APPARATUS FOR DISPENSING A METERED AMOUNT OF FLUID


Filed: June 5, 1972

Appl. No.: 259,368

Related U.S. Application Data

U.S. Cl. 222/209, 222/336, 222/405, 401/184, 118/266

Int. Cl. B65d 37/00

Field of Search 222/207, 209, 205, 213, 187, 222/269, 338, 335, 336, 318, 405; 401/196, 183, 184, 185, 264; 95/94 R; 118/266, 264, 401

References Cited
UNITED STATES PATENTS
2,643,408 6/1953 Decker .................................. 401/183
138,662 5/1973 Leet et al. ............................. 401/184

3,685,412 8/1972 Lehmann .......................... 222/213 X
1,928,235 9/1933 Taylor ................................ 95/94 R
3,018,756 1/1962 Kilham .............................. 118/264 X
3,133,484 5/1964 Wright ................................ 118/264 X

Primary Examiner—Stanley H. Tollberg
Assistant Examiner—James M. Slattery

ABSTRACT
Dispenser apparatus including a container configured for retaining a source of liquid and having a plurality of deformable wall portions which may be selectively activated by an external force so as to reduce the volume of the container and thereby provide repetitive application of a given pressure to the retained source of liquid for dispensing of the liquid from the container. Preferably, a plurality of the wall portions are configured for irreversible deformation so as to permit successively reduced volume in accordance with their actuation and at least one is configured for reversible deformation and is biased to return to its original position upon removal of the actuating force thereby returning any excess of the dispensed liquid to within the container.

12 Claims, 10 Drawing Figures
APPARATUS FOR DISPENSING A METERED AMOUNT OF FLUID

RELATED APPLICATIONS

This application is a division of application Ser. No. 103,986, filed Jan. 5, 1971, now U.S. Pat. No. 3,685,412.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to dispenser apparatus and more particularly to an improved dispenser adapted for repetitively dispensing processing liquid to photographic material.

2. Description of the Prior Art

In modern technology, it is often desirable to simply and efficiently apply processing liquids during a particular operation. For instance, as noted in the parent application following exposure of photographic material, it is usually necessary to subject it to a suitable processing liquid for a prescribed imbibition period. Generally, it is important to minimize the amount of processing liquid employed and to dispense the latter with a minimum of entrapped gas. Since the processing liquid employed is generally corrosive it must be suitably confined so as to protect both the apparatus and the operator. Moreover, application of the processing liquid in portable apparatus with which the present invention is particularly concerned, further compounds the difficulties of storing and applying the liquid since this often requires the application of predetermined quantities of the liquid, uniformly and at relatively high rates, and the necessity for so doing in apparatus that may be operated manually and presents the problem of precluding spillage.

Accordingly, it is an important object of this invention to provide improved apparatus for dispensing fluid.

Another object of the invention is to provide apparatus for repetitively dispensing a predetermined quantity of processing liquid.

A further object of the invention is to provide an applicator for efficiently dispensing a predetermined amount of gas-free processing liquid uniformly over sheet-like material.

A still further object of the invention is to provide apparatus for rapidly applying processing liquid to photographic material.

SUMMARY OF THE INVENTION

Broadly, the apparatus comprises a container of predetermined volume configured for retaining a liquid and includes means configured for successively decreasing the container volume and egress means for permitting dispensing of the liquid in accordance with such reduction of volume. Preferably, the egress means comprises porous filter material which, within a given range of pressure differential, is liquid permeable and gas impermeable such that gas-free processing liquid may be substantially uniformly dispensed over the filter surface in accordance with operation of the volume decreasing means.

