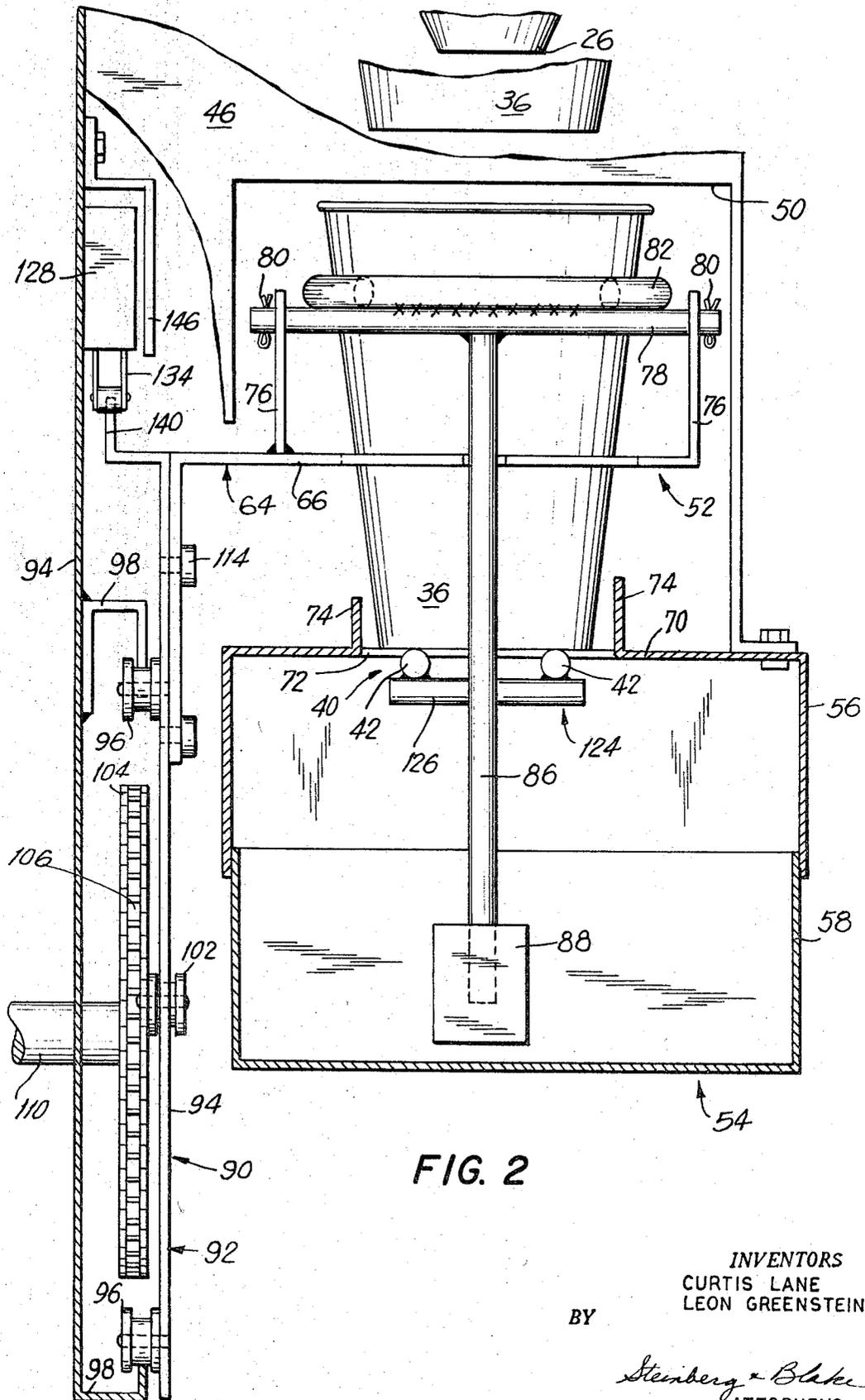


10  
12  
14  
**FIG. 1**

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