

April 1, 1952

D. W. BROUS

2,591,507

SANITARY LIQUID DISPENSING MACHINE

Filed Sept. 16, 1948

3 Sheets-Sheet 1

Fig. 1

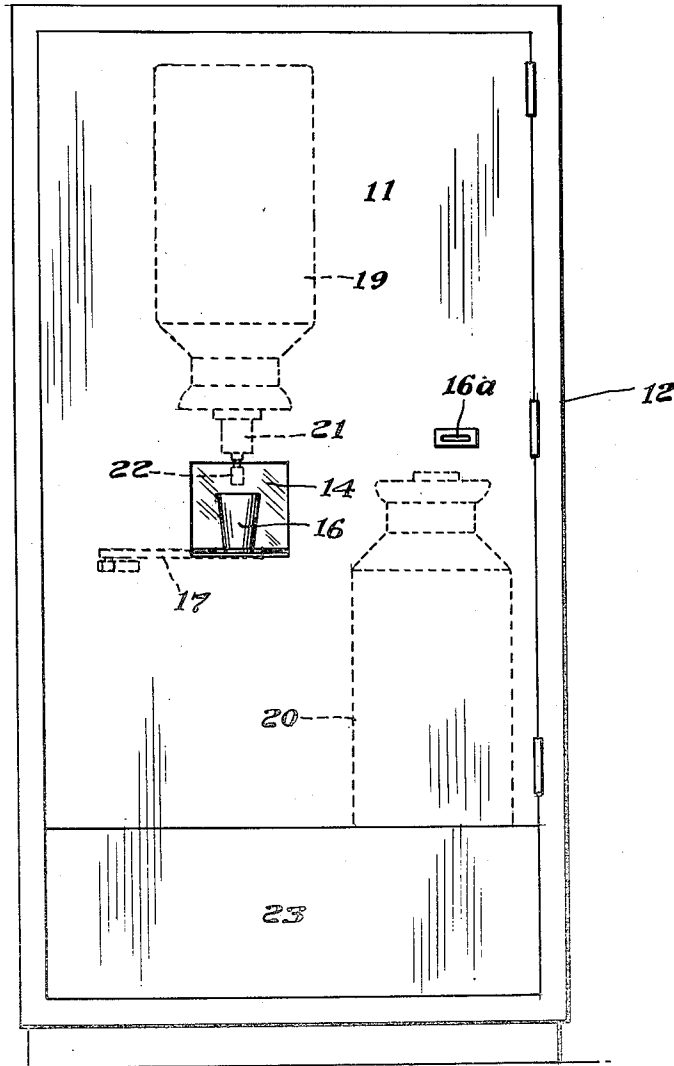
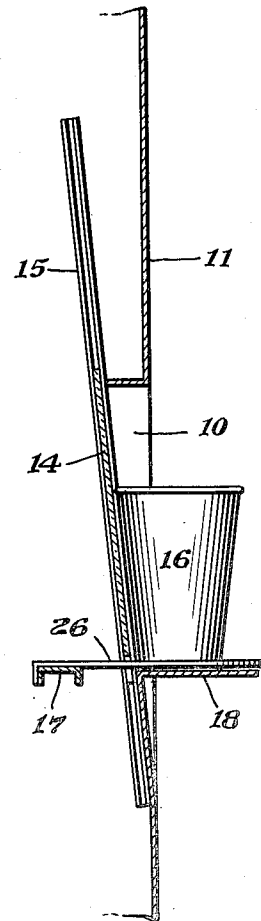
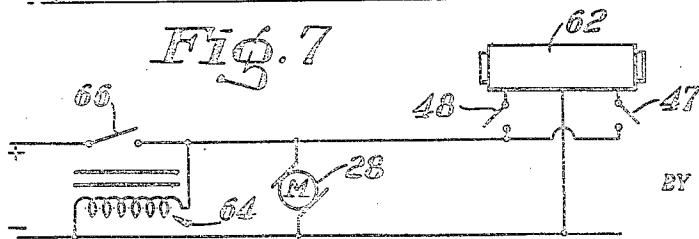


Fig. 3



INVENTOR.