In the illustrated embodiment, the dispenser is employed in a camera structure for applying processing liquid to a photosensitized sheet of photographic film and is configured to dispense to the film a prescribed amount of processing liquid from a source thereof and, following an appropriate imbibition period, to return any excess liquid to the source. In this arrangement, the container includes a plurality of deformable wall portions, each adapted to reduce the container volume and thereby increase the source pressure by a prescribed amount in accordance with inward pressure of the wall portions responsive to application of an external force. One of the discrete portions is adapted for reversible deformation for repetitive dispensing of the liquid from the container upon application of the external force and return of any excess liquid upon removal of such force. The remainder of deformable portions are adapted for irreversible displacement so as to maintain a substantially constant source pressure intermediate repeated applications of the liquid. In this embodiment, the container body is constructed of material which, while capable of providing a substantially rigid container of fixed volume is sufficiently elastic to permit displacement of thin wall portions. Each of the discrete wall portions are substantially rigid portions of the same wall thickness as the body of the container which are coupled to the latter by a thin wall portion so as to provide a diaphragmlike member. Additionally, the elasticity of the thin wall section surrounding each portion tends to bias each portion to its original position. This is utilized in regard to the one reversible portion but circumvented in the case of the irreversible portions which include means for automatically latching them in their depressed position.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation together with additional objects and advantages thereof will best be understood from the following description of the preferred embodiment when read in connection with the accompanying drawings wherein like numbers have been employed in the different figures to denote the same parts and wherein:

A FIG. 1 is a diagrammatic view in perspective of a photographic camera embodying the invention;

FIG. 2 is a diagrammatic view partially in section illustrating one film magazine employed in the camera of FIG. 1;

FIG. 3 is a diagrammatic view partially in section showing another film magazine employed in the camera of FIG. 1;

FIG. 4 is a diagrammatic view in perspective illustrating the processing station of the camera;

FIG. 5 is a view in section of the processing station taken along line 5—5 of FIG. 4;

FIG. 6 is a diagrammatic view in perspective of another operative element of the camera; and

FIGS. 7, 8, 9 and 10 are diagrammatic plan views of the interior of the camera and illustrating its operation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of this invention is illustrated as a camera including apparatus facilitating application of a compatible processing liquid to a photosensitive image-recording sheet following its exposure and superposition of this sheet with an image-receiving
3,795,351

Slideably mounted within magazine 18 is a film engaging member 52 which includes a flexible tongue 54 adapted to drive each successive film sheet in a direction opposite to the displacement of the engaging member, or that is, to move the lowermost film sheet through aperture 44 as the engaging member is displaced in a direction away from this aperture. This is accomplished by any conventional means such as by confining tongue 54 within a track or channel (not shown) so as to force it to bend back on itself. The unit is completed by integral mounting arms 56 which extend from the leading edge 58 of the magazine for releasably pivotal mounting to housing 10, for example, by engagement with post 59 of the housing as shown in FIG. 1. A conventional later (not shown) is employed to releasably secure the magazine 18 in a closed position with its exit aperture 44 located adjacent the feed rolls of the camera for dispensing of each image-recording sheet 42 thereto, as later explained in detail.

Processing station 20, as shown in FIGS. 4 and 5, includes a demountable applicator unit 60 which is configured for releasable mounting to housing 10 in an adjoining relationship to a film support member 62. The applicator unit 60 is made up of a box-like housing 64 which is closed at its open end by an applicator body 76. This forms a narrow cavity or internal chamber 66 of predetermined volume between the rear wall 74 and body 76 for containing a source of processing liquid 68. Preferably, applicator body 76 is a substantially inflexible member of porous material which facilitates delivery of gas-free liquid from source 68 to the exterior surface 78 of the body. Hence, the body 76 provides egress means for permitting dispensing of the liquid 68 from the chamber 66 to the exterior of the housing 64. The exterior surface 78 is of slightly greater area or dimension than that of exposure aperture 14 whereby all of the photoexposed area of each film sheet may be disposed in contact with the applicator surface at a given time.

The body 76 is of so called membrane filter material, that is, microporous material having a sponge-like structure of small interconnected pores which provide, a relatively high degree of pressure in the processing liquid, and hence, in cooperation with the surface tension of the liquid, preclude passage of gas up to relatively high pressure. Substantially coplanar with the applicator surface 78 is a sealing member of perimetic gasket 79 of 40 durometer rubber or the like which provides a rectangular surface enclosure and is intended to engage the perimetic margin of the film sheet 24 exteriorly of its photosensitive area.