FIG. 3

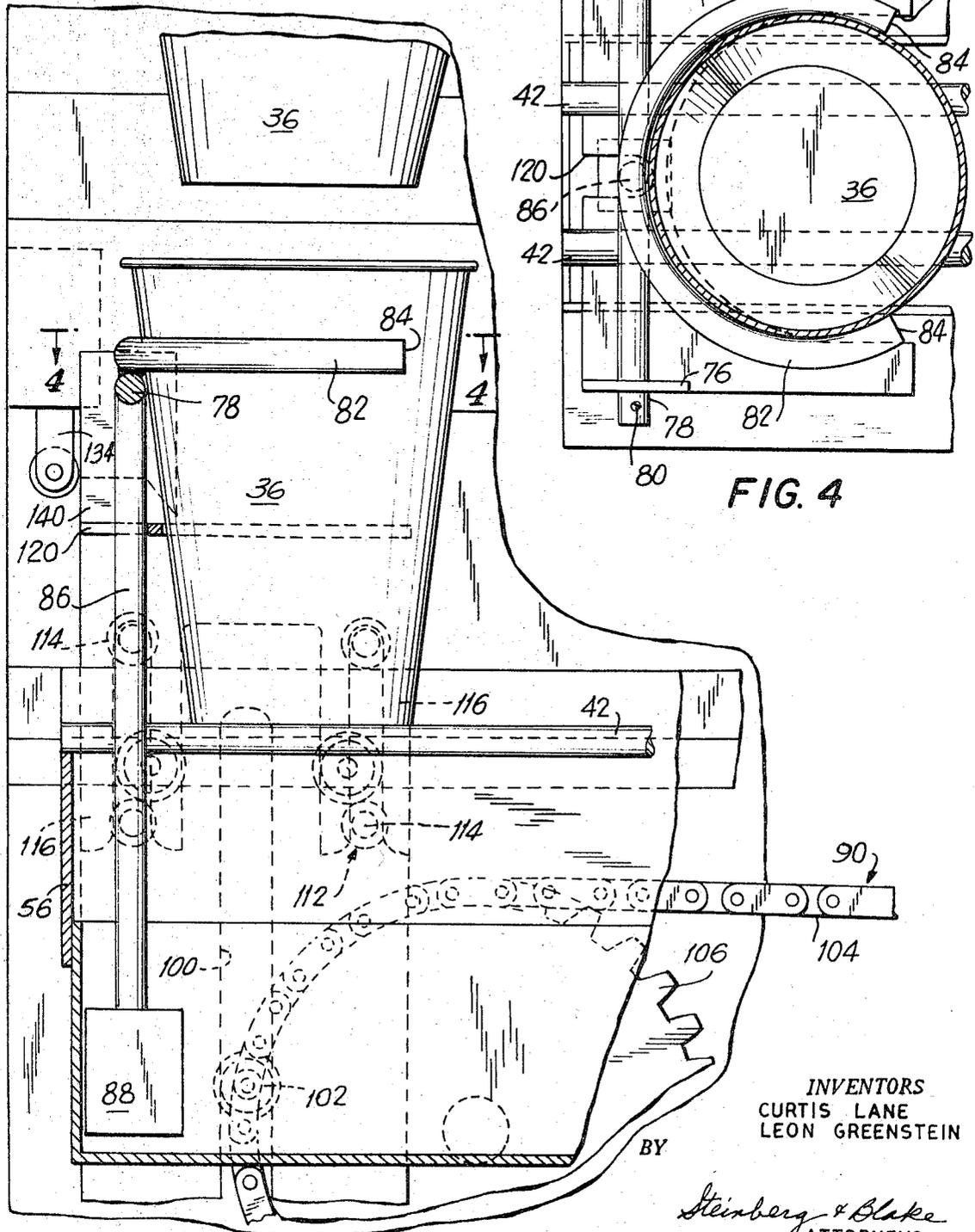
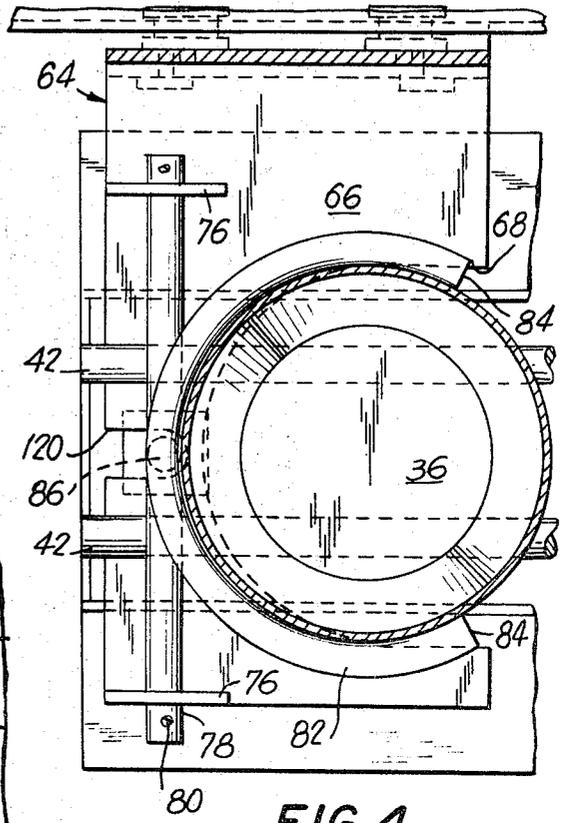