Douglas W. Brous

BY

Edgar H. Kent
ATTORNEY

April 1, 1952

D. W. BROUS

2,591,507

SANITARY LIQUID DISPENSING MACHINE

Filed Sept. 16, 1948

3 Sheets-Sheet 2

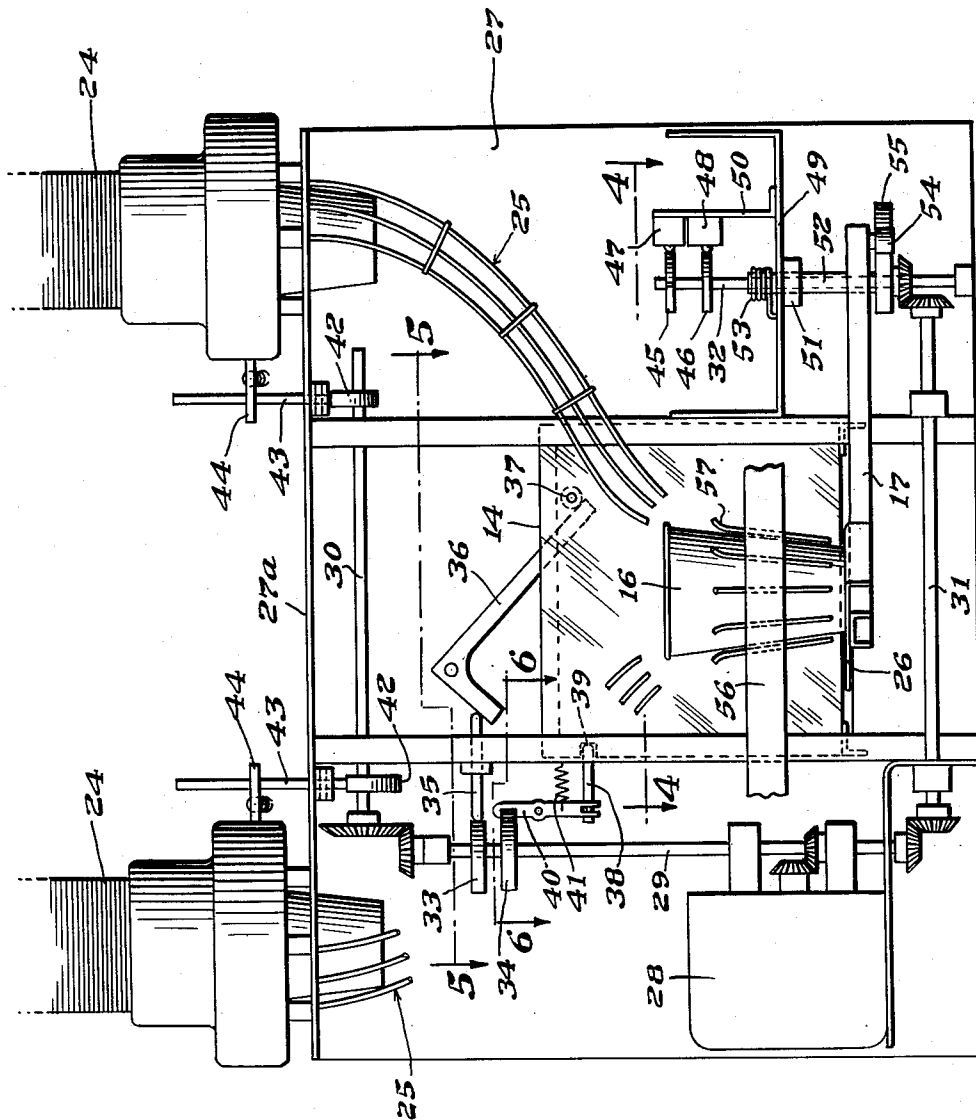


FIG. 2

INVENTOR.

