ABSTRACT: The present invention relates to a substantially tetrahedral container manufactured from a flexible material. Such containers may, for example, be used to collect urine from patients confined to bed instead of the conventionally used bottles of glass. Such a container can easily be folded flat during storage before its use and thereafter, when it is to be used, can easily be positioned and stabilized by the weight of the contents on the bottom of the container, whereby the inlet opening of the container is positioned about the liquid level in the container.
The present invention relates to a foldable container provided with an opening, preferably for liquids, and a method and means for its manufacture.

The object of the invention is to effect a container which can easily be folded flat during storage to save space and which, when it is to be used, can easily be positioned and stabilized by the weight of the contents on the bottom of the container at the same time as the inlet opening of the container is positioned at a level above the level of the contents.

The container proposed according to the invention is substantially characterized in that the container is manufactured from a flexible, tubular material which, when flat, is provided at one end with a first seal in the form of a seam situated in the horizontal plane of the tube and perpendicular to the longitudinal direction of the tube, and at the other end is provided with a partly open seam in a vertical plane situated perpendicular to the horizontal plane and coinciding with the center line of the tube, the container being arranged to be stored prior to use in substantially flat, folded condition, and after being opened out is fixed in its original shape by the weight of the liquid inside and, when the container is placed on a base, the opening in the seam intended as the inlet channel is positioned at a level above that of the contents.

According to a suitable embodiment of the invention the liquid situated in vertical plane to form a substantially tetrahedral container is situated substantially perpendicular to the first seam situated perpendicular to the longitudinal direction of the tube.

According to another embodiment of the invention the container, if desired, may be given a shape other than tetrahedral by arranging the seam situated in the vertical plane at another suitable angle to the horizontal plane.

The container proposed according to the invention can suitably be manufactured by a tubular material, open at both ends, being sealed first along one end by a seam situated in the horizontal plane of the tube and perpendicular to the longitudinal direction of the tube, after which the baglike object thus formed is provided along its opposite end with a partly open seam in a vertical plane coinciding with the center line of the tube and perpendicular to the horizontal plane, to form a container provided with an opening.

A suitable means for producing such containers from a continuous, tubular length of plastic comprises a number of feeding members and shaping points arranged successively in the direction of travel of the plastic, comprising a first sealing tool, a second sealing tool, a cutting means and also a folding means and a final point.

In the following the invention will be described further with reference to the accompanying drawings where FIG. 1 is a perspective view of a container manufactured in accordance with the invention.

FIG. 2 is a side view of the container shown in FIG. 1, in folded state.

FIG. 3 is a view above of the container shown in FIG. 2.

FIG. 4 is a suitable means for manufacturing the container shown in FIGS. 1-3.

The substantially tetrahedral container 1 shown in FIGS. 1-3 is limited by four, substantially equilateral triangles and is made from a tubular casing open at both ends, by means of an end seam 2 and a partially open end seam 3 situated perpendicular to this and consisting of two part-seams 3a and 3b, respectively, with the between them enclose the opening of the container which, in the embodiment shown in the drawings, opens out in the side edge formed by the part-seams 3a and 3b into a substantially perpendicularly projecting, tubular extension 4. The tubular extension 4 serving as inlet channel is stabilized along its entire length projecting from the side edge and fixed in position by means of supporting flaps 5 and 6 respectively, which project from the part-seams 3a and 3b, respectively and are attached to the inlet channel 4 by the edges facing this channel. Just by its end and the inlet channel flaps, preferably that projecting from the part-seam 3a, has also a hole 8 for handling of the container.

