Nov. 10, 1964 P. PLENTIS 3,156,381

AUTOMATIC LIQUOR DISPENSER FOR BARS

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FIG. 1

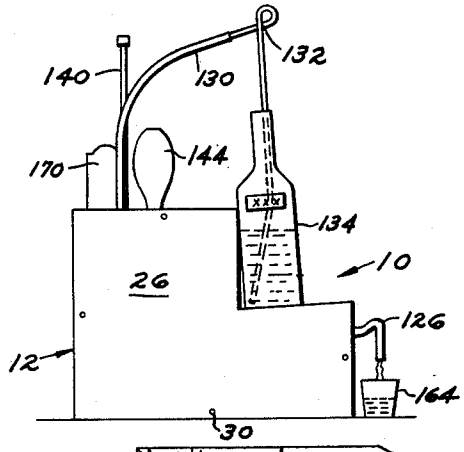

FIG. 5

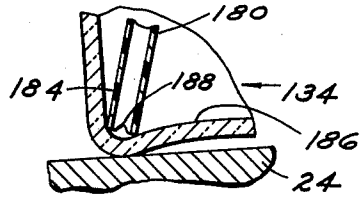

FIG. 6

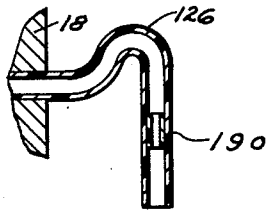

FIG. 4

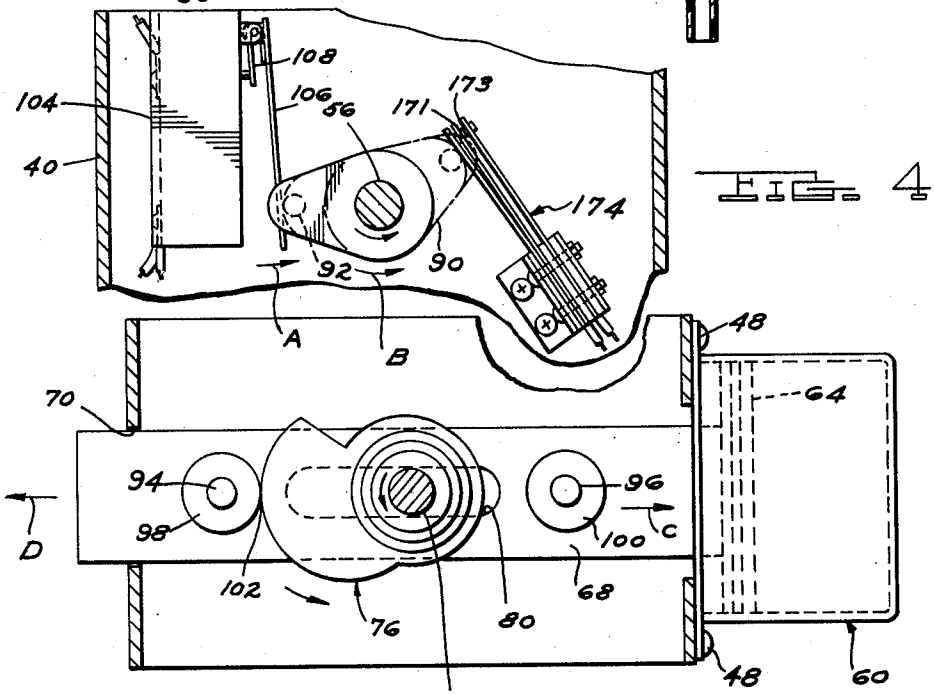

FIG. 2

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AUTOMATIC LIQUOR DISPENSER FOR BARS