Suitable membrane materials are glass, ceramic, carbon or plastic such as nylon or polyvinylchloride or other materials which are chemically inactive with the processing liquid and have a sufficiently small pore size, for example, 1/4 micron to 1/10 micron so that once contacted with the liquid it will pass the same while excluding passage of gas upon application of a low pressure differential to the body. That is, the applicator body is of a substance having sufficiently small pore size, which once contacted by the liquid, is liquid permeable but substantially gas impermeable at relatively low pressures. Inasmuch as the applicator body 76 precludes gas passage and includes a multiplicity of interlocking pores, it uniformly disperses liquid to its exterior surface 78. Stated otherwise, although the source of liquid may not provide uniform contact with
the underside of the body 76, for example, due to entrained gas in the source, the liquid tends to be carried uniformly throughout the body and produces a uniform distribution on the body surface 78. Hence, the applicator body 76 provides means for dispensing fluid from source 68 to the body surface 78 and for providing a substantially uniform distribution of liquid thereat.

It will be appreciated that the unique nature of the applicator provides rapid lateral flow of gas-free liquid to the photosensitive sheet, and simultaneously subjects all the photosensitive surface to the processing solution. Advantageously, the unit provides a slight excess of liquid during imbibition, then removes any remaining excess and returns it to the source. Hence, the arrangement not only minimizes the amount of source needed but also removes excess liquid from the photographic sheet prior to its withdrawal from the applicator unit. This is in contrast to capillary applicators which fail to provide gas-free wetting of the film sheet, fail to remove excess liquid following imbibition and additionally do not provide external control over the liquid flow. Stated otherwise, in capillary devices the fluid flow is caused by absorption into the film of the liquid which can result in non-uniform or incomplete wetting whereas, in the present case, liquid flow is controlled by the applied pressure differential.

In the rear wall 74 of container 64, means are provided for varying the pressure on source 68 and for thereby providing a suitable pressure differential between the source and the exterior surface 78 of the applicator body. These means include a plurality of movable members 82 and 84 formed by discrete deformable portions of the rear wall 74, each of which are adapted to reduce the volume of the chamber and increase the interior pressure by a specific amount and thereby increase the source pressure accordingly. In this embodiment, the members 82 and 84 are portions of the rear wall 74 which are joined thereto by thin wall material to provide diaphragmlike areas which may be depressed, from their location coplanar with the rear wall, into chamber 66 to reduce the volume and increase the internal pressure of the latter. One member 82 is adapted for reversible operation for providing reversible pressure variations and is preferably, elastically coupled to the rear wall. For example, the container is constructed of material having some elasticity such that the deformable portion tends to return to its original location. In operation, member 82 is depressed to dispense liquid from the source 68 and then released to return excess liquid to the source. In contrast to member 82, members 84 are adapted for irreversible operation, and include an interior latch 86 for locking each in its depressed location responsive to engagement of the latch with recess 88. The latter members are designed for non-repetitive operation and function to bring the chamber back up to the original pressure following each operation of member 82. Hence, each of the deformable members 84 compensates for the reduction in source volume (or source pressure) resulting from the absorption of liquid in each processed film sheet.

In a specific example, which is given for purposes of illustration and not intended to be limiting, a 4\times 5 inch sheet of photosensitive material of the type disclosed in the aforementioned U.S. Pat. No. 2,983,606 was processed in the described processing station which contained an aqueous, alkaline solution having a low viscosity substantially that of water and containing:

<table>
<thead>
<tr>
<th>Compound</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium hydroxide</td>
<td>10.0</td>
</tr>
<tr>
<td>N-benzenyl-picolinium bromide</td>
<td>3.0</td>
</tr>
<tr>
<td>Benzoiazole</td>
<td>3.5</td>
</tr>
<tr>
<td>Zinc nitrate</td>
<td>0.5</td>
</tr>
</tbody>
</table>

The applicator unit was constructed with an acrylic container body having an internal volume of approximately 1.5 cubic inches and a membrane filter wall of slightly greater than 3/4 inches in length and width. The membrane filter, which was three-sixteenth inch thick, acrylonitrile polyvinylchloride copolymer reinforced with nylon, with a mean pore size of 1.2 microns and a porosity of approximately 70 percent, formed the front of the container, and the rear of the container, included several 1 inch diameter movable wall portions of rubber material. All but one of the movable members included an internal latch.

