April 19, 1949. F. C. SCHUBART 2,467,599

COLORIMETRIC VESSEL

Filed Jan. 23, 1945

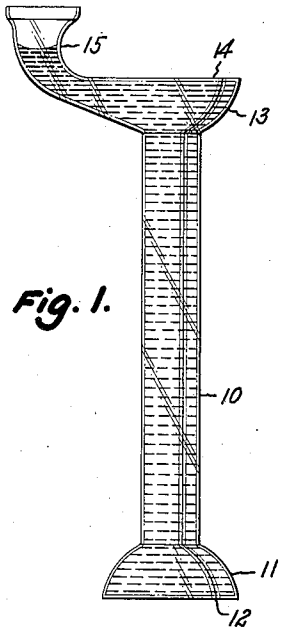


Fig. 1.

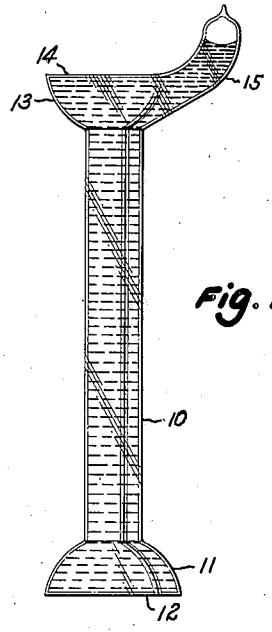


Fig. 2.

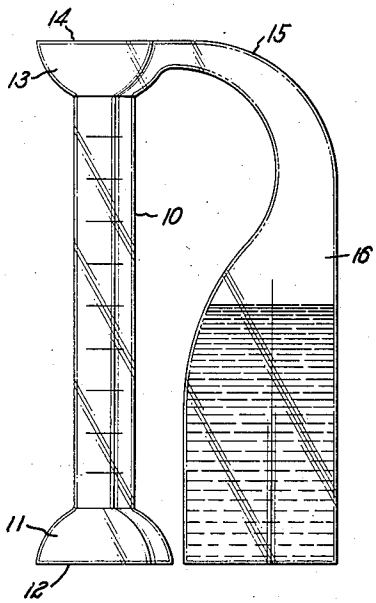


Fig. 3.

Inventor

Frederick C. Schubart

By Pierce & Scheffler

Attorneys

Patented Apr. 19, 1949 2,467,599

UNITED STATES PATENT OFFICE

2,467,599

COLORIMETRIC VESSEL

Frederick C. Schubart, Miami, Fla.

Application January 23, 1945, Serial No. 574,187

4 Claims. (Cl. 88—14)

1

This invention relates to a novel colorimetric device and particularly to containers adapted to hold liquid materials for colorimetric examination of the materials as well as to hold colorimetric standard liquids.

In the colorimetric examination of liquids it is desirable to view a substantial length of the liquid and it is desirable that the view be unobstructed by vapors or sublimates from the liquid, by floating particles, bubbles, foam and the like. Particular difficulty may be encountered in the colorimetric determination of materials of relatively high melting point which have a substantial vapor pressure in the liquid condition. It is also desirable to eliminate from the line of view curved surfaces both solid and liquid and to reduce to a minimum the number of surfaces through which the light must pass.

The difficulties referred to above are eliminated or greatly reduced and other advantages provided by the colorimetric vessel of the invention which comprises a vertical, cylindrical, hollow body member and expanded hollow members at each end of the cylindrical member and integral therewith, the walls of the expanded members being flattened normal to the center line of the cylindrical body member to provide substantially parallel plane wall portions at each end of the vessel of substantially greater diameter than the cylindrical body member.

The invention will be more particularly described with reference to the accompanying drawing in which:

Fig. 1 represents a colorimetric tube embodying the principles of the invention;

Fig. 2 is a modification particularly adapted to preserve a series of colorimetric standards, and

Fig. 3 is a further modification particularly adapted to provide adjustable and measurable depths of a colorimetric standard liquid.

The colorimetric vessels shown in the drawing all include a cylindrical body 10, an expanded base 11 having a wall portion 12 flattened normal to the center line of the cylindrical body to provide a plane surface of greater diameter than body 10, and an expanded top 13 having a plane wall portion 14 parallel to the wall portion 12 of the base.