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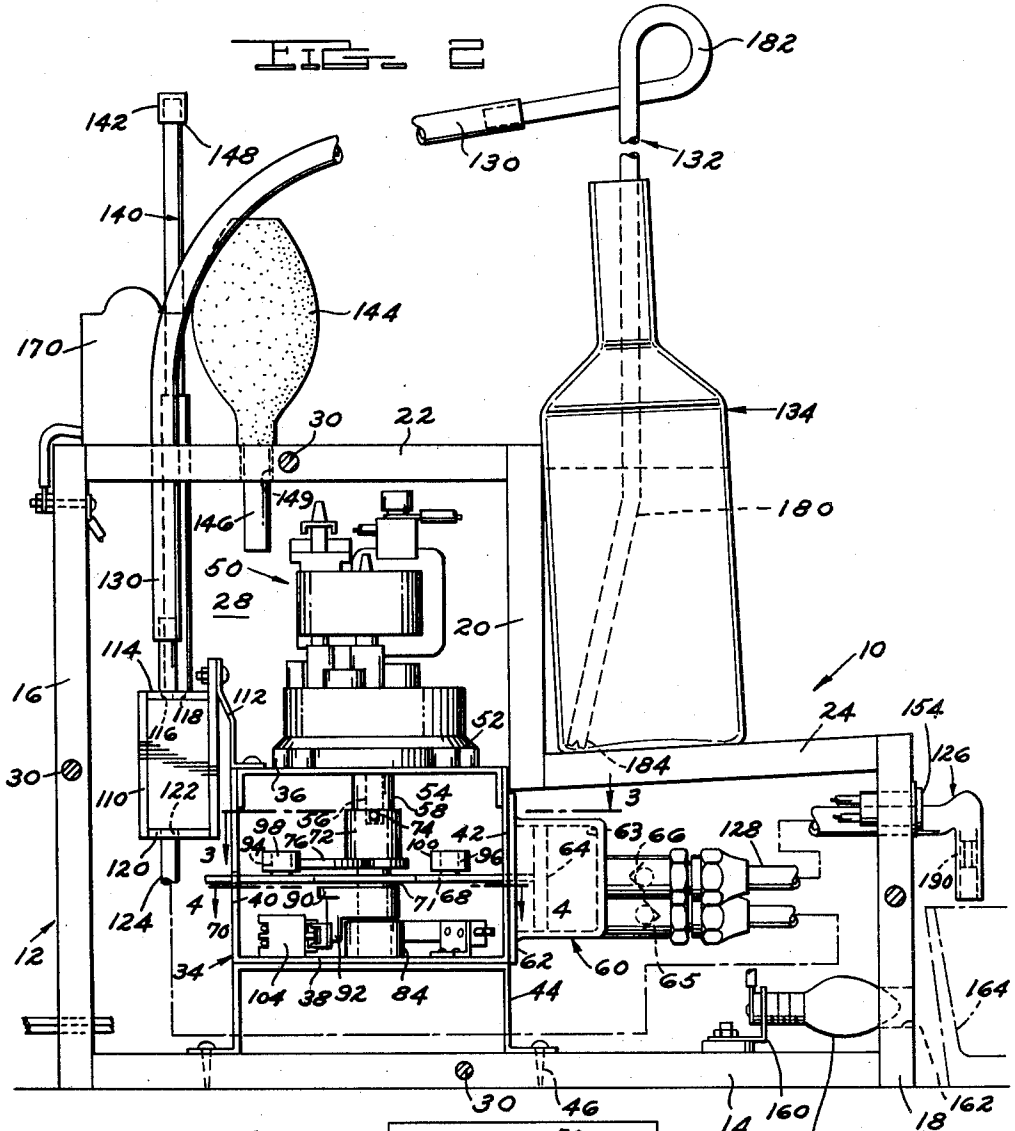
FIG. 2



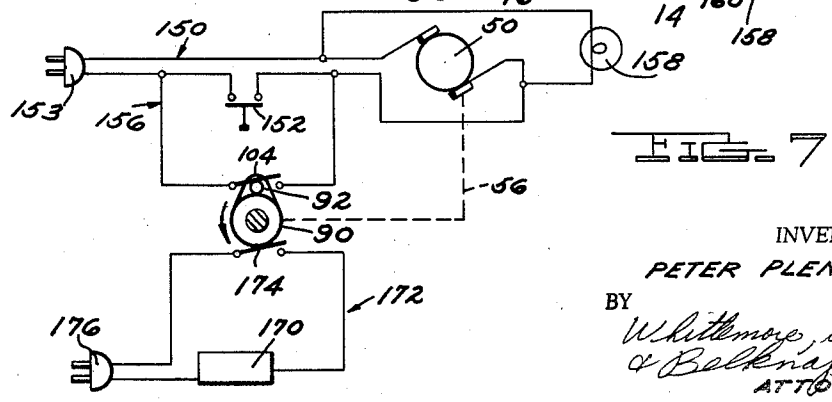


FIG. 7

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AUTOMATIC LIQUOR DISPENSER FOR BARS

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16 Claims. (Cl. 222—60)

This invention relates generally to a dispenser for liquids and refers more particularly to an automatic dispenser for liquors which accurately controls and dispenses a predetermined unit of liquor upon the application of a signal.

Such an automatic dispenser is characterized by the unique arrangement of the component parts which provides for improved accuracy in dispensing liquors and in maintaining a count of the units of liquor dispensed.

Presently, liquor is usually dispensed directly into a shot glass from a liquor bottle. In such an operation, the bartender is apt to pour a greater amount of liquor than required or, if under pressure, to spill the liquor during the dispensing operation. In addition, mechanical devices are provided for liquor bottles for insuring that only the exact amount of liquor is dispensed. However, such mechanical devices require close attention by the bartenders and, if not properly operated, could result in spillage. Regardless of how the liquor is lost, whether by carelessness or design, the owner of the bar, club, or the like suffers a financial loss.

One of the essential objects of the invention is to provide an automatic dispenser for liquids, such as liquors, which insures that only the requisite unit of liquor is dispensed at any given time thereby minimizing loss of liquor through carelessness or design.

