Oct. 16, 1945. C. CHEW ET AL 2,387,213

POUR-OUT FINISHES FOR CONTAINERS

Filed Feb. 1, 1943 2 Sheets-Sheet 1

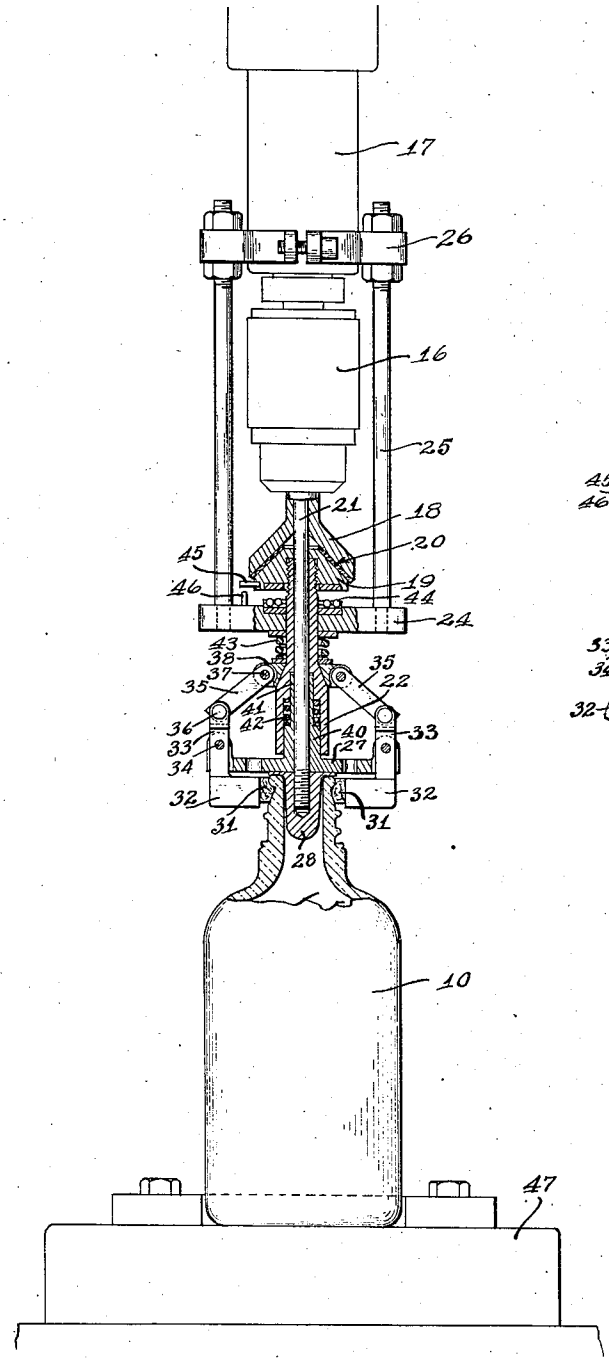


Fig. 1.

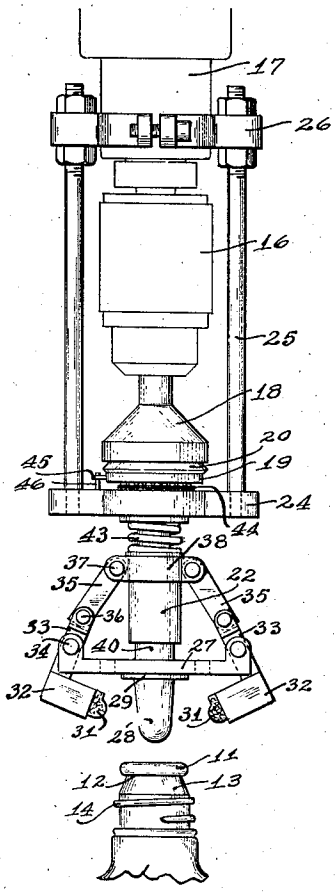


Fig. 2.