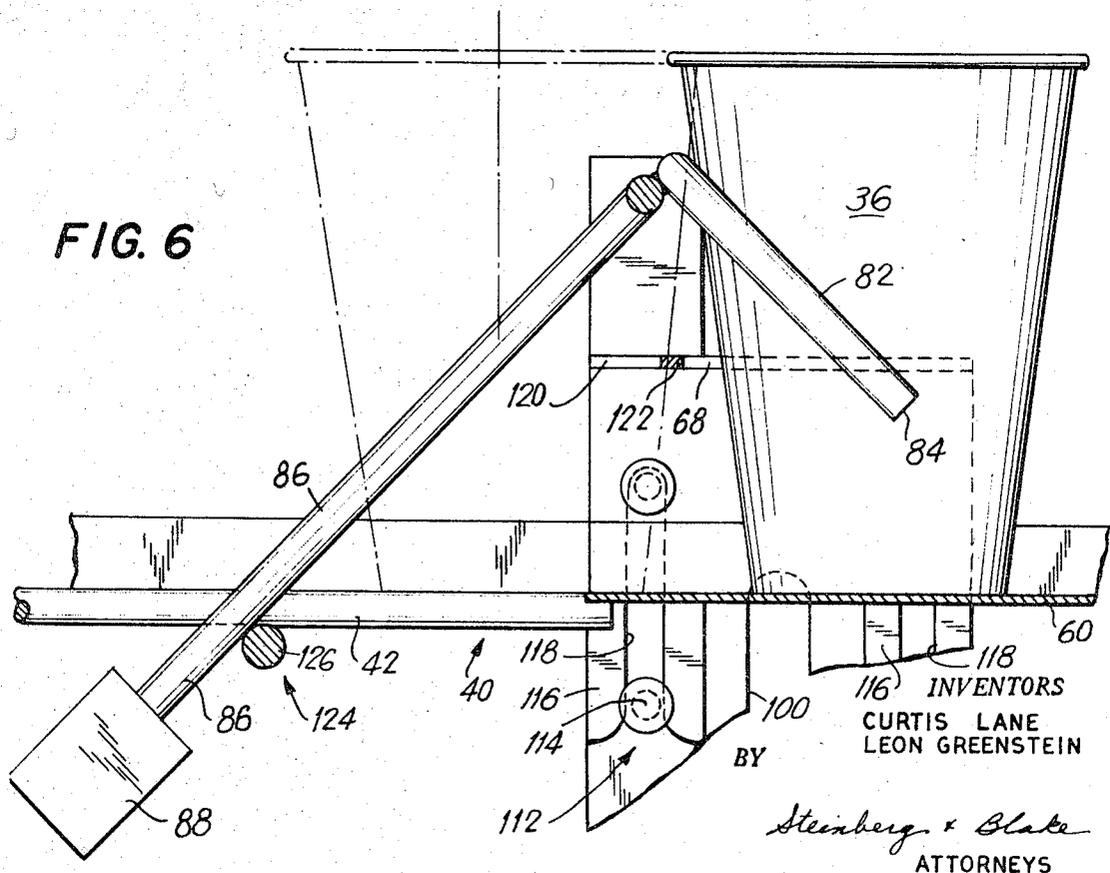
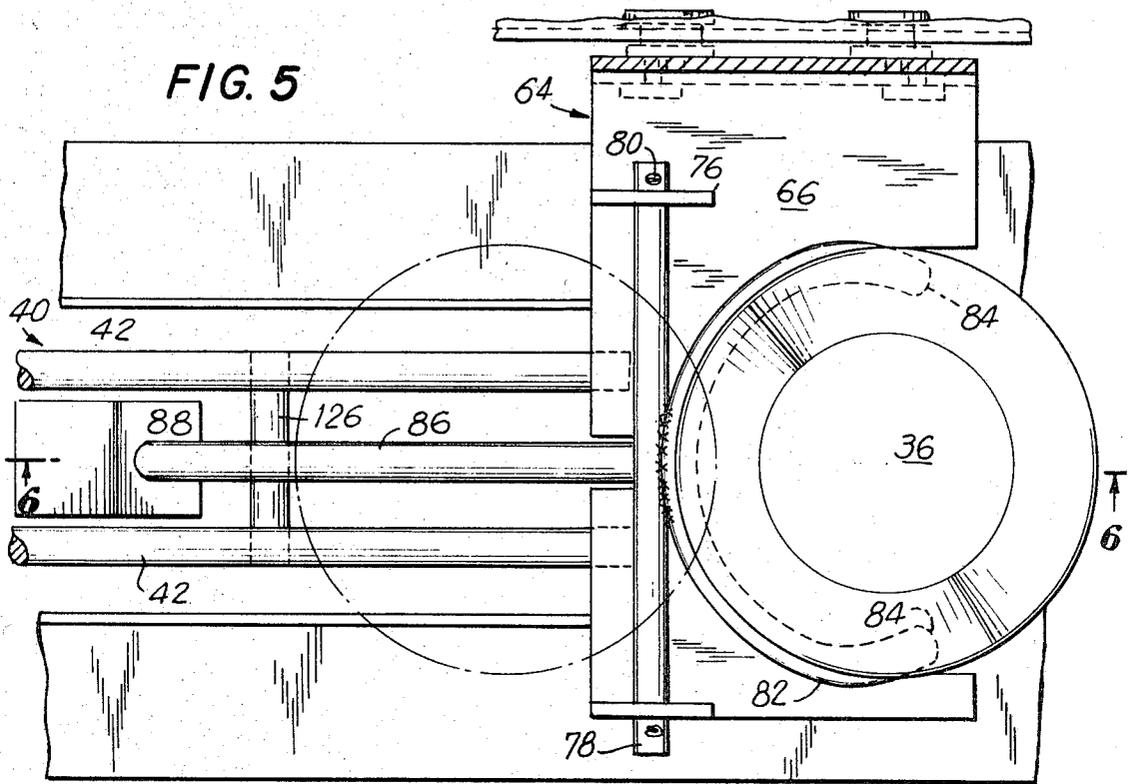
FIG. 4



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## CONTROL AND CUP-PUSHING ASSEMBLY FOR DISPENSERS

### CROSS-REFERENCE TO RELATED APPLICATION

This application relates to a dispenser of the type shown in copending application U.S. Pat. Ser. No. 702,855, filed Feb. 5, 1968, and may utilize a door control of the type shown in copending application, U.S. Pat. Ser. No. 716,045, filed Mar. 26, 1968.