Another object is to provide an automatic dispenser having counting means for keeping a count of the units of liquor dispensed.

Another object is to provide an automatic dispenser for liquors comprising a positive displacement pump having a capacity for a single unit of liquor, a liquor reservoir connected to the pump, a motor, pump actuating means operatively connecting the motor to the pump, and means for energizing the motor which is effective to move the pump through one complete cycle each time the motor is energized, said pump being initially moved by the actuating means in its discharge stroke to dispense the liquor in the pump and then moved in its suction stroke to replenish the pump with liquor from the reservoir.

Still another object is to provide an automatic dispenser for liquors comprising a pump having a capacity for a single unit of liquor, a liquor reservoir connected to the pump, an electric motor, pump actuating means operatively connecting the motor to the pump, an electrical motor circuit including a normally open manually operated switch for energizing the motor and the circuit, and a holding circuit interconnected in the motor circuit including a normally open switch which is closed upon energization of the motor circuit, said holding circuit maintaining the motor circuit energized upon opening of the manually operated switch for one complete cycle of the pump, said pump being initially moved by the actuating means in its discharge stroke to dispense the liquor from the pump and then moved in its suction stroke to replenish the pump with liquor from the reservoir to complete the cycle of the pump.

A further object is to provide an automatic dispenser of the aforementioned type which includes an electrical counter circuit including a counter and a normally opened counter switch, said counter switch being closed during each cycle of the pump to energize the counter circuit and advance the counter one digit.

A still further object is to provide an automatic dispenser of the aforementioned type wherein a light is included in the motor circuit for facilitating the dispensing of the liquor from the pump into a glass or the like.

Another object is to provide an automatic dispenser of the aforementioned type wherein siphon means are provided for connecting the liquid reservoir to a primary source of liquor, such as a liquor bottle, said siphon means being effective to replenish the reservoir with liquor from the source after each discharge stroke of the pump.

Still another object is to provide an automatic dispenser of the aforementioned type wherein a discharge nozzle is connected to the outlet side of the pump, said nozzle being provided with a restriction to prevent dripping therefrom after the discharge stroke of the pump has been completed.

A further object is to provide an automatic dispenser of the aforementioned type wherein the component parts are entirely enclosed in a housing and the manually operated switch in the motor circuit is adapted to be operated by a push button located in a wall of the housing.

A still further object is to provide an automatic dispenser of the aforementioned type wherein the housing is provided with a wall which extends slightly downwardly from a horizontal plane and provides a support for a liquor bottle so that the axis of the liquor bottle will be inclined slightly with respect to a vertical plane to facilitate the emptying of the bottle.

Another object is to provide an automatic dispenser of the aforementioned type wherein the liquor reservoir has a capacity substantially greater than the capacity of the pump.

Still another object is to provide an automatic dispenser of the aforementioned type wherein the liquor reservoir is mounted within the housing and has a capacity approximately equal to twice the capacity of the pump.

A further object is to provide an automatic dispenser of the aforementioned type wherein means are provided for keeping air out of the dispensing system to insure that the pump will dispense the requisite unit of liquor.

A still further object is to provide a control system for a liquor dispenser including an electrical motor circuit for a motor, the circuit having a manual switch for selectively energizing the motor and circuit to drive a pump through one complete cycle and thereby discharge the liquor in the pump and replenish the pump with liquor from a liquor reservoir, and an electrical holding circuit for the motor circuit including a normally opened switch which is closed upon energization of the motor circuit, said holding circuit maintaining the motor circuit energized upon opening of the manual switch until the aforesaid cycle of the pump is completed.

Another object is to provide a siphon tube which is adapted to be connected between a relatively large liquid reservoir and a relatively small liquid reservoir, said tube having an elongated bowed stem which is provided with a loop at one end and a relatively shallow downwardly facing opening at the other end which extends through the wall of the stem.

It is thus another object of this invention to provide simplified low-cost structures of the aforementioned type having certain advantages contributing to efficiency, reliability, and long life, as well as ease of maintenance.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred form of the present invention is clearly shown.

FIGURE 1 is an elevational view of the automatic dispenser.

FIGURE 2 is an elevational view of the automatic dispenser with a side wall of the housing removed so as to illustrate the component parts within the interior of the housing.

FIGURE 3 is a plane view, partly in section, illustrating the pump actuating mechanism and taken along the line 3—3 of FIGURE 2.

FIGURE 4 is a plane view, partly in section, taken along the line 4—4 of FIGURE 2 and illustrating the cam mechanism for a pair of switches.

FIGURE 5 is a fragmentary view in section illustrating the lower end of a siphon tube in a bottle.

FIGURE 6 is a vertical sectional view of the discharge nozzle.

FIGURE 7 is a schematic diagram of the electrical circuit.

Referring now to the drawings, FIGURES 1 and 2 illustrate an automatic dispenser 10 for liquids, such as liquors. The component parts of the automatic dispenser 10 are entirely enclosed in a housing 12 which may be made from any suitable material such as wood or metal in keeping with its environment.

