July 1, 1958 O. J. MULLICH 2,840,900

SANITARY CAN OPENER

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FIG. 1

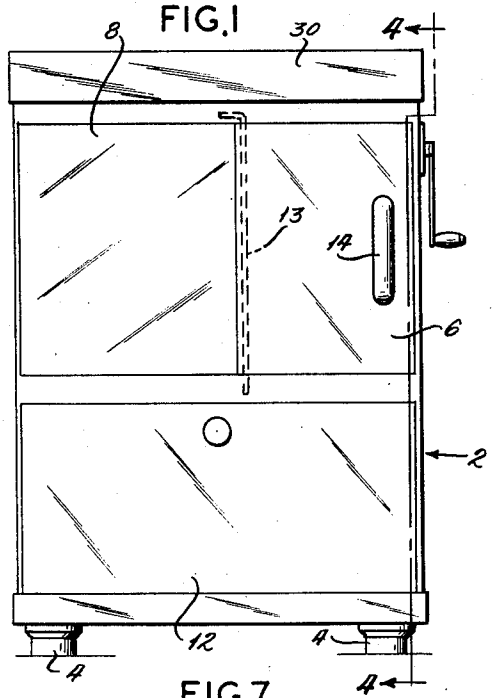


FIG. 2

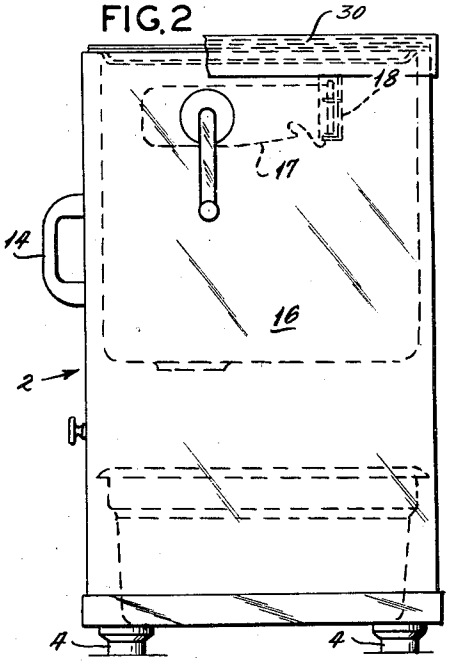


FIG. 7

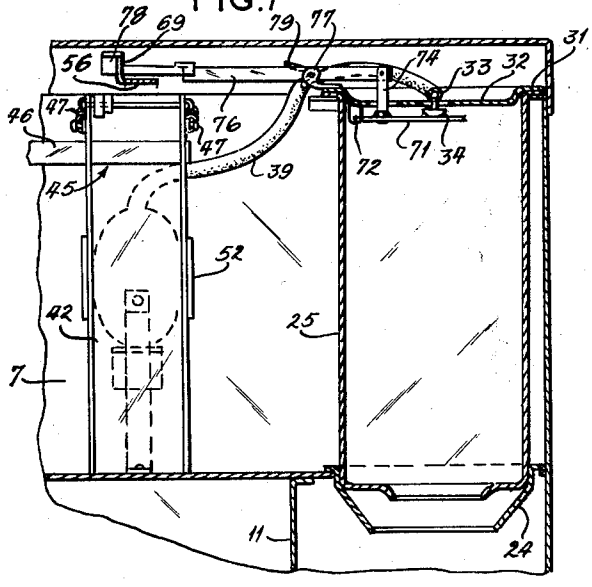
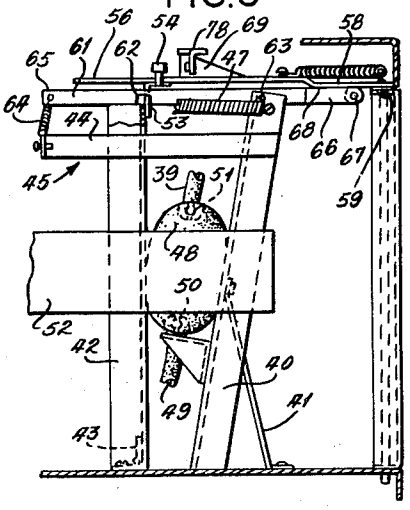


