GUSSET STYLE POUCH IN PARTICULAR FOR FOOD PRODUCT CONTAINING A CLOSURE SYSTEM AND A HOLD OPEN ARRANGEMENT

Abstract: The gusset style pouch (1) is provided with a resealable closure system (2) configured to selectively define a top opening (7) of the pouch, at the opposite from a bottom (3), at least one strip (8, 9) of this system (2) being adapted for locking an open configuration, by engaging locking elements that pivot and cause interengagement between the strips of the closure system. The locking elements (41) are integrally formed with at least one strip (8) of said system and made of a semi rigid plastic material, less flexible than material of the pouch sidewall. An elongated predetermined measuring utensil (100) of shorter length than height (H) of an interior pouch volume can be stored along the sidewall by use of a holding part (55) formed on the strip (8) as a lower extension. A leveling can also be performed using a free edge (56) below the interlocking area.
GUSSET STYLE POUCH IN PARTICULAR FOR FOOD PRODUCT CONTAINING A CLOSURE
SYSTEM AND A HOLD OPEN ARRANGEMENT

BACKGROUND OF THE INVENTION

The present invention relates to a pliable reclosable plastic package, possibly adapted to store a solid food product taken out from the package (for instance granular edible products, using a predetermined utensil serving as a measuring device). More particularly, the invention relates to a gusset style pouch comprising:

- a bag (for instance a pilowbag or Doypack®) having a bottom, a front wall and a rear wall defining a flexible sidewall extending around a longitudinal axis, two junctions (typically longitudinal junctions extending parallel to the longitudinal axis of the sidewall) at opposite sides between the front wall and the rear wall, so that the bag defines a single opening adjacent to an upper end of the bag;

- a closure system comprising a first strip sealed to the front wall and a second strip sealed to the rear wall, the first strip and the second strip having inner mating surfaces, so as to define interlockable strips for attachment at an interlocking area in a closed configuration of the closure system;

- a hold open arrangement comprising:

  i) a first flexing line adjacent to one of the two junctions,

  ii) a second flexing line adjacent to the other of the two junctions, and

  iii) a main flexible part extending between a first end partly delimited by the first flexing line and a second end partly delimited by the second flexing line, locking means being rigidly coupled to at least one of the first end and the second end of the main flexible part and configured to pivot from a first flat configuration obtained when the closure system is in the closed configuration to a second bent, flexed, or engaged configuration.

A package of this type is known for example from document US 2014/0014789. The main flexible part is provided with two opposite locking flexures rigidly coupled to the first end and the second end of the main flexible part, such locking flexures being in locking contact with a surface of a complementary flexible part in the second configuration. Applying a slight pressure opens the arrangement to obtain a non-flat configuration and when the mechanism reaches a predetermined point, at least one of the ends (preferably the two ends) reaches a lock position, maintaining an open configuration. Closing the mechanism only requires a slight
pressure to be applied to the external surface of the flexible parts of the hold open arrangement, resulting in the flexures unlocking and rotating towards a closed configuration. When used to store edible food product for example, the open end of the pouch is typically sealed between uses in order to prolong the useful life of the remaining amount of product stored therein.

5 The bag can be maintained in the open configuration, which is advantageous when a product (preferably a flowable food product), for instance cereals, powdered milk, or similar granular food product has to be retrieved by the user. However, operation for assembling the closure system and the hold open arrangement in an upper part of the flexible bag is complex. Accurate positioning of the one or more bands that define the hold open mechanism is difficult as strips of the closure system have also to be sealed at a top of the bag. The closure arrangements, which have to extend across the entire width of the open end, are not suitable to maintain the side walls of the container in an open position, at least at the open end of the pouch, to permit easy access to the contents.

10 Besides with such kind of package, if the user is retrieving the content of the pouch by a utensil (a spoon for example, along the inner face of the pouch), a tearing action against one of the halves of the hold open mechanism may occur; and if one of the halves is not sufficiently secured to the flexible material of the bag, movement between the closed state and the open state of the pouch will be altered. Such tearing action is likely to occur because the halves are only secured to a bag wall by their main flexible part, not by their ends.

15 Moreover, it can be of interest of having some user-friendly options in such pouch containers provided with a closure system. For instance, a pouch container (gusset style pouch) disclosed in document JP 2013169993 is provided with a foldable portion configured as a spoon holding portion. The manufacturing is also complex when adding this kind of foldable portion secured to the front and rear walls. Additionally, the parts fixed to a flexible sheet material below the closure system can impair usual foldability of a pouch container if these parts have to be made of a rigid or semi-rigid material.

20 SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a pouch container, especially a gusset style pouch, showing user-friendly features by a simple
manufacturing process, and which can be at least as robust as conventional gusset pouches.

To this end, the subject of the present invention is a gusset style pouch of the abovementioned type, wherein the main flexible part and at least one locking element of the locking means are defined by the first strip which is made of a determined semi-rigid plastic material, and wherein the second strip, which is made of a semi rigid plastic material (preferably also of the determined semi rigid plastic material) defines at least one contact surface for retaining said locking element in the second configuration, whereby the first strip and the second strip of the closure system define the hold open arrangement.

With such arrangement, the gusset pouch can be manufactured with a simple assembly step, which is well adapted for mass production (i.e. with production equipment operating at a high rate). The pouch is user-friendly because the strips of the closure system provide the additional features, here for having the open configuration. It is thus understood that the same strip material can be used for defining anchoring elements or similar fixation means of the closure system, and the one or more locking elements of the hold open arrangement.

The strips that include the one or more locking elements are provided with a sealing surface (at the interlocking area), thus advantageously forming a barrier against insects and/or humidity. Preferably, the interlocking area extends from one of the two junctions to the other one of the two junctions. The locking elements are for example part of a zip-type closure (which comprise the Velcro® closures) for creating a reusable air tight seal at the open end of the pouch.

When having the one or more locking elements in the strips of the closure system, a more robust attachment can be obtained since each of the strips have their ends secured to the bag material at the side seams or similar junctions.

The pouch has here a gusset style since the interior volume is delimited by a flexible sidewall, preferably with a bottom gusset wall that optionnaly defines a seat (bearing means) for the pouch. Unlike conventional containers that may spring back to a closed or mostly-closed configuration when not held open (especially true where the container is a package constructed of flexible panels coupled together at a pair of longitudinal side seams), the pouch provided with the hold open arrangement is maintained in the open configuration such that the opposite rear wall and front wall of the pouch are widely separated making it easy to access withheld contents.
In preferred embodiments of the invention, use is furthermore made of at least one of the following arrangements:

- the strips are extruded strips each made of a single piece of a polyolefine material, preferably PP (strong living hinges are obtained with extruded PP material or similar extruded plastic and the strips can be sufficiently stiff; additionally, memory properties can be of interest for biasing or facilitating return of the closure system toward a flat configuration);
- two locking elements (defining two opposite locking tabs) are rigidly coupled to the first end and the second end and are each configured to pivot from the first flat configuration to the second configuration;
- the second strip defines two spaced contact surfaces, each adjacent to one of the two junctions, for retaining the two locking tabs in the second configuration;
- the two locking tabs are cut and are oriented according to opposite directions in the first flat configuration (with such arrangement, the sliding edge of the locking tabs can protrude sufficiently far toward the opposite strip to ensure a good lock, with possibility for the main flexible part to not deviate as much as the locking tab);
- the main flexible part is hingedly connected at said first flexing line to a pivot portion of the first strip distinct from any one of the two junctions and hingedly connected at said second flexing line to an opposite pivot portion of the second strip distinct from any one of the two junctions, the two junctions being longitudinal junctions extending parallel to a longitudinal axis of the sidewall;
- the bag defines a single interior volume between the bottom, the two longitudinal junctions and the interlocking area;
- the first strip and the second strip have each opposite ends that extend outside the interior volume and form part of said two longitudinal junctions;
- the bag is provided with a removable top portion that defines a sealing contact at the opposite from the bottom and prevents access to the closure system, a line of weakness or at least one pre-cut being defined between the removable top portion and the closure system;
- a pair of opposite pull members is provided at an upper end;
- the pull members protrude upwardly from the first strip and the second strip, respectively, in the closed configuration of the closure system;
- the pull members are spaced away from the two junctions and rigidly coupled to the first strip and the second strip for facilitating opening of the closure system and causing flexing of:
- the main flexible part that belongs to the first strip, and
- a complementary flexible part of the second strip, facing the main flexible part with a space in an open configuration of the closure system;
- the first and second strips are each provided with complementary anchoring elements so that the closure system is resealable, a sealing contact being continuously defined by the anchoring elements;
- each of the strips has an upper edge provided with two rectilinear upper rim portions separated by one of the pull members;
- the first strip and the second strip have each a height, measured from the rectilinear rim portions, that increases with increased space from the pull member of the corresponding strip;
- the flexing lines are each provided with a pair of two longitudinally spaced hinge connections (of lower thickness as compared to the thickness of the locking element);
- the locking tabs are each delimited by a cut and hinged at a base thereof, the base of each of the locking tabs extending between the hinge connections of a same pair, the locking tabs being each provided with a preferably rectilinear sliding edge configured to extend along the second strip in the second configuration;
- in at least one of the strips, which comprises an upper edge and a lower edge, the hinge connections have a determined material thickness reduced, and typically less than 50 percent of a material thickness of the adjacent locking tab, the determined material thickness being preferably defined by an outer slot that longitudinally extends from the upper edge to the lower edge;
- the hold open arrangement comprises at least two locking tabs rigidly coupled to a same end of the main flexible part.

A pouch in accordance to the invention may be obtained by a method only bonding two strips to the inner face of the bag to make the closure system, while having an efficient and robust hold open arrangement.

More precisely, a method of producing a gusset style pouch in accordance to the invention is provided, the method comprising the steps essentially consisting of:
- providing a bag having a flexible sidewall by attaching a front wall to a rear wall at two junctions that preferably extend parallel to a longitudinal axis of the sidewall, so that the front wall and the rear wall define a single opening opposite to a bottom of the bag;
- adding a closure system by sealing a first strip to the front wall and a second strip to the rear wall, the first strip and the second strip being interlockable strips for attachment at an interlocking area in a closed configuration of the closure system;
- cutting and/or weakening parts of one determined strip chosen amongst the first strip and the second strip of the closure system, which is made of a determined semi rigid plastic material, in order to define a first predetermined flexing line adjacent to one of the two junctions and a second predetermined flexing line adjacent to the other of the two junctions, so that a main flexible part of the determined strip extends between a first end partly delimited by the first predetermined flexing line and a second end partly delimited by the second predetermined flexing line,
- cutting strip material of the determined strip to define locking means rigidly coupled to at least one of the first end and the second end and configured to pivot from a first flat configuration obtained when the closure system is in the closed configuration to a second configuration, which is a bent, flexed, or engaged configuration;

wherein the other strip, which is also made of a semi rigid plastic material (preferably of the determined semi rigid plastic material) is sealed at the opposite of the determined strip to define at least one contact surface for retaining a locking element of the locking means in the second configuration, whereby the first strip and the second strip of the closure system define a hold open arrangement of the gusset style pouch.

