoes, a valve movable in the chamber to open and close the connection between the chamber and the receptacle, one face of the valve forming a wall the position of which determines the effective depth of the chamber and thereby the thicknesses of the filler pieces which will be delivered to the bottoms of shoes presented to the delivery opening, and a member carried by the valve and projecting from that face of the valve which forms a wall, said member also projecting beyond the delivery opening when the valve is in position to close the connection between the chamber and the receptacle.

8. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery member connected therewith and provided with a chamber having a delivery opening against which the bottom of a shoe to be filled is held, means for pressing the bottom of the shoe against the rim of the opening and for holding the shoe stationary, means adapted to feed filling material from the receptacle into the chamber, a valve slidable in the chamber to control such feeding, said valve being adapted to be moved by pressing the bottom of the shoe against

the rim of the opening to open said connection, and means for varying the extent of movement permitted to said valve.

9. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery chamber connected therewith and provided with a delivery opening against the rim of which the bottom of a shoe to be filled is held stationary, said opening having the outline of the filler piece desired to be placed in the cavity in the rim of the shoe, means adapted to feed filling material from the receptacle into the chamber into contact with the bottom of the shoe, a valve fitting in said chamber and slidable toward the delivery opening to close the connection between the chamber and the receptacle and away from the delivery opening to open said connection, yielding means normally holding the valve in position to close the opening, a measuring member adjustably carried by the valve and adapted to be engaged by the shoe to move the valve away from the delivery opening, and a stop member connected to the measuring member for limiting the extent of the last-named movement.

10. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery chamber connected therewith and having a delivery opening, means adapted to feed filling material from the receptacle into the chamber into contact with the bottom of a shoe, a valve slidable in the chamber, yielding means urging the valve at all times to occupy its lowermost position in which the connection between the receptacle and the delivery chamber is closed, a measuring member adjustable with respect to the valve and adapted to be engaged by the shoe to move the measuring member and with it the valve upward, and a stop member adjustable with the measuring member to limit upward movement of the valve.

11. A shoe bottom filling machine having, in combination, a member provided with a chamber having a delivery opening, a support for a shoe, a receptacle for filling material, force-feed mechanism adapted when actuated to force filling material into the chamber, and operator-controlled means for first moving the support to press the bottom of the shoe and the rim of the delivery opening into firm contact and hold the shoe stationary and then to apply power to the force-feed mechanism.

12. A shoe bottom filling machine having, in combination, a receptacle for filling material, a stationary delivery member connected with the receptacle, said member being provided with a chamber having an opening the outline of which is that of the filler pieces to be placed in the cavities in the bottoms of shoes; power-operated

means acting when permitted to do so to force filling material through the chamber directly into the cavity in the bottom of a shoe held stationary against the rim of the opening, and a valve for controlling the connection between the chamber and the receptacle.

13. A shoe bottom filling machine having in combination, a receptacle for filling material a stationary delivery member connected with the receptacle, said member being provided with a chamber having an opening the outline of which is that of the filler pieces to be placed in the cavities in the bottoms of shoes, power-operated means acting when permitted to do so to force filling material through the chamber directly into the cavity in the bottom of a shoe held stationary against the rim of the opening, a valve for controlling the connection between the chamber and the receptacle, and treadle-controlled means for forcing the bottom of a shoe against the rim of the opening and for opening the valve.

14. A shoe bottom filling machine having, in combination, a receptacle for filling material, a stationary delivery member connected with the receptacle, said member being provided with a chamber having an opening the outline of which is that of the filler pieces to be placed in the cavities in the bottoms of shoes, power-operated means acting when permitted to do so to force filling material through the chamber directly into the cavity in the bottom of a shoe held stationary against the rim of the opening, a valve for controlling the connection between the chamber and the receptacle, a support for a shoe located below the delivery member, and treadle-controlled means for moving the support toward the delivery member and for opening the valve.

15. A shoe bottom filling machine having, in combination, a receptacle for filling material, a delivery chamber provided with a delivery opening the outline of which is that of the filler pieces one of which is to be placed in the cavity in the bottom of each shoe, said chamber being connected with the receptacle, means for holding a shoe stationary with its bottom pressed against the rim of the opening in the delivery chamber, means for forcing material from the receptacle into the delivery chamber while the shoe is so held, and adjustable means for varying the content of the delivery chamber to vary the thickness of the filler piece while maintaining its outline.

16. A shoe bottom filling machine having, in combination, means for delivering under pressure to the cavities in the bottoms of shoes plastic filler pieces all of the same outline, and an adjustable member manipulation of which varies the thicknesses of said filler pieces.

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