FIG. 8



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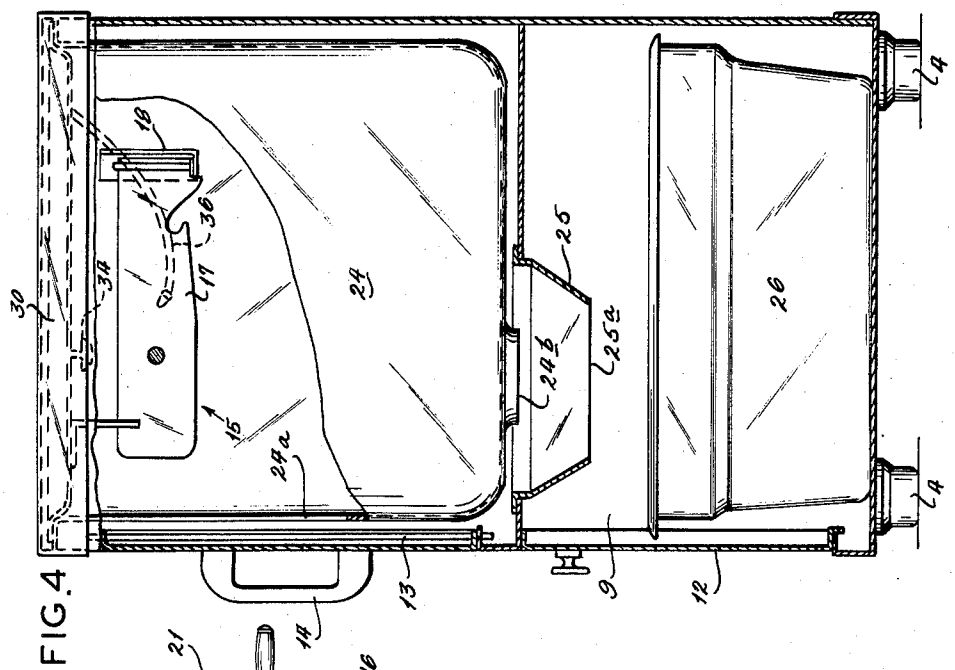