With such a method, the strips are bonded in a simple and robust manner to the respective inner faces of the bag walls, while providing easy access to content for the consumer.

According to a particular, each of the first strip and the second strip are cut from a continuous extruded band of a same polyolefin material and the determined strip is cut to define two opposite locking elements, the two opposite locking elements being defined before a final cut to define a length of the determined strip and after forming anchoring elements of the determined strip.

According to a particular, the two respective ends of the first strip are each placed in a margin bonding area of the front wall used to define the junctions, when sealing the first strip to the front wall, while the two respective ends of the second strip are each placed in a margin bonding area of the rear wall used to define the junctions, when sealing the second strip to the rear wall. The junctions are obtained
by longitudinally bonding side edges of the font wall and the rear wall, parallel (typically with a small distance inferior to 5 mm) to the flexing lines.

 Independently or in combination with above mentioned, and with understanding that examples and details of realization hereafter described each can be used in isolation, the present invention here relates to flexible pouches, in particular gusset style pouches, with a resealable closure system intended for a food product. More specifically, the invention relates to a gusset-style pouch comprising:
- a flexible bag having a front wall and a rear wall made of a sheet material and extending from a bottom;
- a closure system comprising a fitment device secured to the front wall and the rear wall, the closure system comprising:
  - a first strip having an outer surface sealed to the front wall, and
  - a second strip having an outer surface sealed to the rear wall;
the bag defining an interior volume for the food product, the interior volume having a determined height measured between the bottom and a single opening of the bag; wherein at least one of the first strip and the second strip is made of a determined semi rigid plastic material and comprises:
  - an upper edge;
  - a lower edge;
- a protruding contact part adapted to be used in combination with a measuring utensil, the protruding contact part extending entirely below an interlocking area of the closure system and being preferably coupled to the lower edge; and wherein the protruding contact part extends between at least one base portion proximal with respect to the interlocking area and at least one free edge, preferably a same free edge, distal from the interlocking area, wherein the protruding contact part:
  - belongs to a strip portion not bonded to the bag,
  - and defines at least one of a leveling element and a retaining element for retaining an end of an elongated measuring utensil of shorter length than the determined height.
In other words, the closure system of the flexible pouch has at least one of the strips that is provided with a specific tongue-like part or similar contact part (possibly defined by two spaced protruding members) that protrudes toward the content and is matching with the cup shape and/or retaining feature of a measuring
utensil. The pouch is here intended in particular for a food product in powder form, which comprises a fitment at the upper end that defines the single opening.

Since the free edge can be distant from the inner face of the bag, the consumer can easily use the contact part as a leveling element and/or as a holding part where the measuring utensil can be repeatedly stored and retrieved (directly by grasping the handle, at a distance from the food product or other content). The protruding contact part is typically a tongue-like elastically deformable member, which protrudes sufficiently from the lower edge of the closure system, so that the leveling can be performed at a distance from the side wall of the bag. With the elasticity of the contact part, the user is not obliged to incline the measuring device almost vertically which could cause some of the product to fall out and thereby lead to a mismeasurement.

According to a particular, the pouch can be provided with a closure system enabling the particularly easy returning of a specific or nonspecific measuring device to the interior volume of the pouch, such that the user may retrieve this device during a subsequent use while limiting the risks of product contamination.

According to an alternating or complementary particular, the pouch can be provided with a closure system enabling the particularly easy leveling of a measuring device that is specific or nonspecific measuring device, just above the content and below the opening plane defined by the closure system, using the free edge of the protruding contact part. Here, it is understood that the closure system can be operated in any suitable manner, possibly without any anchoring elements. The closure feature is not limited in any way and, for instance, strips provided with magnetic material or magnetic members to perform a magnetic closure could be used. In such option, magnetic members could be reusable with different pouches having a same housing above the opening plane to retain the magnetic means.

The presence of a leveling element proves useful in practice for leveling the contents of a spoon or any other more complex measuring device by sliding the open side of the cup of this spoon past the free edge of this leveling element.

When a granular or powdery product needs to be measured precisely, it is preferable for the user to use for each use the same utensil or measuring device the volume of which is precisely defined. Moreover, if variable volumes of product need to be measured, as is the case in particular for baby milk powder, where the volume to be taken out depends on the quantity of milk to be prepared, the measuring device may prove to be rather more complex than a simple spoon. It is therefore
highly useful for the user to be able to retrieve the measuring device immediately for each use. However, for this purpose, the user should not have to carry out an unnatural or relatively tiresome operation at the end of the preceding use.

Preferably, the fitment device has a simple structure with two strips that are interlockable strips, preferably made of a semi rigid material.

In preferred embodiments of the invention, use is furthermore made of at least one of the following arrangements:
- the flexible bag contains:
  - edible granular material, preferably milk powder, and
  - the measuring utensil provided with a cup and a handle, which is adapted to be stored in the interior volume (typically entirely below anchoring elements of the closure system) in a storage position of the measuring utensil,
- the first strip or the second strip is provided with a holding part made of strip material, preferably as thin as the first strip and the second strip, and configured to maintain the measuring utensil in the storage position direction by a retaining contact defined at an end of the handle;
- the handle of the measuring utensil is provided with an insertion housing, preferably a slit of the measuring utensil, and the retaining contact is obtained by clamping of the holding part into the insertion housing;
- the holding part is provided with a free edge that defines a leveling element and is distal relative to a junction between the holding part and the interlocking area (the free edge is designed to come into engagement with said measuring utensil);
- the free edge extends parallel to a length of the interlocking area;
- the elongated predetermined measuring utensil, which is provided with the pouch, comprises a first end having a cup and a second end, the predetermined measuring utensil extending between the first end and the second end, the cup being provided with an open side;
- the second end of the predetermined measuring utensil comprises a clamping slit configured to match the free edge of the protruding contact part, the predetermined measuring utensil being oriented in a direction transverse to the interlocking area when the free edge is inserted into the slit;
- the second end of the predetermined measuring utensil comprises at least one sliding projection configured to slide and be retained into a slot of the protruding contact part, the predetermined measuring utensil being oriented in a direction
transverse to the interlocking area when the sliding projection is inserted into the
slot;
- the free edge has a length, defined by a rectilinear portion, which is at least equal
to the open side of the cup.

A further purpose of the invention is to provide a method of using a closure
system, in a gusset style pouch, to facilitate operation of retrieving a food content
inside the pouch by a measuring utensil. Indeed, user-friendly handling of a
measuring utensil is needed.

To this end, embodiments of the present invention provide a method of using
a closure system of a gusset style pouch, the closure system comprising a semi
rigid fitment device secured to the flexible front wall and the flexible rear wall and
configured to define a top opening of the pouch, at the opposite to a bottom, the
method comprising the steps essentially consisting of:
- providing an elongated predetermined measuring utensil of shorter length than
height of an interior volume defined by the pouch, the measuring utensil having a
handle free end opposite to a cup,
- fixing the predetermined measuring utensil to the fitment device by connecting a
holding part of the fitment device to a retaining element, preferably forming a
clamping rear slit, provided at the handle free end of the measuring utensil, the
holding part extending entirely below the opening,
whereby the handle free end extends above a content of the pouch and a
substantially vertical storage position for the measuring utensil is obtained when the
pouch stands in an upright position where the bottom defines bearing means of the
pouch.

Accordingly, when the pouch is used the next time, the measuring utensil is
immediately visible and can be withdrawn very easily if the handle free end is
adjacent to the opening and orientation of the measuring utensil is already a vertical
orientation. In other words, the measuring utensil is ready to be used immediately
for each use.

**BRIEF DESCRIPTION OF THE DRAWINGS**

- Figure 1A is a side view of the gusset style pouch with the closure system mounted
to a bag in an open position in accordance with one embodiment;
- Figure 1B is a side view of the gusset style pouch with the closure system mounted
to a bag in a closed position in accordance with one embodiment;
- Figures 2A and 2B show, respectively, the first strip and the second strip used in the closure system in accordance with a first embodiment;
- Figure 3 is a section view of the first strip of Fig. 2A in a non-bent configuration;
- Figure 4 is a section view similar to Figure 3, showing the closure system in an open position in accordance with the first embodiment;
- Figure 5 shows the first strip used in the closure system in accordance with a second embodiment;
- Figure 6 illustrates a cutting step performed to obtain the flexing lines and two locking elements in the first strip in accordance with a third embodiment;
- Figure 7 is a detail view illustrating position of a locking element of the first strip of Fig. 6, in an open position of the closure system;
- Figure 8A is a schematic cross-sectional side view of a flexible pouch similar as illustrated in Figures 1A-1B;
- Figure 8B is a schematic cross-sectional side view of a flexible pouch before removal of a top portion;
- Figure 8C illustrates a first strip used in the closure system in accordance with a fourth embodiment;
- Figure 9A is a perspective view of a measuring utensil provided with a rear slit and wrapped in a bag;
- Figures 9B and 9D illustrate, respectively, a top view of the handle of a measuring utensil adapted to be stored along a flexible side panel of the pouch;
- Figure 9C is a rear view of the measuring utensil of Fig. 9B, showing the rear slit;
- Figure 10 illustrates a leveling operation, using a contact part that protrudes from a lower face of one of the strips of the closure system;
- Figure 11 is a perspective view of a flexible pouch in an open configuration, showing a storage position of a measuring utensil;
- Figure 12 illustrates a first strip used in the closure system in accordance with a fifth embodiment;
- Figure 13 schematically illustrates a method to obtain the strips of the closure system in accordance with an embodiment;
- Figure 14 schematically illustrates a first strip used in the closure system in accordance with another embodiment.
DETAILED DESCRIPTION

In the various figures, identical reference numerals designate identical or similar elements.

