

Dec. 22, 1953

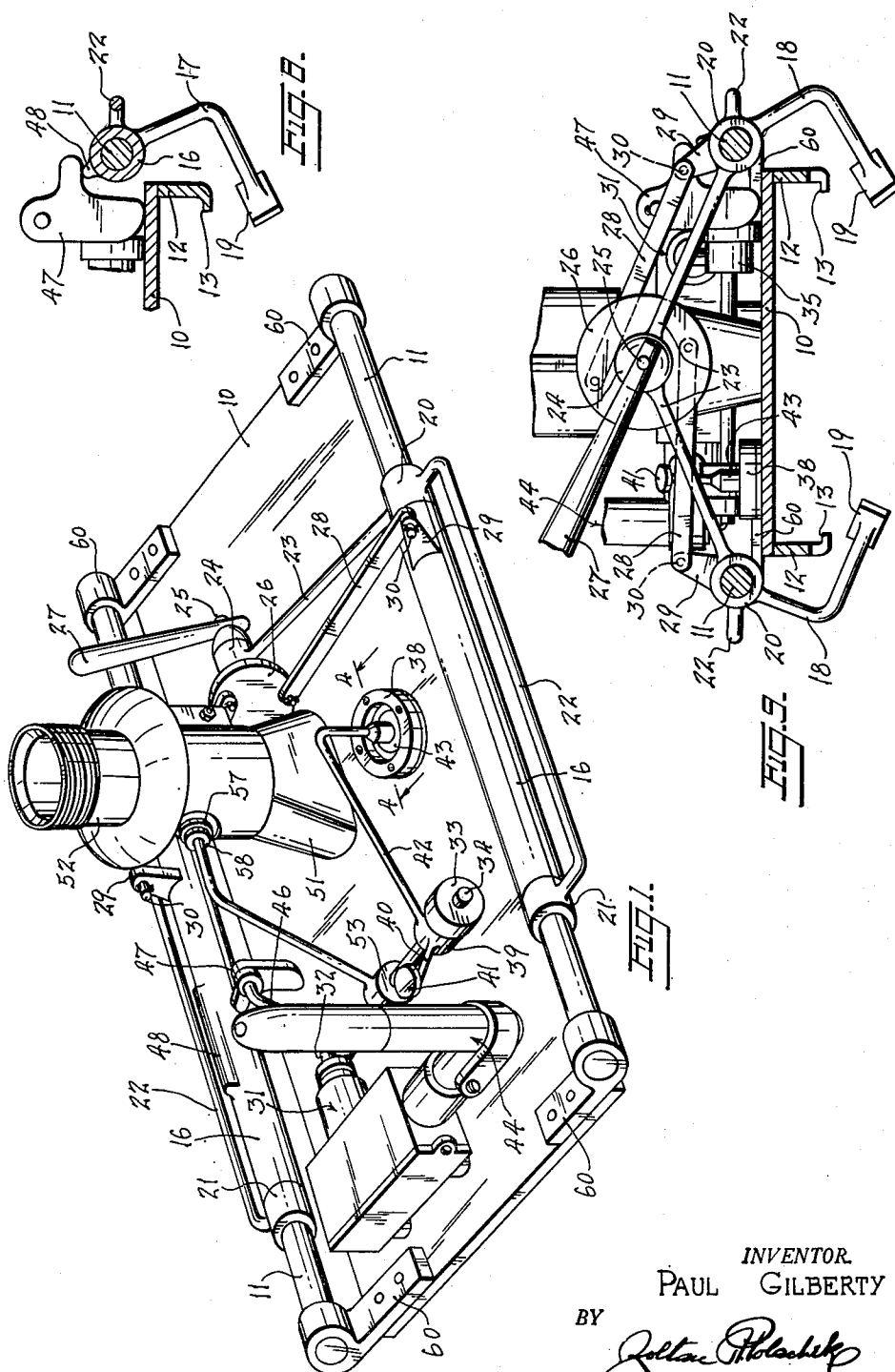
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2,663,482

AUTOMATIC ICE-CREAM FILLER

Filed Oct. 27, 1952

5 Sheets-Sheet 1



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Dec. 22, 1953

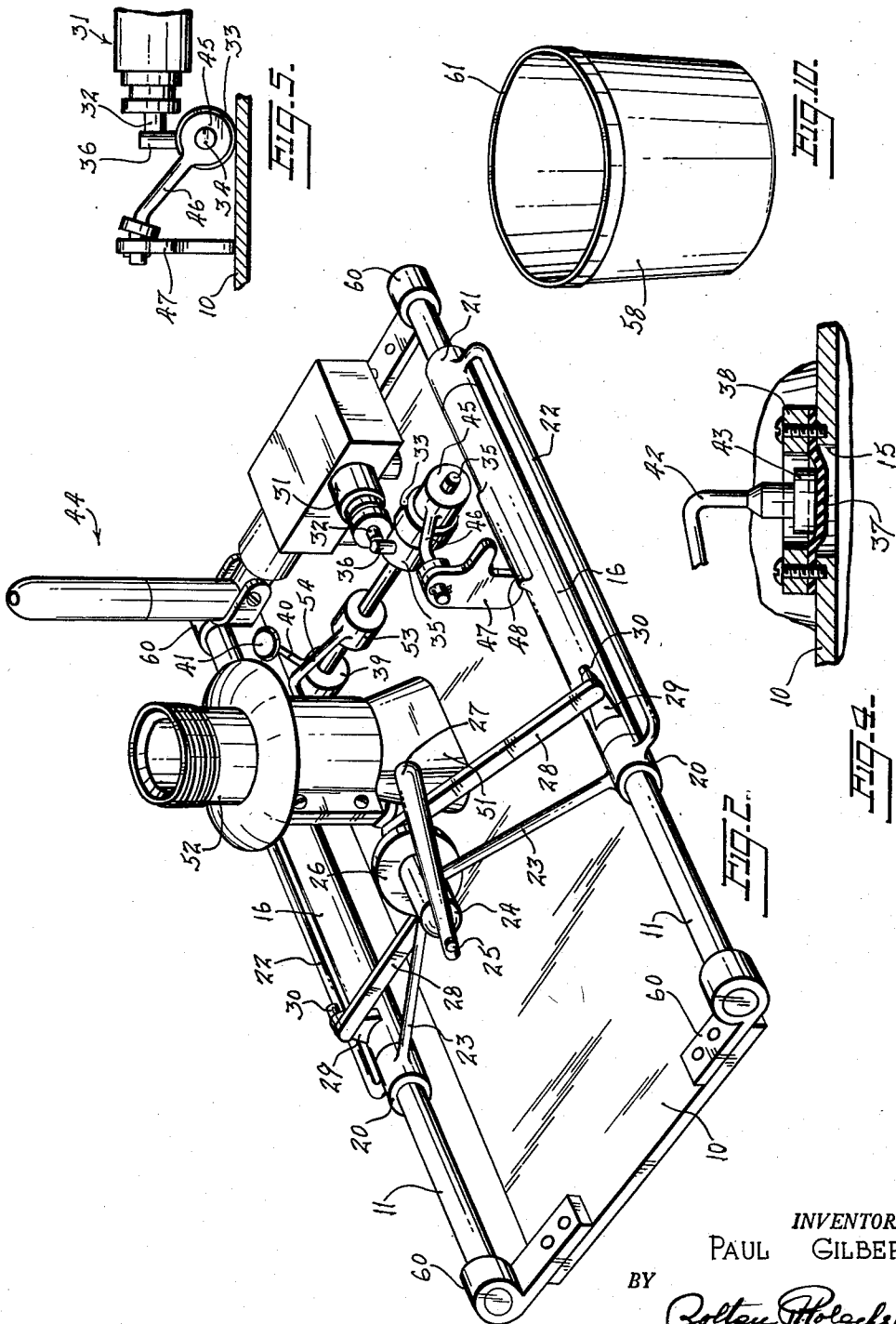
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AUTOMATIC ICE-CREAM FILLER