FIG. 4

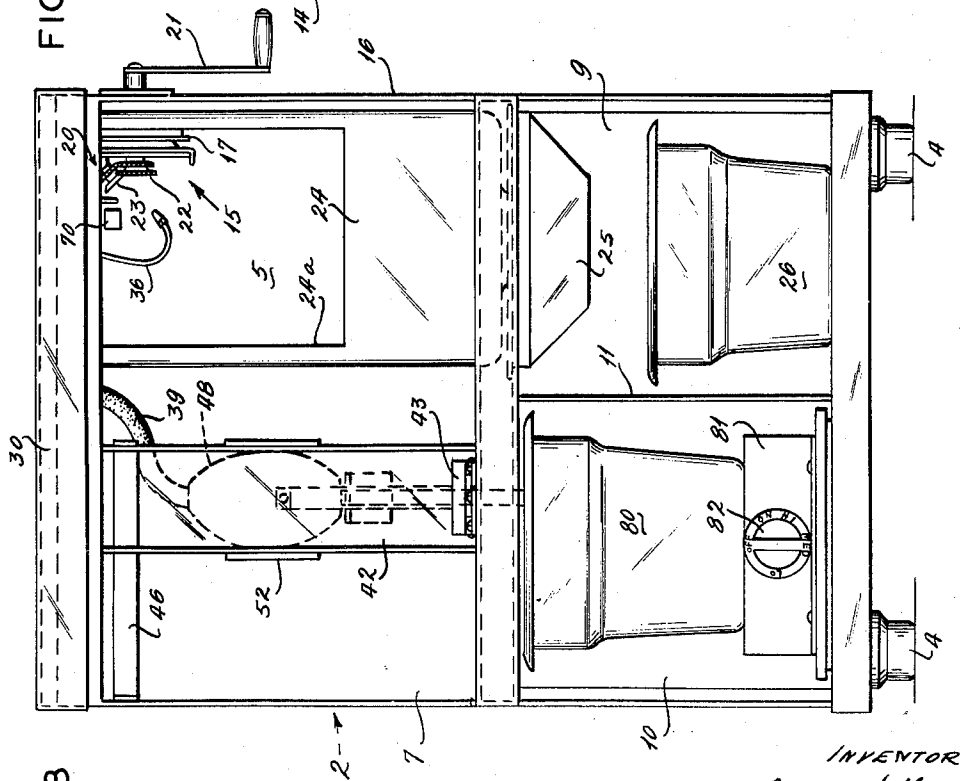


FIG. 3

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FIG.5

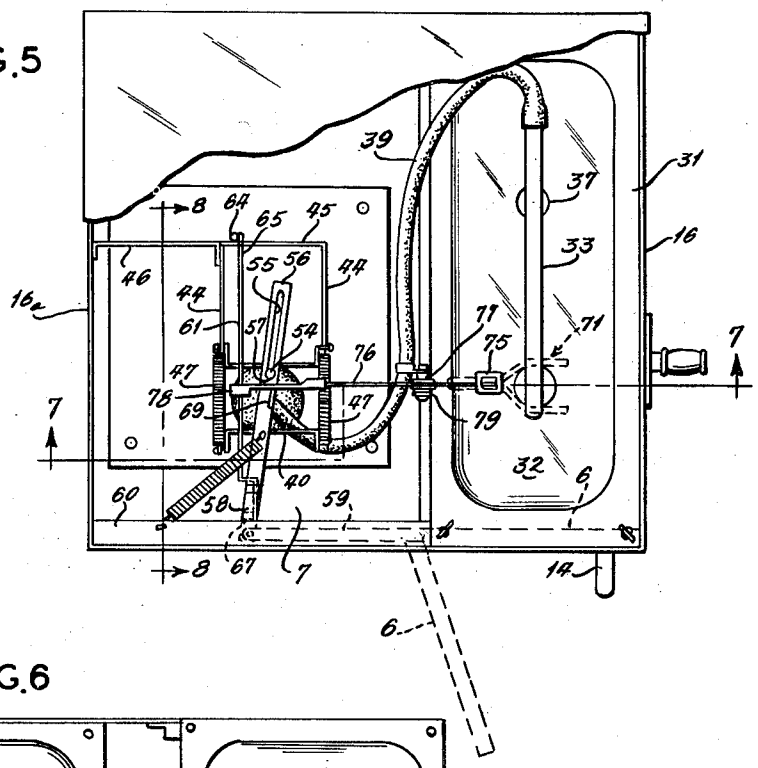
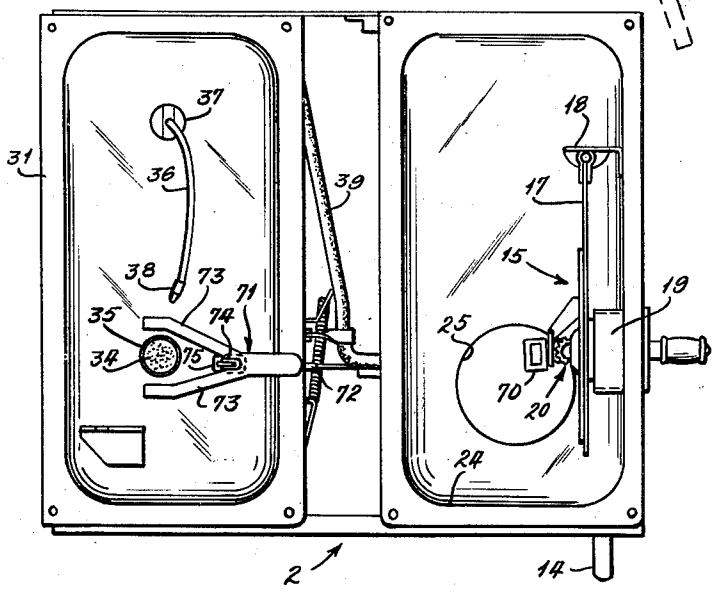


