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MÜHLEMANN(10) **Pub. No.: US 2021/0362920 A1**(43) **Pub. Date: Nov. 25, 2021**(54) **PLASTIC CONTAINER HAVING AN
OPENING MEANS****Publication Classification**(71) Applicant: **MUHLEMANN IP GMBH**, Stein am
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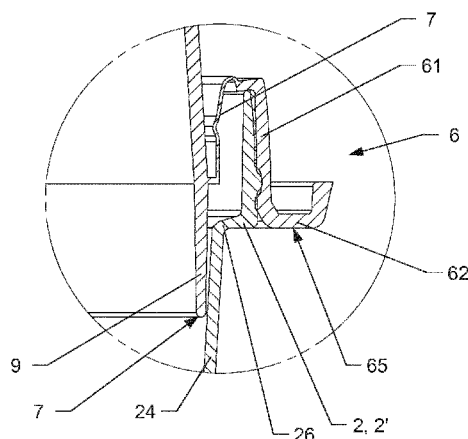
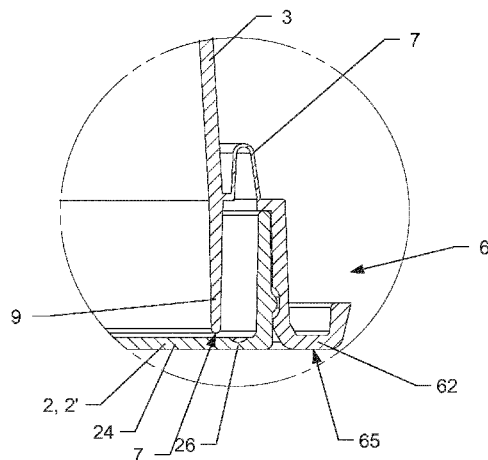
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(57)

ABSTRACT

A plastic container comprises a container body, a container cover, and an opening element for opening the container cover. A container opening is formed at an upper end of the container body lying opposite the container bottom. The container cover is fastened to the upper border of the container body in order to cover the container opening. The upper border is connected to the container wall at a distance radially outward from an upper edge of the container wall and by a flexible connecting portion, the flexible connecting portion permitting sliding of the upper border relative to the container wall and to the opening element such that the plastic container can be brought from a closed position into an open position.



