Jan. 5, 1965 E. E. H. WEBER ETAL 3,164,186

PLASTIC CONTAINER

Filed July 13, 1962 2 Sheets-Sheet 1

Fig. 1

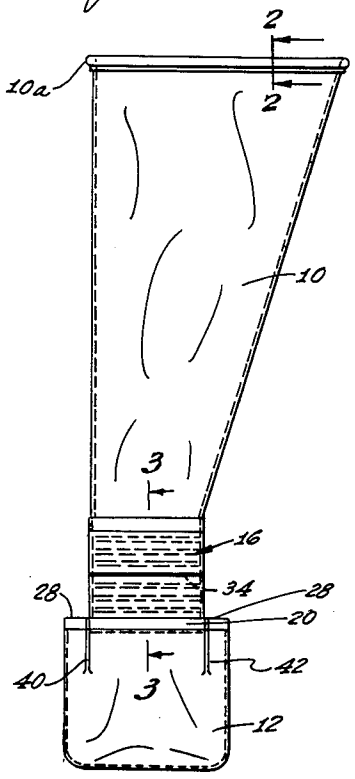


Fig. 2

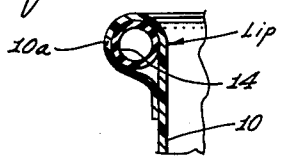


Fig. 3

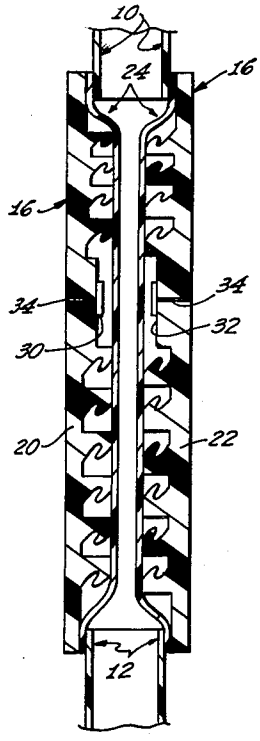
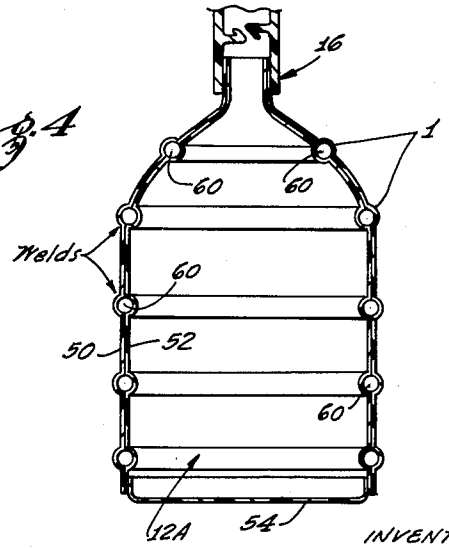


Fig. 4



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Jan. 5, 1965 E. E. H. WEBER ETAL 3,164,186