It should be noted that the following detailed description and illustration are directed to flexible pouches that are releasable for containing a variety of products, preferably food products such as dry or powdered beverages, liquid or frozen single-strength beverages, concentrated juices, dry soups, baking mixes, cooking oils, salted snacks, dry and instant cereals, dried fruit, nuts, coffee, tea, spices, milk powder and other food products. Optionally, medications, tobacco, cold remedies, mouthwash, baking mixes, laundry soaps and softeners, chemicals, other non-edible products could form suitable contents.

As shown in Figures 1A-1B and 8A-8B, the pouch 1 is a packing container having a flexible bag B and a closure system 2. The bag B comprises a bottom 3, a front wall 4 and a rear wall 5 defining a flexible sidewalk. Here, the front wall 4 and the rear wall 5 are interconnected at two longitudinal junctions 6a, 6b extending parallel to a longitudinal axis X of the sidewalk. The two longitudinal junctions 6a, 6b may correspond to two stiffening welds (permanently sealed sides) of the bag B.

The front wall 4 and the rear wall 6 define an opening 7 opposite to the bottom 3. In some embodiments, the bag B made of flexible material is provided with at least one gusset having an interior edge extending between the respective inner faces of the front wall 4 and the rear wall 5.

Here, the bottom 3 is defined by a lower wall provided with a fold (so as to typically define a midsection 14 of gusset, here intersected by the longitudinal axis X). Such lower wall may be configured as a seat for the pouch 1. A W-shape can be used to define the bottom 3 as shown in Figs 8A-8B. In such non-limiting examples, the pouch 1 belongs to the group of the self-standing resealable pouches, so that the pouch 1 is suitable to display optional content information marked on an outer surface of the bag in an upright position. But of course, the bottom 3 may be configured differently and one or more gussets may optionally be provided laterally, preferably at a distance from the opening 7. When two optional gussets are laterally interconnecting the front wall 4 and the rear wall 5, it is understood that such gussets belong to the flexible sidewalk and define the two longitudinal junctions 6a, 6b. Stiffening welds can be provided to have a sealing between the front wall 4 and the gussets and/or a sealing between the rear wall 5 and the gussets.
In some embodiments, the bag B can be a mono-web construction of a film. But in preferred embodiments, the front wall 4, the rear wall 5 and the bottom 3 are obtained by assembling at least two different parts. Here with reference to Figs. 1A-1B and 8A-8B, the bag B is obtained by assembling three parts (a lower wall and two flexible sidewall panels P1, P2 that are superimposed over one another and sealed together).

The bag B includes several seal areas 11a, 11b, 12a where the two flexible sidewall panels P1, P2 are sealed together, e.g., heat-sealed. Here, the panels P1 and P2 are sealed together along side peripheral edges to form the longitudinal junctions 6a, 6b respectively, and optionally along a top peripheral edge 12 to form top seal 12a (Fig. 8B). Bottom peripheral edges 3a and 3b of sidewall panels P1 and P2, respectively, can also be sealed to one another to form a bottom seal and thereby complete a closed pouch structure. However, in a particularly preferred embodiment of the present invention illustrated in Figures 8B and 8B, a bottom gusset panel P3 having at least one fold is attached to the inner surface of sidewall panels P1 and P2. These panels P1, P2 here define the flexible front and rear walls 4, 5. The portion of the bottom gusset panel P3 above seal lines is not attached to the inner surface of the sidewall panels P1 and P2 such that midsection 14 of gusset is free and extends up into the interior of the bag B in a pleated fashion.

Alternatively, the bottom gusset panel P3 and the sidewall panels P1 and P2 can be made from the same web of material. The bottom gusset panel P3 can be formed by folding the bottom portion of the continuous web in a "W" section as disclosed in U.S. Patent 3,380,646 issued to Doyen et al.

More generally, it is understood that in an open state of the pouch 1, the flexible bag B defines an interior volume V having at least three sides (bottom side, right side and left side) that are sealed, whereby the opening 7 of the bag B opposite to the bottom 3 defines a single opening 7 of the bag B. The interior volume V has here a determined height H measured between the bottom 3 and the single opening 7. The longitudinal junctions 6a and 6b may be as long as the determined height H, as illustrated in Fig. 1A.

The film material used to form the bag B can be plastic, such as low, medium or high density polyethylene, polypropylene, polyester (PET), polyamide or any other material that is commonly used in the packaging industry, copolymers, or blends thereof. The film material can be a single layer cast or blown film, a multilayer coextrusion or laminate. The film material can also include one or more layers
of paper, metal foil, vacuum deposited metal or inorganic layer of aluminium or silicon oxide and/or a polymer barrier layer, such as ethylene vinyl alcohol or polyvinylidene chloride.

It is an important aspect of the invention that the material is flexible and capable of allowing a gusset to be formed. If the film is a multi-layer film, it is preferred that at least the inner layer of the bag B is a heat sealable layer.

Now referring to Figs 2A-2B and 8A-8B, it can be seen that the closure system 2 comprises two strips 8, 9 that are fixed one each other at the respective junctions 6a, 6b. Such strips 8, 9 here define two halves of the closure system 2 and are arranged as a fitment proximate to the opening 7. The first strip 8 of the closure system 2 is sealed to the front wall 4, while the second strip 9 is sealed to the rear wall 5. The inner layer of the bag B is thus covered by two strips 8 and 9, which are made of a semi rigid material. The strips 8, 9 are typically sealed in a continuous manner to prevent any leak between the bag B and the strips 8, 9. This is of interest when adding inert gas inside the pouch 1 after filling with the content 13.

Such semi rigid material, typically extruded polymeric material, can be the same for the two strips 8 and 9. The semi rigid material (relatively stiff and resilient, optionally having memory characteristics) can be high-density polyethylene, low-density polyethylene, polypropylene, polystyrene, PET, Nylon™, any other polymeric material feasible in the context of the present invention, or any combination thereof. The term "memory" is intended to mean the phenomenon where a material returns to its original, unstressed configuration after having been deformed to a stressed configuration and the deforming force causing the deformation has been removed.

In preferred embodiments, the two opposite ends 8a-8b, 9a-9b (see Figs 2A-2B) of the two strips 8 and 9 are sealed in two areas that belong to or interfere with the longitudinal junctions 6a, 6b. Such ends 8a-8b, 9a-9b thus extend outside the interior volume V and form part of the two longitudinal junctions 6a, 6b.

As shown in the Figs 1A-1B, 2A-2B, 5, 8A-8C and 11, the two strips 8 and 9 may be provided each with a pull member 16 or 18 that protrudes upwardly from an upper rim. This upper rim surrounds the opening 7 in an open state of the pouch 1. A plane of the opening 7 is defined by such upper rim. Here in the first strip 8, two rectilinear upper rim portions 81, 82, separated by the pull member 16, are provided. In the second strip 9, two rectilinear upper rim portions 91, 92, separated by the pull member 18, are also provided. Such upper rim portions 81, 82, 91, 92 at the upper
edges 8c and 9c of the strips 8 and 9 define a plane of the opening 7, as apparent in view of Figs 1A and 11 in particular.

The pair of opposite pull members 16, 18 are optionally in contact with each other in a first flat configuration of the closure system 2 as shown in Fig. 1B. The pouch 1 assumes a generally flat configuration (especially at a distance from the bottom 3) after it has been formed, filled, and sealed. The pull members 16, 18 are spaced away from the two longitudinal junctions 6a, 6b. Here they define central tabs, with similar height or with a difference of height. Alternatively, the pull members 16, 18 can be arranged differently at the upper end of the closure system 2, possibly with a shift and/or a small spacing between the opposite pull members 16, 18.

Preferably as shown in Figs 2A-2B, the height H1 of the pull members 16, 18 is substantially the same and can be lower than 15 or 20 mm. The pull members 16, 18 are rigidly coupled to the main flexible parts 28, 29 of the strips 8 and 9. With such arrangement, fingers of the user are well positioned, very close to the plane of the opening 7, and it prevents the pull members 16, 18 to be flexed. It is understood that appropriate pressure (outwardly for actuating the opening and inwardly for actuating the closure) is exerted without too significant effort for the user.

Referring to Figs 8A-8B, the pouch 1 is optionally provided with a top peripheral edge 12 and, before a cutting or tearing or peeling action to remove such top part of the pouch 1, the content of the pouch 1 cannot be poured or retrieved through the single opening 7. In other words, the content 13 (powdered milk or other granular or powdery product for example) is perfectly preserved in the pouch 1 until used for the first time when the top peripheral edge 12 is removed, optionally with the aid of one or more peeling-off tongues, tearing tongues, weakened areas or the like. Here, as simple cut along the dash line (a rectilinear dash line in this non limiting example as shown in Figs 8B and 8C) is sufficient to provide access to the content because the closure system 2 is not in the first flat configuration. Preferably, the upper level 19 of the content 13 extends below the closure system 2.

Of course the dash line could also be non rectilinear. For instance, the top peripheral edge 12 could be removed without flexible material remaining at the left and right sides of the corresponding pull member 16 or 18.

The top portion 120 of the pouch 1 is preferably provided with a line of weakness 12b (at the dash line) that extends laterally across both walls 4 and 5 in close proximity to but below the top peripheral 12a and above the strips 8, 9,
described below. The line of weakness 12b may be formed by, for example, perforating or scoring the front wall 4 and the rear wall 5 with a laser or knife either individually before these walls 4 and 5 are sealed together, or collectively after they have been sealed together. One or both ends of line of weakness 12b preferably terminate with a notch 12c (see Fig. 8C), which provides a stress concentration and aids in starting a tear along the line of weakness 12b when the pouch 1 is opened by a consumer.

More generally, any binding means that define a tight seal at the top peripheral edge 12 can be provided to have the resealable closure system 2 protected before the first use. Here pull members 16 and 18 are covered by the binding means. But alternatively, the pull members could extend externally with respect to the film material or foils 21, 22 defining the bag material. In such case, the pull members (not shown) protrude radially outwards from a part of the bag B in the upper end of the pouch 1, so that such part of the bag B is sandwiched between a strip 8 or 9 and the corresponding pull member.

After the first use, as illustrated in Figs 4, 8A and 11, the closure system 2 is in a second configuration, with the front wall 4 and the rear wall 5 widely spaced thanks to a hold open arrangement defined by the two strips 8 and 9.