Inventors
CLARENCE CHEW
ROBERT H. LEVIS II

By Rule and Hoge

Attorneys

Oct. 16, 1945. C. CHEW ET AL 2,387,213

POUR-OUT FINISHES FOR CONTAINERS

Filed Feb. 1, 1943 2 Sheets-Sheet 2

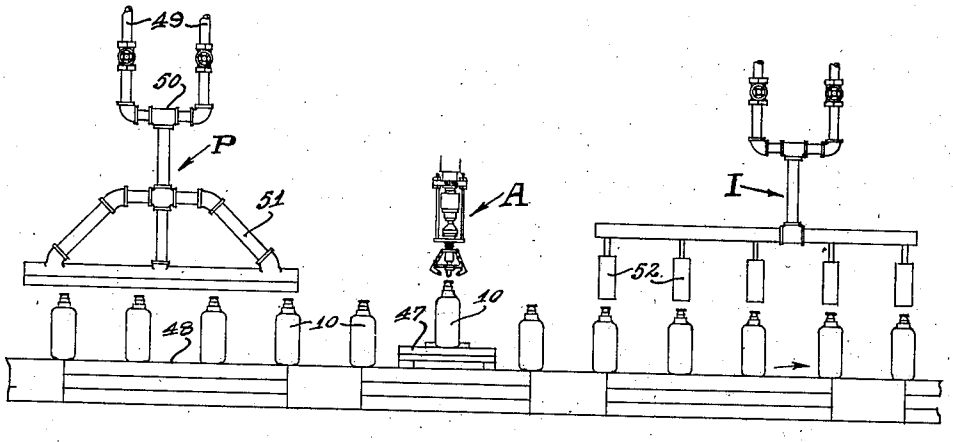


Fig. 3.

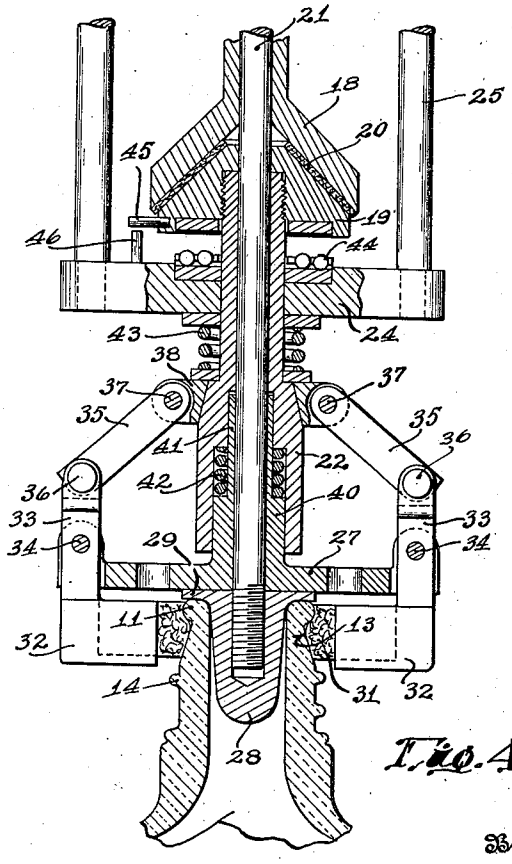


Fig. 4.

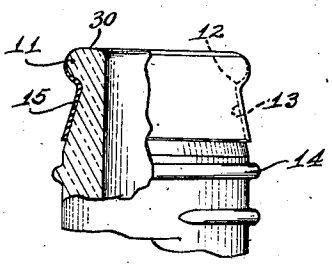


Fig. 5.

Inventors
CLARENCE CHEW
ROBERT H. LEVIS II

By Rule & Hoge

Attorneys

Patented Oct. 16, 1945

2,387,213

UNITED STATES PATENT OFFICE

2,387,213

POUR-OUT FINISHES FOR CONTAINERS

Clarence Chew and Robert H. Levis, II, Alton, Ill., assignors to Owens-Illinois Glass Company, a corporation of Ohio

Application February 1, 1943, Serial No. 474,286

2 Claims. (Cl. 91—37)

Our invention relates to apparatus for coating and impregnating exterior surface portions of bottles or other containers, adjacent to the neck openings thereof with a liquid-repellent substance for giving a better control in pouring or dispensing a liquid from the container, and preventing the liquid from spreading over and running down the exterior surface of the container.

In pouring water and numerous other liquid substances from bottles and other containers, the liquid has a tendency to wet and spread over the exterior surfaces of the container, often running down the outside surface of the container. This is objectionable as it prevents accurate control of the liquid as it is being dispensed and musses the container.

An object of our invention is to provide a novel and practical apparatus for coating and impregnating the finishes or lip portions of containers in a manner to prevent wetting of such portions when a liquid is poured from the container, and to facilitate the accurate control of the liquid while being poured.

Other objects of the invention will appear hereinafter.

Referring to the accompanying drawings:

Fig. 1 is a part-sectional elevation of an apparatus, herein referred to as an applicator, for coating the exterior finish or lip portion of bottles and the like.

