

Feb. 18, 1947.

J. BELADA

2,416,249

APPARATUS FOR LINING CAPS

Filed Feb. 5, 1943

2 Sheets-Sheet 1

Fig. 1.

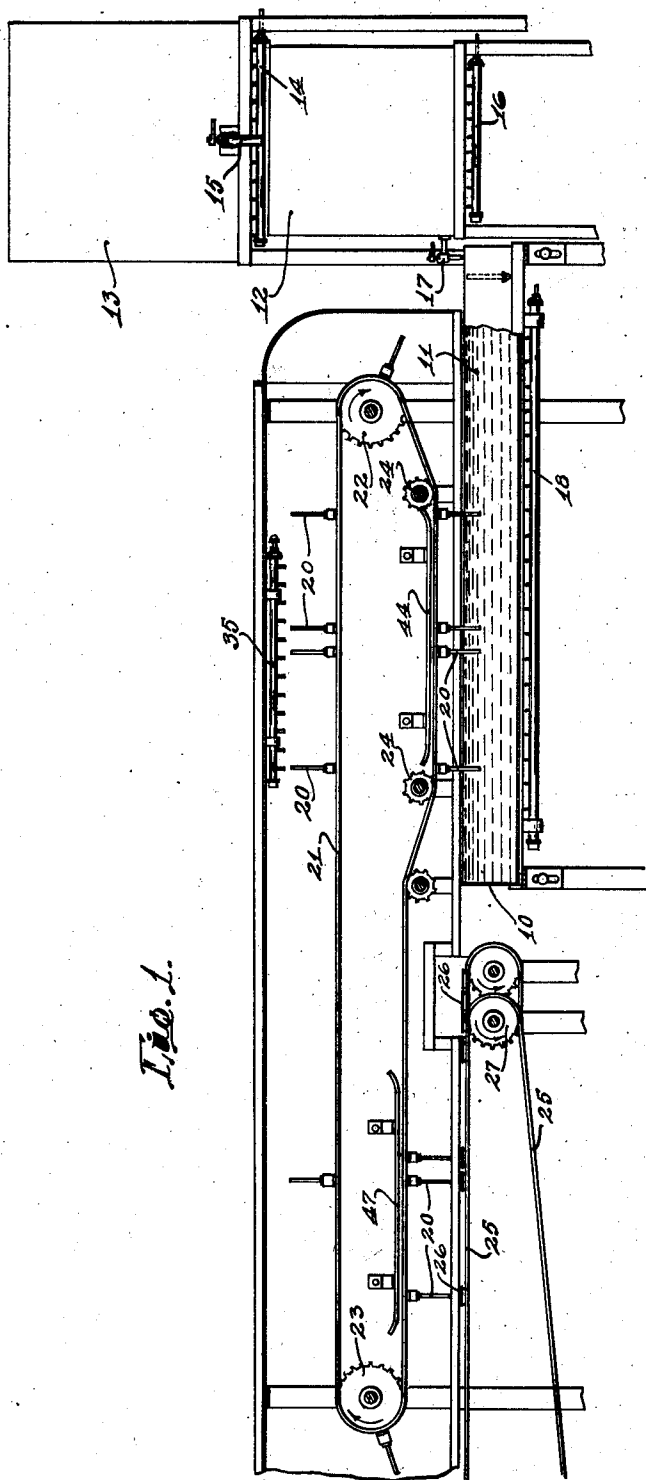
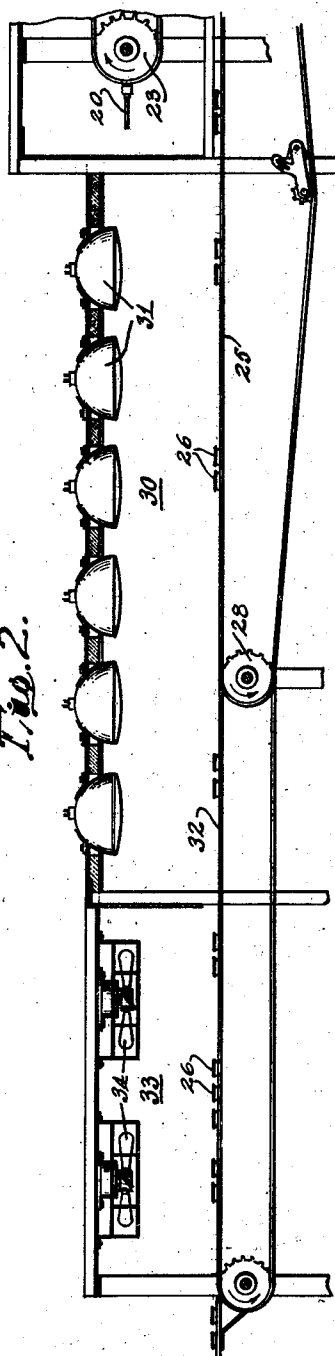


