This invention relates to the structure of a corrugated tube which can be compressed and extended but also it can adapt to all the inclinations required by the user, being really retractable and flexible. This fact can be adopted for the production of a special urinal but also of a retractable bottle.
RETRACTABLE AND FLEXIBLE PLASTIC CONTAINER FOR LIQUIDS

FIELD AND BACKGROUND OF THE INVENTION

[0001] The present invention refers to a previous patent filed by the same inventor titled "A retractable and disposable urinal" registered at the Industrial Property of the Ministry for Economic Services in Malta, with the number 1636 on the date of Sep. 10, 2001 and consequently filed in the U.S.A. with the U.S. Pat. No. 6,668,388, issued on Dec. 30, 2003 and in Europe with the European Patent Application No. 0242551.5, issued on May 21, 2003.

[0002] The main claim of this patent teaches about an urinal, which is a retractable tube, and a liquid absorbing polymer placed into the neck of the same.

[0003] The experience made using the urinals produced following the instructions of the cited patent confirms the validity of the invention but has shown the following negative aspects:

[0004] The lack of retraction and flexibility which for this device are very important.

[0005] Problems for the compulsory use of the absorber polymer placed into the container, as during the production as during the use creating wastage troubles.

[0006] The possibility to use the container as an urinal and not to contain liquid in general as a bottle.

[0007] The present invention intends to solve all the above mentioned problems and to enlarge its applications to plastic bottles.

[0008] Other advantages of the present invention will become apparent from a consideration of the following detailed description and from the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 Shows the section of some convolutions of the prior art.

[0010] FIG. 2 Shows the section of some convolutions of the present invention.

[0011] FIG. 3 Shows the dynamic movement of the convolutions when compressed.

[0012] FIG. 4 Shows the whole corrugated tube in the three essential positions.

[0013] FIG. 5 Shows the manual extension of the tube.

[0014] FIG. 6 Is the front and sectional view of the closing with the conveyer.

[0015] FIG. 7 Is the external capsule incorporating the absorber polymer.

[0016] FIG. 8 Shows the conveyer adaptable to the bottle's neck.

[0017] FIG. 9 Shows the bottle's neck with an usual cap.

[0018] FIG. 10 Shows the container with a screwing cap.

[0019] FIG. 11 Shows a plastic bottle in three positions.

DETAILED DESCRIPTION

[0020] With reference to the above mentioned background of the invention its main objects are:

[0021] A—to give the container a perfect retraction and flexibility handling it;

[0022] B—its use as an urinal with or without the use of the absorber polymer;

[0023] C—its use as a bottle for containing liquid in general.

[0024] A—Retractility and Flexibility.

[0025] The experience made with the containers produced with the previous cited patent has shown that it is not easy to reach the flexibility and the retractility and the same patent does not teach how the convolutions are projected.

[0026] The main problem is the definition of the shape of these convolutions.

[0027] Firstly, in order to better understand this invention, it is important to well identify the terms "retractility" and "flexibility".

[0028] The "retractility" is the possibility to compress (FIG. 4-F) and to extend (FIG. 4-D) the tube.

[0029] Obviously this function is important for a better storage and a better handling of the container.

[0030] The "flexibility" is the possibility to incline the tube in order to be adapted to the positions required by the user (FIG. 4-E).

[0031] The shape of the convolutions adopted by the cited previous patent (FIG. 1) was projected like the corrugated tubes (normally used i.e. as drain-pipe for washing machines) which have a good retractility and flexibility because, being produced with the process of extrusion, the thickness of the tube is constant along its whole length.

[0032] Once the tube is extruded, the neck and the bottom, separately made by injection machines, are soldered to the tube or directly injected to it.

[0033] When the tube is produced with the process of blowing and/or with the injection-blowing, the thickness of the convolutions changes along the tube being more stretched in the external points, with the result that all the mechanical aspects vary with the consequence that the tube has a partial retractility and a low flexibility.

