**Title:** OPEN MOUTH BAG

The invention provides a rigid mouth bag (2) with a rigid mouth (10) that places no stress on the bag and which leaves no entrapment areas between the bag and the rigid mouth for product inside the rigid mouth bag to egress into. The rigid mouth is formed as a "Y" joint and the bag inserted between the prongs of the joint. The joint is closed and sealed.
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OPEN MOUTH BAG

Field of the Invention

The invention relates to an open mouth bag, and in particular to an open mouth bag including a rigid collar, the collar including a "Y" joint method of closure.

Background

Plastic bags are well known. They can be in the form of flexible pouches or packaging as disclosed for example in US 4,286,746, US 3,438,567 or US 3,318,759. Plastic bags may be attached to frames or handles as for example in US 4,411,300 and EP 0 150 027.

Also known are fluid dispensers including collapsible flaccid bags. For example, in US 5,005,733 there is disclosed a collapsible flaccid bag bottle. Integral with the bottle is a thin passive film that passively manages collapsing of the bottle as fluid is dispensed. US 5,012,956 discloses a fluid dispenser system which is a conventional squeeze bottle within which a collapsible flaccid bag, containing dispensable fluid, is suspended. US 5,004,123 discloses a non-venting fluid dispenser system which has a collapsible flaccid bag loosely suspended in a sleeve and exposed at atmospheric pressure. US 4,147,278 discloses a fluid dispenser in which a second container with a flexible wall is positioned inside a first container.

In many of the above examples, it is necessary to hold the plastic bag or pouch inside a rigid container. In US 4,147,278 this is achieved simply by cuffing back a flaccid bag over the neck of a bottle. The flaccid bag must be attached to a bottle and cannot be used alone. It is prone to leaking. In US 3,420,413 the pouch has a moulded in place neck. It is connected to a closure cap by sealing rings.

There is a need for a plastic bag which can be attached to a collar/ring or the like to produce a strong plastic pouch having a rigid open mouth.

The rigidly brimmed wide mouth stretch resistant pouch disclosed in US 5,476,322 relates to a pouch having heat sealingly laminated side margins and a rigidly brimmed wide mouth open end. The pouch is secured to a rigid annular rim by an open end of
the pouch being mechanically expanded and tightly contracted over, around and beneath the rim. The formation of the pouch requires a pouch expander.

The problem with the pouch of US 5,476,322 is that it does not provide a stress-free joint. A weak point of a flexible pouch having heat sealingly laminated side margins is the transition edge between the heat sealed joint itself and the non-heat sealed pouch wall. When such a pouch is stretched, this directly stresses the weakest portion of the pouch. The plastic bag requires stretching to attach it to the rim.

Problems with all current methods include:

i) They have more than two parts, vis-a-vis a rigid mouth, a bag, and a third element such as a heat shrinking band, an external clamp, additional sealing material etc; all these configurations add extra cost to the assembly;

ii) Few rigid mouth bags specifically deal with totally sealing between the bag and the rigid mouth. They all try to form a "hermetic" seal, but leave a significant portion of bag/rigid mouth contact unsealed on the inside, ie. they all have product entrapment areas. This is due to the severe difficulty in sealing between a rigid mouth and a bag when sealing along the open edge surface of a bag.

In other rigid mouth bag design configurations, this is not a problem. The best example is the current "wine bag" configuration, where the closure is welded on to a flat surface portion of the bag, hence sealing together two totally flat surfaces. A fully sealed joint can therefore be obtained.

The problem along an edge surface opening on a bag is caused by two factors:

i) The rigid mouth is generally an injection moulded component (as with the tap assembly in the "wine bag" application), and hence its dimensional tolerances are quite precise;

ii) The bag is generally made from a process that does not have such fine manufacturing tolerances, ie. folded out of flat sheet into a bag through heat sealingly laminated side margins.
Hence, when the rigid mouth is inserted into the open mouth end of the bag, the fit cannot be perfect. A method of sealing 360° around the joint, without forming any entrapment areas has to be found. There are only three possibilities:

a) The tolerance difference leads to the bag-opening aperture being less than the rigid mouth dimensions. In this situation it is near impossible to insert the rigid mouth into the bag.

This is the scenario used in US 5,476,322. Assembly is achieved by stretching the bag over the rigid mouth. As this method keeps the bag in tension, it is claimed that this will provide no possibility of entrapment.

