Jan. 11, 1966 E. E. H. WEBER ETAL 3,228,444

SPECIMEN CONTAINER

Filed Nov. 18, 1964 2 Sheets-Sheet 1

Fig. 1

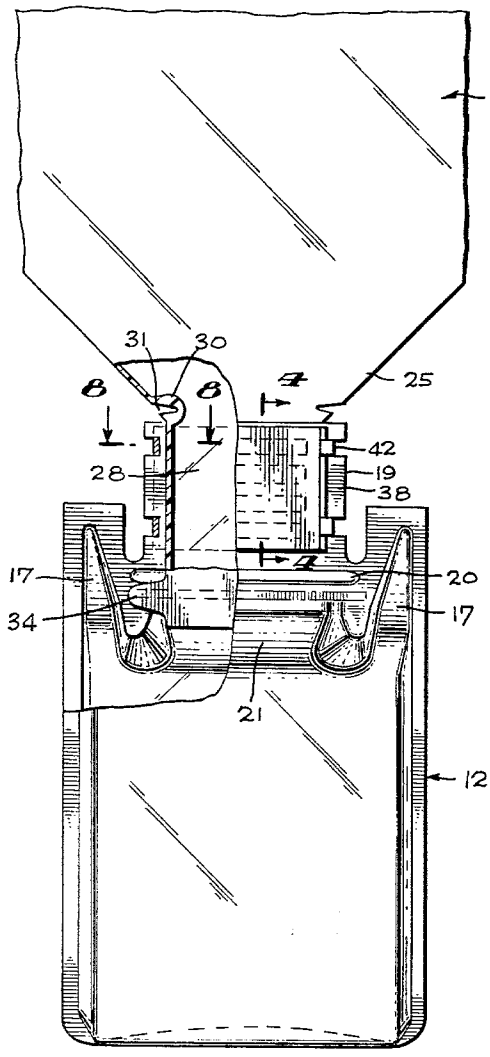


Fig. 2

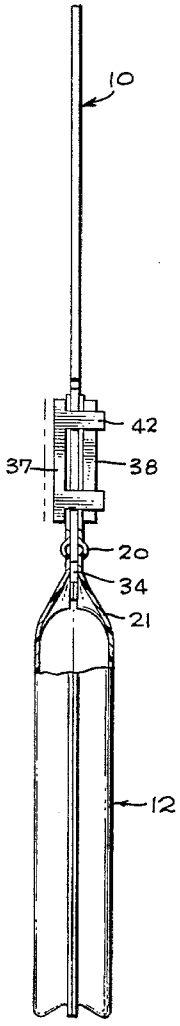


Fig. 3

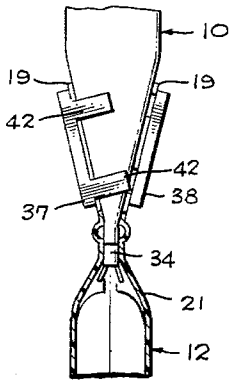


Fig. 11

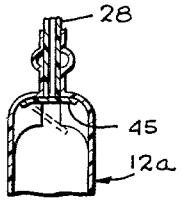


Fig. 4

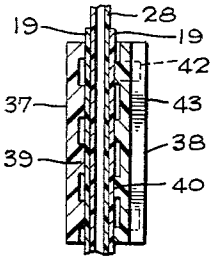
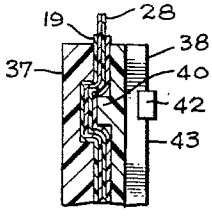


