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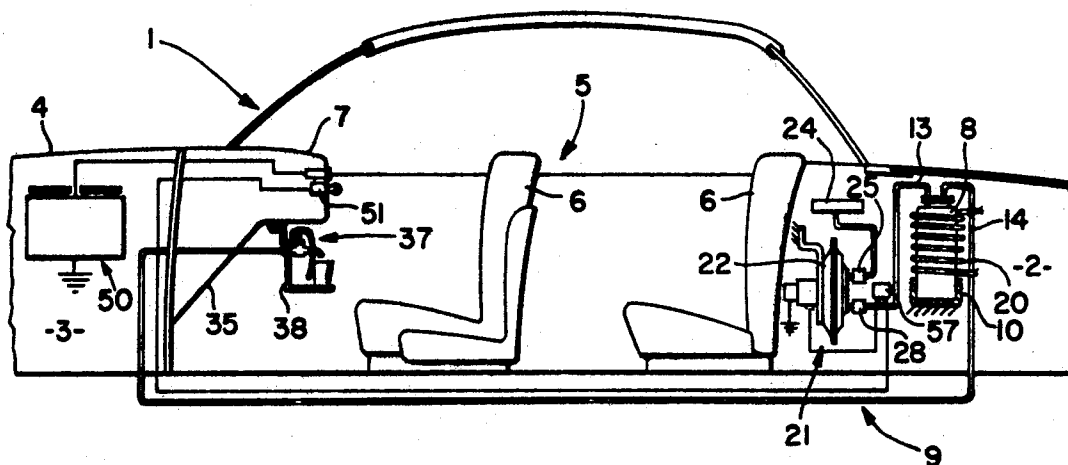
[54] **FLUID DISPENSER ASSEMBLY FOR**
AUTOMOBILES
9 Claims, 2 Drawing Figs.

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B67d 5/14
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15/(Inquired), 250.01, 250.02; 141/(Inquired),
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ABSTRACT: A fluid dispenser assembly for automobiles and the like including a diaphragm-type pump for dispensing the liquid from a container by compressed air. A control circuit prevents dispensing of the liquid until the ignition of the automobile is turned on.



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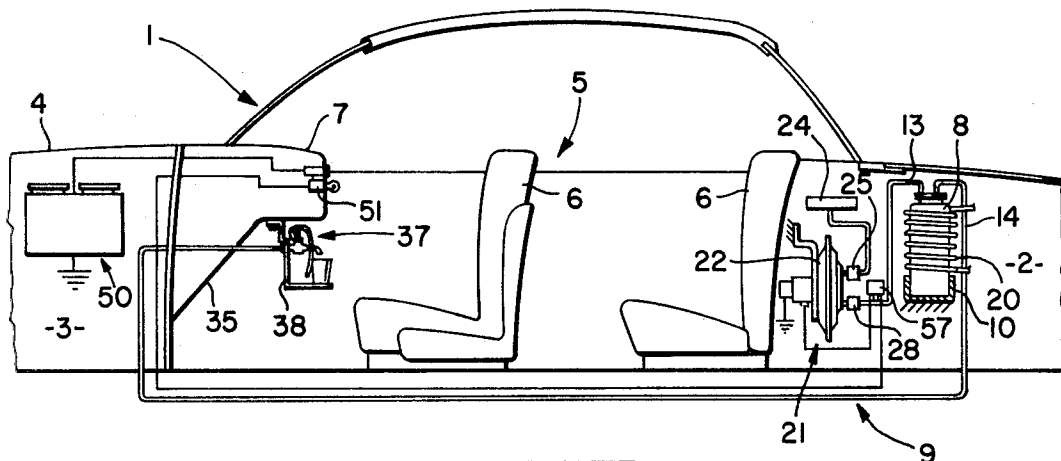