A film support member 62 made up of support plate 90 covered by an arcuate surface layer 92 of urethane foam having a density of 10 pounds per cubic foot was employed. Both the applicator filter surface 78 and the support plate layer 92 were peripherally bordered by sealing margins 79 and 95, respectively, of rubber having a durometer reading of about 40. The chamber of the container was filled with the above solution which permeated the filter applicator and wetted its exterior surface.

After exposure, the photosensitized surface of the sheet was positioned over the applicator surface and progressively pressed into contact with it by forcing the film support member against the rear of the photographic material. Then, the non-latching deformable portion was depressed to a depth of approximately 0.050 inch which increased the source pressure to about 5 psi and dispersed about 1 cc. of gas-free liquid to the photosensitive surface.

The depressed portion was held in its activated position for about 8 sec., then released to return excess fluid to the source. Immediately following this, the photographic sheet was removed from the applicator surface and pressed into superposition with an image-receiving sheet for formation of a visible image therein. Thereafter, one of the self-latching deformable areas was depressed and locked in its depressed condition by its internal latch. This compensated for the reduced source volume and returned the source pressure to approximately its original value. A second photographic sheet was then exposed and the above steps repeated to produce its recorded image.

Applicator unit 60 is releasably mounted on the camera housing 10 by any conventional latching means (not shown) with its applicator surface 78 disposed in juxtaposition with film support member 62 which during camera operation, as later explained in detail, is selectively driven by lever 96 towards applicator unit 60 to press the film sheet against surface 78 in accordance with operation of the camera. To insure complete wetted contact of the film sheet with the applicator surface 78, the support member 62 includes means for removing air from between the interposed sheet and the applicator surface. Thus, the member 62 includes a support plate 90 which carries a resilient surface layer 92 of compressible material such as urethane foam of 10 pounds per cubic foot density or the like having a curved exterior surface 94 which tapers from a raised...
or extended central portion towards the margins such that as the support plate is moved towards the applicator 60, to press the image-receiving sheet 24 into contact therewith, contact between the sheet and applicator surface 78 initially is a small restricted area which is progressively enlarged towards the edges of the structure so as to drive air towards the sheet margin and from between the sheet and applicator surface. Thus it will be recognized that the unit wipes air or gas from the applicator surface as the sheet is deposited and then precludes gas conduction during dispensing.

Carried at the perimeter of the plate 90 in juxtaposition with gasket 79 is a second perimetric gasket 95 of resiliently deformable material such as elastomer, for example, 40 durometer butyl rubber or the like. Gaskets 79 and 95, which are of resilient deformable material and cooperate to seal the margins of sheet 24 to the applicator 60, should be less compressible than the surface layer 92 so that during operation of the unit, the margins remain sealed while film sheet 24 is deflected slightly away from the applicator surface 78 responsive to the liquid pressure.

As previously indicated, the support member 62 and the applicator 60 are mounted at the side of the camera housing 10, as shown in FIG. 1, adjoining exposure aperture 14 such that film sheets may be disposed within the processing station following their exposure. The support member 62 is permanently mounted in the housing for movement towards the exterior surface thereof while applicator unit 60 is releasably mounted in the interior wall of the housing with its applicator surface 78 in juxtaposition with film engaging surface 92 of the support member.

As shown in FIG. 1, film transport system 22 includes a ring gear 100 which is mounted for rotation about the vertical axis of the camera in accordance with operation of hand crank 102. Extending from ring gear 100 and interiorly thereof is a lever of lug member 104 which is adapted for operation of the components of the camera during rotation of the ring gear. Also depending from ring gear 100 is a film engaging or film gripping member 106 which is shown in detail in FIG. 6. As shown in the latter figure, the gripping member 106 includes a pair of coupled lever members 118 and 122 adapted for engaging a film sheet between their sheet-engaging surfaces 126 and 128 in accordance with actuation of arm 130. In this embodiment, the gripping member 106 is biased to a normally closed position by spring 124, and is pivotally mounted on shaft 120 beneath ring gear 100 in position for engagement of the film sheets during camera operation. In this regard, the gripping member 106 is spaced slightly to the right of lug 104, or that is, leads lug 104 in a counterclockwise direction looking down on the camera.