Fig. 5



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Fig. 9

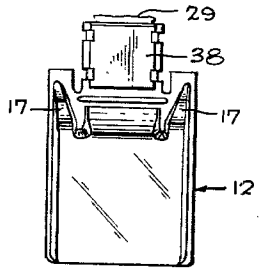


Fig. 6

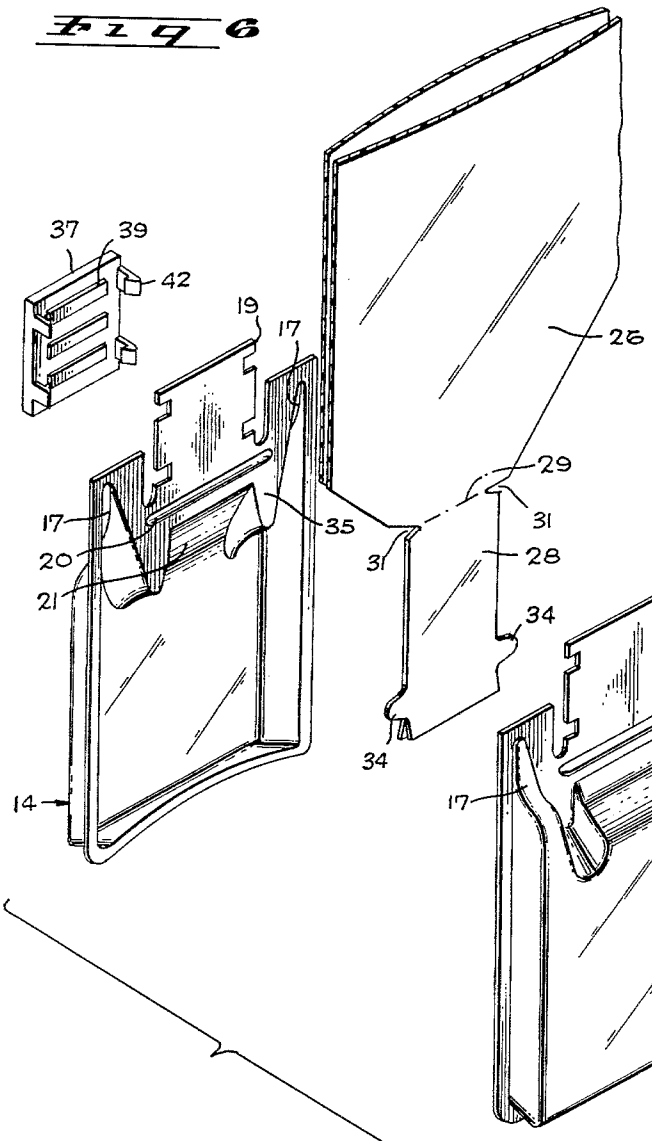
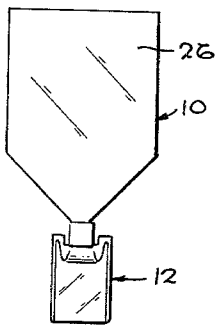


Fig. 10



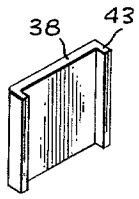


Fig. 7

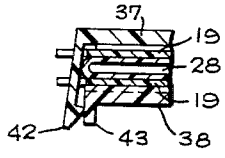
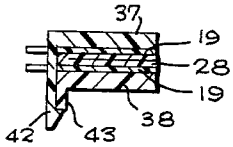


Fig. 8



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3,228,444

SPECIMEN CONTAINER

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Filed Nov. 18, 1964, Ser. No. 412,151
9 Claims. (Cl. 150—3)

This specification and claims constitute a continuation-in-part of application Serial No. 209,562 bearing the title Plastic Container which was allowed for issue May 18, 1964, now Patent No. 3,164,186.

The present invention relates to plastic receptacles which are particularly useful for taking urine samples.

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. It was the prior practice to use this sealing means to seal the lower bag in order that the contents would be permanently secured, but also to enable the convenient emptying of the funnel portion of the excess fluid. However, sealing the neck while much fluid is contained in the funnel has proved awkward in some instances.

Accordingly, it is an object of this invention to provide a valve within the container in order that the funnel may be dumped prior to the sealing of the container.

The valve does not need to be a particularly efficient or perfect valve, because the quantity of fluid retained will be quite sufficient for most purposes, but need only enable the funnel to be dumped without losing an appreciable quantity from the lower bag. Thereafter, the sealing means may be pressed closed to seal off the lower portion.

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 may be used. In addition, the receptacle of the invention may be readily identified, can be easily made in a variety of sizes, and it can easily be made in a variety of colors for color coating purposes.

Another object of the invention is to provide the bag-like container of relatively heavy material suitable for handling with a body of fluid contained therein, but with a thin funnel portion which adapts readily to the body formations and is inexpensive for temporary use and disposal.

A further object of the invention is to provide a unique and operative tear notch system to enable the quick and easy severance of the funnel at the proper location.

A still further object of the invention is to provide swingable carriages for the sealing devices, thereby holding these members in position ready for use without requiring installation by the user.

For a full understanding of the invention, a detailed description of the preferred embodiment of the plastic container will now be given in conjunction with the accompanying drawings:

FIGURE 1 is a front elevation, with parts broken away, of the completely assembled device after sealing of the neck;

FIGURE 2 is a side elevation of the container in the same condition of use;

FIGURE 3 is a side view, with the lower bag-like portion in section, illustrating the condition of the parts as the fluid is being entered into the bag container;

FIGURE 4 is a section taken along line 4—4 of FIGURE 1, with the parts located prior to sealing off the neck;

FIGURE 5 is an enlarged detail of the interlocking nature of the seal;

FIGURE 6 is an exploded illustration of the parts;

FIGURES 7 and 8 are taken along line 8—8 of FIGURE 1, and illustrate the sealing structure prior and after closing;

FIGURE 9 is a side elevation view of the lower bag-like portion after the funnel has been torn off following filling and sealing.