This results in a permanent stress in the bag.

b) Both bag aperture and rigid mouth are the same size within a fine tolerance. This is an extremely low probability, but even if it occurred, one still has a significant problem of how one gets the rigid mouth inserted up inside an extremely tight fit into a very thin-walled bag.

c) The bag aperture is slightly larger than the rigid mouth dimension. Now one can potentially insert the rigid mouth up into the open mouth on the bag, but as one tries to seal around the circumference of the rigid mouth sealing surface, one ultimately must end up with ridges being formed in the bag material (due to the difference in size/circumferences), and these ridges form entrapment areas and can also lead to complete lack of a hermetic seal.

**Summary of the Invention**

The present invention goes some way in overcoming some disadvantages with known types of plastic bags. The present invention goes some way in providing a substantially rigid open mouth to a bag, whereby the bag is adapted to be automatically inserted into a "Y" joint of a rigid mouth, or which at least provides the public with a useful choice.

Throughout this specification, the term "bag" is intended to include pouches, sachets and other similar enclosures.
In one aspect, the invention provides a rigid mouthed bag comprising a pouch or the like of flexible material, the pouch being inserted into a "Y" joint of a substantially rigid mouth, which, upon closure of the "Y" joint, results in a rigid mouth bag in which no stress is placed on the pouch.

The substantially rigid open mouth preferably comprises a collar or the like.

The collar preferably comprises a "Y" joint in its unclosed position. The pouch is adapted to be inserted between the two prongs of the "Y" joint when in its open position and the "Y" joint is then closed to form the rigid mouthed bag.

Preferably no entrapment areas for product inside the rigid mouth bag are provided.

The invention also provides a rigid mouthed bag comprising a pouch or the like of flexible material, the pouch being inserted into a "Y" joint of a substantially rigid mouth, the "Y" joint comprising two prongs of substantially equal length, which, upon closure of the "Y" joint results in a rigid mouth bag with no product entrapment areas.

The invention also provides a rigid mouth bag in construction from a flexible material, the rigid mouth bag including:

- a pouch having an open mouth; and
- a collar, the collar being sealingly connected to the pouch around its open mouth using a "Y" joint method of closure between the mouth and the pouch, thus providing a substantially rigid mouth at the open end of the pouch, without inducing stress in the bag.

Preferably the collar is in line with the open end of the pouch.

The "Y" joint preferably comprises two prongs of substantially equal length which, upon closure of the "Y" joint, results in a rigid mouth bag with no product entrapment areas.

The collar is preferably circular but may be of any required shape such as rectangular, or oval.
The pouch may be constructed of a flexible material and may be either a single or multi-layer laminate material, preferably a plastics material.

The collar may be manufactured from any elastic or semi-elastic material that can be moulded or machined into the specific form required.

The collar may be injection moulded or fabricated out of an extrusion. To manufacture the rigid mouth bag, the pouch may be slid up between the prongs of the Y after which the prongs of the Y are closed.

The invention also provides a method of forming a rigid mouthed bag comprising a pouch or the like of flexible material including the steps of:

- inserting a pouch of flexible material between the two prongs of a "Y" joint in a rigid collar;
- closing the prongs of the joint; and
- sealing the joint,

to thus produce a rigid mouth bag without inducing stress in the bag.

The invention also provides a method of forming a rigid mouthed bag comprising a pouch or the like of flexible material including the steps of:

- inserting a pouch of flexible material between two prongs of equal length of the "Y" joint in a rigid collar;
- closing the prongs of the joint; and
- sealing the joint,

to thus produce a rigid mouth bag with no product entrapment areas.

Closure of the Y-joint may be done by a number of mechanisms. Sealing methods include:

- Ultrasonic Welding, either longitudinal welding from the outside, radial welding from the inside, or a combination of both;
- Radio Frequency welding using a radio frequency activated glue in the joint;
- Gluing;
- Any form of heat sealing process;
- Any form of heat forming process;
- Mechanically "clipping" the Y-joint shut.
Once the "Y" joint with substantially equal length legs is closed, the method of securing the "Y" joint, whatever the sealing method, provides a complete seal between the pouch and the "Y" joint, leaving no entrapment area for product to egress in to.

It is not necessary to stretch the bag around the collar or joint and thus a neat, airtight joint may be provided.