### BACKGROUND OF THE INVENTION

The present invention relates to dispensers. In particular, the present invention relates to that type of dispenser which may be coin-operated or manually operated for the purpose of dispensing into a cup a product such as a chilled, edible product in the nature of ice cream, sherbert, chilled liquids, and the like.

With dispensers of this general type it is conventional to provide a cup for receiving the dispensed product. The cup is displaced from a magazine to a location where it receives the dispensed product, and there may be plurality of such locations in the case where the dispenser dispenses products of different flavors, for example. After the dispensed product is received in the cup, it is displaced to a removal station where access may be had to the cup to remove it from the dispenser.

Various problems are encountered with dispensers of this general type. Thus, when the dispensed product is directed into the cup, the product may issue in the form of a forceful jet which engages the cup in a manner tending to displace the latter undesirably from its position for receiving the dispensed product. This factor results in spills and upsetting of the cup, creating considerable difficulties. While on the one hand it is desired to provide a simple pusher which can push the cup to the receiving and removal stations and then simply be retracted away from the latter, on the other hand such a simple pusher cannot hold the cup against the force of the jet of the issuing product.

Another problem encountered in dispensers of this general type is that the controls require an undesirably large amount of space. Various control switches are required to stop and start the movement of the cup during an operating cycle of the dispenser, and the conventional structure for actuating these switches and for moving the cup requires such a large amount of space that a unit having a desirable compactness cannot be achieved.

### SUMMARY OF THE INVENTION

It is accordingly a primary object of the present to provide a dispenser which will avoid the above drawbacks.

In particular, it is an object of the invention to provide for pushing the cup a structure which will reliably grip and hold the cup so that it cannot be undesirably displaced by the issued product while at the same time being capable of releasing the cup when it reaches the removal station.

Thus, it is an object of the invention to provide a pusher means capable of pushing a cup from a starting position along a given path to an end position and capable of gripping the cup during its movement from the starting position to the end position while at the same time capable of being simply retracted away from the cup back to the starting position while releasing the cup so that it remains at the end position of the path.

In addition, it is an object of the invention to provide an exceedingly compact control structure for controlling the operation of the dispenser and the movement of the cup.

In particular, it is an object of the invention to provide a construction which can accomplish the above objects while at the same time being situated in its entirety in the immediate vicinity of a guide which engages the cup to guide the latter for movement, so that an exceedingly compact unit is provided.

Furthermore, it is an object of the invention to provide a construction which can easily be adapted to cups of different sizes.

Also, it is an object of the invention to provide a construction which is characterized by a relatively small number of rugged elements which will operate reliably to achieve the results of the invention.

With the structure of the invention a guide means is provided to guide a cup for movement from a given starting position along a given path to a predetermined end position. A pusher means engages the cup to push it from the starting position to the end position, and this pusher means has a gripping position where it grips the cup and a release position capable of releasing the cup during retraction of the pusher means back from the end position to the starting position. A moving means coacts with the pusher means for moving it first from the starting position to the end position and for then retracting the pusher means from the end position back to the starting position. A displacing means is situated in the region of the end position of the path of movement of the cup for engaging the pusher means and displacing it from its gripping to its release position as it approaches the end position of the cup, so that when the cup reaches its end position the pusher means will be in its release position to be retracted away from the cup. A plurality of control switches are situated along the path of movement of the cup, and the moving means also carries a switch-actuating means for actuating the control switches during displacement of the cup so as to control the movement thereof.

### BRIEF DESCRIPTION OF DRAWINGS

The invention is illustrated by way of example in the accompanying drawings, which form part of this application and in which:

FIG. 1 is a fragmentary front elevation of a dispenser according to the present invention, a front wall of the dispense being broken away in FIG. 1 to show the structure of the invention situated behind this front wall;

FIG. 2 is a transverse sectional elevation taken along line 2-2 of FIG. 1 in the direction of the arrows and showing the structure at a scale which is enlarged as compared to FIG. 1;

FIG. 3 is a fragmentary front elevation so showing a cup at its starting position and shown showing partly in section the structure located at the starting position of the cup, at a scale which is enlarged as compared to FIG. 1, FIG. 3 showing details in addition to those which are apparent from FIG. 1;

FIG. 4 is a fragmentary sectional plan view taken along line 4-4 of FIG. 3 in the direction of the arrows;

FIG. 5 is a fragmentary, partly sectional plan view showing the position of the parts when the cup has reached its end position; and

FIG. 6 is a partly sectional fragmentary elevation taken along line 6-6 of FIG. 5 in the direction of the arrows.

### DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawings, there is fragmentarily shown in FIG. 1, in a front elevation, a dispenser 10 having a cabinet 12 provided with a front wall 14 part of which is broken away so as to illustrate the structure behind the front wall 14. At the front wall 14, which may be maintained in a closed position by a lock 16, there is a coin-receiving device which is not illustrated and which will start a cycle of operations when a suitable coin is deposited. After the coin is deposited, one of a pair of flavor-selecting switches 18 and 20 is actuated to select a given flavor of the edible product which may be carbonated beverage, a flowable ice cream type of product, a flowable sherbert, or the like. The unit which includes the switches 18 and 20 also includes a coin-return receptacle 22 where a coin will be returned upon actuation of a pushbutton 24 in a well-known manner.