Donald W. Brous

BY

Edgar W. Kent

ATTORNEY

April 1, 1952

D. W. BROUS

2,591,507

SANITARY LIQUID DISPENSING MACHINE

Filed Sept. 16, 1948

3 Sheets-Sheet 3

Fig. 4

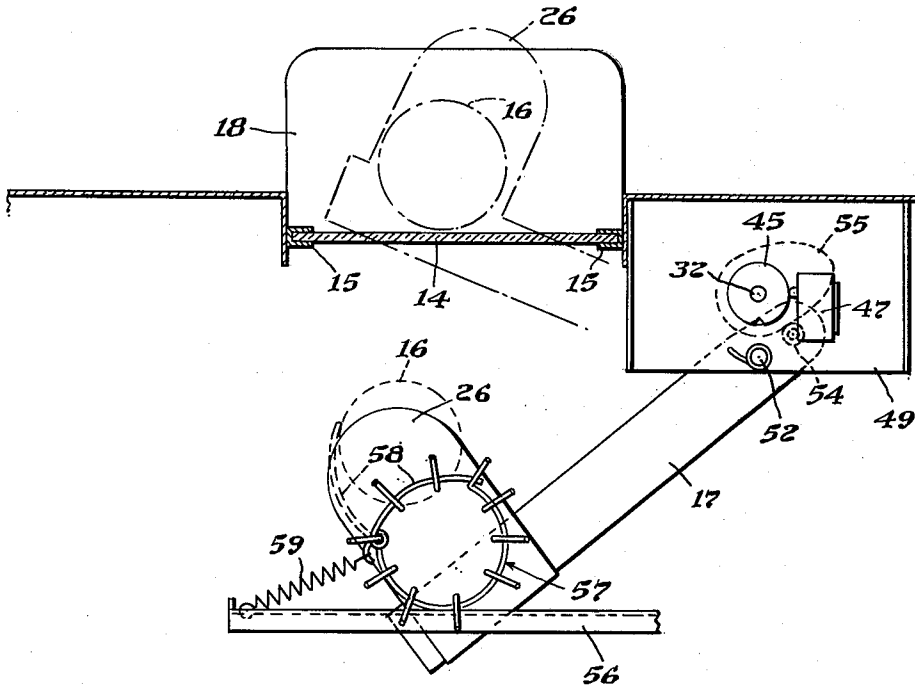


Fig. 5

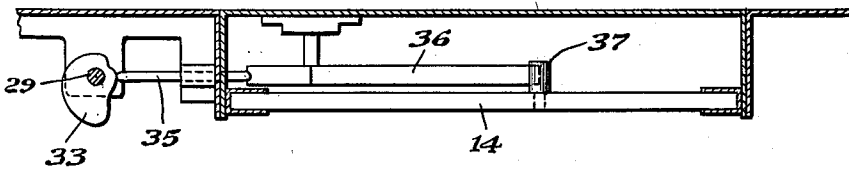
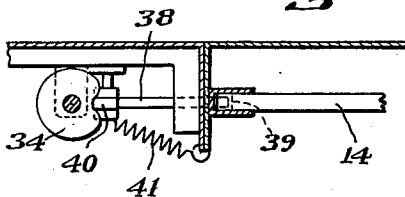


Fig. 6



INVENTOR.

Donald W. Brous

BY

Edward V. Kent
ATTORNEY

UNITED STATES PATENT OFFICE

2,591,507

SANITARY LIQUID DISPENSING MACHINE

Donald W. Brous, Francestown, N. H., assignor
to Food Engineering Corporation, Manchester,
N. H., a corporation of New Hampshire

Application September 16, 1948, Serial No. 49,509

6 Claims. (Cl. 222-21)

1

My invention relates to automatic dispensing devices or machines of the coin or token-operated type and more particularly concerns such a device which is especially adapted for dispensing a beverage, as milk, which must be handled with strict attention to principles of sanitation.

