United States Patent

Frahm et al.

[15] **3,667,197**

[45] **June 6, 1972**

[54] COMBINATION SEALING, VENTING, AND FILTERING MEANS

[72] Inventors: **Carl E. Frahm**, 1428 Oak Meadon Road; **Shirley E. Frahm**, both of 1428 Oak Meadow Road, Arcadia, Calif. 91006

[22] Filed: **Mar. 23, 1970**

[21] Appl. No.: **21,763**

[52] **U.S. Cl.** **55/502**

[51] **Int. Cl.** **B01d 46/10**

[58] **Field of Search** 55/309, 310, 384, 385, 391, 55/502, 504; 210/472, 474–476, 251

[56] **References Cited**

UNITED STATES PATENTS

2,155,259	4/1939	Dickson	55/502
1,806,977	5/1931	Kennen	210/474 X
2,381,104	8/1945	Burnham	210/474 X
2,635,784	4/1953	Bering et al.	55/502 X

Primary Examiner—John Adee
Attorney—Lyon & Lyon

[57] **ABSTRACT**

A combination sealing, venting, and filter element for positioning between a replaceable water bottle and a dispensing stand includes an annular base member from which a resilient tapered flange extends upwardly to sealingly engage the bottle and from which a second L-shaped flange extends radially outwardly therefrom to sealingly contact said stand. A vent aperture extends through such element and through a chamber into which a replaceable filter element is positioned.

2 Claims, 7 Drawing Figures

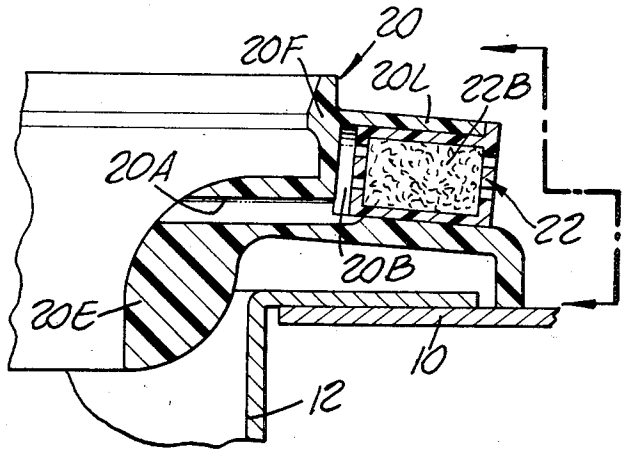


FIG. 1.