A pair of dispensing nozzles 26 and 28 are provided for respectively dispensing the different flavors of the product. The nozzles 26 and 28 are carried by a unit 30 and controlled by valves 32 and 34, respectively, so that the chilled edible

product will be received from a selected one of a pair of agitating cylinders to flow out in a preselected amount from the selected nozzle during a cycle of operation. This part of the structure which relates to the manner in which the product is prepared and dispensed through the nozzles forms no part of the present invention. The dispensed product is received in a cup 36 one of which is automatically released in a well-known manner from a magazine 38 situated to the left of the nozzles, as viewed in FIG. 1. Thus, whenever a coin is introduced into the dispenser a cup 36 will automatically drop from the magazine 38. The structure for dropping the cups 36 one-by-one from the dispenser 38 also forms no part of the present invention and is not further described.

As a cup 36 drops from the dispenser 38 it falls onto a guide means 40 which guides the cup for movement along a given straight path from the predetermined starting position in which the cup is shown in FIGS. 1—4 to a predetermined end position in which the cup is shown in FIGS. 5 and 6. The guide means 40 includes a pair of stationary parallel horizontal guide bars 42 of circular cross section on which the cup 36 can freely slide. The frame structure of the dispenser includes an inner vertical wall 4 situated behind and parallel to the front wall 14. This wall 44 fixedly carries forwardly extending transverse walls 46 and 48 between which the unit 30 is located. The wall 46 extends between the dispenser 38 and the unit 30 and is formed with an opening 50 (FIG. 2) through which the cup 36 and a pusher means 52, described in detail below, can freely pass. The walls 46 and 48 fixedly carry a drip-pan assembly 54 having an upper member 56 directly connected with the walls 46 and 48 and a lower member 58 which can be removably connected with the upper member 56 in any known way so that from time to time the pan 58 can be removed to be cleaned. At its right end, as viewed in FIG. 1, the drip-pan assembly 54 is situated beneath the cup 36 when the latter arrives at its end position, and this right end of the drip-pan assembly is provided with a top wall 60 (FIG. 6) forming a platform on which the cup 36 rests when it reaches its end position at the removal station. As is shown schematically in FIG. 1, a door 62 is available to the operator to be displaced to an open position giving access to the cup when the latter is in its end position at the removal station.

The bars 42 of the guide means 40 are fixedly connected at their right ends, as viewed in FIGS. 5 and 6, to the wall 60, while the left ends of the bars 42 are connected to the left end wall of the upper component 56 of the drip-pan assembly 54, as is apparent from FIG. 3. In this way the guide bars 42 are fixedly mounted in their positions extending along the path of movement of the cup 36 to guide the latter along this path.

The pusher means 52 includes a bracket 64 having a horizontal wall 66 formed with a substantially U-shaped cutout 68 which is open at its right end, as viewed in FIG. 4, and in the starting position of the parts the cup 36 simply drops down through the cutout 68 to rest on the guide means 40. As is apparent from FIG. 2, the top wall 70 of the drip-pan 54 is formed with an elongated slot 72 through which the guide bars 42 are exposed, and at opposite sides of this slot the top wall 70 has upwardly directed cup-guard extensions 74.

The bracket 64 is supported in a manner described below so that the wall 66 thereof remains horizontal and at one elevation while moving back and forth over the guide means 40, and the wall 66 of the bracket carries a pair of upstanding ears 76 which are formed with aligned openings through which a horizontal rod 78 of the pusher means 52 extends. At its ends which project beyond the ears 76, the rod 78 carries pins 80, so that while the rod 78 can swing about its axis it cannot move axially with respect to the ears 76 and will thus remain in its position reliably carried by the bracket 64 for free-swinging movement. This horizontal rod 78 is fixed, as by welding, to a substantially U-shaped pusher member 82 which normally is maintained in a horizontal position. This pusher member 82 terminates in a pair of free ends 84 spaced from each other by a distance which is less than the maximum diameter of the tapered cup 36 at the elevation of the latter surrounded by the

pusher member 82 when the latter is in the horizontal position which it normally assumes in the manner described below. Thus, as may be seen from FIG. 4, the pusher member 82 extends around the cup through an angle greater than  $\lambda^\circ$  with the ends 84 situated closer to each other than the maximum diameter of the cup 36 at the elevation where the pusher member 82 is located, so that in this way the cup is gripped by the pusher member 82 and cannot be displaced therefrom upon movement of the pusher 82 and cup 36, one with respect to the other in the direction of the path determined by the guide means 40.

The pusher means 52 includes in addition to the swingable rod 78 and the U-shaped pusher member 82, a lever 86 which is fixed, as by welding, to the rod 78 midway between the ears 76, this lever 86 extending freely down between the guide bars 42 to an elevation substantially lower than these guide bars to the interior of the drip-pan 54. At its lower end the lever 86 carries within the drip-pan a weight 88 which maintains the lever 86 normally in a substantially vertical attitude where the pusher member 82 will be substantially horizontal to assume its gripping position described above and shown in FIGS. 3 and 4. It is to be noted that the weight 88 is of a size which is small enough to pass freely upwardly through the space between the guide bars 42.