The vessels are preferably constructed of a thermoplastic transparent material such as glass, polystyrene or the like. When made of thermoplastic material, the vessels are easily formed by blowing spherical bulbs at each end of the cylindrical body portion and then heating the end surfaces of the bulbs and flattening them. In

2

this way a predetermined distance between the flattened end surfaces may be reproduced with great accuracy.

By providing a side arm 15 opening into the top portion 13 and extending above the flattened top surface 14 as shown in Fig. 1, for example, floating particles, bubbles, foam, fumes, sublimates and the like, rise into the side arm and cannot obstruct the clear vertical sight through the length of the liquid column. For the preservation of colorimeteric standards for the purpose of comparison, after filling the device with the standard liquid, the side arm may be sealed off above the level of the top plane surface, as shown in Fig. 2.

By connecting the side arm to a liquid reservoir 16, as in Fig. 3, the level of liquid in the vertical body 10 may be adjusted to obtain, by comparison with a sample liquid in a vessel such as that of Fig. 1, a colorimetric value which may advantageously be read directly from suitable graduations on member 10.

The adjustment of liquid level in the vertical body 10 is effected by inclining the vessel so that a part of the liquid in reservoir 16 flows over into tube 10. Enough liquid is transferred in this manner into tube 10 to produce a column of liquid of such height as to provide on vertical through-sight a predetermined color standard indicated by the graduations on member 10.

The devices of the invention have a wide range of adaptability and utility. They are particularly useful in the colorimetric testing of industrial liquids which present various obstacles to accurate measurement by bubbles, foam, floating particles, fumes, sublimates and the like. Many such liquids are encountered in the brewing, soap, oil, fat and petroleum industries, for example.

I claim:

1. A colorimetric vessel comprising a cylindrical, hollow body member, expanded hollow members at each end of said body member and integral therewith, the walls of said expanded members being flattened normal to the center line of said cylindrical body member to provide substantially parallel plane wall portions at each end of said vessel of substantially greater diameter than the cylindrical body member, one of said parallel plane wall portions providing a base for supporting said vessel with the longitudinal axis of the cylindrical body member in vertical position, and a tubulature opening into the expanded member at the opposite end of the cylindrical body member from said base.

2. A colorimetric vessel comprising a cylindrical, hollow body member, expanded hollow members at each end of said body member and integral therewith, the walls of said expanded members being flattened normal to the center line of said cylindrical body member to provide substantially parallel plane wall portions at each end of said vessel of substantially greater diameter than the cylindrical body member, one of said parallel plane wall portions providing a base for supporting said vessel with the longitudinal axis of the cylindrical body member in vertical position, and a tubulature opening into the expanded member at the opposite end of the cylindrical body member from said base and extending above the level of the flattened wall portion thereof.

3. A colorimetric vessel comprising a cylindrical, hollow body member, expanded hollow members at each end of said body member and integral therewith, the walls of said expanded members being flattened normal to the center line of said cylindrical body member to provide substantially parallel plane wall portions at each end of said vessel of substantially greater diameter than the cylindrical body member, one of said parallel plane wall portions providing a base for supporting said vessel with the longitudinal axis of the cylindrical body member in vertical position, a liquid reservoir, and a tubulature connecting said liquid reservoir and the expanded member at the opposite end of the cylindrical body member from said base.

4. A colorimetric vessel comprising a cylindrical, hollow body member, expanded hollow members at each end of said body member and integral therewith, the walls of said expanded members being flattened normal to the center line of said cylindrical body member to provide substantially parallel plane wall portions at each end of said vessel of substantially greater diameter than the cylindrical body member, a liquid reservoir having a flattened base portion coplanar with the flattened wall portion of one of said expanded members, and a tubulature connecting the other end of said liquid reservoir and the other of said expanded members.

FREDERICK C. SCHUBART.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,660,974	Porro	Feb. 28, 1928
2,110,237	Parsons	Mar. 8, 1938
2,310,623	Estey	Feb. 9, 1943

FOREIGN PATENTS

Number	Country	Date
772,283	France	Aug. 13, 1934