Included within the interior of the camera is a pair of upper and lower channels or track 114 and 116 within which the film sheet is moved during camera operation. Additionally, a pair of feed rolls 108 and 110 are rotatable mounted at the rear of the housing 10 and adapted to superpose the film sheets as shown in FIG. 5 where the film engaging surfaces 126 and 128 of gripping member 106. The latter are held in an open position at this time in accordance with engagement of the gripping member against a release lug or trip lug 132 which is fixedly mounted to the left of aperture 14. Continued rotation of the gear ring 100 closes gripping member 106 and draws the image recording sheet 24 into position at exposure aperture 14 where a conventional shutter release (not shown) is activated to photoexpose the photosensitive surface of the sheet. At this time gear ring 100 has been rotated to the position shown in FIG. 7 wherein actuating lug 104 and gripping member 106 are positioned at the trailing edge of aperture 14.

Further rotation of gear ring 104 then draws the film sheet 24 into position within the processing station 20 and automatically actuates lever member 96 which moves member 62 into engagement with the sheet 24 and presses its photosensitive surface against the applicator body 76. The operator of the camera then presses the dispensing member 82 at the rear of container 64 to inject liquid through applicator 76 to the photosensitive surface. That is, deformation or the depressing of portion 82 increases source pressure and applies a positive pressure differential between source 68 and surface 78.

In this embodiment, the imbibition time is controlled by the length of time the operator holds the deformable portion in its depressed condition. Hence, after a proper interval of, for example, 8 seconds the operator releases member 82 which elastically tends to return to its original position. This reduces source pressure and withdraws excess fluid from the vicinity of the film sheet 24. The ring gear 100 is then further rotated to release lever member 96, open the processing station 20 and draw film sheet 24 between feed rolls 108 and 110.

As the film sheet 24 enters the feed rolls 108 and 110, it is superposed within an image-receiving sheet, dispersed from magazine 18 in accordance with actuation of its film engaging member 52 by contact with lug 104. Hence, as lug 104 passes across magazine 18 it strikes film engaging member 52 and drives it along with the moving ring gear 100, as shown in FIG. 9. Consequently film engaging member 52 dispenses an image-receiving sheet 42 in a clockwise direction, that is, toward the processing station 20 where a baffle plate 112 forces it around roll 108 into engagement with image-recording sheet 24 and between the feed roll in superposition therewith. The operation is completed as shown in FIG. 10, when gripper member 106 reaches a position adjoining the trailing edge of magazine 18 where it engages a second release lug or trip lug 134. Magazine 18 is then pivoted to an open position for removal of the superposed sheets. At this stage of the operation, lug 104 is back to its initial position in readiness for engaging the film engaging member 52 for dispensing of a second image-recording sheet 24.

For subsequent exposures, the unit is operated in substantially the same manner, with however, the additional activation of one of the irreversible portions 84. Hence, since a small amount of liquid is imbibed by each film sheet during the processing and applicator body 78 will not admit air to the chamber, release of
portion 82 withdraws excess liquid from the applicator surface 78, but results in reduced pressure on source 68 due to the fluid loss. Consequently, one of the irreversibly
portions 84 is activated following each application of processing liquid (or just prior to subsequent application) to the film sheet so as to return the source pressure to its original value whereby reversible portion 82 will again be ready for dispensing a prescribed amount of liquid to the next successive sheet. Hence, the irreversible portions are activated to return the source pressure to its original value. Consequently, only portion 82 is depressed for processing of the initial film sheet whereas portions 84 and 82 are activated in that order for processing of subsequent film sheets. It should be understood that since the irreversible portions 84 only compensate for the imbibition loss, they need not provide as great a pressure change as that of portion 82, and hence, may be of smaller area, etc.