FIG. 1

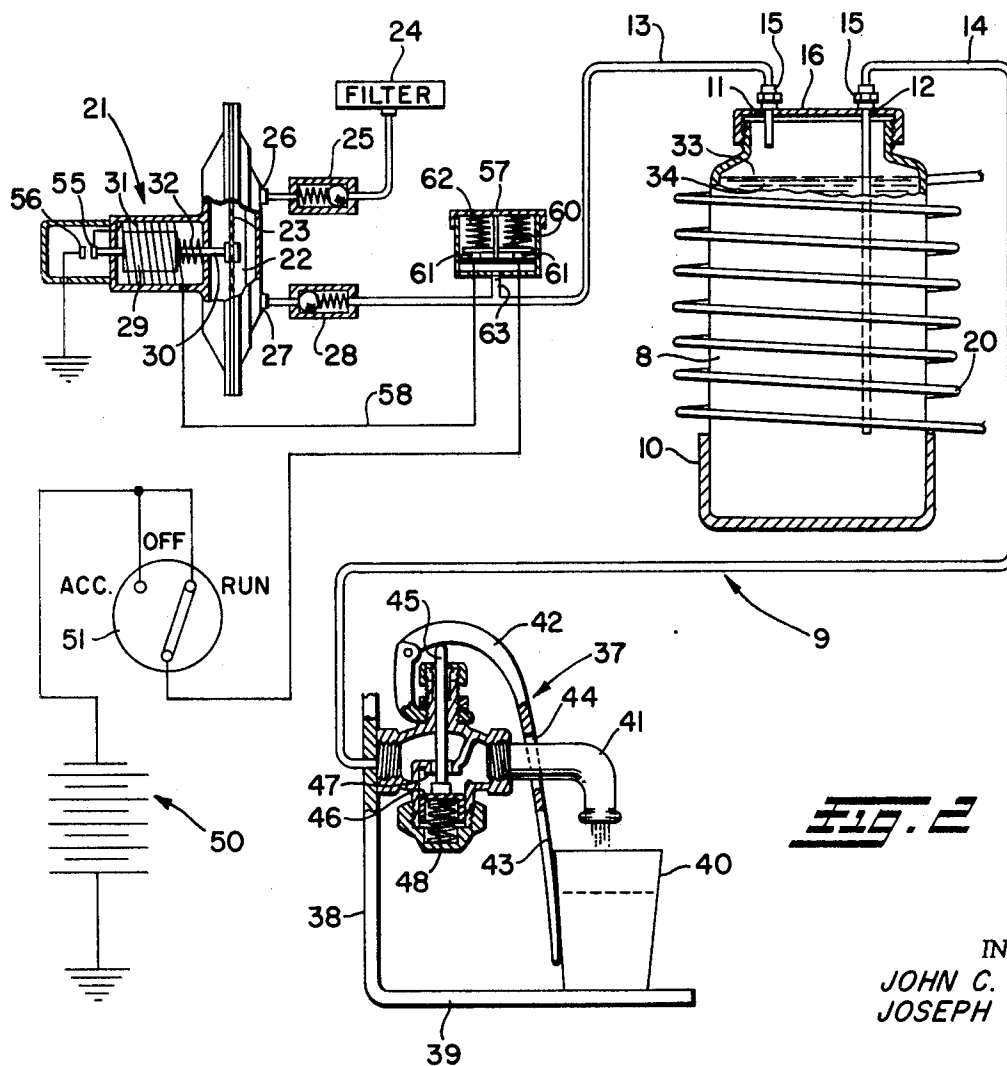


FIG. 2

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FLUID DISPENSER ASSEMBLY FOR AUTOMOBILES

BACKGROUND OF THE INVENTION

The present invention relates generally as indicated to a fluid dispenser assembly particularly adapted for use with automobiles and the like.

In conditions of modern-day travel, it is often inconvenient or impossible to stop when liquid refreshment is desired, particularly during high-speed travel conditions which exist on turnpikes, interstate highways and freeways. Even when facilities for such refreshment are available along the way, service is normally relatively slow and the liquid refreshment and other food products are quite expensive.

As a result, there have been efforts in the past to provide liquid-containing and dispensing equipment within the automobile itself to permit dispensing of liquids as desired by the occupants of the vehicle. However, previous equipment of this general type has not always been satisfactory for a number of reasons. The dispensing assemblies have usually been difficult to install. Moreover, it has been common practice to locate the liquid container and pumping device therefor beneath the hood of the vehicle, which has presented an increasing problem due to the lack of sufficient space under the hood of present-day vehicles. Furthermore, the usual pumping device is relatively complex and expensive and requires the liquid to pass directly through the pump, whereby the various pump parts may become contaminated by the liquids, resulting in early pump failure.