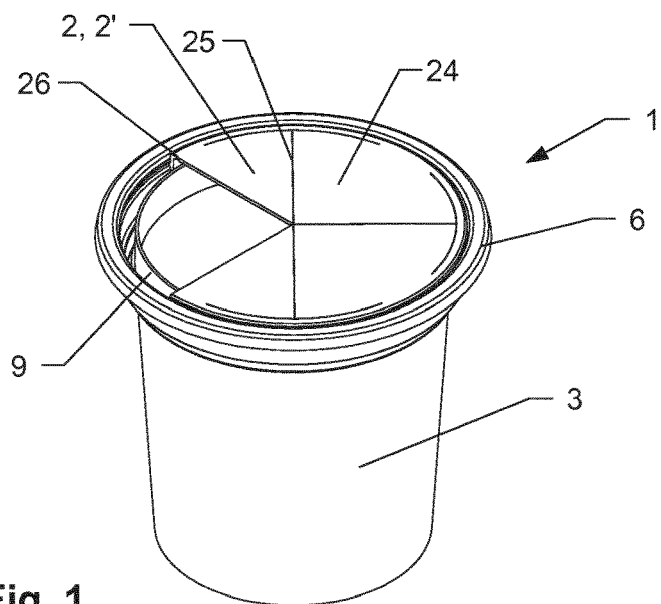


Fig. 1

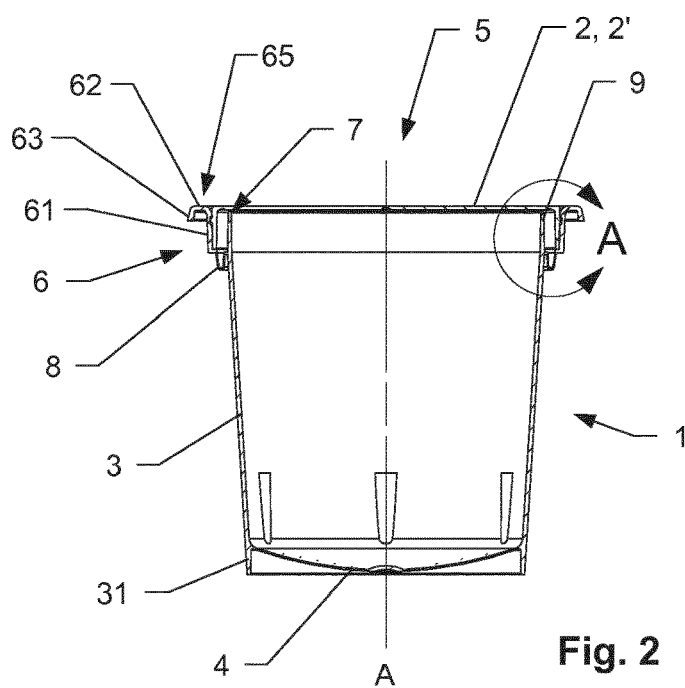


Fig. 2

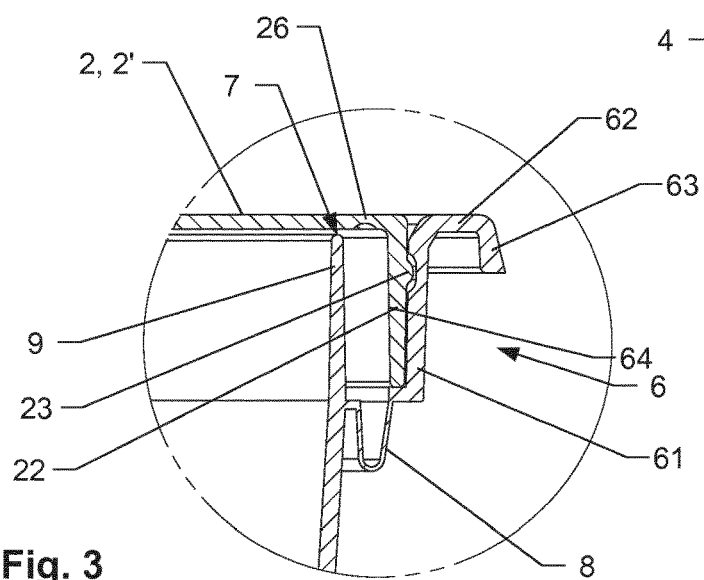


Fig. 3

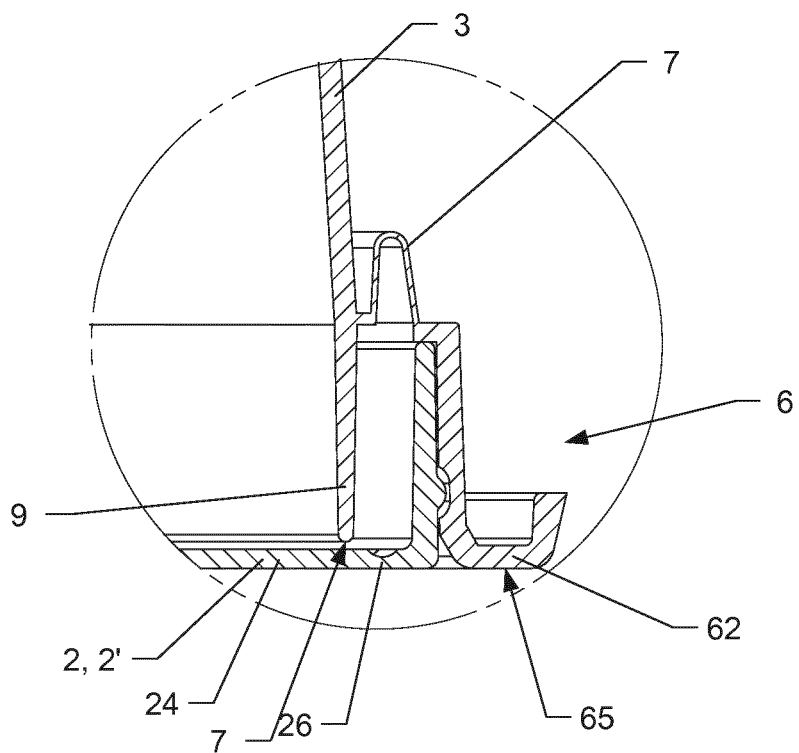


Fig. 4(a)