The bracket 64 which carries the pusher means 52 is operatively connected with a moving means 90 which acts through the bracket 64 on the pusher means 52 in order to reciprocate the latter back and forth along the path determined by the guide bars 42 of the guide means 40. The moving means 90 includes a carriage 92 having a vertical wall 94 which rotatably carries a plurality of grooved rollers 96. The inner wall 44 (FIG. 2) fixedly carries rails 98 which are straight and parallel to each other and extend along the path of movement of the cup 36, and these rails terminate in free edges which are received in the grooves of the rollers 96, so that in this way the carriage 92 is guided for movement back and forth in a horizontal direction. This wall 94 of the carriage 92 is formed with a vertically extending slot 100, and this slot receives a motion transmitting member 102. The motion transmitting member 102 of the moving means 90 is in the form of a roller which is freely turnable on a pin fixed to an endless chain 104 of the moving means 90, this chain 104 extending around a pair of sprockets 106 and 108, as shown most clearly in FIG. 1. These sprockets are fixed to rotary shafts supported in any suitable bearings carried by the wall 44, and the shaft 110 which is fixed to the sprocket 106 is indicated in FIG. 2 and may be connected to any suitable driving motor. Thus, as the motion transmitting member 102 moves with the chain 104, it will as also move vertically along the slot 100 and displace the carriage 92 along the rails 98. Assuming that the sprockets 106 and 108 turn in a clockwise direction, as viewed in FIG. 1, then from the starting position of FIG. 1 the motion transmitting member 102 will first move along the upper run of the endless chain 104 to advance the carriage 92 to the right, as viewed in FIG. 1, and then as the motion transmitting member 102 turns around the sprocket 108 and then moves along the lower run of the chain 104, the carriage 92 of the moving means 90 will be retracted to its starting position.

In order to mount the bracket 64 on the moving means 90, a releasable fastening means is provided so that one size of pusher means 52 can be exchanged for another size. The releasable fastening means 112 includes two pairs of headed pins 114 located one above the other and fixed to the plate 94 of the carriage 92. The bracket 64 has next to the wall 94 downwardly extending portions 116 each of which is formed with a longitudinal slot having a bottom open end which is formed with inwardly curved edges, as shown most clearly for the slot 118 to the left portion 116 of the bracket in FIG. 6. The width of the slot 118 is less than the diameter of the heads of the pins 114 while the slot is large enough to receive the shanks of these pins, so that with this construction the pair of portions 116 can be slid down onto the shanks of the pins 114 and retained by the heads of the pins 114 assembled with the

moving means 90. A given pusher means 52 will have a size corresponding to that of a given cup 36. If a cup of a different size is used, then it is a simple matter to remove the bracket 64 and replace it with another bracket carrying a pusher means of a different size which is adapted to the particular size of the cup which is to be pushed.

Thus, when the structure described above is in the position shown in FIGS. 1-4, a cup 36 which drops from the magazine 38 will fall freely down through the cutout 68 of the horizontal wall 66 of the bracket 64 to engage the guide means 40, and with the pusher member 82 in a horizontal plane it will surround and grip the cup with the ends 84 of the U-shaped member 82 closer to each other than the maximum diameter of the cup in the horizontal plane where the U-shaped member 82 is located. This horizontal wall 66 of the bracket 64 is formed with a rear longitudinal slot 120 which is open at its left end, as viewed in FIG. 4, so that the lever 86 can swing freely in the slot 120. The slot 120 and the cutout 68 are separated by a wall portion 122 of the wall 66, as is most clearly shown in FIG. 6. The structure of the invention includes a displacing means 124 for displacing the pusher means from its gripping position shown in FIGS. 1-4 to a release post position shown in FIGS. 5 and 6. In the release position of the pusher means 52, the U-shaped member 82 thereof is tilted downwardly toward the right, as shown in FIG. 6, so that the free ends 84 are displaced downwardly along the cup 36 to a lower elevation where the distance between the free ends 84 is greater than the maximum diameter of the cup 36 at this lower elevation where the free ends 84 are located upon tilting of the pusher means to the position indicated in FIG. 6.

The displacing means 124 for bringing about the displacement of the pusher means 52 from its gripping to its release position takes the form of a transverse camming bar 126 which is fixed to the guide bars 42, as by being welded thereto, and this camming bar or rod 126 is situated in the region of the end position of the cup 36 which is shown in FIGS. 5 and 6. As the moving means 90 moves the pusher means 52 in order to displace the cup 36 along the path determined by the guide means 40, the pusher means remains in its gripping position until the cup 36 approaches its end position along its path of movement. As the cup 36 approaches its end position the camming bar 126 engages the lever 86 so that by the time the motion-transmitting member 102 has reached the right end of the horizontal diameter of the sprocket 108, as viewed in FIG. 1, the lever 86 will be tilted to the position shown in FIG. 6, thus swinging the rod 78 about its axis and tilting the pusher member 82 from its horizontal gripping position to its inclined release position shown in FIG. 6. When, during the continued movement of the chain 104 the motion-transmitting member 102 starts back toward its starting position, the pusher means 52 will of course be retracted with the carriage 92, and because of the lower elevation of the ends 84 of U-shaped member 82 at this time, the pusher means will simply move back away from the cup 36 without displacing the latter from the end position thereof shown in FIGS. 5 and 6.

Thus, through this simple construction the displacing means 124 responds to the approach of the cup 36 to its end position for automatically displacing the pusher means from its gripping to its release position, so that upon retraction of the pusher means back toward the starting position the cup 36 will simply remain at its end position at the removal station from where it may be removed by opening of the door 62.