Fig. 2.



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Fig. 3.

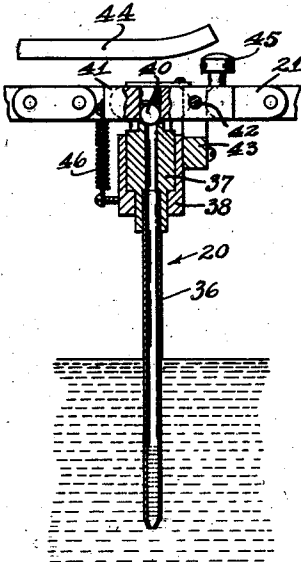


Fig. 4.

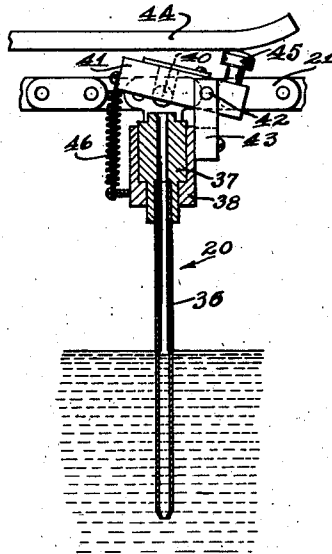


Fig. 5.

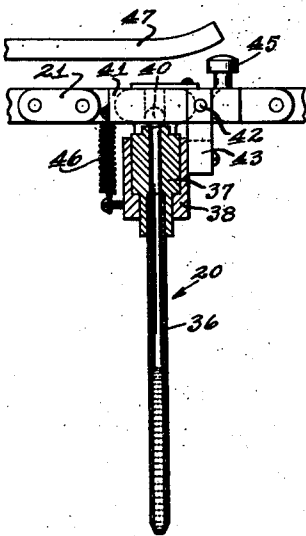
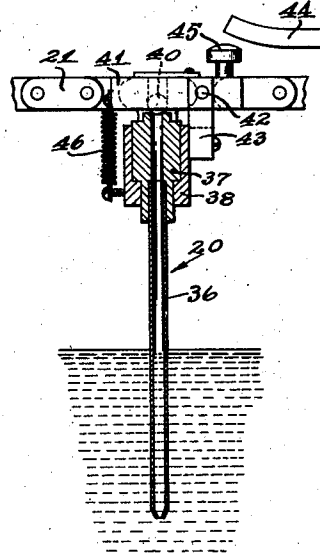


Fig. 6.

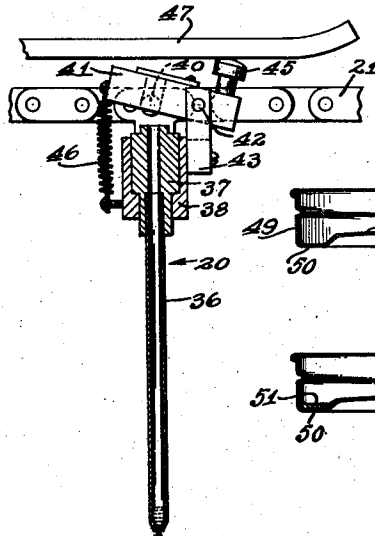


Fig. 7.