FIGURE 10 is a side elevation to show the relative size of the funnel and storage bag; and

FIGURE 11 is an alternative valve structure.

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-shape 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 to hold the sampled fluid.

The particular 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.

The upper rim of the tubular member 10 may require reenforcing or stiffening construction according to the material selected, and the type of use intended. However, this selection will be made according to expediency, and does not determine the novel features of the present invention. As best illustrated in the FIGURE 6, the lower bag portion is preferably composed, in this embodiment, of two substantially identical half bag members 14 formed of plastic material which will hold its shape fairly well and yet be resilient and non-breakable.

Vacuum forming is a technique well known and suitable for the present invention. In the formation of the bag, two vertically extending and separate fingers 17 of decreasing taper form are created. The formation is best seen in FIGURES 1 and 6. The decreasing formation provides a graceful appearance, and whenever two mated half members are united, these tapering fingers 17 will form air traps to prevent fluid entering up into that area of the bag, in order that the top of the fingers may be cut for forming a pouring spout. By trapping air, the technician need not cut through the fluid or have an immediate discharge of fluid from the bag when opening by cutting through one of these two finger members.

Additionally, part of the original sheet material is retained in the form of a flap 19 having a stress relieving loop 20, in order not to exert great pressure against the tubular neck portion 28 of the funnel. Formation of the individual fingers 17 produces a tapering neck section 21 therebetween, positioned in alignment with flaps 19.

Thus, when two of the half bags 14 are united and heat-sealed around the encompassing flange, there will be provided a fluid type container having two vertically extending air traps for pouring spouts, and a central neck portion flanked by upwardly extending flaps 19.

The upper portion of funnel 10 is composed of two relatively thin sheets of plastic material as compared with the material of the lower portion 12, and is heat sealed around the edge. This edge area is indicated by the reference character 25. The funnel is formed into a large receptacle bag area 26 and a reduced tubular portion 28. Thus, there is a junction area along a line suggested by the dotted line 29. At opposite ends of the line 29 an enlarged heat seal area 30 encompasses a sharp notch 31. These notches are directed along the line 29, and when the top portion 26 is subjected to a sheer tear in this area, the material will sever between the two notches 31 and thus the upper portion 26 will be removed for discarding.

Thus tubular portion 28 ends in an enlarged extremity 34. This extremity 34 is dimensioned to overlay the nodes between the fingers 17 and the neck 21. This condition is shown in FIGURE 1 wherein a portion of the bag is broken away. In FIGURE 6, reference numeral 35 indicates that area wherein the enlarged extremity 34 overlays the node between fingers 17 and neck 21. This view further suggests the size of the neck 28 in relation to the flap 19. Thus, it will be seen that when the two half bags 14 are placed together and heat sealing action applied, the funnel tube 28 is sealed at the ends into the material of the bag. Additionally, heat sealing of each half of the funnel neck 28 is accomplished along the strip located beneath the stress relieving loop 20 and the neck 21. This is carried forth by well known plastic art procedures, and employs, for example, a temporary insert through the tube 28 while the perimeter sealing takes place. Thus, the tube 28 is sealed fluid tight into the lower bag like member as the two members are assembled.

A pressure responsive sealing means is provided in the form of interlocking sealing devices 37 and 38. The device 37 has a plurality of ribs 39 and the device 38 has similar ribs 40 positioned to fit between the ribs 39. Thus, if these two members are pressed tightly together with the tube 28 therebetween, an efficient and effective seal is provided by producing a torturous path of the material, as best illustrated in the FIGURE 5 of the drawings. Sealing device 37 is provided with hooks 42 whereas the device 38 is provided with side walls 43. Thus, when the two members are pushed together to the locking conditions, the hooks 42 will drop over the walls 43 as shown in FIGURE 9, and the two devices will thereby be practically inseparable without destroying the material of the hooks 42 and thereby revealing that separation tampering has taken place.

The width of the hooks 42 is not restricted to the width indicated in FIGURE 6, but may extend over the entire length of the sealing device 37, or there may be multiplicity of such hooks. Modifications on the flap 19 would then be in detail to suit the particular design of the hooks 42, but not in concept.

Because it has been found to be distasteful to handle the container when the funnel portion is full or partially full, for the purpose of operating the sealing devices, the end of the tube 28 is constructed in such manner as to represent a flutter valve as shown in the FIGURE 3, which permits unobstructed filling but which closes when the fluid level in the container 15 reaches it or when the container 15 is inverted so that the fluid would attempt to flow out. FIGURE 6 shows a perspective view of such flutter-valve design.

The invention provides also for a different location and a different design of this flutter valve to permit flexibility in circumstances that are dictated by convenience, reliability or cost of the manufacturing technology that is employed in assembling all components.