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5 Sheets-Sheet 2



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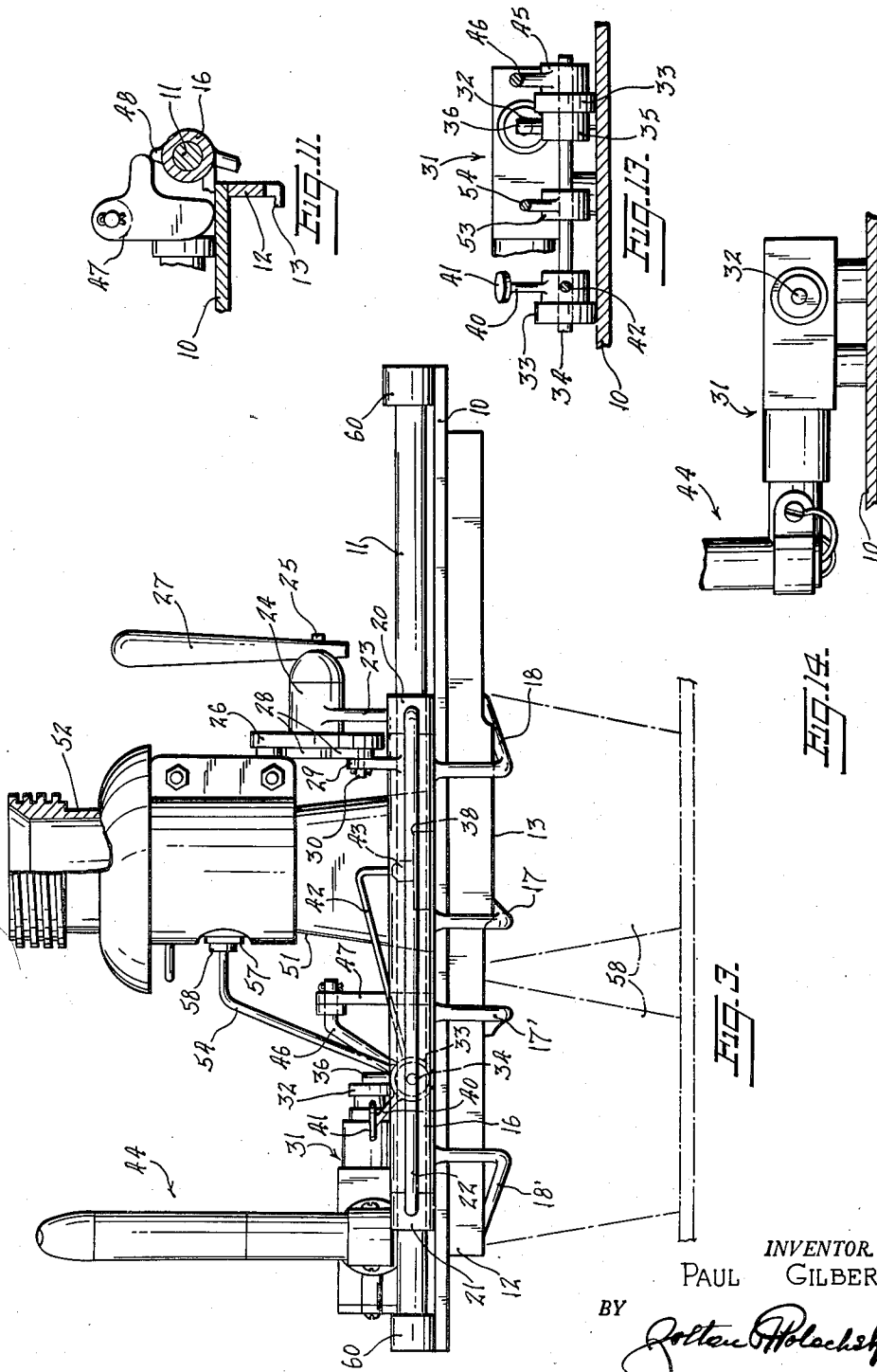
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AUTOMATIC ICE-CREAM FILLER