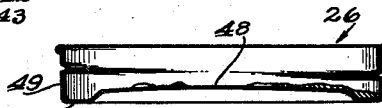


Fig. 8.

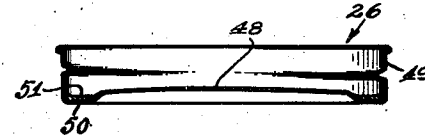
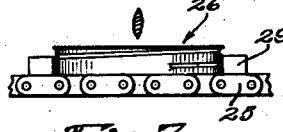
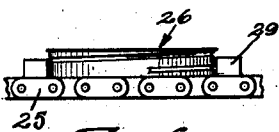


Fig. 9.



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APPARATUS FOR LINING CAPS

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10 Claims. (Cl. 91-43)

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My invention relates to apparatus for applying coating or lining materials to articles and is particularly adapted for applying lining material such as wax or the like to the interior of caps used as closures for bottles, jars and other containers. Such lining may serve as a sealing gasket. An object of my invention is to provide an apparatus by which a sealing material may be applied to a series of caps in rapid succession.

A further object of the invention is to provide such an apparatus in which the sealing material is applied while hot and in a liquid condition, then distributed and evenly spread over the sealing area and thereafter cooled and solidified to form a sealing gasket.

A further object of the invention is to provide apparatus of the character indicated by which measured quantities of the wax or sealing material are withdrawn from a pool of the molten material and discharged into the inverted caps which are to be lined, the material being then spread and distributed to form an annular liner and thereafter cooled and solidified.

Other objects of the invention will appear hereinafter.

Referring to the accompanying drawings which illustrate a preferred embodiment of my invention:

Fig. 1 is a part-sectional longitudinal elevation of a portion of the apparatus.

Fig. 2 is a similar view of the remaining portion, Figs. 1 and 2 taken together showing the entire apparatus.

Figs. 3 to 7 are part-sectional elevational views of a pipette and associated parts, illustrating successive steps in the operation.

Fig. 3 shows a pipette lowered into the pool of molten material.

Fig. 4 shows the valve opened, permitting the material to flow into the pipette up to the level of the pool.

Fig. 5 shows the valve closed to retain the material while the pipette is transferred to a discharge position.

Fig. 6 shows the pipette positioned over a cap.

Fig. 7 shows the valve open and the material being discharged.

Fig. 8 is a sectional view of an inverted cap into which the lining material has been discharged.

Fig. 9 is a similar view after the lining material has been distributed.

Referring to Figs. 1 and 2, the apparatus comprises a tank 10 containing a pool of the lining material 11 (herein referred to as wax) in a mol-

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ten or liquid form. The molten wax is supplied to the tank 10 from a reservoir or supply tank 12. The wax is first introduced into a tank 13 and melted by means of burners 14. The molten wax is run from the tank 13 through a tap 15 into the reservoir 12 in which it may be further heated and/or retained at the required temperature by means of a burner 16 beneath the reservoir. The molten wax flows from the reservoir 12 through a tap 17 into the tank 10. A burner 18 extending lengthwise beneath the tank 10 maintains the wax at the required temperature.

Pipettes 20 are mounted on an endless sprocket chain conveyor or conveyors 21, trained over sprocket wheels 22 and 23 and driven continuously in the direction indicated by the arrows. As the pipettes pass around the sprocket wheel 22, they are inverted from an upright to a depending position by which they are caused to dip into the pool 11 for the gathering operation. The conveyor 21 passes beneath sprocket wheels 24 by which it is guided and the pipettes held partially immersed to the required depth while receiving charges of the molten wax, the volume of each charge depending upon the depth of the pipette. After the pipettes have received their charges they are withdrawn from the pool and brought over an endless conveyor 25 which carries the caps or closures 26 into which lining material is discharged.

