

June 3, 1952

J. A. WHITE

2,598,869

PRESSURE OPERATED PIPETTE FILLER

Filed May 3, 1949

Fig. 1.

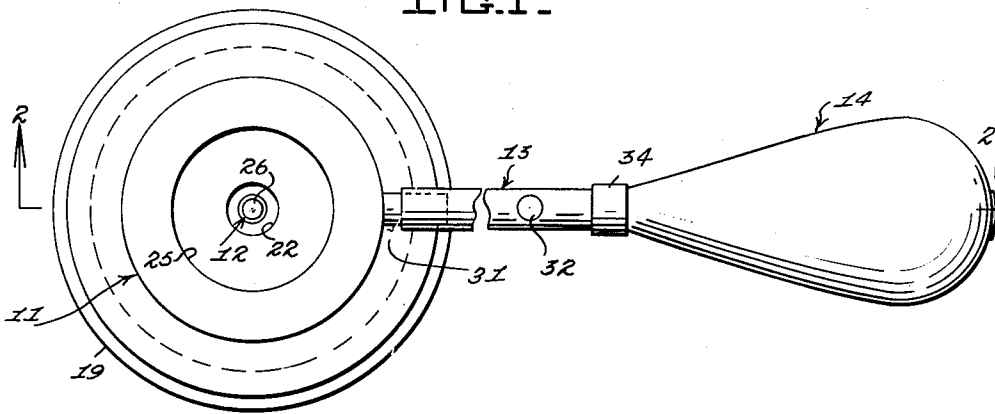


Fig. 2.

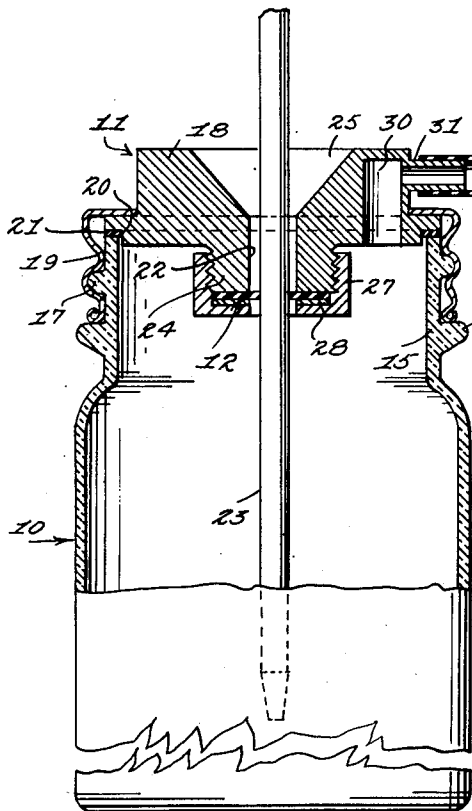


Fig. 3.

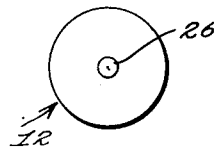


Fig.4.

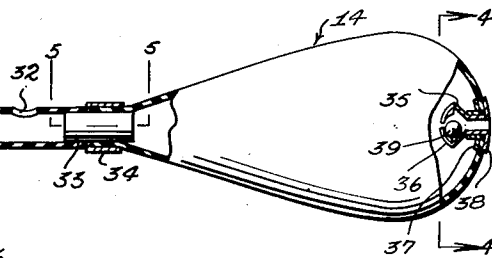
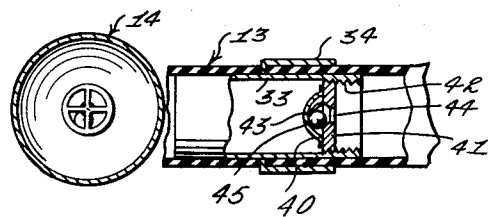


Fig. 5.



INVENTOR.

JAMES A. WHITE
BY

BY

McMorrow, Berman & Davidson
ATTORNEYS

UNITED STATES PATENT OFFICE

2,598,869

PRESSURE OPERATED PIPETTE FILLER

James Adelbert White, Seattle, Wash.

Application May 3, 1949, Serial No. 91,183

1 Claim. (Cl. 226—112)

1

This invention relates to laboratory apparatus, and more particularly to a device for filling pipettes by gas pressure, so that it is not necessary to use the mouth for this purpose or to attach a suction device to each pipette.