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5 Sheets-Sheet 3



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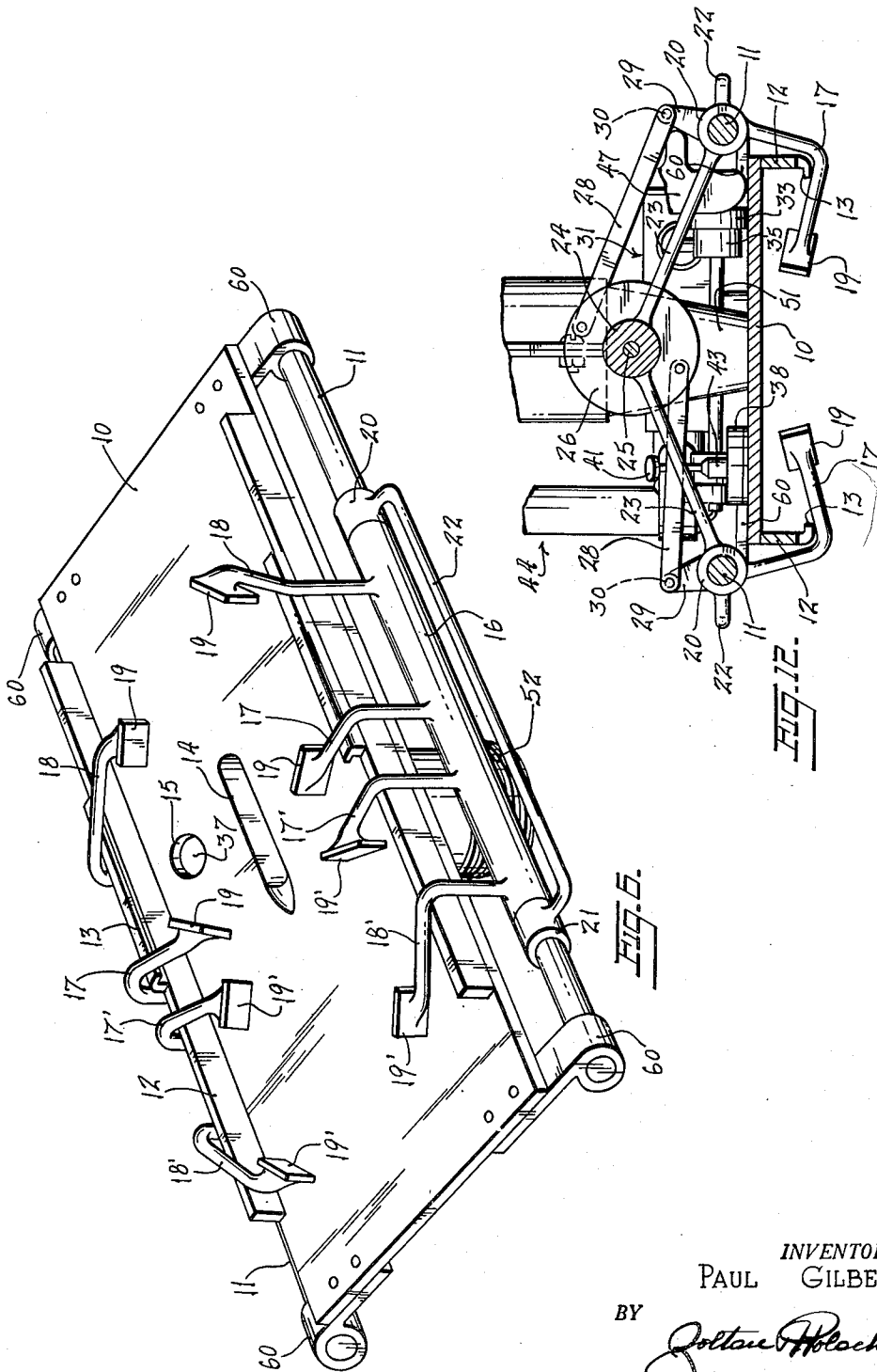
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AUTOMATIC ICE-CREAM FILLER

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5 Sheets-Sheet 4



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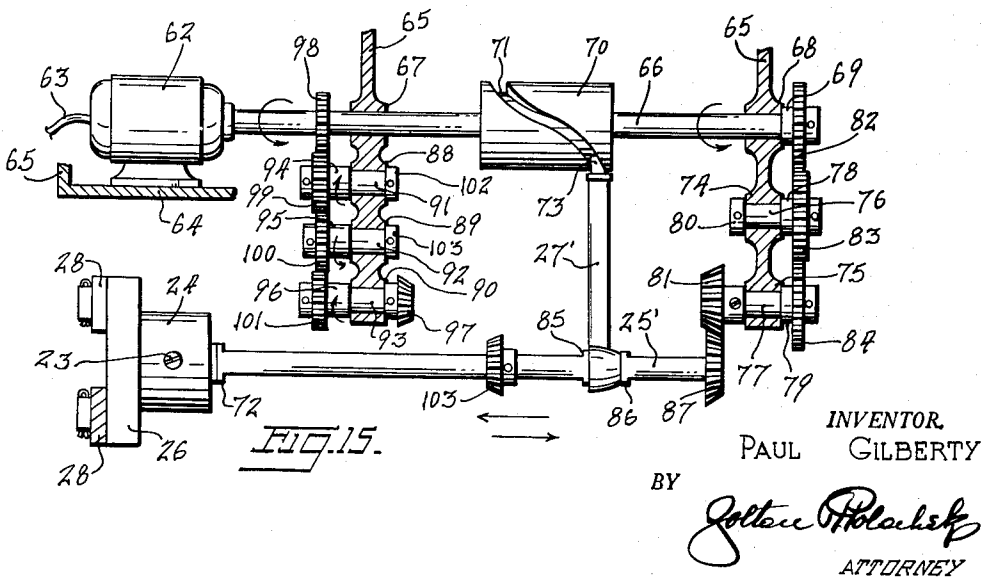
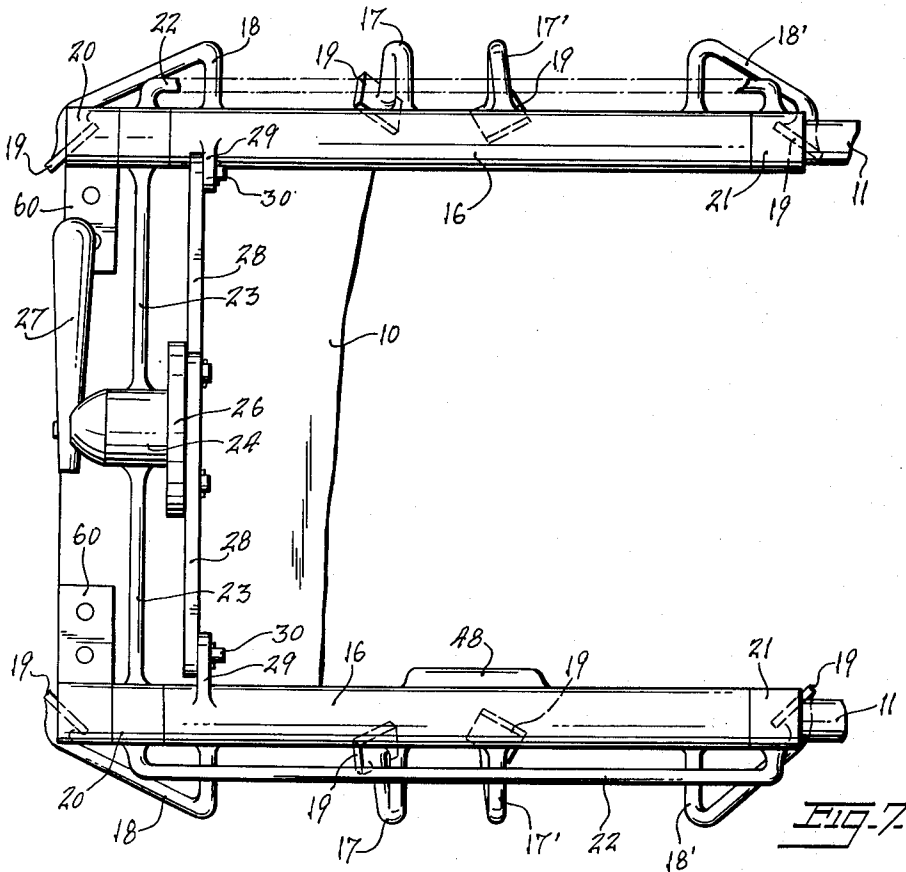
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AUTOMATIC ICE-CREAM FILLER

Filed Oct. 27, 1952

5 Sheets-Sheet 5



## UNITED STATES PATENT OFFICE

2,663,482

## AUTOMATIC ICE CREAM FILLER

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Application October 27, 1952, Serial No. 316,959

14 Claims. (Cl. 226—99)

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This invention relates to dispensing apparatus for semi-solids such as ice cream, whipped butter, cheese, lard or the like and more particularly to a portable flush-type filler adapted to be mounted above a moving belt conveyor carrying containers to be filled and below a tube continuously supplying the semi-solid being dispensed.