PLASTIC CONTAINER

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2 Sheets-Sheet 2

Fig. 5

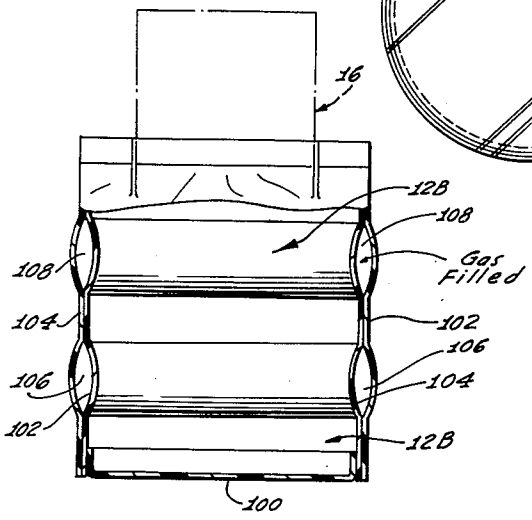


Fig. 7

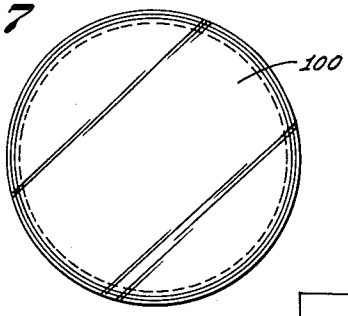


Fig. 6

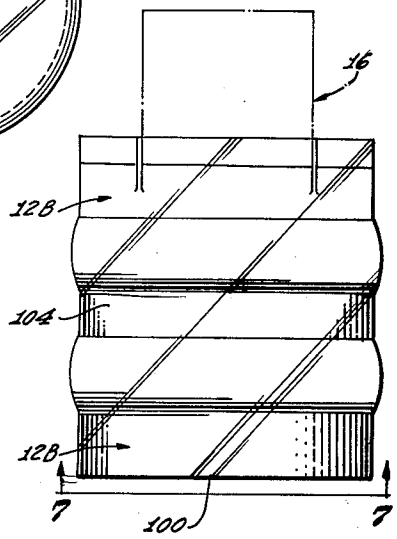


Fig. 8

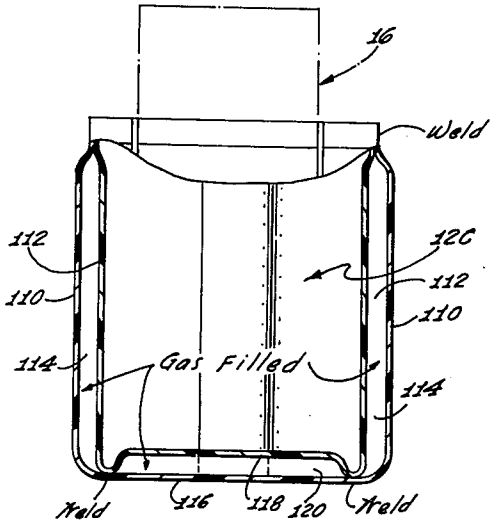
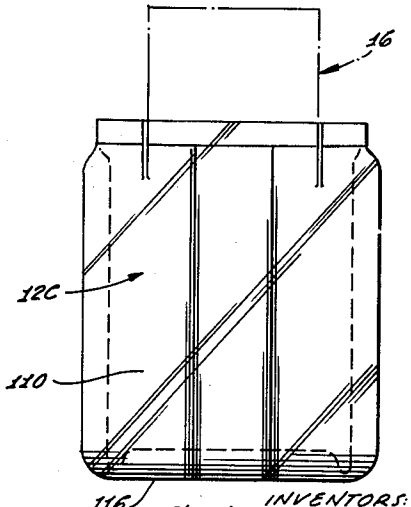


Fig. 9



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PLASTIC CONTAINER

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5 Claims. (Cl. 150—3)

The present invention relates to plastic receptacles which are particularly useful for taking urine samples, but which find general utility in a wide variety of liquid sampling applications.

It is the present medical practice to obtain a urine sample from a patient in a glass bottle; the bottle being later capped and labelled. These bottles, however, have often proven to be awkward to fill, especially by females, without the danger of overflowing. Also, the usual prior art urine sample bottles are inconvenient for carrying, for example to the doctor's office, because they are susceptible to breakage and leakage.

An object of the present invention is to provide an improved, disposable, liquid sampling receptacle composed, for example, of a flexible plastic sheet material, such as polyethylene; which receptacle is not susceptible to breakage, as is the case with the usual prior art glass bottles generally used for urine sampling. However, the invention is not limited to the use of flexible plastic material, as the improved receptacle of the invention may be composed, if so desired, of a rigid unbreakable plastic material.