It is among the objects of the invention to provide a pipette-filling device into which conventional pipettes can be quickly and easily inserted for filling and from which they may be readily withdrawn when filled, which utilizes a low, manually-controlled gas pressure which may be supplied from either a hand-operated or power-driven pump or compressor, which receives standard or conventional pipettes of various sizes and accurately fills such pipettes without waste of reagent, which is readily portable and requires an insignificant amount of laboratory space, and which is simple and durable in construction, economical to manufacture, easy to use, and arranged for quick and easy replacement of the only parts subject to wear.

Other objects and advantages will become apparent from a consideration of the following description and the appended claim in conjunction with the accompanying drawing, wherein:

Figure 1 is a top plan view of a pipette-filling device illustrative of the invention;

Figure 2 is a longitudinal cross-section on the line 2—2 of Figure 1;

Figure 3 is a plan view of a sealing gasket constituting an operative component of the device;

Figure 4 is a transverse cross-section on an enlarged scale on the line 4—4 of Figure 2;

Figure 5 is a longitudinal cross-section on an enlarged scale of a fragmentary portion of the device and is taken on the line 5—5 of Figure 2.

With continued reference to the drawing, the device includes, in general, a container 10, a container cover 11, a sealing gasket 12 detachably secured to the cover 11, a gas conduit 13 connected at one end to the cover, and a suitable gas pump or compressor 14 connected to the opposite end of the conduit.

The container 10 is preferably formed of a material which is substantially chemically inert, such as glass, and is provided with an open end surrounded by a cylindrical neck 15 and provided with an annular bead 16 and external screw-threads 17 between the bead and the open end of the container.

The cover 11 comprises a cylindrical center portion 18 marginally provided with an internally-screw-threaded, annular flange 19, which flange is threadable upon the screw-threads 17

2

of the container neck, the annular bead 16 providing a stop shoulder for the edge of this flange. Within the flange 19 the cover is provided with an annular recess or groove 20 which receives the end of the neck 15 of the container and a gasket 21 is mounted in this groove and bears upon the end of the container neck to provide a gas-tight seal between the cover and the container. An aperture 22 is provided through the center portion of the cover, and this aperture is of a size to loosely receive standard or conventional pipettes, such as the pipette 23, of different sizes. An externally-screw-threaded, cylindrical boss 24 surrounds the aperture 22 and projects from the inner side of the cover inwardly of the container when the cover is operatively assembled with the container, as illustrated in Figure 2. At its end opposite the boss 24 the aperture or bore 22 is conically countersunk, as indicated at 25, to provide a downwardly and inwardly-tapering funnel to guide the ends of the pipettes into the aperture 22.

The sealing gasket 12 is a flat, circular disc of suitable resilient material, such as natural or synthetic rubber, having an outside diameter substantially equal to the outside diameter of the boss 24 and having a central opening 26 of a diameter slightly less than the diameter of the smallest pipette to be inserted into the container, so that the gasket will closely surround the pipettes and provide a gas seal between the pipettes and the cover when the pipettes are inserted through the gasket into the container.

An internally-screw-threaded flange nut 27 is threaded onto the boss 24 in position such that its flange marginally overlies the sealing gasket 12 to retain the sealing gasket in position on the end of the boss. Preferably, a washer 28 is interposed between the sealing gasket and the flange of the nut 27 so that the gasket will not be distorted when the nut is threaded tightly onto the boss.

A gas-inlet channel 30 is provided in the central portion 18 of the cover 11 at a location spaced from the boss 24 and a tubular fitting 31 communicates with this channel and projects radially from the central portion of the boss at a location spaced from the adjacent side of the flange 19.

The gas conduit 13 may comprise a piece of conventional rubber tubing fitted at one end upon the fitting 31 and having a hole 32 therein which may be covered by the thumb to increase the air or gas pressure in the container and uncovered to release such pressure from the container.