FIG.6



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2,840,900

SANITARY CAN OPENER

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Application September 30, 1957, Serial No. 687,249

12 Claims. (Cl. 30—6.4)

This invention relates to can openers for effecting the opening of sealed containers and to improvements in means for maintaining the can opener sanitary.

The sale of beverages, and the like, through automatic vending machines has become commonplace due to the simplicity of the merchandising operation. On the other hand, canned foods, and the like, in sealed containers merchandised from vending machines present the problem of providing a reliable opener which can be maintained in a sanitary state for protracted periods. There is a further problem in this trend toward sale of canned foods from vending machines in warmed or heated condition. Whereas, can openers are commonplace, it has not been common to provide can opener means for use by the public in conjunction with vending machines wherein the opener is both sanitary and easy to operate. The provision of a can opener available to the public and having means to keep it in a sanitary condition will increase the desirability of dispensing warm or heated canned foods which can be consumed in the vicinity of the vending machine. This improvement will obviate the need for keeping an attendant on hand to perform the opening operation and to maintain the opener in a sanitary condition so that the public will not be endangered.

It is, therefore, an object of this invention to provide improved can opener means which is adapted for sanitary operation in repeated use by the buying public who patronize canned food vending machines.

It is also an object of the invention to provide apparatus in conjunction with a can opener for maintaining the can opener in a sanitary condition in repeated use, and to provide a simple organization of parts to carry this and other objects into practice.

Other objects and advantages for providing a sanitary can opener will become apparent from the following specification and the accompanying drawings, wherein one embodiment of the sanitary can opener is illustrated.

The invention consists in the arrangement of means for housing a can opener device in a normally closed compartment accessible through a door and in adapting a sanitizing fluid supply system, having a pressure generating device, to wash the operating wheels of the can opener with a suitable sterilizing fluid to maintain the can opener sanitary and suitable for public use, particularly for use in association with a food vending machine. The invention also consists in operating means responsive to the opening and closing of the housing access door, or responsive to other suitable means, for operating the fluid pressure generating device or fluid pumping mechanism and for actuating the discharge of the can lid from a lid retrieving device.

In the drawings:

Fig. 1 is a front elevational view of the sanitary can opener apparatus forming the subject of this invention;

Fig. 2 is a side elevational view of the apparatus of Fig. 1;

Fig. 3 is a further front elevational view of the sanitary can opener with the front of the casing removed;

Fig. 4 is a side elevational view of the apparatus seen partly in section from line 4—4 in Fig. 1;

Fig. 5 is a top plan view of the apparatus with the top cover partly broken away to show certain details of the internal mechanism;

Fig. 6 is a top view of the apparatus, similar to Fig. 5, but with a part thereof turned over to show the details of portions of the operating mechanism;

Fig. 7 is a sectional elevational view of the apparatus as seen at line 7—7 in Fig. 5; and

Fig. 8 is a further sectional view of the apparatus as seen from line 8—8 in Fig. 5.

Sanitary can opener apparatus according to the present embodiment of the invention comprises a suitable cabinet 2 having feet 4 for disposition on a suitable counter or support placed in the vicinity of a food vending machine. The casing 2, as seen in Figs. 1 and 3, is divided into a can opener compartment 5 to which access is had through the door 6, a sanitary spray pump compartment 7 disposed behind the fixed front wall panel 8, and bottom service compartments 9 and 10 separated by a wall 11 and reached through a common access door 12 at the front.