Possible uses of the rigid mouth bag include, but are not limited to:

photochemical storage, general laboratory storage, all carbonated and non-carbonated drinks, powdered drinks, powdered foodstuffs, foodstuffs, paint, domestic and industrial liquids including but not limited to cleaners and reagents, pharmaceuticals including both liquid and solid forms, as a liner to keep a container clean and reduce the need to clean containers after use, as a free-standing pouch or as a liner/bladder inside a container, in the medical field as for example a colostomy bag.

Brief Description of the Drawings

An embodiment of the invention is now described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a rigid mouth bag made with heat sealingly laminated side margins;

Figure 2 shows the rigid mouth of Figure 1 with a blow moulded bag;

Figure 3 shows a rigid mouth with symmetrical "Y" joint;

Figure 4 shows a rigid mouth with asymmetrical "Y" joint;

Figure 5 showing a rigid mouth with asymmetrical "Y" joint and castellated outer angular leg;

Figure 6 shows a joint ready for closure, with internal moulded feature;
Figure 7 shows a closed "Y" joint;

Figure 8 shows a closed "Y" joint with heat forming seal between the outer edge of the inner leg and the inner bag surface lamination.

**Detailed Description of the Invention**

Referring to figures 1 and 2, a rigid mouth bag is shown generally at 2. It has a plastic pouch 4 which has an open upper end 6 and a sealed lower end 8. The open end 6 is secured to a circular collar 10. The collar 10 is rigid.

The point of attachment of the pouch 4 to the collar 10 provides a joint 12.

Referring to figure 3, the collar 10 has a Y-joint 12 with prongs 12A and 12B. The plastic pouch is slipped up through the prongs 12A and 12B of the Y joint 12. The Y-joint is then securely closed. Figure 3 shows a rigid mouth with a symmetrical "Y" joint.

Figure 4 shows a rigid mouth 10 with an asymmetric "Y" joint 13, having prongs 13A and 13B.

Figure 5 shows a rigid mouth 10 with an asymmetrical "Y" joint having prongs 14A and 14B and an outer angular leg 15 with castellations 16.

Figure 6 shows a "Y" joint 18 ready for closure. A bag 20 is inserted between the prongs 18A and 18B. A moulded internal feature 22 is included.

Figure 7 shows a closed "Y" joint 24 with a bag 20 inserted.

Figure 8 shows a closed "Y" joint 26 with a heat forming seal 28 between the outer edge of the inner leg 26A and the inner bag surface lamination 30.

When both "Y" joint legs are of identical length, there will be a lack of product entrapment. When one leg is shorter than the other, closing of the "Y" joint will be possible but only a hermetic seal will be provided. There will still be an entrapment area between the bag and the longer leg (figure 1).
Referring again to figures 1 and 2, it will be appreciated that when the bag 2 contains a fluid and the bag 2 is turned upside down such that the collar 10 is below the pouch 4, the fluid will flow out of the open end 6. There will be complete removal of the fluid as the rigid mouth bag 2 has no corners to trap remaining fluid.

Some of the advantages of the present invention are as follows:

i) It is a cost-effective assembly.

The joint is only two-piece, a single rigid mouth and a bag. Hence the joint can make a very cost-effective assembly.

ii) Allows the bag to be automatically inserted into the rigid mouth.

The "Y" joint format, whether the joint is circular, oval or even rectangular, allows the bag to be easily slid up into the joint. Typically this is achieved by the combination of a spigot and an associated expanding mandrel.

The rigid mouth is placed on the spigot, the mandrel expanded, the bag is then slid up the mandrel creating a sliding guide right up in to the "Y" joint, and then the mandrel is retracted.

The bag is then inserted in its correct position in the "Y" joint. This process can be readily automated. It should also be noted that this process allows the use of with very thin walled bags.

The "Y" joint can be a symmetrical "Y" as in Figure 3, or any asymmetrical "Y" as in Figure 4.

iii) Places no stress on the bag being inserted.

With the "Y" joint concept, the bag is slid up in to the "Y" joint without stretching or stressing the bag.
One could argue that a slightly undersized bag opening could still slide up inside a symmetrical "Y" joint, and when the joint is closed, the bag opening would be stretched.