[0034] This invention intends to indicate the proper shape of the convolutions of the corrugated tube when is produced with the blowing machines and/or with the process of injection-blowing, for obtaining this target two essential geometrical aspects base to be focused:

[0035] The geometry of the two rings forming a convolution.

[0036] As shown in FIG. 2, the upper ring (4) of every convolution is bigger than the lower one (5) and has a bigger inclination.

[0037] The geometry of the external and internal points of the convolution.

[0038] As shown in FIG. 2, the curvature of the external point (6) of the convolution, point of greatest extension, has an external bulge and is bigger than the internal one (7), point of greatest settlement, which for a perfect work must be sharp like an engraving.

[0039] This bulge (6) in the lower point of connection of the two rings forms a hinge (6a) which allows the movement of the lower ring (5), when the tube is under compression, passing from the natural position (FIG. 3-A) to the compressed position (FIG. 3-C) making an elastic adjustment for balancing the length of the lower ring (5) which pushes against the hinge with a force similar to a leaf spring (FIG. 3-B). The internal point (7) does not offer resistance being very weak.

[0040] Only following these geometrical aspects a perfect combination for the retractility and for the flexibility is reached.
This important disclosure allows to enlarge the application of this invention to plastic bottles as better referred at point C—.

The last convolution (2) has a shape designed to be taken easily with two fingers in order to pull the tube for its extension.

This invented container has a closing device which is or a conveyer (10) for the male and female organ with an anatomical design similar to that one cited in the previous patent or a screwing cap (30-34) usable for containing liquids in general.

The container may be coloured and can have a transparent stripe (8) along its length in order to make visible the content of the liquid inside and, for having a measure of the volume, the correspondent numbers (9) are impressed over the convolutions.

B—Use of the Container as a Urinal with or without the Absorber Polymer.

As mentioned in the “field and background of the invention”, after the mechanical problems of the retractility and the flexibility, that this patent has solved as mentioned at the above point A—, the other problems found with the previous patent were connected with the use of the absorber polymer.

The previous patented urinal has the first convolution located at the tube’s top being a cave neck where a special container (prior art-10) enters which is filled with the absorber polymer (prior art-4). This container is closed with a plastic film (prior art-12) soldered around the edge of the neck. When the conveyer enters the film and the container allowing the polymer to fall inside the tube of the urinal.

The experience made with this previous patented urinal teaches that, being the use of the absorber polymer an integral part of the urinal, the same becomes obviously disposable. In other words, once used this urinal can not be reusable because a perfect cleaning is impossible due to the gelatinized urine kept between its convolutions.

Obviously this fact has caused also waste problems.

Therefore, in order to obviate the problem connected with the polymer, this patent intends the same as an option for the user who can use it or not.

For particular cases the use of the polymer is done as the present invention relates and more exactly encapsulating it into the cap of the conveyer.

The invented conveyer (10) has a structure (10a) joined through a hinge (11a-11b) to the closing cap (10b).

The closing is tight because the edge of the cap (13b) enters the edge of the structure (13a) hermetically. The bottom of the conveyer has a pre-formed ring (12) for joining the neck of the tube in order to form it with a perfect joint.

The cap has a grip (14) on the opposite side of the hinge, in order to facilitate the opening.

In the middle of this cap a hollowed protuberance (16) is made.

In the case of normal use of the urinal, in other words without the absorber polymer, this protuberance is useful for helping the closing.

In the case of using the absorber polymer the same is put inside a hemispherical or cylindrical cap (18) which is inserted into the interior of the protuberance (16).

This cap has in its middle a pin (19) which enters the ring (15) of the protuberance.

When the urinal is taken for a urination the user presses (FIG. 7-O) the top of the protuberance (16) which deflects pushing down the internal cap (18) through the pin (19).

Normally during the urination the tube is inclined and therefore the internal cap (18), once pressed with a finger (FIG. 7-N), falls down the tube (FIG. 7-O), and bumping against the walls of the tube rolls down leaving the powder of the polymer.