Fig. 2 is an elevational view of the same, but with the parts in a different position.

Fig. 3 is a diagrammatic view showing the applicator and means for heating the parts of the containers to be treated both before and after the application of said material.

Fig. 4 is a view similar to Fig. 1 but on a larger scale and with parts broken away.

Fig. 5 is a part-sectional elevation of the neck portion of a bottle to which the coating material has been applied.

The apparatus is herein illustrated and described as adapted for treating bottles 10, although adaptable to other forms of containers. The upper end of the bottle neck comprises an annular bead or lip portion 11 of rounded contour merging at a line 12 into an upwardly and inwardly tapered neck portion 13, said bead and neck portion being comprised in what is usually termed the bottle "finish". Beneath the finish, the bottle neck may be provided with a spiral boss or thread 14 for the attachment of a cap or closure.

In accordance with our invention, the exterior surfaces of the bead 11 and neck portion 13 have applied thereto a coating or layer 15 of a suitable material which is applied while the glass is hot and which after being applied may be heat treated, all as more fully set forth hereinafter.

The material used for the coating 15 may consist of paraffin, tallow, a mixture of paraffin and tallow in any desired proportions, oils or oily substances which are not miscible with water. The nature of the substance used may in some instances be governed by the nature of the liquid contents of the container. The coating material, being water-repellent prevents the liquid contents of the bottle from wetting and spreading over and running down the exterior surfaces of the bottle as the contents are being poured out. Also, with such surface coating, pouring of the liquid contents of the bottle is under better control. The liquid may be poured more slowly and may, if desired, be poured drop by drop with comparative ease.

We have found that in order to make the coating 15 permanent, it is necessary to apply the material while the glass is hot. Good results are obtained with temperatures extending through a rather wide range, as from 200° to 500° F., or even higher. The upper limit is established by the highest temperature of the glass at which the coating material can be applied without checking or breaking the glass. The coating material, if desired, may also be heated and applied while hot to the surface to be coated. Any excess of the material may be removed by wiping the coated surface after the container has been cooled. We have found, however, that any excess material is preferably removed during and by an impregnation treatment which consists in subjecting the coated surface to the action of a burner or series of burners after the coating operation. When the coating material has been applied to the glass, while the latter is at a high temperature as before indicated, an intimate bond or union of a film of the material with the glass is formed. The effectiveness of this bond is increased by the action of the burners after the coating material is applied, the glass surface apparently being impregnated with the material in such a manner as to give great stability. The water-repellent coating or film does not break down, rub off, or wear off under ordinary conditions met with in practice.

An applicator A for applying the coating material, as illustrated in the accompanying drawings will now be described. It includes a revolving chuck 16 extending downward from a non-rotary support or casing 17 in which it is

journalled. A driving clutch member 18 rotates with the chuck and has a limited up-and-down movement therein. A driven clutch member 19 is movable up and down relative to the driving member 18, into and out of frictional driving engagement therewith. A friction washer 20 is interposed between the clutch members. A tubular member or clutch quill 22 is attached at its upper end to the clutch member 19. A vertical spindle 21, concentric with the clutch member 19 and clutch quill 22, extends through said clutch member and quill which are mounted for limited up-and-down sliding movement on the spindle as hereinafter set forth. A frame 25 includes vertical rods and a yoke 26 by which the frame is clamped to the member 17. The lower end of said frame comprises a yoke 24 with a central opening through which the quill 22 extends.

A crossbar or yoke 27 has a fixed mounting on the spindle 21 adjacent the lower end thereof so that the spindle is rotated by the crossbar and moved up and down therewith as a unit. A centering pin 28 is removably attached to the lower end of the spindle, the latter being screw threaded for this purpose so that the centering pin is held in centered position against the bottom face of the yoke 27 and rotates with the yoke and spindle. This centering pin or tip 28 is formed with an annular flange 29 adapted to overlie the top sealing surface 30 of the container and thereby prevent the coating material 15 from coming in contact with said surface. The tip 28 may be replaced by other tips of various sizes and shapes, corresponding to the particular bottles or containers to which the coating material is to be applied.