Another object is to provide such an improved, disposable, plastic liquid-sampling receptacle which is provided with a lower bag-like portion and with a detachable tubular funnel-like portion; the funnel-like portion serving as a convenient filling means for the receptacle, and also as a means for receiving and temporarily holding any excess fluid which may overflow from the lower portion of the receptacle.

In the practice of the invention, a sealing means is provided between the tubular funnel-like upper portion and the bag-like lower portion of the receptacle. This sealing means may be pressure-responsive, for example, so that it may be pressed closed after the lower portion of the receptacle has been filled to completely seal off the lower portion. Any excess overflow fluid from the lower portion may be poured out of the upper portion of the receptacle after the sealing means has been closed, and the upper portion may then be detached from the lower portion and discarded.

The lower portion of the receptacle may be graduated to indicate the quantity of urine therein and to permit predetermined amounts to be removed. An appropriate label may be provided on the lower portion of the receptacle, on which the patient may write his name, or on which other pertinent data may be entered.

The seal between the funnel-like upper portion and the lower portion may be one which offers greater resistance to opening than to closing, for permanency purposes. Although an integral seal will be described herein, it may be a separate clamp, if so desired.

As noted, although the receptacle of the invention is most advantageous in taking urine samples, especially from females; the receptacle has general use in this particular area, and in general for a wide variety of liquid sampling applications. Moreover the receptacle may be used as a disposable bed pan for bed-ridden patients.

A feature of the invention, as noted, is that the receptacle of the invention is not susceptible to breakage; and also in that the receptacle is constructed to eliminate overflow of the sampled liquid, and is sealed positively and in a leak-proof manner after use.

In addition, the disposable feature of the present invention eliminates all the operations required with the

prior art containers, involving washing and sterilizing of the containers after each use. The use of the disposable receptacle of the invention assures that a new and sterile receptacle is provided for each use, so that there is no likelihood, as is the case with the prior art containers, for bacteria, fungus or other extraneous matter to collect in the receptacle and contaminate the sample.

Fungi and yeast cannot enter the improved receptacle of the invention. Therefore, when the improved receptacle is used for urine analysis, the presence of fungi and/or yeast in the sample is of clinical significance and does not constitute a normal contaminant due to inadequacies in the use of the prior art urine bottles.

Another feature of the invention is the facility and ease with which the receptacle of the invention can be used. In addition, the receptacle of the invention can be readily identified, can be easily made in a variety of sizes, and can easily be made in a variety of colors for color coding purposes.

Other objects, advantages and features of the receptacles of the present invention will become apparent from a consideration of the following description, when the description is taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a side elevational view showing a receptacle constructed in accordance with the concepts of the present invention;

FIGURE 2 is a fragmentary sectional view of the upper lip of the receptacle of FIGURE 1, taken along the line 2—2 in FIGURE 1;

FIGURE 3 is a cross-sectional view, taken on the line 3—3 of FIGURE 1, and illustrating a sealing means which is included in an intermediate portion of the receptacle of FIGURE 1;

FIGURE 4 is a side sectional view of the lower portion of a receptacle constructed in accordance with a modified embodiment of the invention;

FIGURE 5 is a side sectional view of a further embodiment of the invention having a flat bottom and having relatively rigid sides;

FIGURE 6 is a side elevational view of the receptacle of FIGURE 5;

FIGURE 7 is a bottom view of the receptacle of FIGURES 5 and 6, taken along the line 7—7 of FIGURE 6;

FIGURE 8 is a side sectional view of a receptacle constructed in accordance with yet another embodiment of the invention; and

FIGURE 9 is a side elevational view of the receptacle of FIGURE 8.

The receptacle of the present invention, as described above, may be composed of flexible sheet-like plastic material, such as polyethylene. The receptacle illustrated in FIGURE 1 includes an upper portion **10** and a lower portion **12**. The upper portion **10** has a tubular funnel-shaped configuration, and it serves to guide the sampled fluid into the lower portion **12**. The lower portion **12** has a bag-like configuration, and it serves actually to hold the sampled fluid.