When the user urinates, the urine progressively gelatinizes.

A perfect closing is obtained with a normal cap as generally used for bottle of detergents as shown in FIG. 10, where the closing is sure due to the screwing of the threads (31) of the cap (30) into the threads (32) of the neck (3).

In this case the invented container will be used for male use only.

C—Use of the Container as a Plastic Bottle for Containing Liquids in General.

This invention intends to enlarge the use of the invented container not limiting it for the urine but also for containing liquid in general as a bottle.

Generally the bottles are produced with the process of injection blowing using PET (Polyethylene-Terephthalate), producing firstly with injection machines a plial which later is put in a mould for blowing machines to blow for assuming its final figure.

These bottles guarantee a barrier effect and are used especially for liquids additioned with gas as mineral water, soft drinks or for containing perishable liquids as milk, fruit juices etc.

The bottles generally used for other liquids as oils, detergents etc. are produced with the process of blowing using HDPE (High Density Polyethylene) or PP (Polypropylene).

The essential goals of these bottles are:

a—to improve its storage, its transport and its handling.

b—to improve the preservation of the contained liquid.

The volume of the bottle can be reduced until the level of the contained liquid, avoiding its contact with the air and obtaining as a result a perfect preservation of its content.

c—to improve its use. As shown in FIG. 11-Y, the flexibility of the invented bottle allows all the inclinations that the user can require.

d—to improve the cycle of its use (FIG. 8).

Once the bottle is totally empty can be used as an urinal, just in case of emergency.

In this case the invented conveyer (36) will have, at its bottom, the same diameter and the same threads (35a) of the original cap (34) of the bottle allowing the same screwing into the threads (35a) of its neck (33), then, once the bottle is empty the cap is replaced by the conveyer which can be supplied as a gadget for a promotional purpose.

In this case this bottle doubles its use anf halves wastage problems.

1. A retractable and flexible plastic container for liquids with a neck portion for the insertion of a conveyer or a screw-
ing cap, said container being a corrugated tube formed by a plurality of convolutions, which allow the retractility and the flexibility of the same tube, characterized in that the upper ring of every convolution is bigger than the lower one and the curvatures of the external point of the convolutions, point of greatest extension, have an external bulge which in the lower point of connection of the two rings forms a hinge, the curvatures of the internal point, point of settlement, are sharp like an engraving.

2 - A retractable and flexible plastic container for liquids where, with reference to claim 1-, the corrugated tube is produced with the process of blowing.

3 - A retractable and flexible plastic container for liquids where, with reference to claim 1-, the corrugated tube is produced with the process of injection-blowing.

4 - A retractable and flexible plastic container for liquids where, with reference to claim 1-, a conveyer for the male-female urinating organ is inserted from its neck, this conveyer has a structure joined through a hinge to the closing cap, its closing is tight because the edge of the cap enters the edge of the structure hermetically, the cap has a protuberance in its centre, the cap has a grip on the opposite side of the hinge.

5 - A retractable and flexible plastic container for liquids where, with reference to claim 4-, a quantity of an absorber polymer is put inside a semispherical or cylindrical small cap which, once filled of this compound, is inserted into the interior of the protuberance of the cap of the conveyer.

6 - A retractable and flexible plastic container for liquids which, with reference to claim 1-, has the neck and the bottom as a normal bottle which can be compressed or extended, due to its retractility, to improve its storage, to improve the preservation of the contained liquid, and can be flexed, due to its flexibility, to improve its use.

7 - A retractable and flexible plastic container for liquids where, with reference to claim 6-, a screwing cap is inserted from its neck, this cap is the same normally used for the closing of plastic bottles, having this neck the same threads of a normal plastic bottle.

8 - A retractable and flexible plastic container for liquids where, with reference to claim 7-, a conveyer is screwed to the bottle’s neck because the bottom of the same conveyer has the same diameter and the same threads of the original cap of the bottle.

* * * * *