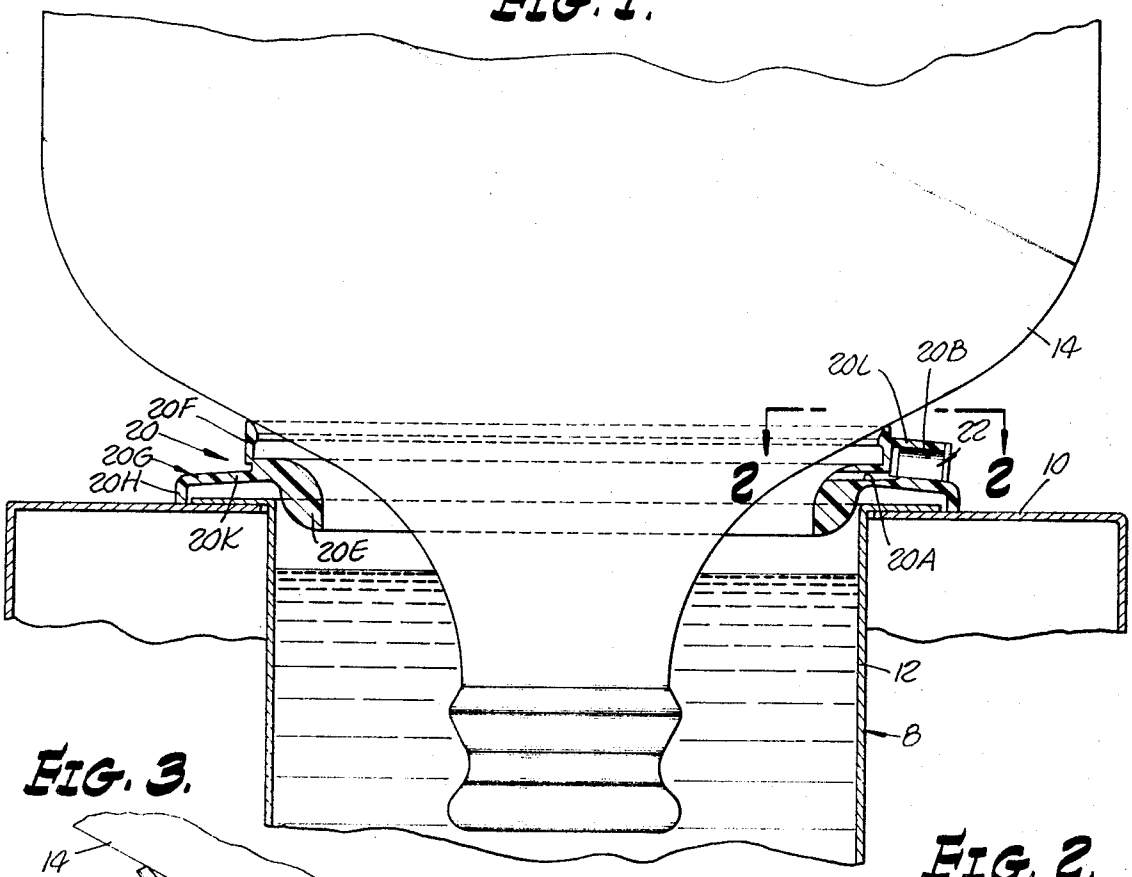


FIG. 3.

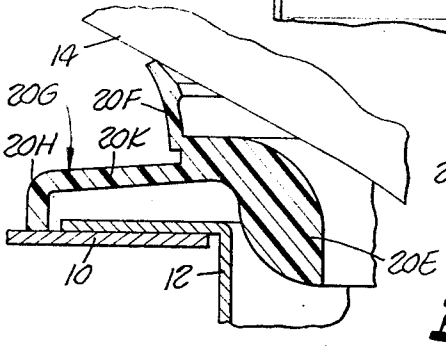


FIG. 5.

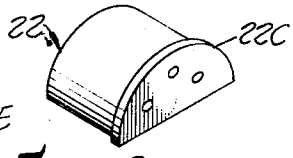


FIG. 2.

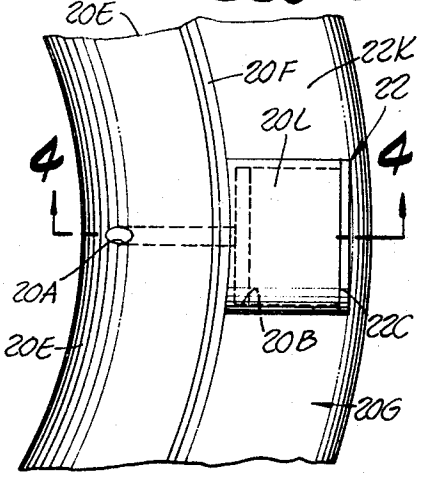


FIG. 6.

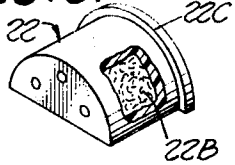
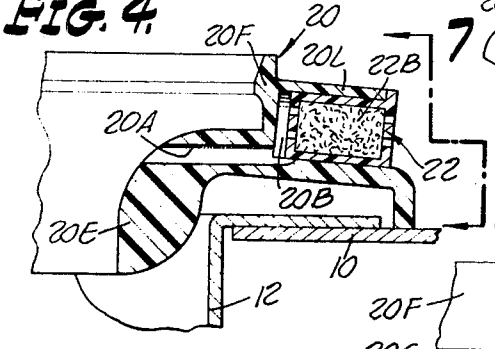


FIG. 4.



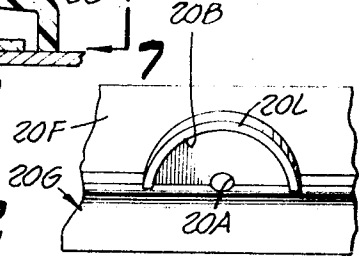


FIG. 7.

CARL E. FRAHM
SHIRLEY E. FRAHM
INVENTORS.

BY Lyon & Lyon
ATTORNEYS

COMBINATION SEALING, VENTING, AND FILTERING MEANS

The present invention relates to improved means and techniques useful in he art of dispensing bottled water.

An object of the present invention is to provide an improved sealing element for positioning between a water bottle and the stand on which such bottle is supported in inverted condition.

Another object of the present invention is to provide an improved sealing element of this character which has the additional feature of providing a vent for water in the reservoir of the stand.

Another object of the present invention is to provide an improved sealing element of this character which is capable of providing the additional function of assuring a filtering of air flowing from the atmosphere to a space above the water in the stand reservoir.