The door 6 for the can opener compartment 5 is suitably hinged from the left side (Fig. 1) at the top and bottom on pin 13, and has a handle 14 for its operation. Opening of door 6 reveals the interior of compartment 5 where a suitable manually operated can opener device 15 (Figs. 2, 3 and 6) is disposed at the upper right side upon the adjacent wall 16. The opener device 15, while it is not per se a part of the invention, may be any suitable type such as shown in Raab Patent No. 2,555,931, issued June 5, 1951, having a frame 16 anchored at bracket 18 on wall 16. In the present application the opener is provided with an operating adapter 19 for the cutting unit 20. The adapter 19 is engaged by an exteriorly located operating crank 21. The cutting unit 20 has a can rim engaging knurled wheel 22 and a cutting wheel 23. The wheel 22 is adapted to be moved in known manner downwardly and away from the wheel 23 upon inserting the can to be opened, as is customary with manually operated devices of this type, such movement being accomplished by reversing the can opening motion of the crank 21. After a can rim has been placed upon the knurled wheel 22, the crank 21 is turned in the cutting direction to move the knurled wheel 22 upwardly toward the cutting wheel 23 to effect the initial puncturing by wheel 23 of the can lid, and continued turning of the crank 21 in the same direction will effect severance of the can lid. The manner of operation of the can opener device 15, as above briefly described, is well known in the art and needs no further explanation

The compartment 5 is essentially a deep well member 24 formed with a front notch 24*a* to receive the can to be opened and a bottom discharge 24*b*. The lower end of the member 24 registers with a suitable funnel-like chute 25 having an open tapered discharge end 25*a* extending into the compartment 9 where a waste collection receptacle 26 is placed to catch the spray fluid and the removed can lids after each use of the opener device 15.

The cabinet 2 has a removable top cover 30 which, when removed exposes the compartments 5 and 7, as shown in Fig. 5. Compartment 5 is covered by a tray-like partition 31 having a depressed central area 32. The partition area 32 supports a tubular header 33 provided with a spray head 34 (Fig. 6) opening through a port 35, and a jet tube 36 extending through a second port 37. The spray head 34 is disposed above the can opener device 15 so that the device may be thoroughly washed down with sanitizing fluid after each use. The jet tube 36 has its nozzle 38 directed at the cutting wheel 23 to deliver a forceful stream of the fluid thereon to dislodge

any food particles that may have adhered thereto during opening operation. Header 33 is supplied with fluid by a suitable conduit 39 which connects with a pump mechanism now to be described in detail.

Reference is now directed to Figs. 5, 7 and 8 for an understanding of the pressure generating or pump device which supplies sanitizing fluid in an impulsive charge to the spray head 34 and nozzle 38. Compartment 7 has a base on which a fixed member 40 is suitably braced by element 41 in a vertically inclined position. Spaced from member 40 is a pump operating member 42 suitably hinged at the lower end by a hinge 43, and extending vertically and in alignment with member 40. The upper end of movable member 42 is free to move between the arms 44 of a stationary guide member 45 carried by member 40 and held at the rearward end by brace 46 attached to the adjacent wall 16a of the compartment. The movable member 42 is urged toward fixed member 40 by motor means which may consist in a pair of springs 47 having the ends affixed to the respective members as shown in Figs. 5 and 8. Movable member 42 is adapted to have alternate movement toward and away from member 40 to operate the pump device 48 which, in the present example, is a flexible, pressure generating, squeeze-type bulb having a suction inlet tube 49 and to which the delivery tube or conduit 39 is connected. The suction and delivery connections of bulb 48 are provided with suitable one-way valves 50 and 51 respectively, which valves may be simple ball elements retained in ball cages. Further, the bulb 48 is partly confined, in its position between members 40 and 42, by similar plates 52 (Figs. 7 and 8) carried by member 40.