As can be seen from FIGS. 2 and 3 a container manufactured in this way can be easily folded up in a space-saving manner so that the tetrahedral shape temporarily disappears. Due to the elasticity of the material used— the container is preferably manufactured in one piece from plastic— the container can easily be returned to its original shape prior to use and is then stabilized by the weight of the contents. A triangular bottom surface 9 is thus formed so that the container can be placed on a base. The container can be positioned, that is folded out, by, for example, holding the seam 2 with one hand against a base and lifting the folded part of the container upwards by means of the hole 8 with the other hand. The inlet channel 4 will then be forced into a position at a level above the level of the liquid in the container. When the container is folded as shown in FIGS. 2 and 3 the upper limit of the part-seam 3e is folded down towards the center of the seam edge 2 so that the upper limiting line of the tetrahedron formed by the part-seams 3e and 3f, respectively, will lie perpendicular to the said seam edge 2. Finally the inlet channel 4 lies in over the container. Due to the elasticity of the material and since the original tetrahedral shape is only defined by a few seams, i.e., most of the edges of the tetrahedron have not been specially marked with folding instructions, therefore, the entire-folding operation can be carried out without any particular-folding instructions. The container can of course be folded in many other ways because of the elasticity of the material. FIG. 4 shows a suitable means for manufacturing the container described in FIGS. 1-3. A plastic tube 10 is here drawn past a number of successive shaping points. The plastic tube is drawn by two pairs of rollers 11 and 12, respectively, arranged at a distance from each other starting from a storage roll 13. The intention here is to enclose air in the tube in known manner in order to separate the two layers of plastic in advance to facilitate subsequent shaping. The plastic tube is then carried to a punch 14 to partially shape the supporting flaps 5, 6 by heat-sealing them by means of similarly shaped sealing tools 15, 16 which effect two seams each, 17, 18 and 19, 20, respectively, and thus abut a bearer 21 situated beneath the plastic tube. The final shaping of the supporting flaps and arrangement of the hole 8 is then carried out by a welding tool 22 and a punch 23, respectively, and a bearer 24. The baglike object thus formed is then cut from the plastic tube by subsequent knives 25, 26. In order to be able to keep the tube stretched during these operations and in order to feed the tube forwards, feeding rollers 27, 28 are arranged on each side of the plastic tube 10 which feed the new separate, baglike object to a folding point 29 consisting of a holder 30 and a member 31 connected to a vacuum-generating means not shown, to separate the walls of the baglike object so that these can be stretched and turned 90° in relation to the plastic tube 10 so that the folding members 33 and 34 can complete the folding of the bag in to the holder 30. The open end of the baglike object will then move from the center line and then be released by the stationary members 32.

The folding members 33 and 34 are attached to an intermittently operating stand, the center of which is marked 35. When the folding operation is completed at point 29, the moveable stand with the holder 30 is moved to a neighboring point 36. During this movement the bag is retained in its position and before this movement has taken place the upper part of the holder 30 is then the plastic object. At the point 36 is a stationary sealing member 37 to seal the bottom of the baglike object, and an assembly means to insert the support ring 7 on the inside of the opening of the inlet channel 4. The support ring is placed on an expanding mandrel 38 which is relatively pointed. The opening of the inlet channel 4 is opened by arms 39 connected to a vacuum means, not shown, after which the mandrel 38 is inserted into
the opening and the support ring 7 is welded inside the opening by means of a heating appliance 40. The bag is then moved to a delivery point, not shown, still being held by the holders 33, 34.

The container may be manufactured from any suitable material which can be sealed and folded. A plastic material or plastic laminate is preferably used. Of course, it is also possible to use paper coated with plastic, or the like.

The container can of course also be produced from a strip of plastic which, for example, during the process is first shaped to a tubular, continuous, flattened length of plastic. Thus it is not necessary to start with a prefabricated tubular material.

Furthermore, the tetrahedral container shown in the drawings may also be shaped differently. For example by arranging the seam 3 at an arbitrary angle to the horizontal plane of the tube, a plurality of different shapes can be achieved.

Containers manufactured according to the invention can be used to collect all types of material, preferably in liquid form.

A particularly advantageous field of use for containers in accordance with the invention is as expendable articles for medical purposes. The containers may, for example, be used to collect urine from patients confined to bed instead of the conventionally used bottles of glass. The advantages of this are obvious and are primarily that the spread of infection is eliminated and that the container may be temporarily kept for inspection and for the nursing staff to take samples and can then be disposed of. Furthermore, such a container for urine is easy to store, since it can be folded, and in spite of this forms a stable container which can be placed on a stationary base without risk of leakage or spilling.

What I claim is:

1. A container having at least four walls including a base for holding liquid material, manufactured from flexible material and provided with an inlet communicating with the inside of the container, the container being produced from a tubular object having end welds arranged substantially at right angles to each other, characterized in that one of the end welds is positioned at an incline to the base of the container and comprises two part-welds in line with each other having the inlet between them, the inlet continues into an inlet channel comprised of a cylindrical tube projecting substantially perpendicularly from the end weld, and the inlet channel is positioned and stabilized by means of support edges arranged on each side of the inlet and in connection with said inlet and the part-welds, the container before use is arranged to be stored in a substantially flat, folded state, being thereafter stabilized to its original shape by the weight of the contents being poured in.

2. A container according to claim 1, wherein one of the support edges is provided with a notch for finger grasping.

3. A container according to claim 2, characterized in that the free end of the inlet channel is provided with a support ring.

4. A container according to claim 3, characterized in that the container is made in one piece from a material which can be heat-sealed, preferably plastic or paper coated with plastic.