Absorbent material 31, such as felt pads, sponges, or the like, is placed in holders 32 formed on the lower end of arms 33 connected by pivots 34 to the yoke 27. Links 35 are connected at their lower ends by pivots 36 to the arms 33 and at their upper ends are connected by pivots 37 to a collar 38 having a fixed mounting on the quill 22. As the driven clutch member 19 and the collar 38 are both fixed to the clutch quill 22, rotation of the clutch member 19 will cause rotation therewith of the links 35, sponge holders 32, yoke 27 to which they are pivoted, spindle 27 to which the yoke is fixed, and centering pin 28 on the spindle. When the clutch member 19, with the quill 22 is moved up and down relative to the yoke 27, the links 35 and arms 33 serve as toggles and operate to swing the holders 32 outwardly to open position (Fig. 2) and inwardly to operative position (Figs. 1 and 4) for applying the coating material with which the pads 31 are impregnated. The yoke 27 is formed with a hub or sleeve extension 40, surrounding the spindle 21 and having a telescoping connection with the quill 22. The upper portion 41 of the extension 40 is of reduced diameter to provide a space in which is housed a coil compression spring 42. A coil spring 43, which functions as a clutch releasing spring, is mounted on the quill 22 between the yoke 24 and the collar 38. Ball bearings 44 are provided between the yoke 24 and the clutch member 19. A stop pin 45 attached to the clutch member 19 is intercepted by a stop pin 46 on the yoke 24 when the clutch members are released and prevents continued rotation of the applicator.

Referring to Fig. 3, the bottles 10 may be supported on a stationary platform 47 or table directly beneath the applicator. The preheater P and the impregnator I are located at opposite sides respectively of the applicator, directly over an endless belt conveyor 48 which travels beneath the table 47.

The preheater P comprises burners positioned over the path of the bottles 10. Fuel gas and air, oxygen or other combustion supporting gas, are supplied through pipes 49, a mixer 50 and a manifold 51 to the burners. As the bottles are carried beneath the preheater, the neck portions are heated so that when they reach the applicator they are at the required temperature. Each bottle as it approaches the table 47 is lifted from the conveyor and placed on the table. The applicator is then operated to apply the coating material. The bottle is then returned to the conveyor and passes beneath the impregnator I. The latter comprises a series of burners 52 which apply heating flames to the coated surfaces and thereby impregnate the glass surfaces with the coating material or strengthen the bond between the glass and said material and at the same time remove any excess material.

In the operation of the applicator A, when a bottle has been placed in position on the table 47, the frame 25 is moved downward, carrying with it the clutch member 19 and the spindle 21, causing the tip 28 to enter the bottle neck and center the bottle. When the tip flange 29 seats on the bottle, the continued downward movement of the frame 25 operates through the coil spring 43 to continue the downward movement of the quill 22 so that it compresses the spring 42 and operates through the toggles to swing the holders 32 inwardly to operative position in which the felt pads 31 bear against the surface to which the coating material is to be applied. The downward movement of the frame 25 also carries the driving clutch member 18 into engagement with the driven clutch member 19 and moves the yoke 24 away from the driven clutch member, compressing the spring 43 and withdrawing the stop pin 46. The applicator now rotates and thereby applies a film or layer of the coating material. The frame 25 is then lifted permitting the spring 42 to expand and swing the toggles to open position (Fig. 2). The spring 43 is also allowed to expand for drawing the lower clutch member 19 and quill 22 downwardly relative to the frame 25 so that the clutch member rests on the ball bearings 44 and the stop pin 46 quickly and positively arrests the rotation of the applicator.

Modifications may be resorted to within the spirit and scope of our invention.

We claim:

1. An applicator for applying a coating material to an exterior surface portion of a round container, said applicator including a spindle rotatable about its axis, a centering pin carried thereby for entering the neck of the container and holding the latter centered, a tubular member concentrically mounted for rotation with said spindle, said member and spindle being relatively movable lengthwise of said axis, a yoke fixed to the spindle, an arm pivoted to the yoke, an absorbent pad carried by said arm in position to bear against said exterior surface of the container, a link connecting said pivoted arm and said member and forming with said arm a toggle connection between the yoke and said member and operable by said relative movement of said member and spindle to move the pad into and out of contact with the surface to be coated.

2. An apparatus for applying a coating material to the exterior surface of a round container, said apparatus comprising a clutch including a

driving member and a driven member rotatable about a vertical axis, a spindle concentric with and extending downward below the driving member, a tubular clutch quill attached to the driven member and depending therefrom, said spindle extending through the quill and said quill being movable up and down on the spindle, a centering pin attached to said spindle for entering the neck of the container and holding the latter centered, pads for applying a coating material, holders for said pads, said holders being pivotally supported on the spindle, and toggle means connecting said quill and pad holders for swinging the pads to and from operative position.

CLARENCE CHEW.
ROBERT H. LEVIS, II.