The conveyor 25 is trained over sprocket wheels 27 and 28 and is continuously driven in synchronism with the conveyor 21, the upper strand of the conveyor 25 traveling horizontally in the same direction and at the same speed as the lower strand of the conveyor 21. The caps 26 are fed in a continuous series onto the conveyor 25 at the right-hand end thereof (Fig. 1), and are uniformly spaced apart by spacing blocks 29 (Figs. 6 and 7) on the conveyor 25. The pipettes 20 are correspondingly spaced, preferably throughout the entire length of the conveyor 21, although they are not all shown on the drawings. The pipette conveyor 21 as shown in Fig. 1 extends a considerable distance beyond the tank 10 at the left-hand end thereof in overlapping relation to the cap conveyor 25 to permit the discharge of the lining material into the caps as hereinafter described.

A heating chamber or compartment 30 (Fig. 2) positioned beyond the conveyor 21 is provided with a series of lamps or heaters 31. The caps 26 travel lengthwise through the heating chamber 30 on the conveyor 25 and a conveyor

32, and are thereby heated. The burners 31 are preferably arranged directly over the path of the caps and direct the heat rays against the caps and the wax therein for heating and distributing the wax. The conveyor 32 extends through a cooling compartment or chamber 33 provided with fans 34 which blow cooling air downwardly against the caps and thereby cool them and harden the lining material. The pipettes 20 may be heated as by means of a gas burner 35 (Fig. 1) before they are dipped into the pool.

Referring to Figs. 3 to 7, each pipette includes a tubular stem 36 having a constricted opening at its lower end, and a cylindrical head 37 attached to the stem and formed with a passage-way therethrough. The head 37 is mounted in a supporting bar 38 which may be in the form of a crossbar adapted for supporting a plurality of the pipettes. A ball valve 40 is mounted in a rock arm 41 which is connected by a pivot 42 to an arm 43 attached to the bar 38. The valve is adapted to seat on the head 37 and seal the opening.

The valve is opened to permit a charge of the molten wax to flow into the pipette, by means of a stationary cam 44 (Figs. 1 and 3 to 5) positioned over the lowermost portion of the conveyor 21. As a pipette approaches the gathering area, a button 45 on the arm 41, engages the cam and swings the arm up, opening the valve (Fig. 4). This relieves the air pressure in the pipette and permits the liquid wax to flow upwardly therein to the level of the pool. The button 45 runs off the cam (Fig. 5) before the pipette is withdrawn from the pool. A coil spring 46 then closes the valve and prevents premature discharge of the liquid from the pipette.

A second cam 47 (Fig. 1) similar to the cam 44, serves to open the valve and hold it open a sufficient length of time for discharging the molten wax. Fig. 6 shows a pipette brought directly over a cap just before the valve is opened. Fig. 7 shows the valve open and the molten wax being discharged.

The cap 26 may be of conventional form as shown in Figs. 8 and 9 and comprises a circular body or cover portion 48 and a skirt or flange 49, with an intermediate annular portion 50 adapted to seat on the rim of a jar or other container when the cap is applied thereto. The body 48 of the inverted cap as shown is somewhat convexed upwardly and the annular sealing portion 50 is offset downwardly, thereby providing a shallow annular trough to receive the sealing material.

The molten material when discharged onto the body portion 48 runs by gravity into the recessed portion 50 and is uniformly distributed therein to form the ring gasket 51 or lining (Fig. 9) of sealing wax. This distribution of the molten wax takes place while the caps are traveling through the heating compartment 30, the cooling and setting of the wax taking place in the cooling compartment 33.

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

I claim:

1. The combination of a container for a pool of molten lining material, an endless traveling conveyor, means for guiding the conveyor and causing a portion thereof to travel horizontally over the pool, through a gathering zone, pipettes carried by said conveyor and arranged to project downward therefrom into the pool and be carried

through the pool while traversing the gathering zone and gather charges of the molten material, a second conveyor arranged to travel beneath said first mentioned conveyor, and means for causing the pipettes to discharge the gathered material into caps supported on and traveling with said second conveyor.

