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[56]

References Cited

UNITED STATES PATENTS

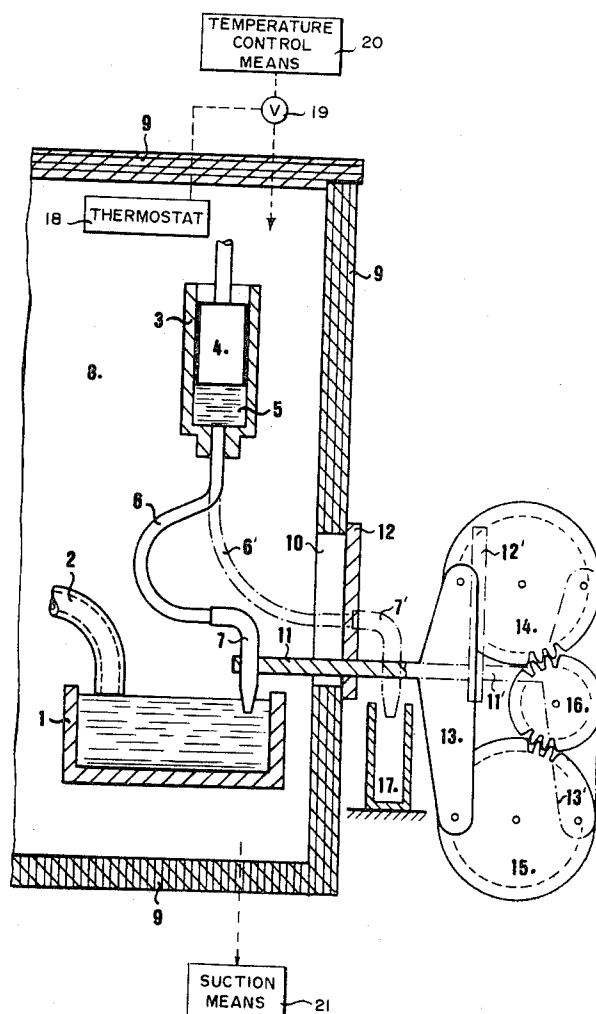
3,252,329 5/1966 Heimann 73/423 A
 3,476,295 11/1969 Telfer 222/538 X

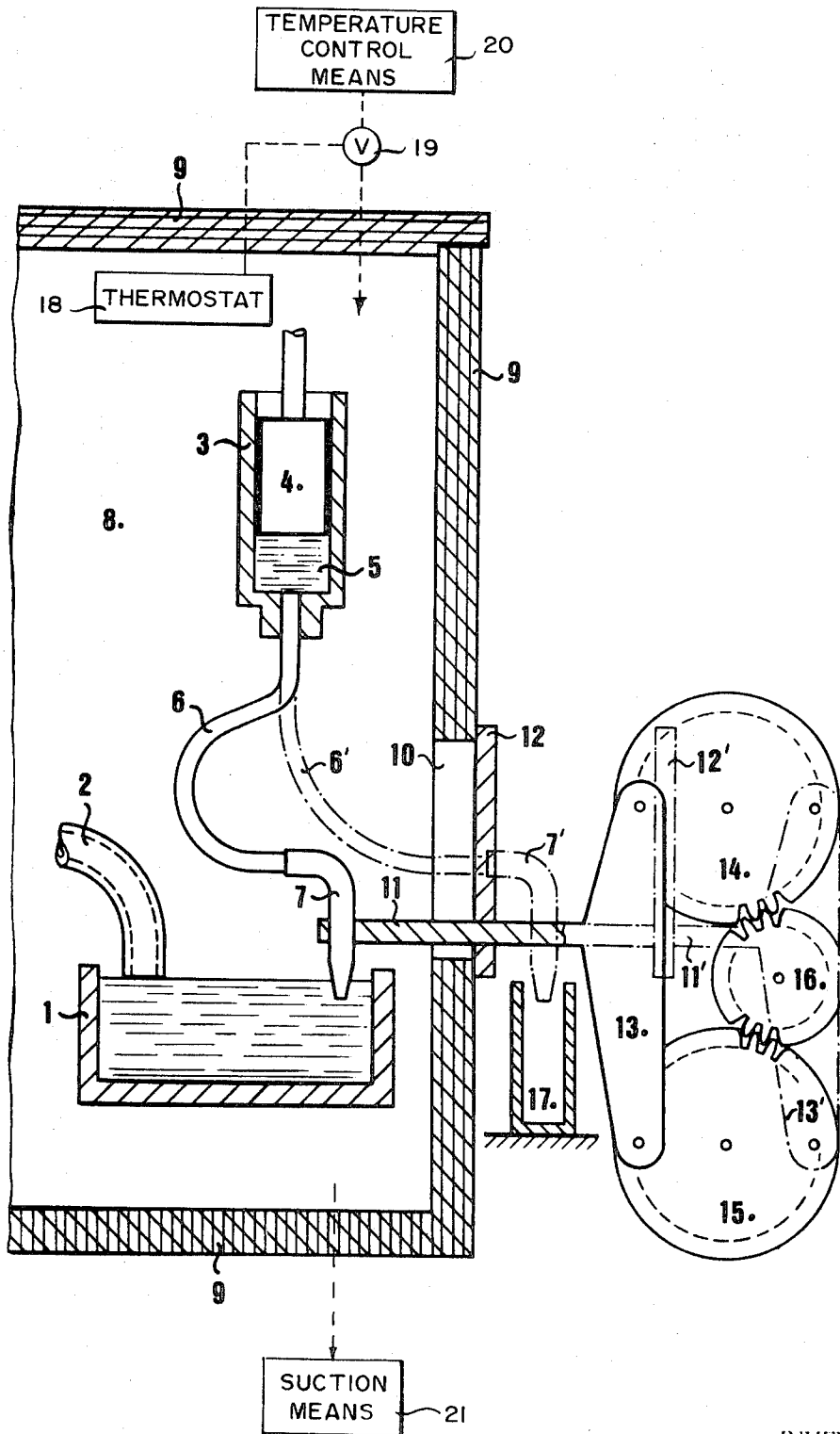
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[54] **LIQUID-DISPENSING APPARATUS INCLUDING A HOUSING AND MOVABLE NOZZLE**
 6 Claims, 1 Drawing Fig.