Alternate compression and expansion of the pump bulb 48 to eject fluid past valve 51 to tube 39 and to suck a fresh charge of fluid through tube 49 and into the bulb chamber past valve 50 is obtained by the movement of member 42 toward and away from fixed member 40. Member 42 carries a bracket 53 at its upper end on which a pivot pin 54 is mounted. The pin 54 is engaged in a slot 55 in pump operating arm 56 so that the arm pivots about the pin 54 and the forward closed end 57 of the slot abuts the pin to displace the member 42 away from fixed member 40 against springs 47. Operating arm 56 for the pump has its inner end 58 connected to an arm 59 connected to and actuated by movement of the access door 6. The arm 59 has an end extending adjacent the front flange 60 of the vertical casing wall for compartment 7. Opening of door 6 causes the arm 59 to move rearwardly (clockwise in Fig. 5) thereby pushing arm 56 rearwardly so that the closed end 57 of the slots 55 abuts pin 54 and forces the member 42 rearwardly to permit the bulb 48 to expand and recharge its chamber. The pump operating arm 56, during rearward displacement, pivots on pin 54 through its articulated connection with arm 59. At the rearward position of member 42, a notch 62 in catch link 61 drops over the end of member 42. The catch link 61 is operatively pivoted at pin 63 on fixed member 40 and is urged downwardly upon the upper end of member 42 by a spring 64 connected between the rearward end 65 of the link and the guide 45. The forward end 66 (Fig. 8) of the catch link 61 extends toward the front wall of the cabinet and is laterally bent toward the arm 59 moved by access door 6. The end 66 of this link has a roller element 67 which is engaged at the proper time by the inner end of the depressed portion 68 of arm 58. This lifts the end 65 of link 61 and releases notch 62 so that the motor means 47 may drive the pump 48 to eject a charge of fluid.

In Fig. 6, the can opener device 15 is provided with a magnetic lid retriever 70 so that the completely severed lids may be lifted free of the container. Such a retriever 70 is also well known in the art and needs no further description. On the other hand, the mechanism for operating the pump 48 in response to or upon opening and closing of the access door 6 is provided with a lid ejector to dislodge the lids held by the magnetic retriever 70. The ejector (Figs. 5, 6 and 7) comprises a fork 71 pivoted at 72 on the under side of tray 31 and arranged with its fingers 73 astraddle the spray head 34 and above the magnetic retriever 70. An operating link 74 is connected to the ejector 71 and extends upwardly through an aperature 75 in tray 31 where it pivotally engages a lever 76. Lever 76 is pivoted on a bracket 77 carried by the flange of tray 31, or at some adjacent suitable place, and this lever 76 extends toward the arm 56 where the end portion 78 rides upon the upper surface of this arm. A spring element 79 on pivot 77 urges the lever 76 in a direction (counter clockwise in Fig. 7) to keep the end 78 bearing upon the arm 56. In the position of the mechanism in Fig. 5, the lever 76 is elevated, thereby forcing link 74 down through aperture 75 and driving the ejector 71 downwardly about its end pivot 72. This acts to cause the ejector fingers 73 to move down on each side of the magnetic retriever 70 dislodging the can lid. Upon opening of the door 6, the lever end 78 rides down upon the depressed portion 68 of arm 56, thereby causing the ejector fingers 73 to rise under the action of spring 79 and clear the can opener device 15 for normal operation upon the next can.