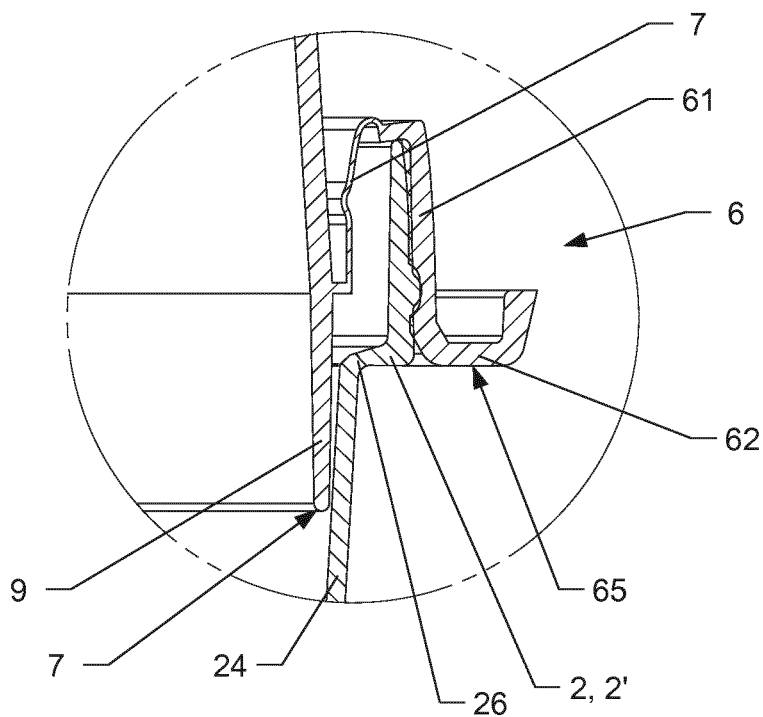


Fig. 4(b)