In the present practice of flush filling ice-cream containers, the operator holds an empty container below and against a horizontal plate having an opening through which the ice-cream flows from above, the container being held in position until the operator feels the pressure exerted by the product in the container, which indicates that all the air has been displaced from the container and that the same is flush filled. The operator then wipes the container across the bottom of the plate and at the same time puts another container below the opening in the plate. In feeling the pressure exerted by the product in the container to thereby indicate when the same is flush filled, the operator must hold the container under the plate until a minimum of 12 ounces of pressure is exerted by the product.

It is accordingly a principal object of the present invention to provide a device which will make an automatic flush fill of the container, providing mechanically the same movements that the hand operator goes through, but getting a more uniform fill in less time and operating with less back pressure against the feeding line, the present invention operating with 4 ounces of back pressure, resulting in less overrun being lost than is the case with hand filling.

It is another object of the present invention to provide a device of the above type which is made entirely of stainless steel and which when mounted will permit one girl to flush fill and cover the same amount of product as is now being done by three girls using the hand method, and which is designed for continuous-flow flush filling.

It is still another object of the present invention to provide a flush type filler bearing the above objects in mind which is entirely automatic in operation and in which there are no adjustments for the operator or plant engineer to make with the exception of installing and occasional replacement of certain of the parts to be hereinafter described.

It is still another object of the present invention to provide a flush type filler bearing the above objects in mind which may be thoroughly washed as it is entirely constructed of stainless steel with the exception of one of the parts, this part being water-proof.

For further comprehension of the invention and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

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In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a top, front perspective view of a flush type filler embodying the features of the present invention.

Fig. 2 is a top, rear perspective view thereof.

Fig. 3 is a front elevational view thereof.

Fig. 4 is a vertical sectional view taken along line 4—4 of Fig. 1.

Fig. 5 is a fragmentary end view of a part of the present invention, shown partly in section, and showing part of the means for operating a micro-switch included in the device.

Fig. 6 is a bottom perspective view of the filler.

Fig. 7 is a fragmentary top plan view of the filler and showing the device in one extreme longitudinal position.

Fig. 8 is a vertical sectional view of a part of the invention showing one of the gripper fingers in an open position and showing a circuit-breaking cam in an inoperative position.

Fig. 9 is a view similar to Fig. 8 showing further parts of the device including the means for opening and closing the gripper fingers, the latter being shown in an open position, and showing a portion of the feeler mechanism for indicating when the containers are flush filled.

Fig. 10 is a perspective view of a container adapted to be used with the present invention.

Fig. 11 is a view similar to Fig. 8 and showing the circuit-breaking cam in an operative position.

Fig. 12 is a view similar to Fig. 9 but showing the gripper fingers in a closed position.

Fig. 13 is a front elevational view of part of the means for operating the micro-switch shown in Fig. 5.

Fig. 14 is a fragmentary front elevational view of the micro-switch showing a portion of a pilot lamp connected thereto.

Fig. 15 is a front elevational view, partly in section, showing a motor and arrangement of gears for automatically operating the filler of Figs. 1 to 14.

Referring more in detail to the drawing in which similar reference characters designate corresponding parts throughout the several views, there is shown a rectangular base plate 10 mounted above a conveyor belt, not shown, of the type currently used in ice-cream dispensing mechanisms and which moves a series of containers 52 (see Fig. 10) therealong in intermittent motion.

Conveyor belts carrying containers therealong in intermittent motion are well known in the art and form no part of the present invention, and have not therefore been shown in the drawing. Such conveyor belts may be provided with an automatic container dispenser supplying empty containers as fast as they are filled, or the containers may be placed manually upon the belt by the operator.

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The base plate 10 is mounted above the conveyor belt in a substantially horizontal direction and is spaced above the belt a sufficient distance to permit the containers to pass below the plate below its central longitudinal axis, this mounting being done in any suitable manner.

The plate 10 is slightly wider than the diameter of the containers and carries a shaft 11 along each longitudinal edge in spaced relation to said plate, the shafts 11 being rigidly secured by suitable brackets 60 surrounding the ends thereof and fastened in conventional manner to the top of the plate at each corner, as shown in Fig. 1. It will be noted that the shafts 11 are spaced slightly outwardly of the longitudinal edges of the plate 10 and slightly above the same, for a purpose which will be hereinafter described. It will also be noted that the longitudinal axes of the shafts 11 are substantially parallel to the moving path of the containers, the shafts extending the length of the base plate 11.

A downwardly extending flange 12 is integrally formed along each longitudinal edge of the plate 11 at the central portions thereof, said flanges along their central portions continuing downwardly and being bent inwardly whereby to provide a pair of inner edges 13 adapted to contact the side walls of the containers 59 with the upper rims 61 thereof intermediate the bottom of the plate and said inner edges with the inwardly bent portion of the flange 12 being adapted to support the rims of the containers, in a manner to be hereinafter described.

The plate 10 is provided along its central longitudinal axis with an elongated slot 14 extending completely therethrough, said slot extending from an imaginary line joining the midpoints of said inner edges 13 to a point slightly beyond the end of the inner edges on one side thereof, substantially as illustrated in Fig. 6, whereby said slot will overlie the open mouth of a container having its rim disposed intermediate the undersurface of the plate and the inwardly extending portions of flanges 12 and will extend longitudinally beyond the mouth of this container to overlie the mouth of a second container following the first container and in point contact therewith along the conveyor belt, said containers being so positioned by means to be hereinafter described.

The plate 10 is further provided with an opening 15 extending completely therethrough alongside one longitudinal edge of the slot 14 and adapted to be above the mouth of the first container mentioned above, for a purpose to be hereinafter referred to.

Elongated cylindrical sleeves 16 are mounted upon each shaft 11 intermediate the brackets 60, the sleeve extending substantially one-half the length of the shafts 11 and being adapted to slide longitudinally therealong between the obvious limits of the brackets 60, as well as being capable of rotation angularly relative to the shafts 11.

A pair of finger members 17 are rigidly secured to bottom of each sleeve 16 in transverse alignment with each other, substantially as illustrated in Fig. 6, said finger members joining the sleeves 16 on one side and adjacent to the longitudinal midpoints of said sleeves and extending downwardly therefrom at right angles to the longitudinal axes of said sleeves, said fingers 17 continuing inwardly at right angles to their respective body portions and parallel to

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the plate 10 below the flanges 12, at right angles to the inner edges 13 of said flanges.