Such different design is suggested in the FIGURE 11, which shows a steeper angle of the neck 21 and a small, pliable piece of plastic 45 welded to the inside of the neck. The width of this piece 45 is sufficient to cover the space formed between the strips through which the fluid will enter the lower portion. When the container is inverted, the small piece will fall over this space, resting on the steep angle part of the neck on the opposite side, thus closing the interspace between the strips. This seal need not be particularly efficient, but will enable the patient to dump the top portion and tear along the line 29 before pressing the sealing devices 37 and 38 together in the final assembly of the device.

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 sample fluid, as described above.

While the instant invention has been shown and described herein in what is conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom with the scope of the invention which is therefore not to be limited to the details disclosed herein but is to be afforded the full scope of the invention as hereinafter claimed.

What is claimed is:

1. A receptacle formed of flexible sheet material including:

a lower bag-like portion composed of two separate half-bags each having a main fluid containing body,

a neck portion including an extension sheet projecting therefrom, and at least one upwardly projecting recessed form portion separate from the neck portion, said two half bags united to define a fluid container fillable through said neck portion and wherein the separate projecting recessed form portions unite to form an air trap capable of becoming a pouring spout by severing the enclosed end thereof;

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 cannot be accommodated by said lower bag-like portion, said funnel-like tubular portion being sealed into the bag-like portion in the said neck area, said air trap spout lying laterally of the tubular portion;

a pair of strip members one carried by each of said extension sheet projections from the neck area of the bag-like portion, each of said strip members having a torturous path formation on the respective inner surface thereof to coact with like surfaces of the other to thereby form an interlocking tooth construction to act as a pressure responsive sealing means extending across the receptacle, said strip members being swingable by reason of being mounted on said extension sheets and thereby disposed between said lower bag-like portion and such upper tubular portion and closeable upon said 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, said lower bag-like portion being formed with two upright lateral recessed form projections and the funnel portion having a neck with a flared extreme end, said extreme end being sealed into the material of the lower bag-like portion across said neck area and between the mated sealed surfaces of the half-bags in the vicinity of the said projections, whereby a separate thin gauge funnel may be provided together with a heavy gauge container and the funnel may be disposed of after the bag-like portion has been filled.

3. In the receptacle of claim 1, said funnel composed of thin gauge relatively flexible material capable of accommodating itself to body formations and to distend under the pressure of liquid contained therein, and having an enlarged fluid containing portion and a neck portion with a junction area therebetween, said funnel composed of two separate sheets sealed together along the respective edges, and having an enlarged sealed spot on opposite sides of the said junction area and with a notch cut into each enlarged area directed toward one another across said junction area to provide a tear starting facility.

4. In the receptacle of claim 1, a flap valve carried internally of the bag-like portion at the end of said funnel, enabling the free entrance of fluid and resisting the exit of fluid, whereby excess fluid may be dumped from the funnel portion without loss of substantial quantities

from the bag-like portion prior to sealing the funnel neck.

5. The receptacle of claim 1 wherein the lower bag-like portion is made of vacuum formed resilient plastic sheet material flexible in nature and generally holding a container formation under gentle pressure, and having two separate upright recessed form portions to unite with an opposite half-member to form two 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.

6. A receptacle formed of flexible sheet material including:

a bag container portion having a top entrance opening, at least one closed air trap dome projecting from said bag, said dome providing a space into which liquid will not enter when filled in an upright position and thereby provides a portion which may be cut to form a pouring spout;

a pair of opposed flap extensions flanking said entrance opening of said bag container;

a funnel having a basin, a tube extending from said basin, said tube dimensioned to fit said opening of the bag container, and means sealing said tube into said opening; and

pinch clamp means having two cooperating parts, one part carried by each said flap extension, for cooperative clamping of said funnel tube to seal off the contents of said bag.

7. A receptacle as defined in claim 1, wherein said bag is a heavy form-holding structure and said funnel is a thin and highly flexible film.

8. A receptacle as defined in claim 1, wherein said pinch clamp is composed of a female member having a bottom wall, a side wall enclosure with an entrance opening, one said flap extension formed to fit into said wall enclosure and lock therewith to provide a swingable support for said female member;

a male member carried by the remaining flap member, said members positioned to engage and interlock upon swinging of said flap extension together and pressing the two members into engagement; and

interlockable rib members on said male and female members adapted when the members are interfitted to form a tortuous path and pinch off the tube of the funnel.

9. A receptacle as defined in claim 1, said funnel composed of two flat sheets heat sealed along common edges, two opposed seal areas on the funnel adjustment the tube being enlarged and notched to provide a tear starting point for detachment of said funnel after use.

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FRANKLIN T. GARRETT, *Primary Examiner.*