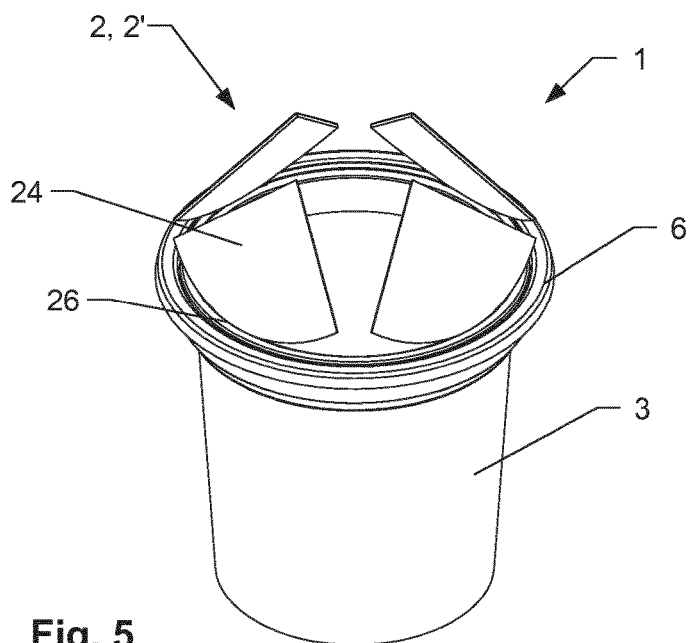


Fig. 5

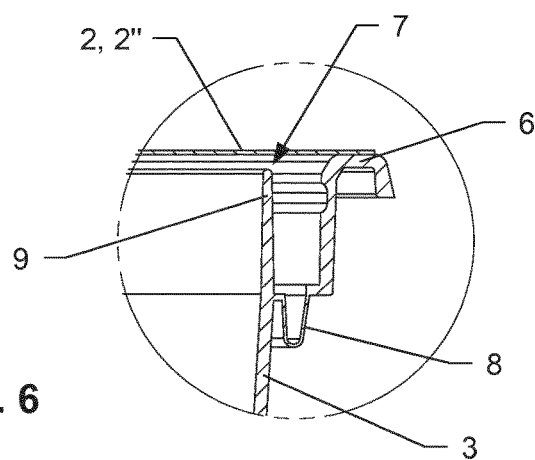


Fig. 6

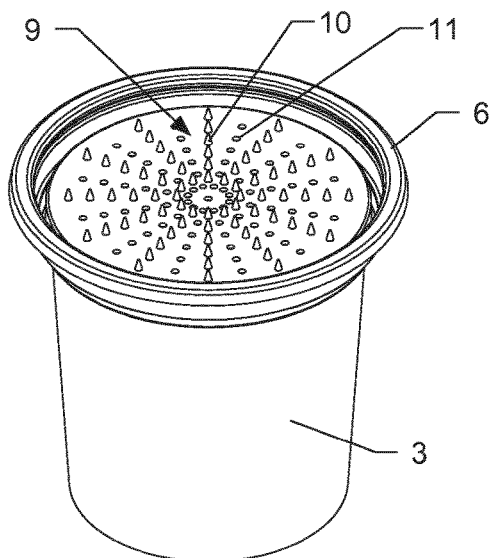


Fig. 7

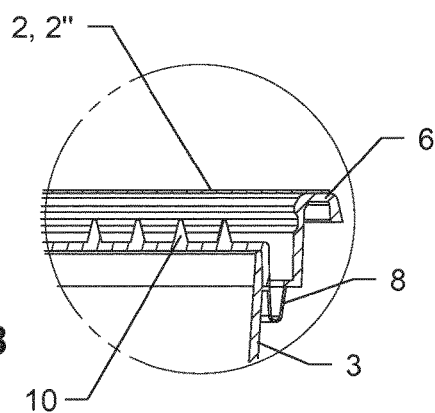


Fig. 8

PLASTIC CONTAINER HAVING AN OPENING MEANS

TECHNICAL FIELD

[0001] The invention relates to a plastic container with opening means, comprising a container body and a container cover.

TECHNICAL BACKGROUND

[0002] Known from WO2012048922, CH700312, WO2006046730, WO03093128, U.S. Pat. Nos. 6,705,462, 6,886,686, 4,247,001 and US2008067172 is a respective plastic container, which in a container chamber has an integrated dispensing device for dispensing substrates received into the container chamber into a mixing container. The plastic container is often designed as a container seal, or is placed on a mixing container opening during use. During activation of the dispensing device, the container is opened, and the substrate is dispensed from the container chamber into the mixing container.

[0003] The plastic containers each comprise a container body, an ejector, and a sealing film. The container body here forms the container interior or the container chamber for receiving solid or liquid substrates, for example solid, free-flowing, or liquid agents, beverage additives, reagents, etc., which is sealed by the sealing film. The ejector is movably incorporated into the container interior in such a way that activating the ejector moves the latter in the direction of the sealing film, cutting through the sealing film in the process. The substrate received in the container interior can exit the container. The ejector can be activated by means of a flexible, curved membrane, or a portion of the ejector is airtightly guided through the container wall and directly activatable.

[0004] U.S. Pat. No. 6,003,728 shows an alternative to the sealing film. The container chamber is here sealed with a lower closing cover that can be pushed open instead of the sealing film, which is non-positively received in a groove of the container wall by means of a circumferential bead. The closing cover can be connected with the container wall by a narrow hinged bridge, and protrudes essentially perpendicularly into the mixing container in the open position. The ejector acts centrally on the closing cover. For dispensing purposes, the closing cover must be pressed out of the latching connection with a relatively high level of exertion, and then “jumps” into the open position. It can here happen that the hinged bridge also breaks, and the closing cover falls into the mixing container.

[0005] The disadvantage to the known plastic containers is that they consist of several parts, which are separately fabricated and subsequently assembled in another step. This costs time and money.