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ABSTRACT: Dispensing apparatus of the type including a dispensing nozzle movable between charging and dispensing positions relative to a liquid supply reservoir and a receptacle, respectively, characterized in that the liquid supply reservoir and the dosage means for charging the nozzle with a quantity of liquid are contained within a protective storage housing. One wall of the housing contains an opening through which the nozzle is displaced from its normal charging position within the housing to the dispensing position relative to a receptacle that is arranged externally of the housing. Temperature-responsive means are provided for maintaining the interior of the housing at a desired storage temperature.





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LIQUID-DISPENSING APPARATUS INCLUDING A HOUSING AND MOVABLE NOZZLE

It is known in the prior art to provide liquid-dispensing apparatus wherein the liquid to be dispensed is removed from a supply reservoir by dosage-charging means that include a nozzle for dispensing the liquid into a receptacle. Nozzle-displacing means are normally provided for displacing the nozzle between charging and dispensing positions relative to said reservoir and said receptacle during the liquid charging and dispensing operations, respectively.

In order to reduce the danger of contamination of the liquid or the nozzle—which contamination is rather likely to occur when the dispensing apparatus is used infrequently—it has been proposed, in accordance with the primary object of the present invention, to arrange the reservoir and the dosage means within a storage housing that contains an opening through which the nozzle is transported during displacement between the charging position within the housing to the dispensing position external of the housing. The means for displacing the nozzle between its charging and dispensing positions comprises a rocker arm that is actuated by means arranged external of the housing, said rocker arm including a support portion that extends through the housing opening when the apparatus is in its normal storage condition to support the nozzle in the charging position relative to the reservoir.

In accordance with another object of the invention, the nozzle support portion of the rocker arm includes closure means arranged to automatically close the housing opening when the nozzle is in the charging position. In accordance with a further object of the invention, temperature-responsive means are provided for maintaining constant the temperature of the fluid within the storage chamber within the housing.

Other objects and advantages of the invention will become apparent from a study of the accompanying single FIGURE of drawing, which figure illustrates diagrammatically the preferred embodiment of the invention, certain parts being omitted for clarity of illustration.

Referring to the drawing, the reservoir 1 is filled with the liquid to be dispensed via a supply tube 2 the lower extremity of which terminates at the desired liquid level to be maintained in the reservoir. Dosage pump means of the type including a cylinder 3 and piston 4 are provided for withdrawing from the reservoir a desired charge of liquid 5 via nozzle 7 and flexible conduit 6. The reservoir and dosage means are contained within the storage chamber 8 of a closed housing 9.