It is obviously highly desirable, for reasons of sanitation, that any machine employed in the dispensing of milk in cups filled by the machine be so designed that the pouring mechanism is completely out of reach of the customer at all times. While certain prior machines provide for filling of the cup behind a closed window, the customer in most instances must manually open the window and extend his hand into the pouring compartment in order to procure the filled cup. In the case of the few machines heretofore proposed which deliver the filled cup to a point forward of the window, the latter is left fully open until the cup delivery mechanism has been withdrawn into the casing. These machines thus only partially solve the problem. They are further unsatisfactory in that they depend for their operation on mechanical arrangements which are unnecessarily complicated and which pose vexing servicing problems.

The present invention aims to overcome the indicated functional and structural disadvantages of the prior machines. I shall particularly describe the invention in terms of the embodiment illustrated by the accompanying drawings, in which:

Fig. 1 is a front view of the machine, certain parts inward of the machine being shown in broken lines;

Fig. 2 is a view from inward of the machine looking through the window;

Fig. 3 is a vertical section through the window portion of the machine;

Figs. 4-6 are detail views taken on the lines indicated in Fig. 2, and

Fig. 7 is a wiring diagram.

Referring first to Figs. 1 and 3 particularly, the numeral 10 denotes an opening in the door 11 forming part of the casing 12 which is advantageously fabricated of sheet metal welded to a welded angle iron frame. Behind the opening 10 is a window 14, most suitably formed of a transparent material resistant to breakage, methacrylate resin, for instance. Window 14 is vertically movable in guideways 15 and is slanted, as shown in Fig. 3, to avoid toppling of the cup 16 on withdrawal of the carrier arm 17 serving to deposit the cup on the ledge 18, shown as in-

2

tegral with the door of the casing which has a coin slot 16a therein.

Inwardly of the casing are two milk containers, the up-ended container 19 being in operative position, container 20 being stored for later use. Affixed to the lid of container 19 is a valve structure 21 comprising a turning member 22. The valve may be of any suitable construction and as it forms no part of the present invention will not be described in detail herein.

Lower compartment 23 encloses a refrigerating unit, not indicated, including the usual motor and compressor and the usual auxiliary apparatus.

Referring now particularly to Fig. 2, in which the parts shown constitute a complete "package" assembly adapted for ready removal and repair, it will be observed that the cups are presented for filling from dispensers 24, the dispensers being equipped with wire frame guideways 25, one of which is shown partly broken away, serving to direct the cups onto a tongue-like platform 26 associated with carrier arm 17. The dispensers and the other parts are housed within and supported by a casing, only the front and top panels of which are shown in the figure, the same being indicated by the numerals 27 and 27a respectively. Guideways 15 for window 14 are an integral part of panel 27. While the assembly may be secured to the back of the door 11, in the preferred construction it is mounted on the back of a second door, not shown, immediately therebehind. The second door, of course, need not be of full length. The position of the assembly relative to the container 19 is believed obvious from Fig. 1 considered in conjunction with Fig. 2.

The assembly includes a motor unit 28 geared to a vertical shaft 29 which in turn is geared to horizontal shafts 30 and 31. A second vertical shaft 32, relatively shorter than shaft 29, is driven by shaft 31. The driving gear at the upper end of shaft 29 has a diameter one-half that of the driven gear keyed to shaft 30. In all other cases the gear ratio is 1:1. Unit 28, of course, comprises suitable reduction gearing.

Keyed to shaft 29 near the upper end thereof, are cams 33 and 34, cam 33 on rotation of the shaft being adapted to drive pin 35 against the head of a hammer-shaped member 36 pivotally mounted on panel 27. The lower end of member 36 bears on the underside of a stud 37 extending inwardly from the inner face of window 14.

Window 14 is normally maintained locked by means of a latch pin 38, which is received by a

3

notch 39 in the window. On rotation of the shaft 29, and before cam 33 has driven cam 35 inwardly against the head of member 36, the latch pin is withdrawn from the notch by a window lock-arm 40 pivotally supported from panel 27 and controlled by cam 34 and spring 41. Cams 42, keyed to shaft 30, are adapted to elevate follower pins 43, which actuate cup release arms 44 associated with the cup dispensers 24.