Simultaneously with opening of the access door 6, the pump operating arm 56 is moved by arm 59 to displace member 42 to recharge itself with fluid from a suitable source, such as the reservoir pan 80 (Fig. 3) in compartment 10 of the cabinet 2. The reservoir 80 is set upon a suitable heating device 81 having a temperature control 82 may be maintained at the correct temperature for proper sanitation of the can opener. The member 42 is held by the notch 62 in catch link 61 in its rearward position until the door 6 is substantially closed. Closing of the door, returns the arm 56 to its initial position (Fig. 5) through the lost motion permitted by the slot 55 in arm 56. During opening and closing of the door 6, the can lid ejector 71 is operated as before described to clear the can opener of a can lid. The final closing movement of the door 6 pivots the inner end 67 of catch link 61 downwardly against spring 64 to release member 42. Member 42 is thereafter drawn toward member 40 by springs 47 compressing the pump bulb 48 and forceably ejecting the fluid charge through conduit 39 to the spray head 34 and jet nozzle 38. Thus the can opener 15 is thoroughly washed down with a charge of fluid and is rendered clean and sanitary for subsequent use.

The next opening operation of door 6 causes the above described mechanism in compartment 7 to reset the pump for taking on a fresh charge of sanitizing fluid. It is noted that the previous door closing movement serves to eject the can lid before the pump operates to deliver its fluid upon the can opener so that no interference is caused by the presence of a lid in front of spray head 34 and in the line of the nozzle 38 discharge.

The present apparatus is arranged so that its parts are fully accessible for inspection and adjustment to deliver complete and satisfactory service. Removal of the service door 12 opens both compartments 9 and 10 for replacement of the waste pan 26, replenishment of the reservoir pan 80 with a suitable sanitizing fluid such as a detergent or like fluid, and to permit setting the heater control 82 to the desired temperature. It is noted that the present apparatus is easily used by opening the door 6 to insert a can for opening, and operation of the crank 21 to sever the lid while the door is open so that the can may be removed. Closure of the door 6 actuates the several mechanisms to eject the severed lid prior to release of the pump to eject its fluid charge, and the door reaches a substantially fully closed position as the pump is released so that no spray can escape from compartment 5. The means herein disclosed for delivering sanitizing fluid upon the container opening device is a squeeze type pressure generator, but other means may be used to accomplish the same ends such as rotary or reciprocating pumps, diaphragm

pumps, and bottled pressure fluid means where the internal pressure effects the spray delivery when a valve is opened.

From the foregoing, the construction and operation of the apparatus will be readily understood. However, changes will occur to those understanding this disclosure and accordingly all suitable modifications and the use of equivalents may be included within the scope of the appended claims.

What is claimed is:

1. Sanitary can opener apparatus, comprising a lid severing type can opener device, pump means having a suction inlet and a discharge, a reservoir for sanitizing fluid connected to said pump suction inlet, fluid discharge means connected to said discharge conduit and arranged adjacent said can opener device to direct the sanitizing fluid thereupon, and mechanism connected to said pump means to operate said pump means between uses of said can opener device to effect periodic delivery of sanitizing fluid through said discharge means upon said can opener device.

2. Sanitary can opener apparatus, comprising a lid severing type can opener device, pump means having a suction inlet and a discharge, a reservoir for sanitizing fluid connected to said pump suction inlet, fluid discharge means connected to said discharge conduit and arranged adjacent said can opener device to direct the sanitizing fluid thereupon, mechanism connected to said pump means to operate said pump means between uses of said can opener device to effect periodic delivery of sanitizing fluid through said discharge means upon said can opener device, and means adapted to retrieve the severed can lid and discard the same to clear said can opener device for the delivery of sanitizing fluid.

3. Sanitary can opener apparatus, comprising a lid severing type can opener device, pump means having a suction inlet and a discharge, a reservoir for sanitizing fluid connected to said pump suction inlet, fluid discharge means connected to said discharge conduit and arranged adjacent said can opener device to direct the sanitizing fluid thereupon, means to discard the can lids severed by said can opener, and mechanism adapted to periodically effect operation of said pump means and said lid discarding means in sequence to clear said can opener for the delivery of sanitizing fluid.