The actual shape of the funnel-like tubular upper portion **10** is not critical, and this portion may assume any shape, to suit the convenience of the particular application. The actual shape of the upper tubular portion **10** will be determined by such factors as economy of material, and convenience for use.

It is preferable, especially when the receptacle of the invention is to be used for receiving urine samples from females, to reinforce the upper rim of the tubular member **10** by any appropriate means. For example, and as shown in FIGURES 1 and 2, the upper rim **10***a* of the tubular upper portion **10** may be turned back on itself and sealed to the wall of the upper portion **10** to form an annular channel extending around the periphery of the

upper portion 10. A resilient member, such as a hard rubber tube 14 may be enclosed in the peripheral channel, and this tube imparts the desired reinforcement to the upper rim of the tubular portion 10.

A pressure-responsive sealing means 16 is included in the receptacle, and the sealing means extends across the receptacle between the lower end of the upper tubular portion 10 and the upper end of the lower bag-like portion 12.

As best shown in FIGURE 3, the sealing means 16 includes a pair of plastic strips 20 and 22. These strips have rows of inter-locking teeth formed on their inner surface, so that when the two strips are pressed into engagement with one another, the respective inter-locking teeth mesh and inter-lock with one another to form a closed, sealed assembly.

To assure a fluid-tight joint, and as shown in FIGURE 3, the lower edge of the funnel-shaped upper portion 10 is sealed to a tubular member 24 which is formed of a thin film-like plastic material. The tubular member 24 extends between the strips 20 and 22, and its lower end is sealed to the upper rim of the bag-like lower portion 12.

As best shown in FIGURE 1, the sealing means 16 may extend only partially across the upper rim of the lower bag-like portion 12, the remaining portions of the rim being sealed closed by an appropriate sealed closure strip 28.

The inner faces of the intermediate portions of the strips 20 and 22 have a flat configuration, as designated 30 and 32 in FIGURE 3, and these inner faces are adapted to move against one another, when the pressure-responsive sealing means is pressed closed. The sealing means is perforated, as shown by the dotted lines 34, these perforations extending through the flattened intermediate portions 30 and 32 of the strips 20 and 22. Thin plastic films 36 may be sealed over the perforations across the inner faces of the strips 20 and 22 to prevent any leakage of fluid through the perforations.

As best shown in FIGURE 1, the front and back walls of the lower bag-like portion 12 may be sealed together to form a pair of elongated sealing joints 40 and 42. These joints extend down from the sealed top of the bag-like portion 12, adjacent the respective side edges thereof. These sealed joints 40 and 42 form respective chambers in the upper end of the bag-like portion 12, the lower ends of the two chambers communicating with the interior of the portion 12 and the upper ends of the two chambers being sealed.

In order to fill the receptacle shown in FIGURES 1–3, the reinforced lip 10*a* of the upper portion 10 is placed in position, and the sampled fluid enters into the bag-like lower portion 12 through the upper portion 10 and through the sealing means 16. After the lower bag-like portion 12 is filled, and (upon occasion) has overflown into the upper tubular portion 10, the sealing means 16 is sealed closed merely by pressing the two strips 20 and 22 against one another. This causes the inter-locking fingers formed on the inner faces of the strips 20 and 22 to inter-lock with one another. It will be appreciated that the film 24 will be drawn into the inter-locking fingers, as the sealing means 16 is pressed closed. The film 24 prevents any fluid from gathering into the crevices between the inter-locking fingers.

As the lower bag-like portion 12 is filled with the sampled fluid, and as the fluid over-flows into the upper funnel-like portion 10, air is trapped in the chambers formed by the sealing joints 40 and 42, and the fluid does not reach the top of the respective chambers formed by these sealed joints.