[0006] Another disadvantage to the known container systems is that the cut film or swiveled out closing cover often plunges into the liquid of the mixing container, and remains in this open position. It is then almost impossible to cleanly remove the plastic container from the mixing container. The structural design of the known containers with integrated dispensing device is also most often complex and expensive. In addition, the sealing film cannot be torn or cut open in a controlled manner, so that handling the plastic container is prone to error. Another disadvantage to the known container is that the substrate is dispensed uncontrollably and often

along the peripheral edge region. It can here happen, for example, that powdery or grainy substrate gets stuck to the interior surface of the mixing container neck, and is not dispensed completely and cleanly into the mixing container.

DESCRIPTION OF THE INVENTION

[0007] The object of the invention is to overcome disadvantages to prior art. In particular, the object of the invention is to enable a more cost-efficient manufacture.

[0008] This object is achieved by a plastic container with the features in claim 1. The plastic container comprises a container body, a container cover, and an opening means for opening the container cover.

[0009] The container body comprises a container wall and a container bottom arranged in a lower region, wherein a container opening is formed at an upper end of the container body lying opposite the container bottom. The container body comprises a circumferential upper border in the upper region. The container cover for covering the container opening can be fastened to the upper border of the container body. The upper border is spaced radially outward from an upper edge of the container wall in relation to a container axis. The upper border is connected with the container wall by means of a flexible connecting portion, wherein the flexible connecting portion permits a displacement of the upper border relative to the container wall and to the opening means, so that the plastic container can be brought from a closed position into an open position.

[0010] The relative displacement presses the opening means for opening the container cover operatively connected with the container wall against the container cover fixedly and operatively connected with the upper border.

[0011] The flexible connecting element makes it easy to manufacture a plastic container with integrated dispensing and opening device for a substrate received in the plastic container, wherein the container body and container cover define a container interior for the substrate. An upper edge of the container wall can here be designed as an opening means for the container cover, as will be explained below.

[0012] Alternatively, it is also possible to arrange a separate opening means, e.g., an ejector, in the container interior.

[0013] The container axis is centrally defined by the container floor and container opening, wherein the container wall need not be circularly cylindrical around the container axis in design, but can rather also have other shapes.

[0014] Additional embodiment types of the invention are indicated in the dependent claims.

[0015] In several embodiments, the opening means can lie below the container cover or inside of the container in the closed position, and be upwardly offset in the opening position, so as to cut, penetrate or push open the container cover.

[0016] In several embodiments, the flexible connecting portion can essentially be loop- or U-shaped in design as viewed in cross section in the closed position. Given a displacement of the upper border into the open position, the flexible, loop- or U-shaped connecting portion is stretched. It can here generate a restoring force, so as to facilitate the displacement of the upper border back into the closed position. The maximum displacement can correspond to roughly the length of the connecting portion, i.e., roughly twice the length of one leg of the loop- or U-shaped connecting portion.

[0017] In several embodiments, the flexible connecting portion can be designed as a flexible and/or elastic thin segment. As a rule, the flexible connecting portion is thinner in design than a standard wall thickness of the container wall. The container wall and upper border can essentially have the same thickness.

[0018] In several embodiments, the upper border can comprise a wall, which essentially runs parallel to the container wall. The lower end of the wall can be connected with the flexible connecting portion. A circumferential, outwardly directed flange can be formed on the upper border or at the upper end of the wall.

[0019] In several embodiments, the upper border can be integrally molded onto the container wall by way of the connecting portion. The container body can be integrally fabricated, e.g., by means of injection molding.

[0020] In several embodiments, the container cover can be a container lid with several flaps, and the upper edge of the container wall can comprise the opening means. For example, the latter can be arranged and configured in such a way that it can push open the container lid that has the several flaps. As a rule, the opening means protrudes upwardly in relation to a neck area of the flexible connecting portion, i.e., in the direction of the container cover.

[0021] Such a container cover can have a peripheral fastening edge and several flaps each connected with the fastening edge by a hinge, wherein the displacement of the opening means in the direction of the container cover deflects the flaps around the respective hinge.

[0022] Activating the plastic container causes the flaps to swivel out, wherein the container cover begins to centrally open. The flaps themselves here act as ramps, which dispense the substrate centrally into the mixing container.

[0023] Such a container cover with flaps is described in the Swiss patent application entitled "Capsule with Integrated Dispensing Device" by the same applicant and with the same application date, the contents of which are hereby included in this application.