4. Sanitary can opener apparatus, comprising a cabinet having a compartment with an access opening, a door for said access opening to open and close the same, a can opener device operatively mounted in said compartment to be accessible through said opening, sanitary fluid pumping means including fluid spray discharge means disposed adjacent said can opener and a reservoir for fluid, and mechanism operatively connected to said pumping means to effect periodic spraying of said can opener, said mechanism including means connecting to said door to control the periodic spraying in response to door opening and closing movement, whereby spraying occurs with said door substantially closed.

5. Sanitary can opener apparatus, comprising a can opener device, manually operative means connected to operate said can opener, a can lid retriever adjacent said can opener, a lid ejector operatively disposed adjacent said lid retriever, a sanitary fluid reservoir and fluid spray means respectively remote and adjacent said can opener, a fluid pumping system connected between said reservoir and spray means including pump operating mechanism subject to periodic operation after can opener operation for spraying said can opener to render it sanitary after each use, and means responsive to the operation of said mechanism to operate said lid ejector for removing a can lid held by said lid retriever to clear said can opener of interference by the lid for subsequent use.

6. Sanitary can opener apparatus, comprising a can opener device, pump means including a suction inlet and a discharge, a reservoir for sanitizing fluid connected to said suction inlet, spray means connected to said discharge and disposed adjacent said can opener to direct fluid thereupon, and mechanism operatively connected to said pump means to effect periodic operation for pumping fluid from said reservoir to said spray means.

7. Sanitary can opener apparatus, comprising a cabinet compartment having an access opening, a can opener device operatively mounted in said compartment near the access opening, pump means including a flexible wall chamber having a suction inlet and a discharge, a reservoir for sanitizing fluid connected to said suction inlet, spray means connected to said discharge and disposed to direct fluid upon said can opener, a compartment door movable to uncover said opening for can opener use and to cover said opening, and mechanism operatively connected to said pump means and responsive to door movement to effect periodic flexing of the wall of said chamber for pumping fluid from said reservoir to said spray means.

8. Container opening apparatus including a cabinet, an access door operably connected to said cabinet interior, container opening means operatively disposed within said cabinet in position to be accessible with said door in open position, and a fluid sanitizing system related with said container opening means comprising fluid discharge means adjacent said container opening means, pump means, conduit means connecting said pump means and said fluid discharge means, and means operably connected to said pump means and arranged to respond to substantial closing of said access door to cause said pump means to operate.

9. Container opening apparatus including a normally closed chamber, an access door movable to open said chamber and returnable to close said chamber, and means adapted to sanitize said container opening means including a fluid pressure generating device, a fluid outlet directed toward said container opening means from said device and means activating said pressure generating device in response to return movement of said door toward closed position.

10. In apparatus for opening a sealed can, a source of cleansing fluid for the apparatus, a discharge nozzle, pressure generating means between said source and nozzle adapted to deliver the cleansing fluid through said nozzle, and means adjacent said nozzle to open a sealed can, said means being in the path of cleansing fluid delivered through said nozzle.

11. In apparatus for opening a sealed can, a compartment, a can opener operably disposed in said compartment, a door hingedly carried on said compartment to open and close the latter for access to said can opener, fluid discharge means adjacent said can opener to direct cleansing fluid thereon, a fluid pressure generating device operably connected to said device, a control operably connected to said device to start the same for delivering cleansing fluid under pressure through said discharge means, and means operably responsive to closing of said compartment by said door to operate said control.

12. In sanitizable apparatus for opening sealed cans, a cabinet having in its lower portion a waste collector for can lids and used sanitizing fluid and a reservoir for sanitizing fluid, a can opener in said cabinet located above said waste collector, control means at the exterior of said cabinet to operate said can opener, a door on said cabinet controlling access to said can opener, a discharge device directed at said can opener, pressure generating means connected between said reservoir and discharge device to deliver fluid upon said can opener, and means responsive to door operation to set said pressure generating device in operation.

No references cited.