As is apparent from the copending application, U.S. Pat. Ser. No. 702,855, filed Feb. 5, 1968, a number of control switches are provided for terminating the operations at the end of a given operating cycle and for stopping the movement of the cup beneath a selected nozzle for a given period of time after which the cup continues to advance to the removal station. Similar control switches 128, 130 and 132 are provided with the structure of the present invention, but in this case they are arranged along a straight horizontal path which is the path of movement of the moving means 90, and it will be noted that these switches are located close to the above-

described structure. These switches are directly carried by the wall 44 and respectively are provided with switch-operating members 134, 136, and 138. The switches 130 and 132 are one-way switches in the sense that when the operating members 136 and 138 swing to the right, as viewed in FIG. 1, these switches will be actuated, while when their operating members 136 and 138 swing to the left, they will have no influence on the switches 130 and 132. On the other hand, the operating member 134 of the switch 128 actuates the latter when this operating member 134 is swung to the left to its position shown in FIGS. 1 and 3. A switch-actuating means 140 is operatively connected to the moving means for movement therewith for the purpose of actuating the switches, and this switch-actuating means 140 is in the form of an upstanding plate portion connected integrally with the top edge of the wall 94, in the manner shown most clearly in FIG. 2, and having a right downwardly inclined edge, shown most clearly in FIG. 3, so that this right edge of the switch-actuating member 140 can ride beneath the switch-operating member 136 and 138 to move the latter for operating the switches 130 and 132. On the other hand, the rear or left edge of member 140 engages the switch-operating member 134 to displace the latter to terminate the operations at the end of the retracting movement of the pusher means when the parts have returned to their starting position at the end of an operating cycle. These switches 128, 130 and 132 are located in a circuit identical with that shown in application U.S. Pat. Ser. No. 702,855, so that in response to insertion of a coin, for example, to start a cycle of operations, the sprocket 106 will turn to advance the pusher means 52 to the right, as viewed in FIG. 1. In the event that the switch 18 corresponding to the nozzle 26 has been actuated to select the flavor which will issue from the nozzle 26, then the switch 130 is rendered operative so that upon movement of the switch-operating member 136 by the switch actuating means 140 the cup 36 will stop for a given period of time beneath the nozzle 26 to receive a given amount of product therefrom. Of course, the sprockets 106 and 108 and the chain 104 stop for this latter period of time so that the pusher means remains stationary with the cup 36 positioned beneath the nozzle 26. On the other hand, if the operator has selected nozzle 28 by actuation of switch 20, then the parts will automatically stop for the same period of time with the cup 36 positioned beneath the nozzle 28 to receive product from the latter. After the allotted period of time has elapsed the moving means again starts operating in a fully automatic manner to continue the advance of the cup 36 to the end position of its path of movement so that it will become located at the removal station to be removed upon opening of the door 62. During the retracting movement of the pusher means back to its starting position, the switch-actuating means 140 will swing the switch-operating members 138 and 136 in the opposite direction, but they will have no influence on the switches 130 and 132 at this time. However, when the switch-actuating means 140 engages the switch-operating member 134 the switch 128 will be actuated to terminate the operations with the parts again located at their starting position.

The door 62 may be maintained closed by a releasable lock which can be released upon energizing of a solenoid, as disclosed in copending application U.S. Pat. Ser. No. 716,045, and in order to energize this solenoid to release the door 62 so that it can be opened, an additional switch 142 is provided. This switch 142 may be identical to with the switches 130 and 132 and also has a switch-operating member 144 which upon being displaced to the right, as viewed in FIG. 1, will actuate the switch 142 while when the member 144 is displaced to the left it will have no influence on the switch 142. The switch 142 is also carried by the wall 144 and is situated in horizontal alignment with the horizontally aligned switches 128, 130 and 132, as is apparent from FIG. 1. Thus, just before the cup reaches its end position switch-operating member 144 so as to close the switch 142 and thus energize the solenoid which releases the lock for the door 62, so that the latter can be opened in the manner disclosed in the above copending application U.S. Pat. Ser. No. 716,045.

The several switches are protected by a guardplate 146 fixed to the wall 44 in the manner shown in FIG. 2 and extending in front of the several switches.

Thus, with the above-described structure of the invention an exceedingly compact unit is provided. All the structure for bringing about movement of the cup and control of the operations is situated in an extremely small space just beneath the nozzles 26 and 28. As the carriage 92 of the moving means 90 moves back and forth it brings about not only the required movement of the cup 36 but also actuation of the controls for the dispenser 10. These results are achieved with rotary members which turn at all times in one direction, and it will be noted that it is immaterial whether the sprockets 106 and 108 rotate in a clockwise or in a counterclockwise direction. As is apparent from FIGS. 5 and 6, as the cup 36 approaches its end position it moves smoothly from the guide bars 42 of the guide means 40 onto the platform 60 on which it stably remains ready to be removed upon opening of the door 62.

We claim:

1. In a dispenser, guide means for guiding a tapered cup for movement along a given path from a predetermined starting position to a predetermined end position, swingable pusher means for pushing said cup along said guide means from said starting position to said end position, said pusher means having a gripping position gripping the cup to prevent displacement of the cup and pusher means one with respect to the other along said path while said pusher means is in said gripping position thereof, and said pusher means having a release position for releasing the cup upon retraction of said pusher means away from the cup along said path, moving means coacting with said pusher means for advancing the latter from said starting to said end position along said path to push the cup from said starting to said end position, and said moving means coacting with said pusher means for retracting the latter back from said end position to said starting position after the cup has been pushed by said pusher means to said end position, and displacing means situated in the region of said end position of said cup for swinging said pusher means as it approaches said end position from said gripping position to said release position to situate said pusher means in its release position when said cup reaches said end position, so that upon retraction of said pusher means by said moving means said pusher means will release the cup which will thus remain at said end position.