SUMMARY OF THE INVENTION

With the foregoing in mind, it is a principal object of the present invention to provide a fluid dispenser assembly which is relatively inexpensive to manufacture and which can be quickly installed in an automobile.

A more specific object is to provide such a dispenser assembly wherein the pump and liquid container can be conveniently mounted in the trunk of the vehicle to be simultaneously inconspicuous and accessible, and wherein the dispensing control mechanism is mounted on or adjacent the dashboard or control panel of the vehicle for convenient dispensing of the liquid by the driver or front seat occupant. The pump is in the form of a diaphragm-type compressor which creates sufficient pressure acting on the liquid in the container to force the liquid therefrom for flow to the dispensing control mechanism.

A further object is to provide a fluid dispenser assembly with a control circuit which prevents dispensing of the liquid until the ignition of the automobile is turned on thereby completely eliminating unauthorized use of the device.

Other objects and advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail a certain illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principles of the invention may be employed.

BRIEF DESCRIPTION OF THE DRAWING

In the annexed drawing:

FIG. 1 is a fragmentary schematic diagram of an automobile with the various elements of the fluid dispenser assembly of the present invention shown mounted therein; and

FIG. 2 is an enlarged schematic diagram of the fluid dispenser assembly of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in detail to the drawing, wherein like parts are indicated by like reference numerals, and initially to FIG. 1, an automobile is shown fragmentarily at 1, with the detailed

features of the automobile being illustrated merely to represent a typical installation of the present invention. As shown, the vehicle 1 includes a trunk compartment 2, an engine compartment 3 beneath the hood 4, and a passenger compartment generally indicated at 5. The latter such compartment includes conventional seating equipment 6 and a dashboard or control panel 7 mounting in normal fashion the usual controls and instrument dials (not shown).

In accordance with the present invention, a liquid container 8 which comprises a part of the fluid dispenser assembly 9 is received in a well 10 in the trunk compartment 2 supported ultimately by the frame of the vehicle. The container 8 may be of any desired capacity, and as best seen in FIG. 2 is provided with a screw-on closure member 16 having a pair of ports 11 and 12 therein for insertion of an air line 13 and fluid line 14, respectively. Suitable quick disconnect couplings 15 may be provided for releasably clamping the lines 13 and 14 to the closure member 16, thus permitting withdrawal of the lines 13 and 14 so that the container 8 may be removed from the well 10 for filling and cleaning, as required. Thermal insulation or the like may be disposed around the container 8 to maintain liquid temperature levels of relatively hot or cold liquids such as, for example, coffee of hot chocolate and water, milk or the like, respectively, for relatively long periods of time. Additional means may also be provided in or around the container 8 to maintain the liquid contents at a predetermined temperature, as, for example, a plurality of cooling or heating coils 20 wrapped around the container which may be operatively connected to the heating or air conditioning unit of the automobile.

Compressed air is supplied to the container 8 through the air line 13 by means of a diaphragm-type pump 21 which, like the container 8, may be mounted in the trunk compartment using a bracket 22 or the like connected to the vehicle frame. The pump 21 is of a relatively simple and inexpensive construction, comprising a pumping chamber 22 containing a flexible diaphragm 23 which when moved toward the left as viewed in FIG. 2 creates a suction for pulling air into the chamber through the filter 24, check valve 25, and suction port 26, and when moved toward the right forces the air out of the chamber 22 through the discharge port 27, check valve 28, and air line 13 connected thereto.

Reciprocation of the flexible diaphragm 23 is effected by means of an iron plunger 29 operatively connected to the diaphragm 23 by a plunger shaft 30 and axially movable into and out of a wire coil 31. When the coil 31 is energized, a magnetic field is created which pulls the iron plunger 29 toward the right into the coil, whereas when the coil is deenergized, a spring 32 surrounding the plunger shaft 30 causes return movement of the plunger 29.