More precisely, one of the strips 8 and 9 sealed to the bag B, here the first strip 8, is provided with:
- a first predetermined flexing line 25a adjacent to one of the two junctions 6a and not defined at one end 8a (corresponding end used to define the junction 6a) of the strip 8,
- a second predetermined flexing line 25b adjacent to the other of the two junctions 6b and not defined at the other end 8b (corresponding end to define the junction 6b) of the strip 8,
- a main flexible part 28 (see Figs 3-4 in particular) extending between a first end 28a, here partly delimited by the first predetermined flexing line 25a, and a second end 28b which is here partly delimited by the second predetermined flexing line 25b,
- opposite pivot portions 31 and 32, including a first pivot portion 31 interconnecting the first end 28a to the end 8a and a second pivot portion 32 interconnecting the second end 28b to the end 8b.

Two opposite pivot portions 31 and 32 are preferably provided in the same strip 8 near the opposite ends 8a and 8b, in order to provide a spacing between the main flexible part 28 and the junctions 6a, 6b that are typically more rigid. In the
firstly strip 8, the main flexible part 28 thus can be hingedly connected at the first and second flexing lines 25a and 25b to the pivot portions 31, 32 that are not attached to the second strip 9 (such pivot portions thus being distinct from any one of the two junctions 6a, 6b). As shown in Fig. 11, the thickness at the junctions 6a-6b can be about twice the thickness (here a constant thickness e1 as shown in Fig. 3) defined in the main flexible part 28 and in the ends 8a, 8b.

In the first strip 8 and optionally in the second strip 9, the flexing lines 25a, 25b extend longitudinally and are obtained by locally reducing the thickness. As shown in Fig. 2A, the distance d between the flexing lines 25a, 25b and the junctions 6a, 6b is reduced and is typically inferior or equal to 10 mm, preferably comprised between 2 mm and 5 or 6 mm. Referring to Fig. 3, the determined thickness e2 of the semi rigid material is for example equal or less than 50 percent of a material thickness e1 of the main flexible part 28. This determined material thickness e2 is preferably defined by respective outer slots 35, 36, 37, 38 that longitudinally extend from the upper edge 8c or 9c of the strip 8 or 9 to the lower edge 8d or 9d. The same thickness profile can optionally be provided in the second strip 9.

As illustrated in Figs 2A, 4 and 11, the first end 28a and the second end 28b of the flexible part 28 can be each provided with a locking tab 41, 42, so as to define the locking means of the hold open arrangement. While the first strip 8 is here described as having two locking tabs 41, 42, other arrangements can be provided, for instance with only one protruding locking element provided in the first strip 8 and/or one or more optional protruding locking elements formed in the second strip 9.

Respective hinge connections, here spaced hinge connections 44a-44b and 45a-45b, are provided where the material thickness is locally reduced. The position of the first predetermined flexing line 25a corresponds to the alignment position of the pair of hinge connections 44a and 44b. The locking tab 41 is delimited by a cut and hinged at a base 41a thereof. An opposite locking tab 42 is also delimited by a cut and hinged at a base 42a thereof, as shown in Figs. 2A and 5. It is understood that the base 41a or 42a of each of the locking tabs 41, 42 here extends between two hinge connections 44a-44b, 45a-45b. With such arrangement, the locking tabs 41, 42 are configured to pivot between a flat configuration (when the strips 8, 9 of the closure system 2 are fastened one to each other) and a second configuration
that is a bent, flexed or engaged configuration (when the strips 8, 9 are bent as shown in Figs 1A, 4 and 11).

It should be noted that the interlocking area 10, in the first flat configuration of the closure system 2, is elongated along a virtual axis Y that intersects the upper hinge connections 44a and 45a, and which is perpendicular to the longitudinal axis X.

Fig. 6 illustrates that the hinge connections 44a-44b and 45a-45b can be defined by a simple cutting operation performed after having the anchoring elements 51 formed on the inner face of the first strip 8. Similar operation can be performed to obtain the second strip 9 but only the slots 37, 38 can be defined as two locking elements on the first strip 8 may be considered as sufficient. In a variant, each of the strips 8, 9 is provided with one or more locking elements such as locking tabs 41, 42.

Referring to Fig. 7, it can be seen that one or more of the slots can be defined as inner slots. It is also understood that the hinge connections 44a-44b and 45a-45b can be optionally shifted with respect to the base 41a, 42a of the locking tabs 41, 42, as shown in Figs 6-7. This can be advantageous to have a longer locking tab 41, 42, 141, 142 without increasing the distance d between the flexing lines 25a, 25b and the junctions 6a, 6b. Such space can be as low as 5 mm or less for the first strip 8. A corresponding distance can be identical in the second strip 9 when provided with similar flexing lines.

Now referring to Fig. 4, it can be seen that the locking tabs 41, 42 are flexed when the strips 8, 9 are widened. The actuation at the pull members 16, 18 (when gripped and pull away one from each other) causes the main flexible parts 28, 29 to be conformed according to an annular shape. Since the junctions 6a, 6b are sufficiently rigid and the adjacent pivot portions 31, 32 are very short when viewed in a transverse plane, such pivot portions 31, 32 are not significantly flexed (they still have a substantially flat aspect).

At the respective flexing lines 25a, 25b, the ends 28a and 28b of the main flexible part 28 are thus in an angled configuration as compared to the junctions 6a, 6b. Because of such angle, the respective locking tabs 41, 42 are orientated away from the adjacent junction 6a or 6b and abut against respective contact surface CS1, CS2 of the second strip 9. The contact surfaces CS1 and CS2 may be each adjacent to one of the two junctions 6a, 6b. When slots 37, 38 are provided to delimit the main flexible part 29 of the second strip 9, it is understood that such
contact surfaces CS1 and CS2 extend at opposite ends 29a, 29b of the main flexible part 29. As well illustrated in Fig. 4, the optional slots 37, 38 are advantageous to define predetermined flexing lines in the second strip 9 that are exactly facing the flexing lines 25a, 25b, so that pivot portions 31', 32' are also present in the second strip 9.

More generally, it is understood that any locking element arranged proximate the pivot portions 31, 32 can be retained by such kind of contact surface CS1, CS2 when the closure system 2 is in a second flexed or bent configuration, as illustrated in Fig. 4.

This open configuration corresponds to a predetermined configuration because of the hold open arrangement, which is here defined by the strips 8, 9 (only two pieces of plastic material is the advantageous depicted embodiments). Indeed, with locking elements such as the locking tabs 41, 42, a bistable pull-snap hold open arrangement is defined by the strips 8 and 9. As the strips 8, 9 extend as far as ends 8a-8b and 9a-9b inserted in the junctions 6a, 6b and are used to define the closure system 2, such hold open arrangement is robust.

In accordance with one embodiment of the present invention, the pouch 1 comprises at least one locking element or similar locking means. As used herein, the term "locking," and derivative terms thereof, refers to a structure that can be held in place by friction, adhesion or other forces feasible in the context of the present invention. The term "locking" and derivative terms thereof may also refer to the engagement of a structure comprising more than one semi-rigid locking tab 41, 42, 141, 142 (see Fig. 5 for instance) or similar elements.

To open the pouch 1 as shown in Fig. 11, anchoring elements 51, 52 of the closure system 2 have to be disengaged. This is performed by simply grasping the upper portion of opposing walls 4, 5 and/or the optional pull members 16, 18 and pressure manually given to separate the anchoring elements 51, 52 is sufficient to have the strips 8, 9 sufficiently bent (beyond an angle threshold).

When angle between the main flexible part 28 and one or more of the pivot portions 31, 32 reaches a predetermined threshold, at least one of the ends 28a, 28b (preferably the two ends 28a, 28b) reaches a lock position, maintaining an open configuration. Closing the mechanism only requires a slight pressure, typically by exerting thumb or finger pression against the pull members 16, 18 or other parts of the strips 8, 9 that define the closure system 2. Memory characteristics of the strip material are preferred to facilitate reclosing in a tight manner.
Of course, the locking elements that here protrude and are configured as locking tabs 41, 42 are rigidly coupled to the respective first end 28a and the second end 28b and configured to pivot from a first flat configuration obtained when the closure system 2 is in the closed configuration to a second configuration, which is a bent, flexed, or engaged configuration.

The locking tabs 41, 42 can be provided with a sliding edge 49 generally parallel with that of the pivot portions 31, 32, which engages the corresponding contact surface CS1 or CS2 of the second strip 9. Because of the engagement by the locking tabs 41, 42 and since the first strip 8 having the locking tabs 41, 42 and the second strip 9 are made of a semi rigid material, the main flexible part 28 is held (here in a bent configuration) in a separated orientation relative to that of the second strip 9.

Referring to Figs 1A, 4 and 8A, it is understood that the complementary anchoring elements 51, 52 used to define the interlocking area 10 remain widened because of the specific orientation of the main flexible part 28. Additionnally, the contact between the locking tabs 41, 42 and the corresponding contact surfaces CS1, CS2 can cause the second strip 29 to be similarly bent. For this purpose, slots 37, 38 (Fig. 4) are optionally provided proximate corresponding pivot portions 31', 32' of the second strip 9.

In the first flat configuration of the closure system 2 as shown in Fig. 1B, it is understood that the inner mating surfaces of the strips 8, 9 can be substantially in a same longitudinal virtual plane defined by the two opposite junctions 6a, 6b. In contrast in the second configuration, such mating surfaces are generally between about 90 degrees and 180 degrees of separation relative to one another.

In the first flat configuration, a sealing contact is continuously defined by the anchoring elements 51, 52. As the two strips 8, 9 cooperate to allow the bag B to be opened and sealed repeatedly, it is understood that the reclose feature is performed by anchoring elements 51, 52 that are not made of brittle material. The reclose feature may correspond to a zipper type feature. As used herein, the expression zipper type feature includes press-to-close zippers.

In some constructions, slide-style zippers can be used, preferably with the strips 8, 9 directly forming parts of such zipper. Numerous other types of reclose features, especially a Velcro® type feature as illustrated in Figs 8A-8B, could be used to form the anchoring elements 51, 52.
Such anchoring elements 51, 52 may include male and female securement means, for instance male members in the first strip 8 and female members in the second strip 9 or vice versa. In a first embodiment (Figs 2A-2B and 3) and in a second embodiment (Fig.5), such sealing contact is obtained by continuous mating surfaces provided in the anchoring elements 51, 52 and in the pivot portions 31, 32, while the ends 8a, 8b are deprived from such anchoring elements 51, 52. Accordingly, the longitudinal sealing between the ends 8a and 8b does not interfere with the interlocking area 10.