[0024] In several embodiments, the several flaps can be formed by slits in the container lid or slits in the cover surface of the container cover, which comprise several sectors of the container lid. The sectors can be tapered sectors, the tips of which converge on the longitudinal axis of the plastic container. These are preferably uniform or constant circle segments, so that a planar circular area of the container lid is divided into at least three identical circle segments. The container lid here opens from the middle, and thereby guarantees a uniform dispensing of the substrate. Webs that bridge the slits can be present between the flaps, and form predetermined breaking points.

[0025] In several embodiments, the hinge can be designed in such a way that a restoring force acts on the flap in the open state of the container lid. For example, the hinge can take the form of an arc, in particular a circular arc. A restoring force here acts on the swiveled out, open flap, and after the opening means has been retracted, the flap moves back into the closed position. The capsule can now be cleanly removed from the mixing container.

[0026] In several embodiments, the opening means, which is preferably formed by the upper edge of the container wall, can have a front stop surface, which upon activation of the plastic container presses against the several flaps, and causes these flaps to swivel out.

[0027] The stop surface can here also be comprised of several (partial) stop surfaces. The stop surface is preferably annularly shaped, or the several (partial) stop surfaces are annularly arranged. As a rule, each stop surface is here arranged radially inwardly offset in relation to a respective hinge.

[0028] This means that an annular stop surface is arranged offset radially inward in relation to the several film hinges, or the several annularly arranged stop surfaces are each offset radially inward in relation to the several film hinges.

[0029] In other words, the diameter of an annular stop surface or several annularly arranged stop surfaces is smaller than the distance between the hinges and the midpoint of the annular shape. Preferably only slightly, so that the stop surface hits the flap as close to the film hinge as possible, but still far enough away from it to ensure that a sufficiently high lever action is present for pressing open the flaps. In this way, the flaps can also be swiveled out almost completely, i.e., by up to nearly 90° in relation to the planar starting position, by a slight movement of the opening means. With the opening means moved completely toward the front, the outward swiveling ideally measures at least 60°.

[0030] In several embodiments, the container cover can be a sealing film, and the opening means can be designed as a cutting edge. The sealing film can here be fastened to an outwardly directed flange of the upper border. The upper border or the flange can have a supporting surface, with which the plastic container is supported for generating the displacement over a mixing container opening of a mixing container.

[0031] In several embodiments, the upper border can have a peripheral skirt with a thread, preferably a female thread, with which the plastic container can be screwed to a mixing container.

[0032] In several embodiments, the opening means can be an ejector arranged in the interior, which is supported relative to the container wall or container bottom.

BRIEF DESCRIPTION OF THE FIGURES

[0033] The invention will be described in more detail below based on exemplary embodiments in conjunction with their drawing(s). Shown on:

[0034] FIG. 1 is a perspective view of a plastic container;

[0035] FIG. 2 is a sectional view of the plastic container on FIG. 1;

[0036] FIG. 3 is a detailed view of the sectional view on FIG. 2;

[0037] FIG. 4 is a detailed view of the connecting portion (a) in a closed position and (b) in an open position;

[0038] FIG. 5 is a perspective view of the plastic container on FIG. 1, with partially open container cover;

[0039] FIG. 6 is a detailed view of a plastic container with sealing film;

[0040] FIG. 7 is a perspective view of a plastic container with an opening means with several perforating means and with a sealing film; and

[0041] FIG. 8 is a detailed view of the plastic container from FIG. 7.

WAYS OF IMPLEMENTING THE INVENTION

[0042] FIGS. 1 to 3 show a plastic container with integrated opening mechanism. FIG. 4 shows a cutout of the plastic container in an open position and a closed position.

The plastic container comprises a container body **1** and a container cover **2** (shown partially cut on FIGS. **1** and **2**). The container body **1** comprises a container wall **3** with a container bottom **4** at the lower end, and a container opening **5** at the upper end. The container wall **3** has an essentially conical shape. At the upper end, the container wall further comprises a peripherally running upper border **6**. In the embodiment shown, the border **6** is designed like a wall **61** extending parallel to the container wall **3**, for example which has a height of 5 to 15 mm. At the upper end of the wall **61**, the border **6** comprises a radially outwardly directed flange **62**, with a peripheral, downwardly directed skirt **63** for reinforcement.