The pump 14, as illustrated, is a hand bulb of

flexible material, such as rubber, attached at one end to the conduit 13 at the end of the latter opposite the fitting 31 by a cylindrical sleeve 33 and a ferrule 34. A check valve 35 is secured in the end of the bulb 14 remote from the conduit 13 and may be of entirely conventional construction including a hollow ball housing 36 having a tubular portion secured in the wall of the bulb by opposed flange formations 37 and 38 disposed at respectively-opposite sides of the bulb wall and a valve ball 39 in the housing cooperating with the tubular portion of the housing in a manner to permit free entry of air into the bulb while precluding passage of air out of the bulb at this outer end of the latter.

A check valve 40 is disposed in the tubular sleeve 33 and may be also of conventional construction, including a centrally-apertured plug 41 threaded into an internally-screw-threaded portion 42 of the sleeve, a perforated ball cage 43 secured to the plug 41 at the side thereof remote from the valve 36 and overlying the central aperture 44 in the plug, and a valve ball 45 retained in the cage 43, which ball cooperates with a valve seat provided in the plug 41 surrounding the central aperture 44 to permit passage of gas or air from the bulb into the conduit 13 while precluding return of air from the conduit into the bulb.

In operation, after a pipette 23 has been inserted into the container through the resilient sealing gasket 12 to a position such that the lower end of the pipette is below the surface of liquid reagent in the container, the bulb 14 is grasped in the hand and the thumb of the same hand placed over the hole 32 in the conduit 13. The bulb is then squeezed to force air through the channel 30 into the container above the liquid reagent contained therein. The bulb may be squeezed and released as many times as necessary to build up in the container sufficient air or gas pressure to force the liquid reagent upwardly in the pipette to a position at or slightly above the desired graduate indication on the pipette. The forefinger of the other hand is then placed over the top end of the pipette to stopper such pipette end and the thumb is removed from the hole 32, whereupon the air in the container escapes, reducing the air pressure in the container to atmospheric pressure. The finger on the top end of the pipette may then be slightly moved to restrictively admit air into the upper end of the pipette until the level of the liquid in the pipette falls to the exact level of the desired graduation, whereupon, the upper end of the pipette is again securely closed by the finger and the pipette removed from the filling device and carried to the receptacle into which its contents are to be placed. When the bottom end of the pipette is over such receptacle, removal of the finger from the upper end of the pipette will permit the liquid content of the pipette to flow into the receptacle in the well known manner.

The container 10, the cover 11, the nut 27 and the sealing gasket 12 should all be made of a material substantially innate to the particular reagent being used, and it is desirable that these components be made of material innate to as

large a class of reagents as possible, so that the same pipette-filling device can be used with a large number of different reagents.

While a hand-operated bulb has been illustrated for the purpose of building up the necessary air or gas pressure in the container to fill the pipettes, it is to be understood that the conduit 13 may be connected to a suitable power-driven pump or compressor supplying air or gas at low pressure, if desired. The pressure in the container will still be controlled by stoppering the hole 32 in the conduit by the thumb or finger in the manner indicated above.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claim rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claim are, therefore, intended to be embraced therein.

I claim:

A pipette-receiving device comprising an open-ended container, a cover detachably secured to said container in covering relationship to the open end of the latter, a sealing gasket, means detachably securing said sealing gasket to said cover, and a tubular gas conduit connected to said cover, said cover comprising a substantially cylindrical center portion having a pipette-receiving bore countersunk at one end for guiding pipettes into said bore, and a gas channel therein, an internally-screw-threaded annular flange surrounding said center portion for attaching said cover to said container, an internally-screw-threaded boss surrounding said bore at the end of the latter opposite said countersunk end, and a tubular conduit fitting extending outwardly from said center portion and communicating with said gas channel, said sealing gasket comprising a thin disc of resilient material having therein a pipette-receiving opening registering with the bore in said cover, and said means detachably securing said sealing gasket to said cover comprising a flange nut threaded onto said cover boss and marginally engaging said sealing gasket to clamp said gasket against the outer end of said boss.

JAMES ADELBERT WHITE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
398,528	Molin	Feb. 26, 1889
581,491	Richardson	Apr. 27, 1897
641,079	Clayton et al.	Jan. 9, 1900
816,345	Lockwood	Mar. 27, 1906
1,009,980	Leisure et al.	Nov. 28, 1911
1,953,102	Brown	Apr. 3, 1934

FOREIGN PATENTS

Number	Country	Date
317,702	France	Sept. 23, 1902