Cams 45 and 46, keyed to vertical shaft 32 near its upper end control switches 47 and 48 respectively, these being in the same circuit with a conventional push-pull solenoid, indicated by the numeral 62 in Fig. 7, the solenoid serving to open and close valve 21 (see Fig. 1), through turning member 22. The solenoid may conveniently be made a part of the assembly by securing it to the underside of top panel 27a, for example.

A platform 49 affords support to a standard 50, to which the switches 47 and 48, are secured. Rearwardly of shaft 32 (with relation to the front of the machine) and extending through a journal type bearing 51, fastened to the underside of the platform 49, is a vertical shaft 52 which is fixedly secured to and supports carrier arm 17. Tension spring 53, wound about and secured to the upper end of shaft 52 urges cam follower 54, associated with the carrier arm, against the periphery of a cam 55 keyed to shaft 32.

Suitably supported above the carrier tongue 26 as by a bracket or cross piece 56 welded thereto (see Fig. 4 as well as Fig. 2) is a bottomless basket-like guard member 57 of wire frame construction serving to prevent toppling of the delivered cup. Such member comprises a gate portion 58, the gate being normally maintained closed by a spring 59 fastened to the gate and to the bracket 56. The ends of the bracket may be detachably secured, with advantage, to lugs extending forwardly from the inside of the back panel of the casing housing the assembly. As gate spring 59 is comparatively weak in relation to the weight of the filled cup, the gate is opened by the cup itself as the carrier arm begins to convey the cup toward the window 14.

Shaft 30 in the embodiment of the invention illustrated by the drawings makes only one complete revolution for each two revolutions of shaft 29 and the cams thereon are so designed that the cups are discharged from the dispensers 24 alternately, a cup being released on conclusion of each half revolution of the shaft. Accordingly, a cup is already in position for filling at the beginning of each cycle of operation.

Upon energization of the motor 28 by the insertion of an acceptable coin in slot 15a, and the consequent rotation of the several shafts, cam 45 contacts switch 47, momentarily energizing the push-pull solenoid controlling valve 21 and the cup is filled. Thereafter cam 46 strikes switch 48, causing momentary re-energization of the solenoid and closing of the valve. At approximately the same time that cam 46 strikes switch 48, cam 34 (see Fig. 6 as well as Fig. 2) strikes arm 40 to unlock the window which is then raised by member 36, actuated through pin 35 by cam 33, as the carrier arm conveys the filled cup through the gate 58 toward the serving ledge. Gate 58 is swung shut by spring 59 as it loses contact with the cup.

When the cup arrives at the position indicated in broken lines in Fig. 4, the window 14 drops behind it, space being left, however, just suffi-

4

cient to accommodate the carrier arm as it is snapped back into the casing by the action of the spring 53. The position of the window at this stage is represented in Fig. 5 by the indented portion of cam 33 below and to the right of shaft 29 which rotates counterclockwise. As indicated hereinbefore, the purpose of providing for substantially complete closing of the window behind the cup is to prevent the customer, frequently a school age child, where milk is the liquid being dispensed, from passing his hand into the pouring compartment.

Cam 34, the window control cam (see Fig. 6), is so cut as to keep bolt 38 out of engagement with the edge of the window as the window is raised and lowered.

The action whereby the filled cup is deposited on the serving ledge is analogous to the parlor trick in which a napkin is jerked from under a tumbler full of water without upsetting the tumbler. On return of the carrier arm, the window drops to fully closed locked position, a cup is released for the next cycle and the action stopped as by engagement of a third cam, not shown, on shaft 29 with a spring loaded limit switch adapted to be momentarily opened by the cam.