[0043] At the lower end of the wall **61**, the border **6** is connected with the container wall **3** by a flexible connecting portion **8**. In the depicted embodiment, the flexible connecting portion **8** has a loop- or U-shaped cross section. The container wall **3** and border **6** essentially have the same wall thickness. The connecting portion **8** is thinner in design than the container wall **3** or border **6**. The connecting portion **8** is flexible enough that the border **6** can be moved from a closed position (FIG. 4(a)) into an open position (FIG. 4(b)) relative to the container wall **3**. Above the attachment point **81** of the flexible connection **8** to the container wall **3**, the container wall **3** extends further upward, and at its upper edge **7** forms the opening means **9**. The upper edge **7** lies below a plane defined by flange **62**.

[0044] The loop- or U-shaped, flexible connecting portion **8** is connected with the two end areas at the container wall **3** or the upper border **6**. In the closed position, the two ends are located essentially at the same height. In the open position, they are moved away from each other, and the flexible connecting portion **87** is stretched.

[0045] In the depicted embodiment, the container cover **2** is a container lid **2'** with several flaps **24** for covering the container opening **5**, and has a peripheral fastening edge **21**. Such a container lid **2'** is described in the Swiss patent application entitled "Capsule with Integrated Dispensing Device" by the same applicant and with the same application date, the contents of which are hereby included in this application. The container lid **2'** can be directly connected with the fastening edge **21** of the boundary **6**, or—as in the depicted embodiment—have a continuous, downwardly directed skirt **22** on the peripheral fastening edge **21**, with a continuous bead **23** arranged on its outer surface. In order to fasten the container lid **2'**, the continuous bead **23** latches into a complementary groove **64** arranged on the interior surface of the wall **61** of the border **6**.

[0046] In the depicted embodiment of the container lid **2'**, four flaps **24** are formed by continuous slits **25** in the cover surface, and resemble uniform circle segments. These flaps **24** are each connected with the fastening edge **21** of the container lid **2'** by way of a hinge **26**, preferably a film hinge. Retaining webs that bridge the slits **25** can be present between the flaps **24**, and form predetermined breaking points. Predetermined breaking points in the form of segments are also possible in place of the slits.

[0047] FIG. 4 shows a detailed view of the flexible connecting portion **7** (a) in a closed position and (b) in an opening position. In the closed position, the border **6** is in an open position in relation to the container wall **3** or opening means **9**, in which the flexible connecting portion **8** has a loop- or U-shaped cross section, and the upper edge **7** of the container wall **3** or opening means **9** is located below a

surface defined by the flange. The opening means **9** is here covered by the container lid **2'**.

[0048] In order to open the container lid **2'**, the border **6** on which the container lid **2'** is fastened is pushed downward along the container axis A in the direction of the container bottom **4**. For example, this can be done by having the plastic container with the flange **62**, which simultaneously comprises a supporting surface **65**, press against the neck of a mixing container. The opening means **9** is here displaced relative to the container lid **2'**, and presses open its flaps **24** with the upper edge **7**. In the open position, the opening means **9** protrudes over the flange **62** of the border **6**. The flexible connecting portion **8**, which has a flexible design, is here stretched (see FIG. 4(b)). The maximum displacement here corresponds to roughly the length of the connecting portion **8** or twice the length of a leg of the U-shape.

[0049] The film hinges **26** on the container lid **2'**, which each retain the flaps **24** on the container lid **2'**, can be arc-shaped in design (see FIG. 1). As a result, a restoring force acts on the flap **24** with the flap **24** swiveled out, i.e., in the open position. If the opening means **9** is retracted again, the flaps **24** also close, at least partially.

[0050] The container bottom **4** is outwardly curved in the depicted embodiment. A skirt **31** that protrudes over the container bottom **4** is formed at the lower end of the container wall **3**.

[0051] FIG. 5 shows the plastic container on FIG. 1 with a partially open container lid **2'**. The flaps **24** are here outwardly swiveled around the film hinges.