The housing 12 is substantially L-shaped and includes a bottom wall 14 and a pair of vertical end walls 16 and 18. The end wall 18 is approximately half the height of the wall 16. The housing 12 also includes a vertical wall 20 intermediate the end walls 16 and 18. The upper ends of the walls 16 and 20 are connected by a first top wall 22 and the lower end of the wall 20 and the upper end of the wall 18 are connected by a second top wall 24. The second top wall 24 is slightly inclined with respect to a horizontal plane for a specific purpose to be hereinafter described. The housing 12 is provided with a pair of side walls 26 and 28, one of which is usually readily removable. The wall of the housing may be connected in any suitable manner, such as by threaded fasteners or screws 30.

Mounted within the interior of the housing 12 is a frame 34 which comprises an upper plate 36, a lower plate 38, and side plates 40 and 42. The frame 34 is mounted on a support 44 which is appropriately connected to the bottom wall 14 by means of fasteners 46. It should, of course, be understood that the support 44 may be eliminated and the frame 34 connected directly to the bottom wall 14. The various plates forming the frame 34 are connected by threaded fasteners 48.

An electrical motor 50 provided with a flange 52 is mounted on the plate 36. The motor 50 is a staple article of commerce and may be of any suitable type or design. The flange 52 of the motor 50 is bolted or otherwise secured to the plate 36. The plate 36 is provided with a central opening 54 through which the motor shaft 56 and bushing 58 extend.

A pump 60 is provided with a flange 62 which is bolted or otherwise secured to the outside wall of the plate 42, as best illustrated in FIGURE 2. The pump 60 is of the positive displacement type and for purposes of discussion is illustrated as a piston type pump. However, it should be understood that the pump 60 may take one of any number of forms of commercially available pumps.

The pump 60 is provided with a pumping chamber 63 in which a piston 64 is movable in discharge and suction strokes. The pump 60 includes the usual intake check valve 65 and the usual discharge check valve 66. An opening is provided in the side wall 62 opposite the piston 64 through which an actuating arm 68 extends. The actuating arm 68 is appropriately connected on one end to the piston 64 by suitable threaded fasteners or the like. The other end of the arm 68 extends through a guide slot 70 provided in the side plate 40, as best illustrated in FIGURES 2 and 3.

The lower end of the motor shaft 56 is provided with a drive member 71. The shaft 56 and drive member 71 are appropriately connected to a concentrically arranged

cam bushing 72 by means of a pin-and-slot connection 74. The lower end of the cam bushing 72 is provided with a first cam 76. The actuating arm 68 has an elongated slot 80 through which the drive member 71 extends. The drive member 71 is mounted for rotation in a bushing 84 fixed to the bottom plate 38. The drive member 71 carries a second cam 90 which is provided with a downwardly extending cam pin 92.

The actuating arm 68 is provided with upwardly extending stub shafts 94 and 96 on opposite sides of the cam 76. The stub shafts 94 and 96 carry rollers 98 and 100 respectively. Prior to moving the piston 64 in its pumping stroke, the high point 102 of the cam 76 is in engagement with the bearing 98 as illustrated in FIGURE 3.

The plate 38 carries a micro switch 104 which includes an elongated arm 106 for opening and closing the contacts, not shown. The arm 106 is biased by a spring 108 in the direction indicated by the arrow A to close the contacts of the switch 104. When the actuating arm 68 is in the position illustrated in the drawings, the cam pin 92 prevents the arm 106 from closing of the contacts of the micro switch 104. However, once the piston 64 is moved by the actuating arm 68 in its discharge stroke, the cam 90 and the cam pin 92 are moved counterclockwise, as indicated by the arrow B in FIGURE 4, to permit the spring 108 to bias the arm 106 in a direction to close the contacts of the switch 104 for a purpose to be subsequently described.

The automatic dispenser 10 also includes a reservoir 110 which may be made from Plexiglas or other suitable material. The reservoir 110 is appropriately carried by a bracket 112 which is bolted to the top plate 36. The top wall 114 of the reservoir 110 is provided with an inlet opening 116 for the liquor and an opening 118 for a siphon tube. The lower wall 120 of the reservoir 110 is provided with an outlet opening 122 for the liquor. The outlet opening 122 is connected to the inlet side of the pump 60 by means of the flexible conduit or tube 124. The outlet side of the pump 64 is connected to the discharge nozzle 126 by means of a flexible conduit or tube 128.

The inlet opening 116 in the top plate 114 of the reservoir 110 is connected by a flexible conduit 130 to a novel siphon tube 132 which will be subsequently described. The siphon tube 132 is interposed in the interior of a liquor bottle 134 for delivering liquor to the interior of the reservoir 110 during the operation of the pump 60.