2. The combination of claim 1 and wherein said pusher means includes a substantially U-shaped member extending in its gripping position around the cup through an angular distance sufficient to hold the cup and prevent separation of the cup from said U-shaped member, said U-shaped member in its release position extending around the cup through an angular distance insufficient to prevent retraction of said pusher means away from the cup.

3. The combination of claim 2 and wherein said U-shaped pusher member has a pair of free ends which in the gripping position of said pusher means are situated beyond and at the elevation of a portion of the cup whose diameter is greater than the distance between said free ends of said U-shaped member, so that the cup and pusher means cannot be separated from each other, while in said release position said free ends of said U-shaped member are located at a lower portion of the cup at an elevation where the maximum diameter thereof is less than the distance between said free ends of said U-shaped member.

4. The combination of claim 3 and wherein said pusher means includes an elongated rod extending transversely of said path and carrying said U-shaped member at a trailing side of the cup, a said moving means carrying said rod and supporting the latter for free swinging movement about its axis, and said pusher means including a lever fixed to and extending from said rod and normally assuming a position where said U-shaped member extends partly around a cup and grips the latter, and said displacing means coacting with said lever as said moving means displaces said pusher means to the region of said end position of said cup for turning said lever and

swinging said rod about its axis to a location where the free ends of said U-shaped member are tilted with said U-shaped member downwardly along said cup to a location where the distance between said free ends is sufficiently great to clear the cup during retraction of said pusher means.

5. The combination of claim 4 and wherein a weight is carried by said lever for normally maintaining the latter in a vertical position with said U-shaped member situated substantially in a horizontal plane in its gripping position.

6. The combination of claim 5 and wherein said displacing means includes a stationary camming bar situated at the region of said end position of said cup and engaging said lever for tilting the latter and turning said rod as said pusher means continues to advance toward said end position so that said displacing means automatically tilts said U-shaped member to its release position.

7. The combination of claim 5 and wherein said guide means includes a pair of elongated guide bars spaced from and parallel to each other and extending along said path of movement for engaging and slideably supporting the bottom end of a cup, said rod and U-shaped member of said pusher means being situated over said bars of said guide means, and said lever extending from said rod downwardly between said guide bars to a location lower than the latter where said weight is located, and said displacing means including a transverse camming bar carried by said bars of said guide means and extending across the space therebetween in the region of said end position of said cup so that said camming bar will engage said lever to tilt the latter and said U-shaped member therewith as said moving means advances said pusher means to said end position.

8. The combination of claim 1 and wherein said moving means includes a carriage and guide rails coacting with said carriage for guiding the latter for movement back and forth along said path, said carriage carrying said pusher means and having a wall formed with an elongated slot passing therethrough, an endless chain and a pair of sprockets coacting therewith, and a motion-transmitting member carried by said chain and extending through said slot for moving along the latter while advancing with one run of said chain during movement of said carriage to displace said pusher means from said starting to said end position and along another run of said chain during retraction of said pusher means back to said starting position.

9. The combination of claim 8 and wherein a plurality of control switches are situated along the path of movement of said carriage, and switch-actuating means carried by said carriage for movement therewith to actuate said switches during movement of said carriage.

10. The combination of claim 1 and wherein said moving means includes a carriage and rails guiding said carriage for movement, and fastening means removably fastening said pusher means to said carriage for movement therewith, so that by way of said fastening means a pusher means of one size can be exchanged for a pusher means of a different size.

11. The combination of claim 10 and wherein said fastening means includes at least one pair of headed pins located one above the other and carried by said carriage, and a bracket carrying said pusher means and formed with an elongated open ended slot narrower than heads of said pins for receiving shanks thereof to removably mount said bracket on said carriage.

12. In a dispenser, a control switch having a one-way switch-operating member movable in one direction for operating the switch and in an opposed direction without operating the switch, a carriage and guide rails coacting with said carriage to support the latter for movement, said carriage carrying a switch-actuating member for moving the latter along a path in which said switch-operating member of said switch is located, and drive means coacting with said carriage for moving the latter back and forth to displace said switch-actuating member back and forth along said path so that in one direction of said

switch-actuating member it will engage and move said switch-operating member in said one direction to actuate the switch while in the opposed direction of movement of said carriage and switch-actuating member the switch-operating member will be moved in said opposed direction without operating the switch.

13. The combination of claim 12 and wherein a plurality of said switches with one-way switch-operating members are respectively displaced from each other and situated along the path of movement of said switch-actuating member.

14 The combination of claim 12 and wherein said carriage has a wall formed with an elongated slot extending therethrough transversely at the path of movement of said car-

riage along said rails, and said drive means including an endless chain, sprockets driving the latter, and a motion-transmitting member fixed to said chain and extending therefrom through said slot to transmit movement of said chain to said carriage.

15. The combination of claim 14 and wherein a guide means for guiding a cup along a path parallel and adjacent the path of movement of said switch-actuating member is situated adjacent said carriage, and pusher means carried by said carriage at substantially the elevation of said switch-actuating member for pushing a cup along said guide means during movement of said carriage.

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