As shown in the drawing, the nozzle 7 is initially maintained in a downwardly depending storage position, the free extremity of the nozzle being submerged beneath the level of liquid in the reservoir 1. The nozzle is supported in this position by the nozzle support arm 11 that extends through opening 10 contained in the right-hand end wall of the housing. In accordance with an important feature of the invention, closure means 12 secured to the support arm 11 serve to automatically close the opening 10 when the nozzle is stored in the normal charging position.

The storage chamber 8 is sealed in a dustproof manner, the walls of the housing 9 preferably being formed of a heat-insulating material. Temperature-responsive means in the form of a thermostat 18 control the setting of regulating valve means 19 to control the supply of temperature-modifying fluid to the chamber 8, thereby maintaining the storage temperature at a desired value (generally slightly less than ambient temperature). Vapors produced by evaporation of the liquid are removed from the chamber 8 by suction means 21.

In accordance with an important feature of the invention, means are provided for displacing the nozzle 7 from the illustrated storage charging position to the dispensing position 7' relative to the receptacle 17 external of the housing, as illustrated in phantom. More particularly, the nozzle support arm 11 has integrally connected therewith a rocker arm 13 the ends of which are connected with a pair of pinions 14, 15 that are driven by the drive pinion 16. These nozzle-displacing

means are arranged externally of the housing 9, and thus are readily accessible for inspection and servicing.

Since the actuating means 11-16 are normally maintained at the storage position illustrated by the solid lines, and since the nozzle is only sporadically displaced to the dispensing position illustrated in the phantom, all of the parts 1-7—which are of decisive significance for the accuracy and reliability of operation of the device, as well as the liquid that is to be dispensed—are effectively protected within the storage chamber 8 against external disturbing influences.

If desired, additional closure means may be provided for closing the opening 10 when the nozzle is withdrawn to the dispensing position. For example, the additional closure means (not shown) may be connected with support arm 11 adjacent the nozzle 7.

It is apparent that various modifications may be made in the described apparatus. For example, instead of the circular driven pinions 14 and 15, it may be desirable in certain instances to provide elliptical pinions to obtain withdrawal of the nozzle support arm 11 along an elliptical path. Furthermore, in the event that a plurality of receptacles are to be filled with different liquids from separate reservoirs contained within the chamber, a plurality of dosage means and openings 10, as well as a plurality of nozzle-displacing means, may be provided for coordinated operation. Other modifications may be made in the described apparatus without deviating from the disclosed inventive concepts.

What is claimed is:

1. In a dispensing apparatus of the type including dosage means (3-6) having a nozzle (7) operable alternately to initially remove a measured quantity of liquid from a reservoir (1) and to subsequently dispense said liquid quantity into a receptacle (17), respectively; and nozzle-displacing means (13-16) for displacing said nozzle between charging and dispensing positions adjacent said reservoir and said receptacle during said liquid removing and dispensing operations, respectively;

the improvement which comprises

housing means (9) completely enclosing said dosage means and said reservoir, said housing means containing an opening (10), said nozzle means normally being stored in the charging position relative to said reservoir;

said nozzle-displacing means being operable to transport said nozzle from said charging position outwardly through said opening to the dispensing position relative to a receptacle arranged externally of the housing.

2. Apparatus as defined in claim 1, further including means (12) normally closing said opening when the nozzle is in the charging position relative to said reservoir, said closure means being operable by said nozzle-displacing means to a position remote from said opening when the nozzle is displaced from the charging position to the dispensing position.

3. Apparatus as defined in claim 1, wherein said nozzle-displacing means is arranged externally of the housing and includes a nozzle support arm (11) that extends through said opening to support said nozzle adjacent said reservoir when said nozzle is in its normal charging position.

4. Apparatus as defined in claim 3, and further including means (12) connected with said arm for normally closing said opening when the nozzle is in the charging position relative to said reservoir, said closure means being operable by said nozzle-displacing means to a position remote from said opening when the nozzle is displaced from the charging position to the dispensing position.

5. Apparatus as defined in claim 3, wherein said nozzle-displacing means further includes a rocker arm (13) integrally connected with said support arm, and pinion means (14, 15) for displacing said rocker arm in a parallel manner to displace the nozzle between said charging and dispensing positions.

6. Apparatus as defined in claim 1, wherein the walls of said housing contain heat-insulating material, and further including means for maintaining uniform the temperature within said housing.

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