After the bag-like lower portion of the receptacle has been filled, in the manner described above, and after the pressure-responsive sealing means 16 has been pressed shut, the excess overflow fluid in the funnel-like upper portion 10 can be poured out, and the upper portion may be detached and discarded. This detachment of the upper portion 10 is achieved merely by separating the strips 20 and 22 of the sealing means 16 along the perforations 34.

The patient may then enter his name on an appropriate label (not shown) which may be provided on the lower portion 12 of the receptacle or on the sealing means 16. The sampled fluid is now tightly sealed within the lower bag-like portion 12, and there is no tendency for it to leak out. Moreover, the plastic nature of the bag-like portion 12 obviates any danger of breakage.

To remove the fluid from the lower bag-like portion 12, either of the upper corners of the portion may be cut, as for example by a pair of scissors. The trapped air in the top of the chambers formed by the sealed joints 40 and 42 assures that the scissors will not contact the actual fluid, to assure that there will be no contamination.

It will be appreciated that although a particular type of sealing means 16 is shown in FIGURE 3, other appropriate seals may be used, and that the invention is not limited to any particular sealing arrangement between the upper and lower portions of the plastic receptacle. It will also be appreciated that the upper and lower portions of the receptacle may have a wide variety of shapes and constructions.

For example, the lower portion of the receptacle may be in the form of a plastic bottle, as designated 12*a* in FIGURE 4. In the construction of FIGURE 4, the lower portion 12*a* is formed of a pair of plastic bags 50 and 52 which are fitted within one another and which may be sealed, for example, to a common bottom 54.

The flexible plastic walls of the bags 50 and 52 are sealed to one another over their contacting areas. However, the sealing is discontinuous in that it does not extend over a plurality of spaced annular areas 60. The sealing of the flexible side walls of the bags 50 and 52 is carried out under pressure, so that when the assembly is placed in the normal atmosphere, the resulting pressurized fluid trapped in the unsealed areas expand, to cause the receptacle to have the configuration shown in FIGURE 4.

In the configuration of FIGURE 4, the lower portion 12*a* of the receptacle has a plurality of stiffening ribs extending around its periphery, these ribs being formed by the pressurized fluid in the unsealed annular spaces referred to above. It will be appreciated that the actual receptacle shown in FIGURE 4 is collapsible, which is convenient for packing purposes.

The lower portion of the receptacle described above may further have the configuration shown in FIGURES 5–7, 8 and 9. In these latter two embodiments, the body-like lower portion has a flat, disc-shaped bottom.

Such a bottom permits the technician to place bottles on the stble once they are opened without fear of spilling the contents. The flat bottom, as shown in FIGURE 7, may comprise a disc-shaped piece 100 of rigid plastic.

The lower portion of the receptacle is designated 12B in FIGURES 5 and 6 In this embodiment the walls of the receptacle are formed of soft plastic sheets 102 and 104. The sheets are sealed together into an essentially cylindrical shape and the peripheral edge of the disc 100 is turned up and sealed to the lower edge of the plastic sheet 104.

The upper part of the portion 12B may have the same configuration as in the embodiment of FIGURE 1. The walls are given rigidity by providing unsealed areas, as in the embodiment of FIGURE 4. These areas are in the form of annular passages 106, 108 These passages can be inflated by air of aerosol-type gases.

When inflated, the ring passages 106, 108 become stiff and handling of the receptacle is made easier. The number and shape of the ring passages is immaterial and is dictated only by the ease of fabricatndonar i iSH SHS dictated only by the ease of fabrication and rigidity required.

The space between the ring passages may be sufficiently

clear and transparent so that the level of the liquid in the receptacle can be determined. Other means may be used to provide rigidity to the walls of the receptacle. For example, a cage-like structure for receiving the receptacle may be provided, which is formed of rigid plastic. Also, the rings on the receptacle may be formed of rigid plastic. Also, the receptacle may have any desired shape, such as rectangular, triangular, and so on.