It is very important in the operation of the present invention that means be provided for eliminating air from the entire pumping system. Obviously if air was pumped along with the liquor through the system, the requisite amount or unit of liquor would not be dispensed. The applicant has eliminated air from the pumping system by providing an elongated tubular member or stem 140 which is connected to the siphon opening 118 provided in the top wall 114 of the reservoir 110. The tubular member 140 is provided with a removable cap 142. In order to remove air from the system, the operator is provided with a suction bulb 144 having a stem 146 which is adapted to fit over the end 148 of the tubular member 140. The bartender squeezes the suction bulb 144 to pull the air from the reservoir 110. This causes a reduction in pressure within the interior of the reservoir 110. The atmospheric pressure acting upon the liquor in the bottle 134 moves the liquor through the siphon tube 132 and flexible conduit 130 into the interior of the reservoir 110 so as to completely fill the reservoir 110. This feature of removing air from the reservoir 110 is termed "priming the reservoir." When the suction bulb 144 is not in use, the operator may insert the stem 146 in an opening 149 provided in the top wall 22 of the housing 12, as illustrated in FIGURE 2.

In order to effect actuation of the pump 60 an electrical system is provided as indicated in FIGURE 7. The sys-

tem includes an electrical motor circuit 150 for the motor 50. The circuit 150 includes a manually operated normally opened switch 152 and a plug connector 153 which is adapted to be connected to a source of alternating current. The switch 152 is operated by a push button 154 which is usually mounted in the end wall 18 of the housing 12 as illustrated in FIGURE 2. An electrical holding circuit 156 is interconnected in the motor circuit 150 and includes the normally open switch 104 aforesaid which is controlled by the cam 90. The motor circuit has a light 158 connected across the circuit in parallel.

The light 158, as shown in FIGURE 2, is mounted on a bracket 160 supported on the bottom wall 14 of the housing 12. An opening 162 is provided in the end wall 18 of the housing 12 to emit rays of light therethrough when the motor circuit 150 is energized. The rays of light are effective to illuminate or brighten a shot glass 164 located beneath the nozzle 126.

In order to maintain an accurate count of units of liquor dispensed, a counter 170 and a counter circuit 172 are provided. The counter circuit 172 includes a normally opened switch 174 which is closed by the cam pin 92 upon rotation of the cam 90. The closing of the counter switch 174, once during each revolution of the cam 90, is effective to advance the counter 170 one digit. The counter circuit 172 is provided with a plug connector 176 which may be connected to a separate source of alternating current. The counter switch 174 includes a pair of contacts 171 and 173 as illustrated in FIGURE 4.

It should be understood that the counter circuit 172 may be interconnected in the motor circuit 150. In addition, the counter 170 may be located in a circuit separate from the counter circuit 172 so that a plurality of automatic dispensers may be connected thereto. As an example, a bar may have ten automatic dispensers but only one counter for accurately recording the units of liquor dispensed from all of the dispensers. For purposes of illustration, the counter 170 is mounted on the top wall 22 of the housing 12 so that a person may readily see how many units have been dispensed.

Referring once again to the electrical system, when it is desired to dispense a unit of liquor, the bartender or operator pushes the push button 154 so as to momentarily close the switch 152 thereby completing the circuit 150. As a result, the motor 50 is energized so as to rotate the shaft 56 and the cams 76 and 90 connected thereto counterclockwise as viewed in FIGURES 3 and 4. Initially, the high point 102 of the cam 76 which engages the bearing 98 moves the pump actuating arm 68 to the left a relatively short distance to pull a little more liquor into the pumping chamber 63. The cam 76 as it continues to rotate, leaves the bearing 98 and picks up the other bearing 100 so as to move the pump actuating arm 68 and the piston 64 of the pump 60 to the right in a pumping stroke as indicated by arrow C in FIGURE 3. Simultaneously with the rotation of the cam 76 the cam pin 92 moves away from the arm 106 of the micro switch 104. As result the spring 108 moves the arm 106 in the direction of arrow A in FIGURE 4 to close the contacts of the switch 104 in the holding circuit 156. The holding circuit 156 maintains the motor circuit 150 energized until the cam 90 is rotated one revolution to a position where the cam pin 92 again trips the micro switch 104 and moves the arm 106 inwardly to a position to open the contacts and break the holding circuits 156. The light 158 which is connected in the motor circuit 150 is lit throughout the entire dispensing operation.

As previously mentioned as the cam 76 rotates counterclockwise it initially leaves the bearing 98 and picks up the bearing 100 to move the actuating arm 68 and piston 64 in a pumping or discharge stroke. During the discharge stroke the liquor in the pumping chamber 63 is forced out of the check valve 66 on the outlet side of the pump 60 where it is delivered through the conduit 128 and nozzle 126 into the shot glass 164.