In Fig. 7 there is shown in the circuit comprising the motor unit 28 and the push-pull solenoid 62, controlled by switches 47 and 48, a holding relay 64 which when energized on the closing of the switch 66 serves to maintain such switch closed. Switch 66 is in the path of the coin used in the operation of the machine and may be either spring loaded or weighted, for example, so that once the coin has lost contact therewith it tends to return to open position. With this arrangement it will be readily seen that upon the de-energization of the holding relay, resulting from the momentary opening of the aforementioned limit switch, the system is restored to the condition shown.

My invention is not to be restricted to the precise details of construction shown since various changes and modifications may be made therein without departing from the scope of the invention or sacrificing the advantages derived from its use.

I claim:

1. In an automatic liquid purveying machine, the combination within a casing having an opening therein sealed by a normally locked window and comprising a serving ledge below and forward of the window, of a container of the liquid purveyed, a cup dispenser, means for presenting a cup to be charged with a predetermined quantity of the liquid, means for unlocking and opening the window, carrier means for conveying the filled cup through the opened window and for depositing it on the ledge, means for substantially closing the window behind the filled cup, means for returning the carrier means to a point within the casing, and means operable on return of the carrier means to completely close and lock the window.

2. In an automatic liquid purveying machine, the combination within a casing having an opening therein sealed by a normally locked window and comprising a serving ledge below and forward of the window, of a container of the liquid purveyed, a cup dispenser, means for presenting a cup to be charged with a predetermined quantity of the liquid, said means including a bottomless basket-like device functioning to prevent toppling of the cup, said device comprising a

5

normally closed gate adapted to be opened outwardly by the weight of the filled cup, means for unlocking and opening the window, carrier means for conveying the filled cup through the opened window and for depositing it on the ledge, means for substantially closing the window behind the filled cup, means for returning the carrier means to a point within the casing, and means operable on return of the carrier means to completely close and lock the window.

3. In an automatic liquid purveying machine, the combination within a casing having an opening therein sealed by a normally locked window and comprising a serving ledge below and forward of the window, of a container of the liquid purveyed, a cup dispenser adapted to present cups for filling from said container, cam operated means for sequentially unlocking and opening, substantially closing, and then completely closing said window and cam operated carrier means for conveying the filled cup through the opened window and for depositing it on the ledge, said carrier means after deposition of the cup being returned to a point within the casing, the operation thereof being so synchronized with the operation of the window control means that the window substantially closes after passage of the cup therethrough and closes completely following the return trip of said carrier means.

4. In an automatic liquid purveying machine, the combination within a casing having an opening therein sealed by a normally locked window and comprising a serving ledge below and forward of the window, of a container of the liquid purveyed, a cup dispenser adapted to present cups for filling from said container, means adapted to prevent toppling of the presented cup having the form of a bottomless basket and comprising a normally closed, outwardly swingable gate operable by the weight of the filled cup, cam operated means for sequentially unlocking and opening, substantially closing, and then completely closing said window and cam operated

6

carrier means for conveying the filled cup through the opened window and for depositing it on the ledge, said carrier means after deposition of the cup being returned to a point within the casing, the operation thereof being synchronized with the operation of the window control means so that the window substantially closes after passage of the cup therethrough and closes completely following the return trip of said carrier means.

5. In a liquid dispensing machine, the combination with a cup dispenser and a platform receiving cups from the dispenser for filling and on which the filled cups are transported after filling, of a bottomless guard independently supported over said platform in position to prevent toppling of the cups as they are deposited on the platform, said guard having a normally closed gate adapted to be swung outwardly by the weight of the filled cup as the cup is conveyed away from the guard.

6. In a liquid dispensing machine, the combination with a cup dispenser and a platform receiving cups from the dispenser for filling and on which the filled cups are transported after filling, of a bottomless basket-like guard of wire frame construction independently supported over said platform in position to prevent toppling of the cups as they are deposited on the platform, said guard having a normally closed gate adapted to be swung outwardly by the weight of the filled cup as the cup is conveyed away from the guard.

DONALD W. BROUS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,317,006	Weightman et al.	Apr. 20, 1943
2,472,921	Quimper	June 14, 1947