A second pair of finger members 18 are rigidly secured to the bottom of each sleeve 16 in transverse alignment with each other, substantially as illustrated in Fig. 6, said fingers joining the sleeves 16 at one end and extending downwardly therefrom at right angles to the longitudinal axes of said sleeves, the finger members 18 continuing inwardly at right angles to their respective body portions and parallel to the plate 10 below the flanges 12, at an inclined angle at the inner edges 13 of said flanges, extending outwardly from the first pair of finger members 17.

Each of the finger members 17 and 18 is provided with an integrally formed head 19 at the free ends thereof, each of said enlarged heads on the side remote from said fingers presenting a vertical plane surface disposed at an inclined angle to the inner edges 13, the four heads 19 collectively being adapted to engage the first container referred to above below its rim at four points.

Second and third pairs of finger members 17' and 18' are similarly disposed on the other end of the sleeves 16, in symmetrical relation to said first and second pairs, and are provided with enlarged heads 19' adapted to engage the second container referred to above at four points below its rim, the geometric centers of the sets of enlarged heads 19 and 19' being  $\frac{1}{16}$  of an inch closer to each other than the actual centers of the first and second containers referred to above placed together, with the result that the containers are pressed together at that point in the middle where they pass under the slot 14.

A first pair of cylindrical brackets 20 are mounted on each of the shafts 11 adjacent the sleeves 16 at one end and adapted to slide therealong, a second pair of cylindrical brackets 21 being similarly mounted at the other end of the sleeves 16.

The brackets 20 and 21 on each shaft 11 are connected by elongated arms 22 extending the length of the sleeves 16 parallel thereto and bent inwardly at each end, substantially as illustrated.

A pair of transverse, aligned arms 23 are rigidly secured at one end to the inner sides of the brackets 20 and extend inwardly across the top of the plate 10 to terminate above the longitudinal center of the plate where they are joined by a bearing 24 rigidly secured to their inner ends.

Preferably, the brackets 60, the shafts 11, the downwardly extending flanges 12, the elongated sleeves 16, the finger members 17, 18, 17' and 18' and the enlarged heads 19 and 19', the cylindrical brackets 20 and 21, the transverse arms 23, the elongated arms 22, and the bearing 24 are all formed of the same material as the base plate 10, namely stainless steel, this material being likewise used for the parts to be hereinafter described.

The longitudinal axis of the bearing 24 is parallel to the shafts 11, and rotatably mounts a third shaft 25 extending outwardly of the bearing 24 at both ends for a purpose to be hereinafter described.

An operating disc 26 is rigidly secured to the rotatable shaft 25 at its end nearest the slot 14 while a hand lever 27 is rigidly secured to the shaft 25 at its other end, said operating disc 26 and said lever preventing longitudinal displace-

ment of the shaft 25 through the bearing 24, these members being suitably spaced from the ends of the bearing by washers not shown.

A pair of transverse connecting rods 23 are pivotally mounted at their inner ends to the periphery of the operating disc 26 at diametrically opposed positions, substantially as illustrated, on the face of said disc remote from the bearing 24.

The outer ends of the rods 23 are pivotally connected to upwardly extending lugs 29 rigidly secured to the sleeves 16 adjacent the brackets 20 by means of pins 30 whereby angular motion imparted to said operating disc 26 by the hand lever 27 will be transmitted to the sleeves 16 and their respective finger members to rotate the latter inwardly, as shown in Fig. 12, whereby to grip the first and second containers referred to above, or to rotate them outwardly, as shown in Fig. 9, whereby to release the containers.

The hand lever 27 may also be pulled longitudinally from the position shown in Fig. 2 to the position shown in Fig. 7, whereby to carry the first container from its position under the slot 14 by means of the closed finger members to a position on the conveyor belt at one end of the plate 11, this movement also carrying the second container to a position directly below the slot 14.

At this point, suitable angular movement of the lever will cause the finger members to release the containers in the aforesaid positions, permitting return longitudinal movement of the lever and finger members to their original position, where further suitable angular rotation in the opposite direction of the lever will cause the finger members to grip the second container now positioned below the slot 14 and a third container which has been moved up to the position formerly occupied by the second container by means of the conveyor belt.

It will thus be noted that four movements are involved in the cycle of operation: first, a longitudinal movement of the hand lever from its position at the center of the plate 10 to a position at the end thereof, second, angular rotation of the lever in its position at the end of the plate to release the containers, third, return longitudinal movement of the lever to its original position at the center of the plate, and fourth, reverse angular rotation of the lever to move the fingers again inwardly.

The first movement described above will commence only when the container under the slot is flush filled, and must therefore be suitably timed. The second and third movements will automatically follow the first movement, but the second movement can obviously not occur until the end of the first movement, and the third movement cannot occur until the second is completed. This latter sequence can be observed by the operator operating the hand lever, or by suitable mechanism automatically operating the hand lever.

As a means of indicating when the first movement should properly occur, i. e. when the first container is flush filled, there is shown a micro-switch 31 in operative engagement with a feeler mechanism to be hereinafter described and which is connected to a pilot lamp 44, also to be hereinafter described.

An inverted funnel-shaped member 51 is secured to the plate surrounding the slot 14, the bottom of said member 51 being rectangular and adapted to surround said slot, the top of the member 51 being circular in cross-section and having a cylindrical neck integrally formed

thereto. The neck 52 is provided with an opening 55 for a purpose to be hereinafter referred to.

A diaphragm 56 is positioned over the outside of the opening 55 and is secured to the outside of the neck 52 by a ring 57, the ring 57 being secured to the neck 52 by screws, not shown, and holding the diaphragm intermediate the neck and the ring. The top of the neck 52 is threaded to receive a threaded ice-cream filler, not shown, and adapted to supply a continuous supply of ice-cream in a known manner to the neck 52 and the member 51 therebelow.

The micro-switch 31 previously referred to is secured to the top of the plate (see Fig. 14) in any suitable manner at the end of the plate remote from the bearing 24, and includes a horizontally extending push-button 32 extending outwardly therefrom. The push-button 32 is spring urged outwardly in the usual manner, it being necessary to push the push-button 32 inwardly into the switch to close the same, all as well known in the art.

A pair of transversely aligned bearings 33 are secured to the top of the plate adjacent the push-button 32, substantially as illustrated, and mount a rotatable transverse shaft 34, the shaft 34 being disposed with one end thereof under the outer end of the push-button 32.

A first cylindrical sleeve 35 is rigidly mounted on the shaft 34 directly below the push-button, substantially as illustrated in Fig. 13, and fixedly carries an upwardly extending projection 36 adapted to coincide with the end of the push-button 32, whereby rotation of the shaft 34 will move said projection against the end of the push-button to move the same inwardly and thereby close the micro-switch 31.

A diaphragm 37 is positioned above the opening 15 in the plate 10, a ring 38 being secured to the plate 10 surrounding the opening 15 by means of screws whereby to secure the diaphragm 37 above the opening intermediate the plate 10 and the ring 38.