In FIGURES 8 and 9 the illustrated embodiment 12C also has a double walled, solid disc-shaped bottom, construction. In the latter embodiment the walls are formed of a pair of flexible plastic sheets 110 and 112 which have unsealed portions. In the latter embodiment the unsealed portions form vertical columns 114 in the side walls. These columns may be filled with pressurized gas to add rigidity to the walls.

In addition, the bottom 116 of the receptacle 12C may be formed of flexible, rather than solid plastic; and a further layer 118 of flexible plastic may be sealed at its edges to the bottom. The space 120 between the bottom layers may be gas-filled to give rigidity to the structure.

The reinforcing ring passage 106 and 108 of the embodiment of FIGURES 5–7, and the reinforcing vertical colums 114 of the embodiments of FIGURES 8 and 9, may be formed by merely sealing plastic strips to the inner or outer surfaces of the corresponding receptacle walls.

The improved receptacle of the invention is advantageous in that it can be folded and requires less storage space than the prior art glass bottles. Also, the receptacles can be made and delivered in a sterilized condition. The receptacles are light in weight so as to lighten the load of nurses, laboratory assistants, and the like.

The receptacles of the invention are also advantageous in that they do not require washing or drying, because they are disposable. Also, the non-breakable feature of the receptacle means that they are safer and not subject to breakage and resulting loss of specimens.

In the use of the receptacle of the invention, there is no tendency for the patient to contaminate hands while providing the specimen. Also the pressure seal provided is airtight, and there is no danger of leakage of the specimen in transit.

The invention provides, therefore, an improved disposable, flexible liquid-sampling plastic receptacle. The improved receptacle of the invention is relatively simple and inexpensive to fabricate. Moreover, the receptacle is extremely convenient to use, and it provides a non-overflow, leak-proof, non-breakable receptacle for the sampled fluid, as described above.

While particular embodiments of the invention have been shown and described, modifications may be made,

and it is intended in the claims to cover such modifications as fall within the spirit and scope of the invention.

What is claimed is:

1. A receptacle formed of flexible sheet material including:

a lower bag-like portion;

an upper funnel-like tubular portion for enabling fluid to be filled into said lower bag-like portion and for temporarily holding any excess fluid which may overflow from said lower bag-like portion;

a pair of strip members each having a plurality of rows of interlocking teeth formed on the respective inner surfaces thereof to act as a pressure-responsive sealing means extending across the receptacle and disposed between said lower bag-like portion and said upper tubular portion, said sealing means serving to seal off said lower bag-like portion into a closed container for fluid filled into said lower portion through said upper tubular portion.

2. In the receptacle of claim 1, a tubular film connected fluid tight to the lower bag-like portion and the upper funnel-like tubular portion, and extending through said pair of strip members, said interlocking teeth of the strip members deforming said film into conformity with the interlocking teeth when engaged, to thereby provide a fluid seal.

3. In the receptacle of claim 1, said pair of strip members having a plane of weakness intermediate the ends thereof enabling the sealing means to be broken apart for detachment of the funnel-like tubular portion after the sealing means has been closed.

4. The receptacle of claim 1 in which the lower bag-like portion has air trap chambers assuring the provision of one area of the bag which may be cut to form a pouring spout without cutting through the enclosed liquid.

5. The receptacle of claim 1 in which the interlocking teeth of the strip members are more difficult to separate than they are to be joined.

References Cited in the file of this patent

UNITED STATES PATENTS

1,554,397	Beldam	Sept. 22, 1925
1,994,127	Fenton	Mar. 12, 1935
2,036,687	Fisher	Apr. 7, 1936
2,542,294	Smith	Feb. 20, 1951
2,689,812	Mollica	Sept. 21, 1954
2,780,261	Svec	Feb. 5, 1957
3,082,867	Gelpey	Mar. 26, 1963

FOREIGN PATENTS

1,195,513	France	May 19, 1959