The strip 108 of the second embodiment essentially differs from the strip 8 of the first embodiment in that additional locking tabs 141 and 142 are provided, as shown in Fig. 5. Three hinge connections may be provided to define the flexing lines 25a, 25b. It can be seen that the two upper locking tabs 41 and 42 are cut and oriented according to opposite directions in the first flat configuration. Similarly, the two lower locking tabs 141 and 142 are cut and oriented according to opposite directions in the first flat configuration.

In a third embodiment as shown in Fig. 6, the closure system 2 can be provided with pivot portions 31, 32 that are not containing any anchoring elements 51, 52 so that the interlocking area 10 is shorter than the distance L6 measured between the junctions 6a, 6b in the closed configuration of the closure system 2. Indeed, the interlocking area 10 is only provided in the main flexible part 28. As the pivot portions 31, 32, 37, 38 can be short portions which are not oriented substantially differently in the second open configuration, the closure system 2 is still efficient to seal access to the content 13. In particular, the strips 8, 9 are sufficiently fastened in the first flat configuration to prevent insect from passing in the interior volume V.

For having a good barrier effect (against humidity in particular), first and second embodiments are preferred. In a fourth embodiment as shown in Fig. 8C in particular, the anchoring elements 51 (here under form of a band) extend over the whole width or almost such width of the pouch 1. For instance, the end 8b of the strip 308 (which is sealed to the end 9a of the strip 9) also comprises a margin part of the anchoring elements 51. Such configuration is efficient to have a good barrier effect when the closure system 2 has been manually closed by the user. Such arrangement for the anchoring elements 51, 52 can be used, of course, in the other depicted embodiments.
Referring to Fig. 12, a fifth embodiment is shown with a first strip 408 very similar to the strip 108 of the second embodiment, but with anchoring elements 51 that extend between upper locking tabs 41, 42 and lower locking tabs 141, 142. Such embodiment is of interest to have a robust hold open arrangement and provide more space above the interlocking area 10 for the fingers when grasping the pull members 16, 18. Of course, the second strip (not shown) is provided with corresponding anchoring elements 52 and with two flexible parts (one above the interlocking area 10 and the other below the interlocking area 10) to form the opposite contact surfaces engaged by the locking tabs.

It is understood that strips 8, 9 having one or more intermediate sections of lower height as compared to the height at the ends 8a-8b, 9a-9b can be preferred. As shown in Figs 2A—2B, 5 and 11, amount of plastic can be saved, while having robust junctions at the ends 8a, 8b, 9a, 9b since height is greater. In such preferred embodiments, for at least one of the strips 8 and 9, there is an increase of height (here measured from the rectilinear rim portions 81, 82, 91, 92 of the upper edge 8c or 9c) with increased space from the pull member 16 or 18.

It is also understood that the main flexible parts 28, 29 can flex more easily when having a reduced height, for instance as low as 6 mm or less (minimum of height, at a distance from the ends 8a, 8b, 9a, 9b). It should also be noted that the anchoring elements 51, 52 may act as stiffening elements of the corresponding strip 8 or 9.

The anchoring elements 51, 52 may be either integrally formed with strips 8, 9 (using the same plastic material) or coextruded with the strips 8, 9 or overmoulded. When not using the same material, the anchoring elements 51, 52 are for example made of a flexible material having a lower modulus than that of the strip material used to define the flexible parts 28, 29, the pivot portions 31, 32, 31’, 32’ and the ends 8a-8b, 9a-9b.

The method of manufacturing the pouch 1 may proceed, inter alia, in the following manner. The walls of the bag B, here defined by two opposite panels P1 and P2 and the optional gusset wall P3 (see Figs 8A-8B) are produced each in a conventional manner. The flexible material of the bag B can include plastic and is preferably a multilayer compound forming a very effective oxygen barrier when the product is powdered milk, for example. However, it may, of course, be a bag B produced from another material, in particular metal or composite material (one or more multilayer boards could also form at least some parts of the bag B).
Referring to Fig. 13, the first strip 8, 108, 208, 308, 408 and the second strip 9 are separately produced from a polyolefine material, preferably PP, using an extrusion apparatus 60 and a forming roller 62. A barrel or similar section of the extrusion apparatus 60 melts and forces the molten plastic 20 through a die 61 into the nip 64. More precisely, the molten plastic 20 (also called molten resin) is continuously introduced to a gap formed along a peripheral surface of the rotating forming roller 62, such that the plastic forms at least a part of the strip-form base of the strip 8, 108, 208, 308, 408 or 9 at the peripheral forming roller surface and fills an array of fixed cavities defined in the rotating roller 62 to form portions of the fastener / anchoring elements 51, 52 as projections extending from a side of the sheet-form base. Here, the continuous band of molten plastic 20 may be as narrow as one strip 8 or 9 and the anchoring elements 51 can be formed as shown at the top of Fig. 6, before a cutting step. The cavities in the roller 62 are typically shaped to form anchoring elements 51 adapted to engage loops. When the anchoring elements 51, 52 form a zipper closure, the cavities may be replaced by one or more grooves having the complementary profile (constant profile) with respect to the desired shape for the anchoring elements 51, 52.

A base roller 63 is used in a conventional manner to have sufficient pressure when molding the anchoring elements 51 or 52. Such configuration is particularly suitable to define hook-like anchoring elements 51 in the first strip 8. The second strip 9 provided with the loops or similar anchoring element 52 can be obtained in a conventional manner, and may optionally combine two layers of material (a base layer and a layer for forming the loops). Optionnally, the loops are not necessarily totally closed loops and can be arranged as female hooks having a pronounced curvature, which are more flexible than the male hooks.

More generally, it is understood that the anchoring elements 51, 52 can be provided with a great multiplicity of fastener members (for example hooks and loops) or with continuous fastener members (for example press-to-close zippers or the like).

The strips 8, 108, 208, 308, 408, 9 provided with the anchoring elements 51, 52, after passing the nip 61, may travel around the periphery of the roller 62 and optionally around a stripping roller 67 which assists in pulling the strip 8 or 9 and extracting each relief from the corresponding cavity of the roller 62, and thence to a windup device, not shown.
At least for the first strip 8, 108, 208, 308, 408, a cutting step is performed by cutting means 65, 66, here downstream with respect to the roller 67. Indeed, the section S8 of the continuous band, obtained just after operation by the roller 62, has to be cut, in order to have:

5 - the locking tabs 41, 42, 141, 142 or similar locking means;
- the slots 35, 35, 37, 38;
- optionally a specific profile at the upper edge 8c, 9c, preferably with a pull member 16 or 18 at a midsection;
- optionally a specific profile at the lowered edge 8d, 9d, preferably with removal of plastic material at a distance from the ends 8a, 8b, 9a, 9b of the strips 8, 9, a
holding part 55 for a measuring utensil 100 and/or a free edge 56 of a leveling element being also optionally defined.

The cutting means may comprise one or more modules 65, 66. Here, the locking means are precut and obtained using longitudinal cuts and transverse cuts.

The cutting means are thus adapted to perform cuts at short distance from the strip ends 8a, 8b such a shown in the non-limiting example of Fig. 6. One ore more locking tabs 41, 42, 141, 142 or similar locking elements are formed in the strip material and are able to form protrusions in the second configuration. Some parts, instead of being cut (using a cut module to define slots 35, 36, 37, 38), can be weakened by any suitable means (for example, by forming recesses when forming the anchoring elements 51, 52).

The first strip 8, 108, 208, 308, 408 and the second strip 9 are each cut from a continuous extruded band and the same polyolefin material is preferably used to define the closure system 2.

At least one of the strips 8, 108, 208, 308, 408, 9 may optionnaly be obtained by combining more than one layer of extruded plastic material. For instance, a sheet-form base may serve as support for an outer layer provided with the anchoring elements 51, 52. Of course, if an outer layer is supplied, such outer layer become permanently bonded to the molten plastic of the base layer and become part (when solidifying the resin) of the strip-form base of the strip 8, 108, 208, 308, 408 or 9 so that one cannot distinguish the two layers on the final strip.

After a cooling step, it is understood that the semi rigid plastic material of the continuous band has memory features and is typically stiff, for instance as stiff as Nylon® and in a plastic material less brittle as Nylon® (preferably with an elastic modulus superior to 1 GPa). Polypropylene is typically preferred because the living
hinges defined at the flexing lines 25a, 25b, are stronger and the locking tabs 41, 42, 141, 142 are stiff enough.

The strips 8, 108, 208, 308, 408, 9 having the anchoring elements 51, 52 are retrieved, preferably after a final cut (not shown) to define a length of the strip 8, 108, 208, 308, 408 or 9. These strips 8, 108, 208, 308, 408, 9 are then each bonded to either the inner face of the front wall 4, or the inner face of the rear wall 5.

Figs 8C and 12 show typical position of the first strip 308, 408, with the ends (here only the end 8b is shown) interfering with a margin bonding area 30 of the front wall 4. Such margin bonding area 30 is used to define the junction 6b (operating bonding area during the fastening between the front wall 4 and the rear wall 5). Preferably, each end 8a, 8b, 9a, 9b of the strips 8, 108, 208, 308, 408, 9 can be placed in such manner, in order to have these strips partly inserted in the junctions 6a, 6b.

The junctions 6a, 6b (which can extend between the bottom 3 and the top peripheral edge 12 or other suitable end beyond the opening 7) and at least one lower seal are obtained in a a first sealing step before a filling step. In some constructions, the bottom peripheral edges 3a and 3b extend transversally to the longitudinal junctions 6a, 6b and two lower corner portions CP1, CP2 are defined at intersection between the junctions 6a, 6b and the edges 3a, 3b, respectively. The top seal 12a at the top portion 120 is defined in a second sealing step after the filling step for filling the interior volume V with the content 13.

In some embodiments an additional box, typically more rigid than the bag B, can be provided to house one or more pouches 1. While the embodiments depicted in the figures show rectangular margin bonding areas 30, it is understood that other shapes can be used, depending of the kind of pouch 1 to be produced. Additionnaly, some steps such as one ore more cutting steps could be performed at earlier or later stage. The hinge connections 44a, 44b, 45a, 45b thus are not necessarily formed by a slitting operation performed after molding (or similar forming) of the anchoring elements 51, 52.

In some constructions, the hinge connections 44a, 44b, 45a, 45b can be formed by die cutting, or directly in an injection molding process, or laser engraving, among other possible techniques. In some constructions, the hinge connections 44a, 44b, 45a, 45b can have a material thickness that is 10 percent or less of a material thickness of the adjacent locking tab 41, 42 and the adjacent pivot portion
31, 32. The material thickness of the hinge connections 44a, 44b, 45a, 45b can be between about 0.2 mm and about 0.5 mm in some constructions.