Many other variations and different embodiments are possible within the scope of these teachings. For instance, in some applications it may be desirable to utilize a conventional pump or other means for varying the reservoir pressure so as to provide proper pressure differential across the applicator body. Moreover, various mechanisms for transporting the film sheet into position with the applicator member will be suitable and different arrangements for removing air from between the film sheet and the applicator surface may be employed. For example, the raised surface portion of the pressure member may be located along one edge rather than in the center, or the pressure member may be a substantially planar surface which is initially contacted against a given edge of the film sheet and then progressively pressed into contact with the remainder of the sheet so as to drive air towards the opposite edge. Additionally, although the applicator body is illustrated as an integral body of filter material, it could of course be a laminated unit having a supporting perforated substrate or supporting base of large pore material which allows liquid and gas to pass to a thin surface membrane (for example, 140 microns thick) of filter material. In this case, the substrate provides essentially a supporting function while the filter membrane controls the exclusion of gas. Advantageously, the use of a composite body allows efficient operation with a smaller source since only a small amount of liquid is stored in the thin membrane.

Since these and other variations of the invention and its modes of utilization may be made within the scope of the present teachings, the preferred embodiment described herein is therefore illustrative and not restrictive, the scope of the invention being indicated by the appended claims and all variations which come within the meaning of the claims are intended to be embraced therein.

What is claimed is:
1. An apparatus for repetitively dispensing predetermined amounts of liquid from a source of fluid, said apparatus comprising a housing defining a substantially closed chamber of predetermined volume configured for receiving such source of fluid, said housing including egress means configured for permitting passage of such liquid between said chamber and the exterior of said housing for dispensing fluid therefrom while precluding entrance of gaseous fluid thereto, and said housing including a plurality of displaceable wall portions adapted to vary said predetermined volume of said chamber in accordance with displacement of each of said portions responsive to application of an external force thereto, said wall portions being in communication with said chamber and configured for independent displacement between a first position defining an initial volume of said chamber and a second position defining a reduced volume of said chamber thereby providing increased pressure on such fluid within said chamber in accordance with displacement from said first to said second position, at least one of said displaceable portions being configured for reversible displacement between said first and second positions for dispensing liquid from said chamber responsive to displacement of said one portion from said first to said second position and for subsequently returning any excess of such liquid to said chamber responsive to displacement of said one portion from said second to said first position, and another of said portions being configured for irreversible displacement from said first to said second position for maintaining the pressure within said container approximately constant intermediate with dispensing such liquid therefrom responsive to operation of said one portion.
2. An apparatus for repetitively dispensing predetermined amounts of fluid from a source contained therein, said apparatus comprising a substantially rigid housing defining a substantially closed chamber of predetermined volume configured for receiving such source of fluid, said housing including egress means configured for permitting passage of such fluid between said chamber and the exterior of said housing for dispensing fluid therefrom, and said housing including a plurality of displaceable wall portions adapted to vary said predetermined volume of said chamber in accordance with displacement of each of said portions responsive to application of an external force thereto, said wall portions being in communication with said chamber and configured for independent displacement between a first position defining an initial volume of said chamber and a second position defining a reduced volume of said chamber thereby providing increased pressure on such fluid within said chamber in accordance with displacement from said first to said second position so as to dispense an appropriate amount of such fluid through said egress means, at least one of said displaceable wall portions being elastically coupled to said housing such that, upon removal of an external force configured for displacement of said one portion from its said first to its said second position, said one portion tends to automatically return to its original location and thereby tends to return the reduced volume of said container to its volume just prior to actuation of said one portion, at least another of said portions is elastically coupled to said body, said another portion including means configured for latching said another portion in its said second position following its displacement thereto.
3. An apparatus for repetitively dispensing predetermined amounts of liquid from a source of fluid, said apparatus comprising a housing defining a substantially closed chamber of predetermined volume configured for receiving such source of fluid, said housing including egress means configured for premitting passage of such fluid between said chamber and the exterior of said housing for dispensing fluid therefrom, said egress means including a porous filter medium which in cooperation with the surface tension of such liquid permits
passage of the latter while precluding passage of gaseous fluid within a given range of pressure differential, and said housing including a plurality of displaceable wall portions adapted to vary said predetermined volume of said chamber in accordance with displacement of each of said portions responsive to application of an external force thereeto, said wall portions being in communication with said chamber and configured for independent displacement between a first position defining an initial volume of said chamber and a second position defining a reduced volume of said chamber thereby providing increased pressure on such fluid within said chamber in accordance with displacement from said first to said second position, at least one of said displaceable portions being configured for reducing said container volume by a predetermined amount so as to increase the internal pressure within said chamber and to produce a pressure on the interior of said filter medium which in cooperation with the exterior pressure thereof produces a pressure differential across said medium which is within said given range of pressure differential so as to thereby dispense an appropriate amount of such liquid.