A second cylindrical sleeve 39 is rigidly mounted on the shaft 34 and fixedly carries an outwardly extending arm 40 on the side remote from the diaphragm 37, an enlarged, manually operable button 41 being integrally formed in the free end of the arm 40.

A second outwardly extending arm 42 is fixedly carried by the sleeve 39 on the side adjacent the diaphragm 37, the arm 42 extending to a point above the center of the diaphragm 37 and continuing downwardly at substantially right angles to the body portion of said arm 42, substantially as illustrated, and is provided at its end with an enlarged button 43 rigidly secured thereto and adapted to rest on said diaphragm, when said projection 36 is adjacent the end of the push-button 32 in its outer, open position whereby upward displacement of the diaphragm 37 will move the button 43 upward to rotate the shaft 34 and the projection 36 thereby closing the micro-switch 31.

This upward movement of the diaphragm 37 will be occasioned when the ice-cream is flush filled within the container and all the air has been evacuated therefrom, a pressure of 4 ounces being sufficient to close the micro-switch 31.

A pilot lamp 44, consisting of a fountain-pen type flashlight with a self-contained dry-cell therewithin well known in the art, is secured to the micro-switch 31 substantially as illustrated in Fig. 14, with the switch of the flash-light in an "on" position, having the micro-switch 31 and the circuit of the flashlight connected in series

therewith, whereby closing of the micro-switch by the diaphragm 37 in the manner described above will light the lamp 44 and indicate to the operator that the container is flush filled and that it is time to start the first movement of the hand lever 27.

It will be noted at this point, that at the conclusion of the fourth movement which closes the finger members upon the second container, it will be necessary to again open the switch 31 to prevent the lamp 44 from being continuously illuminated, which would of course prevent it from indicating when the next container is flush-filled.

Accordingly, a third sleeve 45 is rigidly mounted on the shaft 34 and fixedly carries an upwardly and outwardly extending arm 46 terminating above the plate 10 adjacent one of the elongated sleeves 15, substantially as illustrated, a T-shaped cam 47 being pivotally secured to the free-end of the arm 46. It will be noted that the central portion of the cam 47 extends outwardly over one elongated sleeve 16, the sleeve 16 fixedly carrying an elongated projection 48 which is adapted to slide under said central portion when said sleeve and the finger members thereon are in an open position during the third movement (see Fig. 8), and adapted to raise the central portion of the cam when the sleeve and finger members are rotated in the fourth movement (see Fig. 11).

This raising of the central portion of the cam 47 causes the arm 46 to drop, thereby rotating the shaft 34 in the opposite direction, and moving the projection 36 away from the push-button 32 to thereby open the micro-switch during the fourth movement of the hand lever 27.

Additional means in operative engagement with the micro-switch 31 to indicate when the container is flush-filled is afforded by an additional feeler mechanism to be described directly.

A fourth cylindrical sleeve 53 is rigidly mounted on the shaft 34, and fixedly carries an upwardly extending arm 54, said arm 54 being bent in a substantially horizontal direction and terminating adjacent the diaphragm 56 previously described. An enlarged button 58 is secured to the end of the arm 54 and is in contact with the diaphragm 56 when the projection 36 is adjacent the end of the push-button 32.

Outward movement of the diaphragm 56 will be occasioned when the ice-cream is flush-filled within the container upward to the neck 52 and all the air has been evacuated therefrom, a pressure of 4 ounces being sufficient to close the micro-switch 31, as in the case of the diaphragm 37, which operates simultaneously with the diaphragm 56.

In operation, first and second containers are moved to their respective positions below the slot 14 by the conveyor belt, with the first container directly below the slot 14 and the rim thereof intermediate the inner edges 13 and the bottom of the plate 10. The hand lever 27 is rotated in the fourth movement to close the finger members upon the two containers and to open the micro-switch. The continuous flow of ice-cream is started and the first container begins to fill.

The product passes through the elongated slot 14 in the bottom of the plate 10 into the container. Air escapes from the first container into the second container by means of the overlapping position of the slot 14 along with a small amount of product after the first container is filled. The first container is filled flush. At that instant,

the microswitch 31, operated by the button 43 resting against the diaphragm 37, closes and thereby illuminates the pilot lamp 44. The finger members gripping the containers are then moved forward by means of the lever 27 in the first movement to a position at the end of the plate, resulting in the delivery thereof of a smooth, flush-filled first container. When the first container is all the way forward, the lever 27 is rotated angularly in the second movement to release the first and second containers, the flush-filled first container moving along the conveyor belt to a covering table, not shown. During the first movement, the second container is brought forward by the closed finger members to a position directly below the slot 14 to take the place of the now filled first container, to be held in position by the inner edges 13. A third container is brought up to the position previously occupied by the second container by the still intermittently moving conveyor belt. The container directly under the slot 14 may be further secured by a spring urged stool, not shown, positioned above the conveyor belt and below the container. Alternately, such a stool may be raised and lowered by a cam, not shown, the motion of which is synchronized with the intermittent motion of the conveyor belt. Such a stool and the inner edges 13 will hold the container under the slot 14 until the finger members are moved back in the third movement by the hand lever 27 and another container has moved in behind the container on the stool.

The finger members are then swung inwardly in the fourth movement by the hand lever 27 to grip the containers, which movement also opens the microswitch and turns off the pilot lamp 44. The container then fills until the microswitch indicates again to start the next cycle of movement.

It should be noted that only during the first movement of the cycle described above, will the conveyor belt move, remaining motionless during the remainder of the cycle and while the cup is filling. At this time, the cam referred to above under the stool can be made to rotate and raise the stool directly under a container in position directly below the slot 14, such movement being synchronized with the intermittent movement of the conveyor belt. A dispenser for empty containers, feeding the latter onto the conveyor belt from above, can also be provided, the operation of the dispenser being synchronized with the conveyor belt, so that when the belt moves forward one container, a new container will be fed onto the belt by the dispenser. Mechanisms for effecting the desired movement of the containers from the dispenser onto the conveyor belt, at the proper time, are well known in the art and form no part of the present invention, and have not, therefore, been described in detail.

Referring now particularly to Fig. 15, there is shown means for automatically operating the filler including an electric motor 62 connected to a source of power, not shown, by wires 63 and mounted on the base plate 64 of a housing 65, the housing 65 being suitably mounted above the plate 10 with the motor 62 directly over the bearing 24, when the latter is in one extreme position at the end of the plate 10, substantially as illustrated.

The motor 62 is provided with a drive shaft 66 extending outwardly through bearings 67 and 68 integrally formed in the housing 65, an enlarged shoulder 69 preventing inward longitudinal dis-

placement of the shaft 66 relative to the bearing 68. A cam 70 is rigidly mounted on the shaft 66 intermediate the bearings 67 and 68 and has a helical dwell 71 for a purpose to be hereinafter referred to.