Other objects and advantages of the present invention will be apparent from the following description, reference being made to the accompanying drawings wherein:

FIG. **1** is a sectional view of a portion of a water dispenser embodying features of the present invention with a typical or conventional water bottle shown in relation to the combination sealing and venting and filtering means.

FIG. **2** is a view taken as indicated by the lines **2—2** in FIG. **1**.

FIG. **3** is an enlarged view of a portion of the structure shown in FIG. **1** but with the weight of a partially filled water bottle distorting the sealing means to effect a good seal.

FIG. **4** is a view taken substantially as indicated by the line **4—4** in FIG. **2**.

FIGS. **5** and **6** illustrate perspective views of the filter means with a portion of the filter means in FIG. **6** broken away to show internal construction.

FIG. **7** is a view taken substantially as indicated by the line **7—7** in FIG. **4** with, however, the filter element removed.

That part of the conventional water bottle stand or water dispenser **8** shown in FIG. **1** includes a sheet metal structure formed to provide a horizontal shelf member **10** continguous with a downwardly extending cylindrical receptacle or reservoir **12** into which the open mouth portion of a conventional water bottle **14** extends. The water is dispensed by gravity from the reservoir **12** through a conventional manually operated valve (not shown) positioned near or at the bottom of reservoir **12**.

An annular seal structure **20** is positioned between the annular flat shelf portion **10** to assure a good seal that seals against possible leakage of water. The presence of such sealing structure **20**, if not vented in accordance with features of the present invention would cause sub-atmospheric pressure to be developed in that internal space adjacent such seal when and as water is dispensed from the lower end of reservoir **12** and thus cause an objectionable diminution in rate of dispensed water flow. To obviate that problem, the sealing structure **20** is provided with a vent channel or bore **20A** that extends through the inner wall of structure **20** and terminates in a chamber **20B** within which a replacable filter element **22** is frictionally held.

A purpose of such filter **22** is to filter the air which passes from the surrounding contaminated and dust or dirt laden atmosphere through such filter **22** and channel **20A** into the space above reservoir **12** in the automatic process of maintaining the desired full atmospheric pressure above the water in reservoir **12**.

For these multipurposes, the combination sealing, venting, and filtering structure is of the special construction now described in detail.

The sealing structure **20** is of plastic material in the general form of a ring which in cross section includes, as seen in FIG. **3**, a relatively heavy base portion **20E** from which a thin wall flexible and tapered sealing ring portion **20F** extends upwardly as a cantilever to sealingly contact the outer surface of water bottle **14**. Also, this base portion **20E** has a generally L-shaped flange portion **20G** extending radially outwardly therefrom with its downwardly extending leg **20H** sealingly contacting the shelf **10**, the other horizontally extending leg portion **20K** being sufficiently prolonged and sufficiently thin in cross section to be flexible to assure a good seal with shelf **10** despite any irregularities in its surface.

The previously mentioned chamber **20B** which frictionally receives and retains filter element **22** is defined by the following, namely: a portion of flange **20F** serving as a back wall; an arcuate strip **20L** suitably secured or integrally formed with the sealing member **20** and serving as a ceiling for the chamber; and a portion of the flange **20G** which serves as the floor of such chamber **20B**.

The disposable filter element **22** of hollow perforated plastic material is commensurately shaped, is filled with suitable porous filter material **22B** and is provided with an outer arcuate flanged portion **22C** which cooperates with the arcuate chamber portion **20L** to limit inward movement of the filter element **22** into its chamber **20B**. This filter element **22** may be replaced each time a bottle is emptied and replaced by a filled bottle.

We claim:

1. A sealing and venting arrangement for positioning between a fluid dispenser and a replaceable container of said fluid, an annular element having one portion thereof resiliently engaging said container and having a second portion resiliently engaging said dispenser, a venting aperture extending through said sealing element, said element having a base portion from which a first annular resilient and tapered flange element extends upwardly and from which a second generally L-shaped flange element extends radially outwardly with said first element being sufficiently resilient to conform with surface irregularities on said container and with said second element being sufficiently resilient to conform to surface irregularities in said dispenser, said venting aperture extending through a portion of said base portion and also through a portion of said tapered flange element, chamber means formed on said sealing element, and a replaceable filter element releasably secured in said chamber, said chamber means extending only partially around the periphery of said sealing element without disturbing appreciably the resiliency of said first and second flange elements.

2. An arrangement as set forth in claim **1** in which said chamber means is a generally semi-cylindrical opening defined by an arcuate strip having an edge thereof secured to said first flange element.

* * * * *