After the pumping stroke has been completed during approximately 180° of cam rotation the cam 76 continues to rotate. The high point 102 of the cam 76 leaves the bearing 100 and once again comes into contact with the bearing 98 and moves the actuating arm 68 and piston 64 to the left in a suction stroke as indicated by the arrow D in FIGURE 3. As a result, a unit of liquor is pulled into the pumping chamber 63 from the reservoir 110 during the final 180° of cam rotation by means of the conduit 124 and check valve 65 on the inlet side of the pump 60. After the suction stroke has been completed the cam 76 assumes the position illustrated in FIGURE 3, with the pump 60 ready for the next dispensing operation. At this time the cam pin 92 will engage the arm 106 of the micro switch 104 so as to break the holding circuit 156 and, in turn, the motor circuit 150.

It should be observed that the cam pin 92 is effective during rotation of the cam 90 to close the counter switch 174 some time during the discharge stroke of the pump 60 so as to advance the counter 170 one digit.

As mentioned previously, when the piston 64 of the pump 60 is moved to the left in a suction stroke, liquor is withdrawn from the reservoir 110 into the pumping chamber 63. Simultaneously, the reservoir 110 is replenished with liquor from the bottle 134 by means of the siphon tube 132 and conduit 130.

The pump 60 has a capacity equal to one unit of liquor. The capacity of the pump may be adjustable to suit various conditions. As an example, the unit of liquor may be a shot of liquor that varies somewhat in different states. A shot of liquor may be anywhere, as an example, between ½ to 1½ ounces. Generally the size of a shot is ⅞ ounce. The reservoir 110 is usually designed to have a capacity which is twice the size of the pumping chamber 63; in other words, the reservoir 110 holds two units of liquor. When the bottle 134 has just been emptied, it should be understood that three units of liquor remain in the pumping system, plus whatever liquor is in the conduits 124 and 130.

In order to take the last drops of liquor from the bottle 134, a novel siphon tube 132 is provided. The siphon tube 132 is made of transparent material and includes an elongated stem 180 which has a length greater than the height of the bottle 134 as illustrated in FIGURE 2. The outer end of the stem 180 is provided with a loop 182, the outer end of which is adapted to be connected to the flexible conduit 130. The inner end 135 of the stem 180 is held in surface-to-surface contact with the bottom wall 186 of the bottle 134, as best illustrated in FIGURE 5. A pair of downwardly facing diametrically extending notches 188 are provided at the end 184 of the stem 180 in the wall thereof to provide passages located 180° apart through which the liquor enters the interior of the stem. It has been found that the siphon tube 132 is more effective to withdraw the last few drops of liquor from the bottle 134 than has heretofore been possible. This results in a substantial savings in liquor over a long period of time. The location of the bottle 134 on the slanted wall 24 of the housing 12 helps to insure that the lower end 184 of the stem 180 is located against the bottom 186 of the bottle 134 and in the lowest possible corner therein. In order to accomplish this purpose the stem 180 is slightly curved or bowed lengthwise so that the stem can reach the lowest corner of the bottle 134.

The loop 182 of the siphon tube 132 provides an indicating instrument for the bartender. When the bottle 134 is nearly empty the tube 132 will pull liquor and air therethrough. Air bubbles are trapped in the liquor and will readily appear in the transparent loop 182. When the bottle is finally empty the bottle 134 is replaced with a new bottle of liquor after which time the reservoir 110 is again "primed" if necessary to remove the air therein. Generally if the bottle 134 is replaced immedi-

ately upon emptying the reservoir 110 does not have to be primed. As mentioned previously the wall 24 is slanted to facilitate the emptying of the bottle 134.

The nozzle 126 is provided with a suitable restriction 190 which is effective to prevent dripping of liquor from the nozzle 126 after the dispensing operation. Any liquor remaining in the nozzle tends to remain on the upstream side of the restriction 190.

A locking cap, not shown, is generally provided on the bottle 134 to prevent theft of liquor therefrom. The tube 132 extends through the cap. An air vent is provided in the cap so that the liquor in the bottle 134 is exposed to atmospheric pressure.

The motor 50, as illustrated, is designed to make 12 r.p.m. or, in other words, it requires five seconds for each cycle. The pump 60 may be of any suitable type. Means are provided for adjusting the capacity of the pump to suit various conditions and requirements. The reservoir 110 provides a convenient means for changing the liquor bottle without taking air into the pump 60. With such a construction the exact amount of liquor is always dispensed.

It should be understood that the bottle 134 can be located at any convenient place with respect to the housing 12 although in order to obtain the maximum results it is recommended that it be located on the slanted wall 24.

Various seals, not shown, are provided to prevent air from entering the system and to prevent liquor from escaping.