4. The apparatus of claim 3 wherein said one of said portions is configured for reversible displacement so as to repetitively apply a pressure differential across said filter material for repetitively dispensing such liquid therethrough responsive to repetitive actuation of said one portion.

5. The apparatus of claim 4 wherein including means for latching another of said displaceable portions in said second position so as to irreversibly reduce the volume of said chamber whereby said another portion may be displaced to its said second position and latched therein following actuation of said one portion so as to retain the internal pressure of said chamber to approximately the initial pressure existing just prior to said actuation of said one portion so as to compensate for the reduced amount of liquid in said chamber.

6. The apparatus of claim 5 wherein said first portion is biased to its said first position and said latching means includes an arm member affixed to and extending inwardly from said another portion and means located within said housing for cooperating with said arm member when said another portion is displaced to its said second position so as to retain it therein.

7. An apparatus for repetitively dispensing predetermined amounts of liquid from a source of fluid, said apparatus comprising:

a housing defining a substantially closed chamber of predetermined volume configured for receiving such source of liquid, said housing including egress means for permitting passage of such fluid between said chamber and the exterior of said housing, said egress means including means configured for permitting passage of liquid while precluding passage of gaseous fluids, and means for selectively reducing said predetermined volume of said container in discrete incremental steps so as to repetitively dispense an amount of such fluid through said egress means, said volume reducing means includes means operative to repetitively reduce the volume of said chamber by a predetermined amount so as to dispense liquid therefrom and then to tend to return said volume to its initial state so as to return any unused portions of such dispensed liquid to said chamber and means operative to irreversibly reduce the volume of said chamber to compensate for used portions of such dispensed liquid.

8. The apparatus of claim 7 wherein said housing includes a substantially planar wall portion forming a wall of said chamber and said volume reducing means includes a plurality of discrete portions of said housing wall which are configured for independent displacement from a first position defining said predetermined volume to a second position which reduces said volume responsive to application of an external force to said wall portions.

9. The apparatus of claim 8 wherein said wall portions are initially substantially coplanar with said housing wall when they are located in said first position and are configured for displacement inwardly along an axis substantially perpendicular to said wall.

10. The apparatus of claim 8 wherein at least said one wall portion is biased to its said first position and configured to automatically return thereto from its said second position responsive to removal of such external force and thereby tends to return the volume of said container to its volume just prior to actuation of said one portion.

11. An apparatus for repetitively dispensing predetermined amounts of liquid from a source thereof, said apparatus comprising:

a housing defining a substantially closed chamber of predetermined volume configured for receiving such source of liquid and retaining it at an initial pressure;

egress means located on said housing and configured for passage of liquid between said chamber and the exterior of said housing and substantially precluding passage of gaseous fluid therebetween at least when a given range of pressure is maintained in said chamber;

first means for reversibly varying the volume of said chamber so as to first decrease said chamber volume and thereby increase the pressure on such source so as to dispense liquid therefrom through said egress means and then subsequently return said chamber volume to its initial state existing just prior to decreasing said volume and thereby decrease the pressure on such source so as to return any unused portion of such liquid to said chamber; and

second means for irreversibly reducing said chamber volume by a discrete amount following operation of said first means so as to substantially compensate for the reduced volume of said source within such chamber and thereby return the pressure of said chamber to approximately said initial pressure whereby said first means may be again operated to dispense said amount of such liquid and return unused portions thereof.

12. The apparatus of claim 11 wherein said first means and said second means include a plurality of discrete wall portions of said housing which are in communication with said chamber and configured for displacement between a first position defining said predetermined volume of said chamber and a second position defining a reduced volume of said chamber.