The air line 13 extends only a short distance into the top of the container 8 so that the air pressure supplied thereby will act on the upper surface 33 of the liquid 34 in the container. The fluid line 14, on the other hand, extends a substantial distance into the container, preferably terminating closely adjacent the bottom thereof so that substantially all of the liquid may be forced therethrough by the air pressure. From the container 8 the fluid line 14 desirably extends beneath the floor of the automobile and up into the passenger compartment 5 through the firewall 35 where it is connected to a dispenser valve assembly 37 mounted on the instrument panel 7 by a bracket 38. The bracket 38 may also be provided with a horizontally outwardly extending flange 39 below the dispenser valve 37 for supporting a beverage cup 40 directly beneath the spigot 41. Pivotaly mounted on the dispenser valve assembly 37 is a handle 42 provided with a downwardly extending portion 43 for engagement by the cup 40. The spigot 41 extends through an opening 44 in the handle extension. When pressure is applied to the handle extension 43 as by pushing the cup against the handle extension, a plunger 45 is forced inwardly, thereby moving the valve element 46 of the valve assembly 37 away from its seat 47 against the bias of a spring 48 thus to permit fluid flow through the spigot for filling

the cup. When the cup is full, the pressure exerted on the handle extension 43 is released thus permitting the spring 48 to return the valve 46 to the closed position preventing further flow through the spigot.

The coil 31 for the pump 21 is desirably electrically connected to the vehicle battery 50 to permit the operation of the dispenser assembly 9 of the present invention without providing a separate source of power. The electrical connection may be through the ignition switch 51 so that the circuit between the battery 50 and coil 31 is completed only when the ignition switch is turned on or in the accessory position, as desired. Thus, when the ignition key is not in the ignition switch, the dispensing of liquid from the container 8 is prevented, thereby substantially eliminating unauthorized operation of the dispenser assembly.

With the initial switch on, current will flow through the coil 31 when the plunger 29 has been moved to the left by the spring 32 forcing the spring contact 55 into engagement with stationary ground contact 56 to establish electrical contact therebetween. Energization of the coil 31 causes the plunger 29 to move toward the right until the contacts 55 and 56 are disengaged, after which the magnetic field collapses and the spring 32 returns the plunger 29 to the initial left position again closing the contacts 55, 56, and so on, causing reciprocation of the flexible diaphragm 23 for supplying air pressure to the container 8 as previously described. A pressure switch 57 may be inserted in the electric line 58 between the ignition switch 51 and coil 31 for opening the electrical circuit when the pressure in the air line 13 reaches a predetermined level of approximately 3 p.s.i. even though ignition switch 51 is on to prevent excessive pressure from acting on the liquid within the container 8. As shown, the pressure switch 57 may comprise an electrically conductive pressure plate 60 which is normally biased against a pair of isolated stationary contacts 61 by a spring 62 to close the electrical circuit 58 when the fluid pressure supplied by the branch line 63 is below 3 p.s.i., but which is moved away from the stationary contacts to open the circuit when the pressure acting on the pressure plate 60 exceeds 3 p.s.i. As long as there is sufficient pressure acting on the liquid within the container 8, such liquid may be dispensed from the dispenser valve assembly 37 simply by actuating the handle extension 43 to open the valve 46, as previously described.

It will thus be seen that the fluid dispenser assembly of the present invention is comprises of but a few parts thereby permitting manufacture at relatively low cost. The assembly can be quickly installed in practically any existing automobile, with the pump of the assembly being electrically connected to the vehicle battery. The liquid container can be conveniently mounted in the trunk compartment of the vehicle so that it is readily accessible and removable for filling and cleaning.

Other modes of applying the principles of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims or the equivalent of such be employed.