The bearing 24 rotatably mounts a modified shaft 25' differing from the shaft 25 in its elongated length and in the provision of a shoulder 72 which prevents longitudinal displacement of the shaft relative to the bearing 24. The bearing 24 carries the transverse arms 23, one end of the shaft 25' fixedly carrying the operating disc 26 and its connecting rods 28. The other end of the shaft 25' rotatably mounts a modified lever 27' differing from the lever 27 in the provision of a pin 73 at the upper end thereof adapted to ride the dwell 71, substantially as illustrated.

Directly below the bearing 68, the housing 65 is provided with integrally formed bearings 74 and 75 mounting shafts 76 and 77, the shafts 76 and 77 having enlarged shoulders 78 and 79 whereby to prevent inward displacement through the bearings longitudinally. The inner end of the shaft 76 is provided with an enlarged sleeve 80 preventing outward displacement of the shaft relative to the bearing, while the inner end of the shaft 77 fixedly carries a gear 81 for a purpose to be hereinafter referred to.

The outer ends of the shafts 66, 76 and 77 are provided with aligned gears 82, 83 and 84 adapted to mesh with each other, substantially as illustrated, whereby angular rotation of the shaft 66 is transmitted in the same direction to the gear 81, as well as to the cam 70.

The lever 27' is rotatably mounted on the shaft 25' and is prevented from longitudinal displacement relative thereto by enlarged shoulders 85 and 86.

A gear 87 is rigidly mounted on the outer end of the shaft 25' and is adapted to mesh with the gear 81 when the pin 73 reaches the outer end of the helical dwell 71, during operation of the motor 62.

Directly below the bearing 67, the housing 65 is provided with integrally formed bearings 88, 89 and 90 mounting shafts 91, 92 and 93, and shafts 91, 92 and 93 having enlarged shoulders 94, 95 and 96 whereby to prevent longitudinal displacement through their respective bearings in one direction. The other end of the shaft 93 fixedly carries a gear 97 preventing displacement of the shaft in the opposite direction and receiving reverse angular motion from the drive shaft 66 by means of aligned gears 98, 99, 100 and 101, substantially as illustrated. Sleeves 102 and 103 prevent inward longitudinal displacement of the shafts 91 and 92.

A gear 103 is rigidly mounted on the shaft 25' and is adapted to mesh with the gear 97 when the pin 73 reaches the inner end of the helical dwell 71, during operation of the motor 62.

The motor 62 is connected to a source of power, not shown, in series with the micro-switch 31 by means of the wires 63 whereby closing of the switch 31 will energize the motor and automatically drive the shaft 66. This rotation will impart reciprocal motion to the shaft 25' through the cam 70 and the rotatably mounted handle 27', angular motion being imparted at each end of the stroke and of the dwell 71 by the interaction of the gears 97 and 103, and 81 and 87.

In operation, first and second containers are moved to their respective positions below the slot 14 by the conveyor belt, with the first container directly below the slot 14 and the rim thereof

intermediate the inner edges 13 and the bottom of the plate 10. The button 41 is pushed by the operator to drive the motor 62 until the finger members close on the first and second containers in the fourth movement, which automatically opens the switch and stops the motor. The continuous flow of ice-cream is started and the first container begins to fill. The product passes through the elongated slot 14 in the bottom of the plate 10 into the first container. Air escapes from the first container into the second container by means of the overlapping position of the slot 14 along with a small amount of product after the first container is filled. The first container is filled flush. At that instant the micro-switch 31, operated by the button 43 resting against the diaphragm 37 and by the button 58 resting against the diaphragm 56, closes and thereby illuminates the pilot lamp 44 and activates the shaft 66 to move the containers and finger members to the end of the plate by means of the cam 70 moving the pin 73. It will be understood that the pin 73 is at the inner end of the dwell 71 at the end of the fourth movement. This results in the delivery of a smooth, flush-filled first container at the end of the plate, with the second container now directly under the slot 14. At this point, the gear 87 meshes with the gear 81, to rotate the shaft 25' in the second movement, and to release the first and second containers, the flush-filled first container moving along the conveyor belt to a covering table, not shown.

During the first movement, the second container is brought forward by the closed finger members to a position directly below the slot 14 to take the place of the now filled first container, to be held in position by the inner edges 13 and, if desired, a spring urged stool, not shown. A third container is brought up to the position previously occupied by the second container by the still intermittently moving conveyor belt.

After the shaft 25' has rotated 20 degrees, the pin 73 is moving in the opposite direction in the third movement to disengage the gears 81 and 87 thereby stopping further rotation, and to bring the finger members back to their original position adjacent the next container to be filled. At this point, the gear 103 meshes with the gear 97 to rotate the shaft 25' 20 degrees in the opposite direction to close the finger members on the containers in the fourth movement, which movement also opens the micro-switch 31 and turns off the pilot lamp 44 and the motor 62. The container then fills until the micro-switch is again closed to start the next cycle.

Other mechanisms may, of course, be used to effect the movements of the shaft 25' and it is not proposed to limit the invention to the particular arrangement set forth in Fig. 15. For example, the swing of the finger members in the start of the stroke and the swinging of the finger members out at the end of the stroke may be accomplished by a hinge lever connected from a roller riding a two lobe cam to the jaw or container finger operating a pull rod, with the motor engaging a one revolution clutch for longitudinal movement of the shaft 25'.

To run different type containers it will be necessary to raise or lower the filling unit to the desired height.

Another method of indicating when the container is flush-filled and which is basically the same as the button headed indicators shown in the drawing is to have the ice cream filler connected to the plate 10 by a 6 inch length of pure

gum tubing. Around this tubing would be disposed a pair of spring loaded fingers that would be connected to the microswitch in a manner similar to the button-headed indicators. As the container was filled, immediately that the product had displaced all of the air in the container, a slight pressure would be exerted on the hose causing it to expand. This expansion would in turn operate the above mentioned fingers causing the actuation of the jaws to move the container forward. Another desirable feature of this pure gum hose connector is that it eliminates the need of a surge tank to compensate for the variable pressure that will necessarily arise in that fraction of a second period when the container is filled and moved to the point where the product is released again to the following container. This pure gum hose will expand and immediately that the empty container is under it, this tube contracts again and will continue the cycles. The finger members may be replaceable to accommodate other diameter containers.

It is to be understood that the neck 52 of the filler member 51, may be connected to a rubber tube 110, which acts as an expansion valve during the interval while the filled cup is being shifted.

In practice, instead of the pilot light 44, the microswitch 31 may be connected direct to the motor 62.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

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

1. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means.

2. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said gripping means comprising a pair of shafts mounted along the longitudinal edges of said plate, a pair of sleeves rotatably and longitudinally slidable along said shafts, and a plurality of finger members carried by said sleeves, said finger members extending

downwardly and under said base plate and being adapted to engage the side walls of the containers.

3. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said gripping means comprising a pair of shafts mounted along the longitudinal edges of said plate, a pair of sleeves rotatably and longitudinally slidable along said shafts, and a plurality of finger members carried by said sleeves, said finger members extending downwardly and under said base plate and being adapted to engage the side walls of the containers, and an inwardly extending flange along the longitudinal edges of said plate adapted to engage the rim of a container directly under said slot when said finger members are in an outer position.

4. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said gripping means comprising a pair of shafts mounted along the longitudinal edges of said plate, a pair of sleeves rotatably and longitudinally slidable along said shafts, and a plurality of finger members carried by said sleeves, said finger members extending downwardly and under said base plate and being adapted to engage the side walls of the containers, said activating means comprising longitudinally slidable brackets carried by said shafts at each end of said sleeves, means interconnecting said brackets on each shaft, transverse arms carried by said brackets at one end of said sleeves, a bearing member connecting said arms, a third shaft in said bearing member, an operating disc rigidly mounted on said third shaft at one end, means interconnecting said operating disc and said rotatable sleeves, and means mounted on said third shaft at the other end for rotating said shaft and for moving it longitudinally along said plate.

5. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly

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thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said semi-solid supplying means comprising an inverted, substantially funnel-shaped member mounted on said plate above said slot, the bottom of said member being shaped to surround said slot, the top of said member being substantially circular, a substantially cylindrical neck secured to said top, and a semi-solid filler secured to the top of said neck and adapted to continuously supply semi-solid material thereto.

6. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot there-through adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said indicating means comprising a switch, said base plate having an opening adjacent said slot, a diaphragm secured to said plate above said opening, means operable by said diaphragm in operative engagement with said switch whereby to close the same, and signaling means connected in series with said switch.

7. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot there-through adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said semi-solid supplying means comprising an inverted, substantially funnel-shaped member mounted on said plate above said slot, the bottom of said member being shaped to surround said slot, the top of said member being substantially circular, a substantially cylindrical neck secured to said top, and a semi-solid filler secured to the top of said neck and adapted to continuously supply semi-solid material thereto, said indicating means comprising a switch, said base plate having an opening adjacent said slot, a diaphragm secured to said plate above said opening, means operable by said diaphragm in operative engagement with said switch whereby to close the same, and signaling means connected in series with said switch, said neck having an opening, a second diaphragm secured to said neck above said opening, second means operable by said second diaphragm in operative engagement with said switch whereby to close the same, and means operable by said gripping means in operative engagement with said switch whereby to open the same.

8. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot there-

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through adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said indicating means comprising a micro-switch, said micro-switch including a push-button in operative engagement therewith, a shaft rotatably mounted below said push-button, a projection carried by said shaft in contact with said push-button, said base plate having an opening adjacent said slot, a diaphragm secured to said plate above said opening, an arm rigidly carried by said shaft, said arm terminating above said diaphragm, an enlarged button secured to the end of said arm and in contact with said diaphragm, and signaling means connected in series with said micro-switch.

9. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot there-through adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said semi-solid supplying means comprising an inverted, substantially funnel-shaped member mounted on said plate above said slot, the bottom of said member being shaped to surround said slot, the top of said member being substantially circular, a substantially cylindrical neck secured to said top, and a semi-solid filler secured to the top of said neck and adapted to continuously supply semi-solid material thereto, said indicating means comprising a micro-switch, said micro-switch including a push-button in operative engagement therewith, a shaft rotatably mounted below said push-button, a projection carried by said shaft in contact with said push-button, said base plate having an opening adjacent said slot, a diaphragm secured to said plate above said opening, an arm rigidly carried by said shaft, said arm terminating above said diaphragm, an enlarged button secured to the end of said arm and in contact with said diaphragm, and signaling means connected in series with said micro-switch, said neck having an opening, a second diaphragm secured to said neck above said opening, a second arm rigidly carried by said shaft, said second arm terminating above said second diaphragm, a second enlarged button carried by said second arm and in contact with said second diaphragm, and means operable by said gripping means in operative engagement with said micro-switch whereby to open the same.

10. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot there-through adapted to overlie one container and

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a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said gripping means comprising a pair of shafts mounted along the longitudinal edges of said plate, a pair of sleeves rotatably and longitudinally slidable along said shafts, and a plurality of finger members carried by said sleeves, said finger members extending downwardly and under said base plate and being adapted to engage the side walls of the containers, said activating means comprising longitudinally slidable brackets carried by said shafts at each end of said sleeves, means interconnecting said brackets on each shaft, transverse arms carried by said brackets at one end of said sleeves, a bearing member connecting said arms, a third shaft in said bearing member, an operating disc rigidly mounted on said third shaft at one end, means interconnecting said operating disc and said rotatable sleeves, and means mounted on said third shaft at the other end for rotating said shaft and for moving it longitudinally along said plate, said last mentioned means comprising a lever rotatably mounted on said third shaft, a motor connected in series with said indicating means, said motor including a drive shaft, means interconnecting said drive shaft and said lever for imparting reciprocal motion to said lever, and means interconnecting said drive shaft and said third shaft for imparting angular motion to said third shaft in opposite directions at each end of said reciprocal motion.

11. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said indicating means comprising a switch, said base plate having an opening adjacent said slot, a diaphragm secured to said plate above said opening, means operable by said diaphragm in operative engagement with said switch whereby to close the same, and signaling means connected in series with said switch, said signaling means comprising a lamp having a self-contained dry-cell therewithin, the switch of said lamp being in an "on" position with the circuit thereof connected in series with said first switch.

12. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on

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the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, and a spring urged stool adapted to engage the bottom of the container directly under said slot whereby to further secure the rim thereof against the undersurface of said base plate.

13. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, and a stool adapted to engage the bottom of the container directly under said slot, and a cam beneath said stool whereby to raise said stool against the bottom of the container to further secure the rim thereof against the undersurface of said base plate, the motion of said cam being synchronized with the movement of the conveyor belt.

14. In a semi-solid dispenser mechanism having a conveyor belt moving empty containers therealong, a base plate mounted above the conveyor belt, said base plate having a slot therethrough adapted to overlie one container and a portion of the next container, gripping means on the bottom of said plate adapted to first releasably grip the containers and then to move them longitudinally to one end of said plate, means for activating said gripping means in the aforesaid sequence, means for continuously supplying a semi-solid to said slot and therethrough to a container directly thereunder, and means for indicating when the container is flush-filled whereby to control said activating means, said semi-solid supplying means comprising an inverted, substantially funnel-shaped member mounted on said plate above said slot, the bottom of said member being shaped to surround said slot, the top of said member being substantially circular, a substantially cylindrical neck secured to said top, and a semi-solid filler secured to the top of said neck and adapted to continuously supply semi-solid material thereto, said indicating means comprising a length of gum tubing intermediate and connecting said filler and said neck, said tubing being normally partially collapsed, a pair of spring loaded fingers in contact and surrounding said tubing, a switch, said fingers being in operative engagement with said switch whereby to close the same upon expansion of said tubing, and signalling means connected in series with said switch.

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No references cited.