In some constructions, the hinge connections 44a, 44b, 45a, 45b are provided by a separate material and/or multi-piece hinge mechanism coupled between the main flexible part 28 or 29 and each locking tab 41, 42, 141, 142. However, the hinge connections 44a, 44b, 45a, 45b may be provided as any portion that enables folding, bending, or pivoting. For example, the hinge connections 44a, 44b, 45a, 45b may be provided by only a fold or crease in the material.

A closure system 2 suitable to be used as a fitment in a pouch 1 will be now described, referring to Figs 2A-2B, 5, 8C, 9A-9C and 10-11, 14, such closure system having two strips and a tongue-like contact part 55, 55' interacting with a measuring utensil 100.

The closure system 2 can have all the features that have been described above. However, the hold open arrangement and/or the specific way of implementing the interlocking area 10 are considered as options. For sake of conciseness and simplicity, additional description of the bag B will be not provided since the walls of the bag B can be typically as in the preceding part of the description. But the way the closure system 2 is connected to the upper end of the bag B is no way limited to the preceding examples when considering the following part of the description.

With regard to the measuring utensil 100 as illustrated in Figs 9A and 11, this is similar to a spoon in the embodiment shown, that is to say it has a cup 101 which defines a fixed measuring volume and is, in such option, substantially cylindrical up to the open side of this cup 101. A handle 102 extends from the cup 101 to a free end 102a. The measuring device 100 thus has an elongate form and is made of plastic material or equivalent material. The measuring utensil 100 is a measuring device of predetermined form, preferably designed to be sold with the whole pouch 1 and the fixed measuring volume of which is specific to the content 13 in question, here a food product.

When sold with the pouch 1, the measuring utensil may be initially wrapped in a bag shown in Fig. 9a, inside the interior volume V or in a separated houding defined by the top portion 120 or in a bag fastened onto an outer surface of the bag B.

Using a predetermined measuring utensil 100 enables a coupling free edge 56 of a contact part 55 integrally formed with one of the strips 8 and 9 to be
configured such that it engages tightly with a corresponding portion, here a rear slit 103 and/or the annular rim 14 of the cup 101, of the measuring utensil 100 that has a known and precise geometry.

Now referring to Figs 2A-2B and 11, it can be seen that each of the strip 8, 9 that are actuated to close the opening 7, directly or indirectly, can be be provided with a tongue-like (but other shapes can be used) contact part 55 for interacting with a measuring utensil 100. The contact part 55 is arranged entirely below the interlocking area 10 and defines a leveling element not directly fastened to the inner face of the bag B. Here in Fig. 11, it can be seen that the contact part 55 may be provided with a recess or a central hole 50. Two arm portions 40a, 40b extend downwardly from a base portion 55a proximal with respect to the interlocking area 10 to an insert portion 55b provided with the rectilinear free edge 56. The insert portion 55b is configured to slide inside the rear slit 103 and, because of a clamping effect at the handle 102, the measuring utensil 100 is retained by the contact part 55.

Since the contact part 55 is defined as a lower extension protruding downwardly, the movement to connect the handle 102 is thus a short upward movement. The contact part 55 is made of strip material, typically as thin as the first strip 8, 108, 208, 308, 408 and the second strip 9. Each of the opposite faces defined by the contact part 55 may be deprived from any relief. Accordingly, no powder can accumulate on such faces, which is of interest for having a correct connection of the insert portion 55b through the slit 103. Optionnally some projections may be formed on one of the opposite faces, for example for guiding movement of the handle 102 during insertion of the insert portion 55b. Such optional projections may be distributed around the contact area between the handle 102 and the insert portion 55b.

Referring to Figs 9B-9C, the rear slit 103 may be defined between a main portion of the handle 102 and at least one clamping member 106, 107 that longitudinally extends between a connection part 106a, 107a and a free end 106b, 107b. The slit 103 is here not laterally delimited by left and right walls, in order to facilitate insertion of the insert portion 55b. The contact part 55 may be a protruding contact part that is connected to the edge 8d or 9d of the corresponding strip 8; 9. An interspace is defined between the inner face of the bag B and the contact part 55 so that a leveling can be performed by use of the free edge 56.
Regarding the rear slit 103, the term "rear" should not be interpreted in a strict manner (not necessarily having a rear orientation in the measuring utensil 100). It simply means that the slit 103 is arranged at or close the free end 102 of the measuring utensil 100. In a preferred embodiment as shown in Fig. 9D, the measuring utensil 100 can be of simple construction with the slit 103 opening forwardly and with a slit access provided on the same side as the open side of the cup 101. Such configuration can be obtained with a single longitudinal cut, substantially as wide or almost as wide as the handle 102. A clip element 110, here defined by a single elastic tongue, is defined because of the cut (but the cut may be significantly shorter than the clip element 110 to improve strength of the connection of the clip element 10). With such kind of rear slit 103, the hole 50 is required to define a passage for the clip element 110, when engaging the contact part 55 in the rear slit 103.

The clip element 110 may have a structure similar to a clip of pen cap and the insert portion 55b of the contact portion 55 may be engaged into the slot 103 by a consumer without placing fingers below the contact portion 55. Indeed, only the free end 102a will be touched by the consumer when storing the measuring utensil 100.

As shown in Fig. 10, leveling is performed by sliding the open side of the cup 101 of the measuring utensil 100 against the rectilinear free edge 56, thereby obtaining a volume of product in the measuring utensil 100 which corresponds very precisely to the volume of the cup 101. For this purpose, length of the rectilinear portion of the free edge 56 is at least equal to the open side of the cup 101. Else, if there were no rectilinear portion, for example if there were a concave free edge, the powder would not be leveled off correctly at the top of the open side, and what is worse, in the case of a convex free edge, the locally protruding rim thereof could catch on the cup 101 and cause powder to tip out. On the other hand, it is necessary for the free edge 56 to be sufficiently spaced from the bag sidewall of the bag B so that the user is not obliged to incline the measuring device 100 almost vertically which could cause some of the product to fall out and thereby lead to a mismeasurement. The interspace is here obtained because the material BM of the bag B is flexible and cannot stop the cup 101 when leveling is performed. The flexure of the bag B allows an angle Θ to be locally formed behind the contact part 55, and the free edge 56 can thus be radially spaced with respect to the material BM of the bag B, while the base portion 55a remains along this sheet material BM.
When the contact part 55 defines a leveling element, it is understood that it can be configured as a tongue that cannot flex significantly, and typically that cannot be folded (without cracks or rupture). In the non-limiting depicted embodiments, because of memory effect of the semi rigid material forming the strip 8 or 9 provided with the contact part 55, the contact part can extend parallel to a plane defined by the interlocking area 10 in the closed configuration of the closure system 2, even after several leveling operations and repeated closures of the pouch 1.

Referring to Figs 2A-2B, it can be seen that extension L5 of the protruding contact part 55 is lower than height of the ends 8a, 8b, 9a, 9b of the strips. Such small extension, for example less than 20 mm and preferably less than 15 mm, is advantageous to perform the leveling sufficiently above the upper level 19 of the content 13 while having a pouch 1 sufficiently filled with the product.

Here, the contact part 55 defines a leveling element and an insertion edge for retaining the free end 102a of the handle 102. As shown in Fig. 11, the measuring utensil 100 is of shorter length than the determined height H of the interior volume V.

In order to immobilize the measuring utensil 100 when the handle 102 has been engaged in the insert portion 55b, one or more pressing members 59 or similar immobilizing members can engage directly the insert portion 55b when the insert portion 55b is in an engaged configuration within the rear slit 103. These members 59 are here arranged on an inferior face of the clamping members 106, 107. The slit 103 thus can have an increased clamping action approximate the free end 102a, which is advantageous when the members 59 are engaged in the central hole 50 or similar recess. More generally, a clip function can be provided near the free end 102a of the handle 102 for retaining the insert portion 55b.

After taking the required quantity, the user attaches the measuring utensil 100 by engaging the contact part 55 in the slit 103, so that the contact part 55 then forms a holding part. In a gusset pouch 1, the maximum of spacing between the two strips of the closure system 2 is defined in a median plane between the junctions 6a, 6b. Accordingly, it is of interest of having a contact part 55 that intersect such virtual median plane P5 (Figs 8C and 12 show such median plane P5).

In some options advantageous to reduce amount of plastic in the strip 8 or 9, the contact part 55 has a length (large size thereof) typically strictly lower than one third of length of the interlocking area 10, preferably lower than one quarter of length of the interlocking area 10. In preferred embodiments, the length of the contact part
55, here measured at the junction 55a, may be strictly lower than 50 mm and the rectilinear contiguous portion of the free edge 56 is typically comprised between 15 mm and 40 mm.

The open side of the cup 101 is oriented toward the bottom 3. The measuring utensil 100 is then held in position, here a longitudinal position, and immobilized in this position after the pouch 1 has been closed by fastening the strips 8, 9 each other or suing any suitable closure system 2 suitable for this kind of flexible package. Should the pouch 1 be handled energetically in a closed state, immobilization of the measuring utensil 100 by the insert portion 55b can be sufficient to prevent the measuring utensil 100 from falling into the content 13.

When the pouch 1 is used the next time, the measuring utensil 100 is immediately visible and can be withdrawn very easily if the handle 102 is adjacent to the opening 7 and orientation of the measuring utensil 100 is already a vertical orientation.

Of course, the content of the pouch 1 could also be retrieved with a standard teaspoon or tablespoon, but no user-friendly retaining of the spoon would be obtained and advantages of a longitudinal storage position of the measuring utensil 100 would be lost.

In some options, the contact part 55 formed on a first strip 8 or 9 can only be shaped as retaining means for holding a predetermined measuring utensil 100 and either a tongue-like leveling element is provided on the other strip 8 or 9, or no leveling element is provided. In other options, no rear slit 103 is provided in the measuring utensil 100 but a hook-like projection is formed proximate the free end 102a, allowing retaining of the measuring utensil 100 in a same longitudinal storage position (same general position as shown in Fig. 11) when the projection is engaged in the central hole 50 or similar recess defined by one of the strips 8, 9 of the pouch 1.

In one option, the tongue-like contact part 55 is provided as separated element that can be fastened to one of the strips 8, 9, below the interlocking area. Such tongue can for example be wrapped in the same bag where the measuring utensil 100 is initially housed.