What I claim is my invention is:

1. An automatic dispenser for a liquid comprising a pump including a pumping chamber and a movable pumping element in said chamber; a primary liquid reservoir; a secondary liquid reservoir; conduit means connecting said reservoirs; passage means connecting said pumping chamber to said secondary liquid reservoir; an electrical motor including a rotatable shaft; and pump actuating means operatively connecting said motor to said pump comprising an actuating arm connected to said pumping element, a slot in said arm through which said shaft extends with clearance between said shaft and the end walls of said slot, a pair of spaced abutments on one side of said arm opposite the ends of said slot, and a cam fixed to said shaft between said abutments and rotatable with said shaft upon energization of said motor; said cam being engageable with one of said abutments during a portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in one direction to discharge the liquid in said pumping chamber and engageable with the other of said abutments during a later portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in the opposite direction to replenish the chamber with liquid from said secondary liquid reservoir.

2. The automatic dispenser defined in claim 1 wherein said conduit means includes siphon means which is effective to replenish said secondary liquid reservoir with liquid from said primary liquid reservoir as liquid is withdrawn from said secondary reservoir to replenish said pumping chamber.

3. The automatic dispenser defined in claim 2 wherein said abutments are in the form of roller bearings.

4. An automatic dispenser defined in claim 1 wherein a discharge nozzle is connected to the outlet side of said pump, said nozzle being provided with a restriction to prevent dripping after the discharge stroke has been completed.

5. An automatic dispenser for a liquid comprising a pump including a pumping chamber and a movable pumping element in said chamber; a primary liquid reservoir; a secondary liquid reservoir; siphon means connecting said reservoirs; passage means connecting said pumping chamber to said secondary liquid reservoir; a motor circuit including a motor having a shaft and a normally opened manually operated switch for energizing said motor so as to rotate said shaft; and pump actuating means operatively connecting said motor to said pump comprising an actuating arm connected to said pumping element, a slot in said arm through which said shaft extends with clearance between said shaft and the end walls of said slot, a pair of spaced abutments on one side of said arm opposite the ends of said slot, a cam rotatably fixed to said shaft between said abutments and engageable with one of said abutments upon closing of said switch and the energization of said motor during a portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in one direction to discharge the liquid in said pumping chamber and engageable with the other of said abutments during a later portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in the opposite direction to replenish the chamber with liquid from said secondary liquid reservoir.

6. An automatic dispenser for a liquid comprising a pump including a pumping chamber and a movable pumping element in said chamber; a primary liquid reservoir; a secondary liquid reservoir; siphon means connecting said reservoirs; passage means connecting said pumping chamber to said secondary liquid reservoir; a motor circuit including a motor having a shaft and a normally opened manually operated switch for energizing said motor so as to rotate said shaft; pump actuating means operatively connecting said motor to said pump comprising an actuating arm connected to said pumping element, a slot in said arm through which said shaft extends with clearance between said shaft and the end walls of said slot, a pair of spaced abutments on one side of said arm opposite the ends of said slot, a cam rotatably fixed to said shaft between said abutments and engageable with one of said abutments upon closing of said switch and the energization of said motor during a portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in one direction to discharge the liquid in said pumping chamber and engageable with the other of said abutments during a later portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in the opposite direction to replenish the chamber with liquid from said secondary liquid reservoir; and an electrical holding circuit interconnected in said motor circuit and including a normally opened switch which is closed upon energization of said motor circuit; said holding circuit maintaining said motor circuit energized upon the reopening of said manually operated switch prior to the completion of the first cycle of rotation of said cam.

7. An automatic dispenser for a liquid comprising a pump including a pumping chamber and a movable pumping element in said chamber; a primary liquid reservoir; a secondary liquid reservoir; siphon means connecting said reservoirs; passage means connecting said pumping chamber to said secondary liquid reservoir; a motor circuit including a motor having a shaft and a normally opened manually operated switch for energizing said motor so as to rotate said shaft; pump actuating means operatively connecting said motor to said pump comprising an actuating arm connected to said pumping element, a slot in said arm through which said shaft extends with clearance between said shaft and the end walls of said slot, a pair of spaced abutments on one side of said arm opposite the ends of said slot, a cam rotatably fixed to said shaft between said abutments and engageable with one of said abutments upon closing of said switch and the energization of said motor during a portion of the first cycle of rotation of said cam to move said pumping element and

said actuating arm with respect to said shaft in one direction to discharge the liquid in said pumping chamber and engageable with the other of said abutments during a later portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in the opposite direction to replenish the chamber with liquid from said secondary liquid reservoir; an electrical holding circuit interconnected in said motor circuit and including a normally opened switch which is closed upon energization of said motor circuit; said holding circuit maintaining said motor circuit energized upon the reopening of said manually operated switch prior to the completion of the first cycle of rotation of said cam; an electrical counter circuit separate from said motor circuit; said counter circuit including a counter and a normally opened counter switch; and mechanical means carried by said rotatable shaft for closing said counter switch once during each cycle of rotation of said shaft to energize said counter circuit and advance said counter one digit.