We claim:

1. A liquid dispenser assembly for motor vehicles and the like comprising a liquid container, diaphragm pump means for supplying air pressure to said liquid container to pressurize the liquid contained therein, and a dispenser valve assembly operatively connected to said container for dispensing the liquid supplied thereto by such air pressure, said diaphragm pump means comprising a pumping chamber having suction and discharge ports, a flexible diaphragm in said pumping chamber, means for reciprocating said flexible diaphragm within said pumping chamber, and check valves for said suction and discharge ports permitting air to enter said chamber through said suction port and discharge through said discharge port during such reciprocating of said flexible diaphragm, said discharge port being operatively connected to said container for supplying air pressure thereto as aforesaid, said means for reciprocating said flexible diaphragm comprising a plunger connected to said diaphragm, a coil surrounding said plunger which when energized pulls said plunger and thus

said diaphragm from a first position to a second position, spring means urging said diaphragm toward such first position, and contact means which are closed by said plunger to connect said coil with a current source when said plunger is in such first position to energize said coil, and opened when said plunger is moved toward such second position to permit said spring means to return said plunger to such first position, and so on, and pressure switch means in the current path between said contact means and said current source for opening said current path when the air pressure developed by said diaphragm pump means exceeds a predetermined level.

2. A liquid dispenser assembly for motor vehicles and the like comprising a liquid container, electrically operated pump means for supplying air pressure to the top of said liquid container to maintain the liquid contained therein under pressure, a dispenser valve assembly, and a liquid line extending from adjacent the bottom of said container to said dispenser valve assembly through which liquid is forced by the pressure acting thereon in said container to said dispenser valve assembly and pressure switch means in the current path for said electrically operated pump means for opening said current path when the air pressure developed by said electrically operated pump means exceeds a predetermined level.

3. The liquid dispenser assembly of claim 2 wherein said electrically operated pump means comprises a pumping chamber having suction and discharge ports, a flexible diaphragm in said pumping chamber, electrically operated means for reciprocating said flexible diaphragm within said pumping chamber, and check valves for said suction and discharge ports permitting air to enter said chamber through said suction port and discharge through said discharge port during such reciprocating of said flexible diaphragm, said discharge port having an air line extending therefrom to the top of said container for supplying air pressure thereto as aforesaid.

4. The liquid dispenser assembly of claim 3 wherein said means for reciprocating said flexible diaphragm comprises a plunger connected to said diaphragm, a coil surrounding said plunger which when energized pulls said plunger and thus said diaphragm from a first position to a second position, spring means urging said plunger toward such first position, a movable contact carried by said plunger for movement therewith, and a stationary contact which is engaged by said movable contact to connect said coil with a current source when said plunger is in such first position to energize said coil, and disengaged by said movable contact when said plunger is moved toward such second position to deenergize said coil and permit such spring means to return said plunger to such first position, and so on.

5. The liquid dispenser assembly of claim 4 further comprising an ignition switch in the current path between said contact means and said current source for breaking said current path when said ignition switch is in the off-position.

6. The liquid dispenser assembly of claim 3 wherein said container has a removable closure member, and said air and liquid lines have quick disconnect couplings to said closure member to permit removal of said air and liquid lines from said closure member.

7. The combination of a liquid dispenser assembly mounted within a motor vehicle comprising a liquid container contained in the trunk compartment of said vehicle, electrically operated pump means contained in said trunk compartment for supplying air pressure to the top of said liquid container to maintain the liquid contained therein under pressure, a dispenser valve assembly mounted in the passenger compartment of said vehicle, and a liquid line extending from adjacent the bottom of said container to said dispenser valve assembly through which liquid is forced by the pressure acting thereon in said container to said dispenser valve assembly, said pump means being electrically connected to the battery of said vehicle through the ignition switch, whereby when said ignition switch is off, electrical contact is broken to prevent unauthorized use of said liquid dispenser assembly and pres-

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sure switch means in the current path for said electrically operated pump means for opening said current path when the air pressure developed by said electrically operated pump means exceeds a predetermined level.

8. The combination of claim 7 wherein said dispenser valve assembly comprises a pivotally mounted handle having a downwardly extending portion, a spigot, a valve element spring biased into engagement with a seat to prevent flow to said spigot, and a plunger movable into engagement with said valve element by pressing against said downwardly extending portion with a cup and the like to permit discharge of liquid from said spigot which has been supplied thereto by the air

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pressure in said container, and a bracket for mounting said dispenser valve assembly to the instrument panel of said vehicle, said bracket having a horizontally extending flange below said valve assembly for supporting such cup directly beneath said spigot.

9. The combination of claim 7 further comprising coil means in said trunk wrapped about said container and associated with the air conditioning unit of said vehicle for maintaining the contents of said container at a desired temperature.

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