Now referring to Fig. 14, it can be seen that the protruding contact part 55′ can also be provided with two tongue like members, separated by a slot 75, and integrally formed with the main flexible part 28. In the measuring utensil 100, at the end 102a of the handle 102, the slit 103 may be replaced by at least one kerf or
similar groove, for example two opposite side grooves, and/or one or more sliding projections 103a, 103b (here rib like projections). Such projections 103a, 103b may be used to cooperate with the edges of the slot 75. The front end of each projection 103a or 103b, which is the first to be in contact with the contact part 55' when placing and storing the measuring utensil 100, may be provided with small ribs R1, R2 or similar relief elastically engaged at the locally wider rear end of the slot 75. A snap fitting is thus provided in such option. Of course, one or more pressing members 59 such as shown in the embodiment of Fig. 9C may be used to produce a snap at the end of placing the handle 102.

Two holes 50 are here optionnally provided for facilitating the curving of the main flexible part 8 when the pouch 1 has to be open. While two free edges 56a, 56b are shown in Fig. 14 for allowing a leveling, such free edges 56a, 56b of significant size (with a rectilinear portion as in most of the other preceding embodiments) can be partly or entirely replaced by narrow tongues.

It should be noted that in that case the leveling element is produced, in the same way as one of the strips, from extruding plastic, this enables geometric forms which are rather precise. This can provide good adaptability to the geometry of the measuring utensil 100, especially if the latter does not have a well-known predetermined form.

Of course, the embodiments described above are in no way limiting, their features can be combined and other variants are conceivable. It is in particular possible to produce another kind of fixation in the closure system 2, not necessarily with an interlocking area 10 such as shown in the figures. For instance, as an additional feature or substitution feature, at least one of the pull members 16, 18 could be provided with a fixation element to maintain the closure system 2 in the first flat configuration.

The terms "rear" and "front" are used, only for purpose of the description, to define relative positions of the main flexible panels of the bag B. However, it is understood that these terms are relative and the terms "rear" and "front" may be inverted, depending of the context. Accordingly, it is understood that the wall 5 could be called "front wall" and the wall 4 could be called "rear wall".

The single opening 7 is preferably as wide as the bottom 3 for a closed pouch 1, as shown in the depicted embodiments. But in some constructions, the opening 7 may be shaped and sized differently. For instance, a tapered part or similar transition section may be provided in the bag B.
Besides, while the two strips 8 and 9 have been described as two pieces of semi rigid plastic material, options with a single annular piece of semi rigid plastic material or with at least three interconnected pieces of semi rigid plastic material are not excluded. Of course, the section or assembly parts fixed to the front wall 4 have to be considered as defining the first strip 8, while the section or assembly parts fixed to the rear wall 5 have to be considered as defining the second strip 9.

While the bag B can advantageously have a front wall 4 and a rear wall 5 in a flat configuration when the interior volume V is empty, in the first configuration of the closure system 2, one can form another kind of bag, for example with additional panels (for instance in order to define an assembly of two front panels functionnaly similar to the front wall 4 depicted in the figures) or one or more intermediate walls defining all or part of the longitudinal junctions 6a, 6b. More generally, it will be obvious that the use of the verb "to comprise" and its conjugations does not exclude the presence of any other elements besides those defined in any claim.

The word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. Any reference sign in the following claims should not be construed as limiting the claim.
CLAIMS

1. A gusset style pouch (1) comprising:
   - a flexible bag (B) comprising a bottom (3), a front wall (4) and a rear wall (5) defining a flexible sidewall extending around a longitudinal axis (X), two junctions (6a, 6b) at opposite sides between the front wall and the rear wall, so that the bag defines a single opening (7) opposite to the bottom (3);
   - a closure system (2) comprising a first strip (8; 108; 208; 308; 408) sealed to one amongst the front wall (4) and the rear wall (5) and a second strip (9) sealed to the other one amongst the front wall (4) and the rear wall (5), the first strip and the second strip being interlockable strips for attachment at an interlocking area (10) in a closed configuration of the closure system;
   - a hold open arrangement comprising:
     - i) a first predetermined flexing line (25a) adjacent to one of the two junctions (6a),
     - ii) a second predetermined flexing line (25b) adjacent to the other of the two junctions (6b), and
     - iii) a main flexible part (28) extending between a first end (28a) partly delimited by the first predetermined flexing line (25a) and a second end (28b) partly delimited by the second predetermined flexing line (25b), locking means being rigidly coupled to at least one of the first end (28a) and the second end (28b) and configured to pivot from a first flat configuration obtained when the closure system (2) is in the closed configuration to a second configuration, which is a bent, flexed, or engaged configuration;

characterized in that the main flexible part (28) and at least one locking element (41, 42, 141, 142) of said locking means are defined by the first strip (8) which is made of a determined semi rigid plastic material, and in that the second strip (9), which is made of a semi rigid plastic material, preferably of the determined semi rigid plastic material, defines at least one contact surface (CS1, CS2) for retaining said locking element (41, 42, 141, 142) in the second configuration, whereby the first strip (8; 108; 208; 308; 408) and the second strip (9) of the closure system (2) define the hold open arrangement.

2. The gusset style pouch according to claim 1, wherein the first strip (8; 108; 208; 308; 408) and the second strip (9) are extruded strips made of a single piece of a polyolefine material, preferably PP.
3. The gusset style pouch according to claim 1 or 2, comprising two locking elements that define two opposite locking tabs (41, 42, 141, 142) rigidly coupled to the first end (28a) and the second end (28b) and each configured to pivot from the first flat configuration to the second configuration, and wherein the second strip (9) defines two spaced contact surfaces (CS1, CS2), each adjacent to one of the two junctions (6a, 6b), for retaining the two locking tabs (41, 42, 141, 142) in the second configuration.

4. The gusset style pouch according to claim 3, wherein the two locking tabs (41, 42; 141, 142) are cut and are oriented according to opposite directions in the first flat configuration.

5. The gusset style pouch according to any one of claims 1-4, wherein the main flexible part is hingedly connected at said first flexing line to a pivot portion of the first strip distinct from any one of the two junctions (6a, 6b) and hingedly connected at said second flexing line to an opposite pivot portion of the second strip distinct from any one of the two junctions, the two junctions (6a, 6b) being longitudinal junctions extending parallel to a longitudinal axis (X) of the sidewalk.

6. The gusset style pouch according to claim 5, wherein the bag (B) defines a single interior volume (V) between the bottom (3), the two longitudinal junctions (6a, 6b) and the interlocking area (10), and wherein the first strip (8; 108; 208; 308; 408) and the second strip (9) have each opposite ends (8a-8b, 9a-9b) that extend outside the interior volume (V) and form part of said two longitudinal junctions (6a, 6b).

7. The gusset style pouch according to any one of claims 1-6, comprising a removable top portion (120) that defines a sealing contact at the opposite from the bottom (3) and prevents access to the closure system (2), a line of weakness (12b) or at least one pre-cut being defined between the removable top portion (120) and the closure system (2).

8. The gusset style pouch according to any one of claims 1-7, comprising an upper end provided with a pair of opposite pull members (16, 18) that protrude upwardly from the first strip (8; 108; 208; 308; 408) and the second strip (9) in the first flat configuration, the pull members (16, 18) being spaced away from the two junctions (6a, 6b) and rigidly coupled to the first strip (8; 108; 208; 308; 408) and the second strip (9) for facilitating opening of the closure system (2) and causing flexing of:
- the main flexible part (28) that belongs to the first strip (8; 108; 208; 308; 408), and
- a complementary flexible part (29) of the second strip (9), facing the main flexible part (28) with a space in an open configuration of the closure system (2).

9. The gusset style pouch according to claim 8, wherein the first and second strips (8, 9) are each provided with complementary anchoring elements (51, 52) so that the closure system (2) is resealable, a sealing contact being continuously defined by the anchoring elements (51, 52).

10. The gusset style pouch according to claim 8 or 9, wherein each of the first strip (8) and the second strip (9) has an upper edge (8c, 9c) provided with two rectilinear upper rim portions (81-82, 91-92) separated by one of the pull members (16, 18), and wherein the first strip (8; 108) and the second strip (9) have each a height, measured from the rectilinear rim portions, that increases with increased space from the pull member (16 or 18) of the corresponding strip (8 or 9).

11. The gusset style pouch according to any one of claims 1-10, wherein the first flexing line (25a) and the second flexing line (25b) are each provided with a pair of two longitudinally spaced hinge connections (44a, 44b, 45a, 45b) of lower thickness as compared to the thickness of the locking element (41, 42, 141, 142).

12. The gusset style pouch according to claim 3 and claim 11, wherein the locking tabs (41, 42, 141, 142) are each delimited by a cut and hinged at a base (41a, 42a, 141a, 142a) thereof, the base of each of the locking tabs extending between the hinge connections (44a, 44b, 45a, 45b) of a same pair, the locking tabs (41, 42, 141, 142) being each provided with a preferably rectilinear sliding edge (49) configured to extend along the second strip (9) in said second configuration.

13. The gusset style pouch according to claim 12, wherein in at least one of the first strip (8; 108; 208; 308; 408) and the second strip (9), which comprises an upper edge (8c, 9d) and a lower edge (8d, 9d), the hinge connections (44a, 44b, 45a, 45b) have a determined material thickness less than 50 percent of a material thickness of the adjacent locking tab (41, 42, 141, 142), the determined material thickness being preferably defined by an outer slot (35, 36, 37, 38) that longitudinally extends from the upper edge (8c, 9c) to the lower edge (8d, 9d).

14. The gusset style pouch according to any one of the preceding claims, wherein the hold open arrangement comprises at least two locking tabs (41, 141;
42, 142) rigidly coupled to a same end chosen amongst the first end (28a) and the second end (28b) of the main flexible part (28).

15. The gusset style pouch according to any one of the preceding claims, wherein the flexible bag (B) contains:

5 - edible granular material (13), preferably milk powder, and

- a measuring utensil (100) provided with a cup (101) and a handle (102), which is adapted to be stored in an interior volume (V) defined by the flexible bag (B), entirely below anchoring elements (51, 52) of the closure system (2) in a storage configuration of the measuring utensil,

and wherein the first strip (8; 108; 208; 308; 408) or the second strip (9) is provided with a holding part (55) made of strip material, preferably as thin as the first strip and the second strip, and configured to maintain the measuring utensil (100) in the storage position direction by a retaining contact at an end (102a) of the handle (102).