8. An automatic dispenser for a liquid comprising a pump including a pumping chamber and a movable pumping element in said chamber; a primary liquid reservoir; a secondary liquid reservoir; siphon means connecting said reservoirs; passage means connecting said pumping chamber to said secondary liquid reservoir; a motor circuit including a motor having a shaft and a normally opened manually operated switch for energizing said motor so as to rotate said shaft; pump actuating means operatively connecting said motor to said pump comprising an actuating arm connected to said pumping element, a slot in said arm through which said shaft extends with clearance between said shaft and the end walls of said slot, a pair of spaced abutments one one side of said arm opposite the ends of said slot, a cam rotatably fixed to said shaft between said abutments and engageable with one of said abutments upon closing of said switch and the energization of said motor during a portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in one direction to discharge the liquid in said pumping chamber and engageable with the other of said abutments during a later portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in the opposite direction to replenish the chamber with liquid from said secondary liquid reservoir; a second rotatable cam fixed to said shaft; and an electrical holding circuit interconnected in said motor circuit and including a holding switch which is held opened by said cam prior to the rotation of said shaft; said cam being moved away from said holding switch upon rotation of said shaft thereby permitting said holding switch to close so as to energize said holding circuit; said holding circuit maintaining said motor circuit energized upon the reopening of said manually operated switch prior to the completion of the first cycle of rotation of said cam; said second cam reopening said holding switch upon the completion of one revolution thereby de-energizing said motor circuit.

9. An automatic dispenser for a liquid comprising a pump including a pumping chamber and a movable pumping element in said chamber; a primary liquid reservoir; a secondary liquid reservoir; conduit means connecting said reservoirs; passage means connecting said pumping chamber to said secondary liquid reservoir; a motor circuit including a motor having a shaft and a normally opened manually operated switch for energizing said motor so as to rotate said shaft; pump actuating means operatively connecting said motor to said pump comprising an actuating arm connected to said pumping element, a slot in said arm through which said shaft extends with clearance between said shaft and the end walls of said slot, a pair of spaced abutments on one side of said arm opposite the ends of said slot, a cam rotatably fixed to said shaft between said abutments and engageable with one of said abutments upon closing of said switch and the energization of said motor during a portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in one direction to discharge the liquid in said pumping chamber and engageable with the other of said abutments during a later portion of the first cycle of rotation of said cam to move said pumping element and said actuating arm with respect to said shaft in the opposite direction to replenish the chamber with liquid from said secondary liquid reservoir; a second rotatable cam fixed to said shaft; an electrical holding circuit interconnected in said motor circuit and including a holding switch which is held opened by said cam prior to the rotation of said shaft; said cam being moved away from said holding switch upon rotation of said shaft thereby permitting said holding switch to close so as to energize said holding circuit; said holding circuit maintaining said motor circuit energized upon the reopening of said manually operated switch prior to the completion of the first cycle of rotation of said cam; said second cam reopening said holding switch upon the completion of one revolution thereby de-energizing said motor circuit; and an electrical counter circuit separate from said motor circuit; said counter circuit including a counter and a normally opened counter switch; said second cam closing said counter switch during each cycle of rotation of said cams to energize said counter circuit and advance said counter one digit.

10. The automatic dispenser defined in claim 9 wherein said conduit means includes means which is effective to replenish said secondary liquid reservoir with liquid from said primary liquid reservoir as liquid is withdrawn from said secondary reservoir to replenish said pumping chamber.

11. The automatic dispenser defined in claim 9 wherein said abutments are in the form of roller bearings.

12. An automatic dispenser defined in claim 9 wherein a light is included in said motor circuit.

13. An automatic dispenser defined in claim 9 wherein a discharge nozzle is connected to the outlet side of said pump, said nozzle being provided with a restriction to prevent dripping after the discharge stroke has been completed.

14. An automatic dispenser defined in claim 9 wherein the component parts, with the exception of said primary liquid reservoir, are enclosed in a housing and the manually operated switch in said motor circuit is adapted to be operated by a push button located in an outer side wall of said housing.

15. An automatic dispenser defined in claim 14 wherein the top wall of said housing extends downwardly from a horizontal plane and provides a support for said primary liquid reservoir located exteriorly of said housing.

16. An integral siphon tube for an elongated bottle containing a liquid which is subjected to atmospheric pressure, said tube being made from transparent material and having an elongated stem within the interior of the bottle, said stem being slightly curved longitudinally with respect to the longitudinal axis of the bottle, said stem having a length exceeding the height of the bottle, the lower end of said stem being in surface-to-surface contact with the bottom wall of the bottle, the upper end of said stem extending outwardly beyond the top of the bottle, said upper end of the stem being provided with a loop throughout approximately 270° which terminates in a relatively short laterally extending arm which is adapted to be connected to a source of negative pressure, the portion of said tube forming said loop serving as an indicator for showing when the bottle is empty by trapping bubbles of air in the loop, the lower end of said stem being provided with a pair of relatively shallow downwardly facing diametrically opposed notches which extend laterally

through the wall of the stem and through which the liquid at the bottom of the bottle enters the interior of the tube.

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