2. The combination of a container for a pool of molten lining material, an endless conveyor, pipettes carried thereby, means for driving the conveyor and causing the pipettes to dip into the pool and travel with the conveyor while in dip, valves for the pipettes, means for opening the valves and holding them open while the pipettes are in dip and closing them before the pipettes are withdrawn from the pool, and means for again opening the pipettes at a position beyond the pool for discharging the material therefrom.

3. The combination of a container for a pool of molten wax, an endless belt conveyor, pipettes, means for attaching the pipettes to the conveyor with the pipettes projecting outwardly from the conveyor, means for guiding said conveyor and causing a portion thereof to travel horizontally over the pool through a gathering zone with the projecting pipettes extending downward into the pool while traversing said gathering zone, valves individual to said pipettes, a stationary cam, means operated by the cam for opening the valves and thereby admitting charges of the molten material into the pipettes, and means for closing the valves before the pipettes are withdrawn from the pool.

4. The combination of a container for a pool of molten wax, an endless belt conveyor, pipettes, means for attaching the pipettes to the conveyor with the pipettes projecting outwardly from the conveyor, means for guiding said conveyor and causing a portion thereof to travel horizontally over the pool through a gathering zone with the projecting pipettes extending downward into the pool while traversing said gathering zone, valves individual to said pipettes, a stationary cam, means operated by the cam for opening the valves and thereby admitting charges of the molten material into the pipettes, means for closing the valves before the pipettes are withdrawn from the pool, and means positioned beyond the pool for again opening and closing the valves while traveling with the conveyor and thereby discharging the charges of molten material.

5. The combination of a tank to contain a pool of molten wax, an endless horizontally traveling conveyor comprising a portion traveling over the tank and a portion extended beyond the tank, pipettes, means for attaching the pipettes to the conveyor to travel therewith with the pipettes projecting into position to be partially immersed in the pool while traveling with the conveyor, valves for said pipettes, a stationary cam, means actuated by the cam for opening and closing the valves while the pipettes are moving through the pool, a second stationary cam, and means actuated thereby for opening the valves while the pipettes are traveling with that portion of the conveyor which extends beyond the pool.

6. The combination of a pipette comprising a tubular stem, a head connected to the stem at one end thereof and having an opening extending therethrough in register with the stem, an arm pivotally connected to said head, a valve carried by said arm and movable thereby into position to seat on said head and close said opening, means for swinging said arm into position to open the valve, and means for swinging the arm into posi-

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tion to close the valve, said stem having a restricted opening at the free end thereof.

7. The combination of a pipette comprising a tubular stem, a head connected thereto at one end thereof and having an opening extending there-
5 through in register with the stem, a valve mounted for movement into and out of position to seat on said head and close said opening, a cam, and means actuated thereby for opening the valve.

8. The combination of a pipette comprising a
10 tubular stem, a head connected thereto and having an opening extending therethrough in register with the stem, an arm pivotally connected to said head, a ball valve carried by said arm, a cam, means for effecting a relative movement of said
15 head and cam and thereby causing the cam to swing said arm and open the valve, and a spring for returning said arm and closing the valve.

9. A pipette comprising a tubular stem, a head
20 attached to said stem and having a bore extending therethrough in line with the stem, a traveling chain conveyor, a supporting block attached to and carried with the conveyor and in which said head is mounted, a container for a pool of liquid material in position for the pipette to move
25 through the pool as it travels with the conveyor, a lever arm having a pivotal connection with said block, a ball valve carried on said arm and positioned over said head, a cam, means for supporting the cam in position to swing said arm and
30 lift the valve while the pipette is moving through the pool, and a spring for returning said arm and moving the valve downward to close the pipette.

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10. The combination of a traveling conveyor, a pipette carried thereby and comprising a depending tubular stem with an inlet and discharge opening at the lower end thereof, means for introducing a measured quantity of a lining material in liquid form through said opening into the traveling pipette and thereby bringing the material to a predetermined level within said stem, and means for retaining the material at said level while the pipette is carried by the conveyor to a discharging position, means for discharging said material through said opening while the pipette is traveling with the conveyor, and means for supporting a cap in position to receive the material as it is discharged.

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