[0052] FIG. 6 shows a detailed view of a plastic container with a sealing film **2''** as the container cover **2**. The sealing film **2''** is fastened to the upper border **6**, e.g., by being welded to the flange of the border **6**.

[0053] The opening means **9** can be designed as a cutting edge, e.g., in that the upper edge **7** of the container body **1** or container wall **3** comprises the cutting edge. A relative displacement of the cutting edge from the closed position of the plastic container into its open position causes the sealing film **2''** to be cut.

[0054] FIG. 7 and FIG. 8 also show a plastic container with a sealing film **2''** in a perspective view and in a detailed view, wherein FIG. 7 does not depict the sealing film **2''**. In contrast to the plastic container on FIG. 6, the opening means **9** is provided with at least one piercing means **10**. The opening means **9** is designed in such a way as to be operatively connected with the container wall **3**. A relative displacement of the piercing means **10** from the closed position of the plastic container into its opening position causes the sealing film **2''** to be pierced.

[0055] In the depicted embodiment, the opening means **9** rests on the upper edge **7** of the container wall **3**. It can also be fastened to the container wall **3**, e.g., by latching means.

[0056] For example, the opening means **9** can be designed as a filter plate with filter openings **11**. The filter openings can be covered with a filter paper.

REFERENCE LIST

- [0057] **1** Container body
- [0058] **2** Container cover
- [0059] **2'** Container lid
- [0060] **2''** Sealing film
- [0061] **21** Fastening edge
- [0062] **22** Skirt
- [0063] **23** Bead

[0064] 24 Flaps
 [0065] 25 Slits
 [0066] 26 Hinge, film hinge
 [0067] 3 Container wall
 [0068] 31 Skirt
 [0069] 4 Container bottom
 [0070] 5 Container opening
 [0071] 6 Border
 [0072] 61 Wall
 [0073] 62 Flange
 [0074] 63 Skirt
 [0075] 64 Groove
 [0076] 65 Supporting surface
 [0077] 7 Upper edge
 [0078] 8 Flexible connecting portion
 [0079] 9 Opening means
 [0080] 10 Piercing means
 [0081] 11 Filter openings
 [0082] A Container axis

1-12. (canceled)

13. A plastic container comprising a container body, a container cover and an opening means for opening the container cover; the container body comprises a container wall and a container bottom arranged in a lower region; wherein a container opening is formed at an upper end of the container body lying opposite the container bottom; the container body comprises a circumferential upper border in the upper region; wherein the container cover for covering the container opening is fastened to the upper border of the container body; wherein the upper border is spaced radially outward from an upper edge of the container wall and connected with the container wall by a flexible connecting portion, wherein the flexible connecting portion permits a displacement of the upper border relative to the container wall and to the opening means, so that the plastic container can be brought from a closed position into an open position.

14. The plastic container according to claim 13, wherein the opening means lies below the container cover in the

closed position, and is upwardly offset in the opening position, so as to penetrate, cut or press open the container cover.

15. The plastic container according to claim 13, wherein the flexible connecting portion is loop- or U-shaped in design as viewed in cross section in the closed position.

16. The plastic container according to claim 13, wherein the flexible connecting portion is designed as a flexible thin segment.

17. The plastic container according to claim 13, wherein the upper border comprises a wall, which essentially runs parallel to the container wall.

18. The plastic container according to claim 13, wherein the border comprises a radially outwardly directed flange.

19. The plastic container according to claim 13, wherein the upper border is integrally molded onto the container wall by way of the connecting portion.

20. The plastic container according to claim 13, wherein the upper edge of the container wall comprises the opening means.

21. The plastic container according to claim 20, wherein the container cover in the form of a container lid has several flaps, which are designed to be pushed open by the upper edge of the container wall.

22. The plastic container according to claim 13, wherein the container cover is designed as a sealing film, and the opening means is designed as a cutting edge.

23. The plastic container according to claim 13, wherein the upper border has a supporting surface, with which the plastic container can be placed on a mixing container to initiate the displacement over a mixing container opening.

24. The plastic container according to claim 13, wherein the upper border has a peripheral skirt with a thread, preferably a female thread, with which the plastic container can be screwed to a mixing container.

* * * * *