16. The gusset style pouch according to claim 15, wherein the handle (102) of the measuring utensil (100) is provided with an insertion housing, preferably a slit (103) of the measuring utensil, and the retaining contact is obtained by clamping of the holding part (55) into the insertion housing.

17. The gusset style pouch according to claim 15 or 16, wherein the holding part (55) is provided with a free edge (56) that defines a leveling element distal relative to a junction (55a) between the holding part (55) and the interlocking part (10).

18. A method of producing a gusset style pouch (1) as defined in any one of the preceding claims, comprising the steps essentially consisting of:

- providing a bag (B) having a flexible sidewall by attaching a front wall (4) to a rear wall (5) at two junctions (6a, 6b) that preferably extend parallel to a longitudinal axis (X) of the sidewall, so that the front wall (4) and the rear wall (5) define a single opening (7) opposite to a bottom (3) of the bag (B);

- adding a closure system (2) by sealing a first strip (8; 108; 208; 308; 408) to the front wall (4) and a second strip (9) to the rear wall (5), the first strip (8) and the second strip (9) being interlockable strips for attachment at an interlocking area (10) in a closed configuration of the closure system (2);

characterized in that the method comprises

- cutting and/or weakening parts of one determined strip chosen amongst the first strip (8; 108; 208; 308; 408) and the second strip (9) of the closure system (2),
which is made of a determined semi rigid plastic material, in order to define a first predetermined flexing line (25a) adjacent to one of the two junctions (6a) and a second predetermined flexing line (25b) adjacent to the other of the two junctions (6b), so that a main flexible part (28) of the determined strip (8; 108; 208; 308; 408) extends between a first end (28a) partly delimited by the first predetermined flexing line (25a) and a second end (28b) partly delimited by the second predetermined flexing line (25b),

- cutting strip material of the determined strip to define locking means rigidly coupled to at least one of the first end (28a) and the second end (28b) and configured to pivot from a first flat configuration obtained when the closure system (2) is in the closed configuration to a second configuration, which is a bent, flexed, or engaged configuration;

and in that the other strip (9), which is also made of a semi rigid plastic material, preferably of the determined semi rigid plastic material, is sealed at the opposite of the determined strip to define at least one contact surface (CS1, CS2) for retaining a locking element (41, 42, 141, 142) of said locking means in the second configuration, whereby the first strip (8; 108; 208; 308; 408) and the second strip (9) of the closure system define a hold open arrangement of the gusset style pouch.

19. The method of claim 18, wherein each of the first strip (8; 108; 208; 308; 408) and the second strip (9) are cut from a continuous extruded band of a same polyolefin material and said determined strip is cut to define two opposite locking elements (41, 42, 141, 142),

and wherein the two opposite locking elements are defined before a final cut to define a length of the determined strip and after forming anchoring elements (51, 52) of the determined strip.

20. The method of claim 18 or 19, wherein respective ends (8a, 8b) of the first strip (8; 108; 208; 308; 408) are each placed in a margin bonding area of the front wall (4) used to define the junctions (6a, 6b), when sealing the first strip (8; 108; 208; 308; 408) to the front wall (4),

wherein respective ends (9a, 9b) of the second strip (9) are each placed in a margin bonding area of the rear wall (5) used to define the junctions (6a, 6b), when sealing the second strip (9) to the rear wall (5),

and wherein the junctions (6a, 6b) are obtained by longitudinally bonding side edges of the front wall (4) and the rear wall (5), parallel to the flexing lines (25a, 25b).

21. A gusset style pouch (1) for a food product comprising:
- a flexible bag (B) having a front wall and a rear wall made of a sheet material and extending from a bottom;
- a closure system comprising a fitment device secured to the front wall and the rear wall, the closure system comprising:
  - a first strip (8; 108; 208; 308; 408) having an outer surface sealed to one of the front wall (4) and the rear wall (5), and
  - a second strip (9) having an outer surface sealed to the other one of the front wall (4) and the rear wall (5);
the bag (B) defining an interior volume (V) for the food product, the interior volume having a determined height (H) measured between the bottom (3) and a single opening (7) of the bag;
characterized in that at least one of the first strip (8; 108; 208; 308; 408) and the second strip (9) is made of a determined semi rigid plastic material and comprises:
- an upper edge (8c, 9c);
- a lower edge (8d, 9d);
- a protruding contact part (55; 55') adapted to be used in combination with a measuring utensil, the protruding contact part extending entirely below an interlocking area (10) of the closure system (2) and being preferably coupled to the lower edge (8d, 9d);
and it that the protruding contact part (55; 55') extends between at least one base portion (55a) proximal with respect to the interlocking area (10) and at least one free edge (56; 56a, 56b), preferably a same free edge, distal from the interlocking area (10), wherein the protruding contact part (55; 55'):
- belongs to a strip portion not bonded to the bag (B),
- and defines at least one of a leveling element and a retaining element for retaining an end (102a) of an elongated measuring utensil (100) of shorter length than the determined height (H).
22. The gusset style pouch according to claim 21, wherein the free edge (56; 56a, 56b) extends parallel to a length of the interlocking area (10).
23. The gusset style pouch according to claim 21 or 22, further comprising an elongated predetermined measuring utensil (100) that comprises a first end having a cup (101) and a second end, the predetermined measuring utensil extending between said first end and said second end, said cup (101) being provided with an open side, the length of the predetermined measuring utensil (100) being inferior to the determined height (H).
24. The gusset style pouch according to any one of claims 21-23, wherein the protruding contact part (55; 55') has a substantially constant thickness and/or is made of strip material and configured to maintain the predetermined measuring utensil (100) in a storage position by a retaining contact at the second end of the predetermined measuring utensil.

25. The gusset style pouch according to any one of claims 21-24, wherein the second end of the predetermined measuring utensil comprises a clamping slit (103) configured to match the free edge (56) of the protruding contact part (55), the predetermined measuring utensil (100) being oriented in a direction transverse to the interlocking area (10) when the free edge (56) is inserted into the clamping slit (103).

26. The gusset style pouch according to any one of claims 21-24, wherein the second end of the predetermined measuring utensil comprises at least one sliding projection (103a, 103b) configured to slide and be retained into a slot (75) of the protruding contact part (55'), the predetermined measuring utensil (100) being oriented in a direction transverse to the interlocking area (10) when said sliding projection (103a, 103b) is inserted into the slot (75).

27. The gusset style pouch according to any one of claims 21-24, wherein the protruding contact part (55) at least partly delimits a hole (50) and the second end of the predetermined measuring utensil comprises a clip element defining a slit (103) where the protruding contact part (55) can be inserted when the clip element is inserted through the hole (50), the predetermined measuring utensil (100) being oriented in a direction transverse to the interlocking area (10) when the protruding contact part (55) is inserted into the slit (103).

28. The gusset style pouch according to any one of claims 21-27, wherein the first strip (8, 108, 208, 308, 408) and the second strip (9) are interlockable strips for resealable attachment at the interlocking area (10) in a closed configuration of the closure system (2) after an initial opening of the closure system, and wherein:

- the upper edge (8c, 9c) extends above the interlocking area (10);
- the lower edge (8d, 9d) extends below the interlocking area (10);
- at least two predetermined flexing lines (25a, 25b) are provided in the closure system (2) so that the strips (8, 108, 208, 308, 408, 9) are movable from a first flat configuration obtained when the closure system is in the closed configuration to a second flexed configuration when the closure system is open.
29. A method of using a closure system (2) of a gusset style pouch (1), the closure system comprising a semi rigid fitment device secured to the flexible front wall (4) and the flexible rear wall (5) and configured to define a top opening (7) of the pouch in an open configuration, at the opposite to a bottom (3), the method comprising the steps essentially consisting of:

- providing an elongated predetermined measuring utensil (100) of shorter length than height (H) of an interior volume (V) defined by the pouch (1), the measuring utensil having a handle free end (102a) opposite to a cup (101),

- fixing the predetermined measuring utensil (100) to the fitment device when the closure system (2) is in a open configuration, by connecting a holding part (55; 55') of the fitment device to a retaining element, preferably forming a clamping rear slit (103), provided at the handle free end (102a) of the measuring utensil, the holding part (55) extending entirely below the opening (7), whereby the handle free end (102a) extends above a food content (13) of the pouch (1) and a substantially vertical storage position for the measuring utensil (100) is obtained in a closed configuration of the closure system when the pouch stands in a upright position where the bottom (3) defines bearing means of the pouch.

30. The method of claim 29, wherein the holding part (55; 55') that belongs to the closure system (2) is engaged by the cup (101) of the measuring utensil in a leveling step, in which an open side of the cup (101) of the measuring device (100) slides against a rectilinear free edge (56; 56a, 56b) of the holding part (55), the rectilinear free edge (56; 56a, 56b) extending parallel to an interlocking area (10) defined by the closure system (2) in the closed configuration, which is a substantially flat configuration of the fitment device.
INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2015/002369

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D33/00 B65D33/25 B65D77/24
ADD.

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):
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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* Further documents are listed in the continuation of Box C.
* See patent family annex.

* Special categories of cited documents:
  - "X" document defining the general state of the art which is not considered to be of particular relevance
  - "Y" earlier application or patent but published on or after the international filing date
  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
  - "P" document published prior to the international filing date but later than the priority date claimed

Date of the actual completion of the international search: 14 April 2016

Date of mailing of the international search report: 29/04/2016

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Form PCT/ISA/210 (second sheet) (April 2005)
# INTERNATIONAL SEARCH REPORT

**INTERNATIONAL SEARCH REPORT**

**Box No. II** Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.☐ Claims Nos.: becaus e they relate to subject matter not required to be searched by this Authority, namely:

2.☐ Claims Nos.: becaus e they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.☐ Claims Nos.: becaus e they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III** Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

> see additional sheet

1.☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2.☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3.☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos. :

4.☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos. :

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant’s protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant’s protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.
# INTERNATIONAL SEARCH REPORT

**International application No**

PCT/IB2015/002369

## DOCUMENTS CONSIDERED TO BE RELEVANT

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Form PCT/ISA/210 (patent family annex) (April 2005)
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-14, 18-20
   Gusset Style Pouch with Closure System and Hold Open Arrangement and Method for producing such a Pouch

2. claims: 15-17, 21-30
   Gusset Style Pouch with Holding Device for a Measuring Utensil and Method of Use of such Pouch