This is circumvented by the bag opening aperture always being made with a positive tolerance, in other words the bag is made using a tolerance specification where bags are rejected during manufacture if the final opening circumference is under-sized, but accepted if their opening circumference is within tolerance over-sized.

iv) Forms a complete seal between the bag and rigid mouth leaving no entrapment areas between the bag and rigid mouth for product to egress into.

When the "Y" joint is closed up, the oversized bag does not form ridges that can form entrapment areas.

There are a number of ways to seal closed the "Y" joint, but first the "Y" joint has to be physically closed. As mentioned above, no matter whether the "Y" joint is symmetrical or asymmetrical, by controlling the tolerance of the bag during manufacture, the action of closing the "Y" joint cannot stretch or "stress" the bag.

Closing the "Y" joint is a simple mechanical activity, but sealing the joint is not simplistic. As displayed in the attached Figures, there are a number of possible joint combinations:

i) The "Y" joint can be symmetrical - Figure 3 ie. each leg is at the same but opposite angle out from the centre-line. This configuration suites highly elastic material, as one leg must compress and one must stretch as the joint is closed.

ii) The "Y" joint can be asymmetrical - Figure 4 ie. one leg is effectively cylindrical while the other leg is at an angle to the centre line. In this case, when the joint is closed the inner cylindrical leg neither compresses or expands, while the outer angular leg compresses to form the joint.

iii) The "Y" joint can be further improved by castellating the angular legs - Figure 5 shows a cylindrical inner leg and castellated angular outer leg. In
this joint again the inner cylindrical leg neither expands nor compresses, while the outer angular legs fold in without need for compression - the castellation slits are designed such that once the outer leg has been folded hard against the inner leg, all castellation slits close up tight. Castellations can be used on symmetrical or asymmetrical Y joints.

iv) Any number of other combinations are also possible.

Once the joint is closed, it has to be sealed. The main points in sealing the joint are:

i) In order to effect a hermetic seal as well as have no entrapment areas, the inner leg must fully seal against the bag inner surface.

ii) As the inner surface forms the full seal, the outer leg need only be used for increasing joint strength and for cosmetic purposes to "tidy up" the outside of the joint.

iii) Because the two legs are of equal length, and once closed, mechanical pressure can be applied to the joint, any ridges formed by the effective circumference of the bag being greater than the effective circumference inside the rigid mouth joint are flattened out leaving no possibility for entrapment areas.

iv) As shown in Figure 6, one can also mould other features in to the joint, such as raised shoulders or even recesses. These features can have more than one function:

a) For ultrasonic welding, the raised shoulder concentrates the ultrasonic energy leading to a better welded joint;

b) Another possible function of the raised shoulder, as well as corresponding recesses, is to provide additional restraint to stop the bag being pulled out of the joint, hence increasing overall joint strength.

Figure 7 shows a "Y" joint fully closed.

Figure 8 shows a "Y" joint fully closed based on the combination of closure and sealing techniques used. The points to note about the joint are:
i) The preferred format is as shown in Figure 6, with a 360° moulded ridge around the inside of the joint to reduce the potential of the bag being pulled out;

ii) The "Y" joint leg configuration is preferably as shown in Figure 5, with a cylindrical inner leg and a castellated angular outer leg;

iii) The joint is mechanically closed, then first ultrasonically welded on each castellated joint on the outside. This does not weld the outer leg to the outer surface of the bag, rather it turns the castellated outer leg into a contiguous 360° band that holds the joint tightly closed and forms a tidy joint on the exterior;

iv) A heat forming process is then used to physically "melt" part of the inner leg into the bag inner surface right at the transition between the inner leg and bag inner surface. For this situation, the bag is generally a multi-layer laminate.

This forming can be achieved by either melting part of the leg into the bag surface or by injecting additional molten material into this region of the joint;

v) For this style of joint, the rigid mouth material and bag inner surface material need to be of similar nature in order for them to effectively melt together.

With this joint, it is obvious that, irrespective of any possible ridges formed in the rigid mouth bag as it is sandwiched between the two legs of the "Y" joint, there is provided:

1. A cost effective and tidy joint;
2. Good mechanical strength;
3. The whole process can be automated;
4. The finished joint has no internal product entrapment areas;
5. No stress has been induced into the bag.

It is to be understood that the scope of the invention is not limited to the described embodiment but that modifications and variations may be made to the particularly described example without departing from the scope of the invention as disclosed in the specification.
Industrial Applicability

The invention provides a rigid mouth bag with a rigid mouth that places no stress on the bag and which leaves no entrapment areas between the bag and the rigid mouth for product to egress into. The rigid mouth bag comprises a "Y" joint method of closure between the rigid mouth and the bag. The bag will find uses in numerous fields including, but not limited to, photography, drinks, foodstuffs, paint, pharmaceuticals, domestic and industrial liquids and as a liner to keep a container clean and reduce the need to clean containers after use.
CLAIMS

1. A rigid mouthed bag comprising a pouch or the like of flexible material, the pouch being inserted into a "Y" joint of a substantially rigid mouth, which, upon closure of the "Y" joint results in a rigid mouth bag in which no stress is placed on the pouch.

2. A rigid mouthed bag according to claim 1, wherein there are no entrapment areas for product inside the pouch.

3. A rigid mouthed bag comprising a pouch or the like of flexible material, the pouch being inserted into a "Y" joint of a substantially rigid mouth, the "Y" joint comprising two prongs of substantially equal length, which, upon closure of the Y joint results in a rigid mouth bag with no product entrapment areas.

4. A rigid mouth bag according to claim 3 wherein the Y joint is closed mechanically.

5. A rigid mouth bag according to claim 3 or claim 4 in which the Y joint is sealed after closing.

6. A rigid mouth bag according to claim 5 wherein the sealing method is selected from ultrasonic welding, radio frequency welding, gluing, heat sealing, heat forming.

7. A rigid mouth bag according to any one of the preceding claims which is comprised of only two pieces: a pouch and a rigid collar.

8. A rigid mouth bag according to any preceding claim in which the rigid mouth is circular, oval or rectangular in shape.

9. A rigid mouth bag according to any one of claims 3-6 in which the "Y" joint is symmetrical.

10. A rigid mouth bag according to any one of claims 3-6 in which the "Y" joint is asymmetrical.
11. A rigid mouth bag according to any one of claims 3-6 or 10 in which the "Y" joint includes a castellated leg, on one or more angular legs.

12. A rigid mouth bag constructed from a flexible material, the rigid mouth bag including:
   a pouch of flexible material having an open mouth; and
   a collar, the collar being sealingly connected to the pouch around its open mouth using a "Y" joint method of closure between the mouth and the pouch, thus providing a substantially rigid mouth at the open end of the pouch, without inducing stress in the bag.

13. A rigid mouth bag according to claim 12 in which the "Y" joint comprises two prongs of substantially equal length, which, upon closure of the "Y" joint results in a rigid mouth bag with no product entrapment areas.

14. A rigid mouth bag comprising a pouch of flexible material and a collar, the pouch being inserted between two prongs of a "Y" joint in the collar, the joint being mechanically closed and sealed such that no stress is placed on the pouch.

15. A rigid mouth bag according to claim 14 in which the joint is sealed by ultrasonic welding, radio frequency welding, gluing, heat sealing or heat forming.

16. A rigid mouth bag according to claim 14 or claim 15 in which the inner and/or outer leg of the "Y" joint is castellated.

17. A rigid mouth bag according to any preceding claim in which the pouch is of a plastics material.

18. A method of forming a rigid mouthed bag comprising a pouch or the like of flexible material including the steps of:
   inserting a pouch of flexible material between the two prongs of a "Y" joint in a rigid collar;
   closing the prongs of the joint; and
   sealing the joint,
   to thus produce a rigid mouth bag without inducing stress in the bag.
19. A method of forming a rigid mouthed bag comprising a pouch or the like of flexible material including the steps of:
   inserting a pouch of flexible material between two prongs of equal length of the "Y" joint in a rigid collar;
   closing the prongs of the joint; and
   sealing the joint,
   to thus produce a rigid mouth bag with no product entrapment areas.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ 98/00112

A. CLASSIFICATION OF SUBJECT MATTER
Int Cl6: B65D 35/10, 35/12, 33/02, 53/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC: A61J 1/10, 1/12; B65D 30/IC, 33/00, 33/01, 33/02, 33/16, 33/36, 35/02, 35/10, 35/12, 35/44, 37/00, 53/02, 77/06, 85/80

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU: B65D 33/02, 33/16

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT: IPC + Keywords

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>US 5429263 A (HAUBENWALLNER) 4 July 1995</td>
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