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(54) **CONTAINER SYSTEMS WITH LIDS FOR UNIT DOSE DETERGENT COMPOSITIONS**

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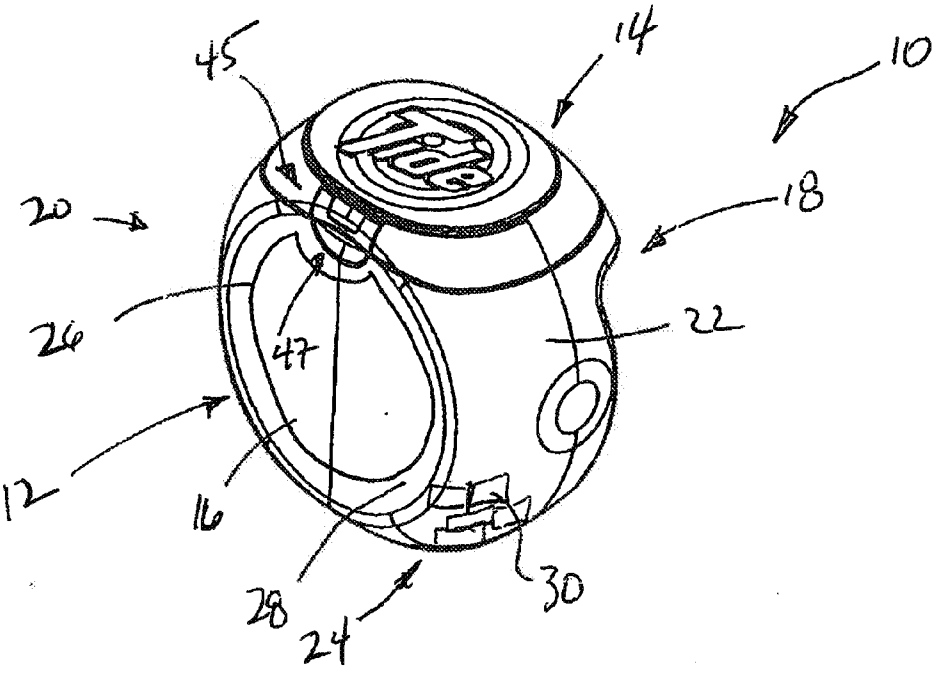
(57) **ABSTRACT**

A container system includes a tub including a front wall, a back wall opposite the front wall and side walls extending between the front wall and the back wall. A bottom extends between the front wall, back wall and side walls. A mouth structure includes a fastening feature configured for connecting to a lid. The mouth structure has an opening therethrough that provides access to a containing volume of the tub. A shoulder extends inwardly from the side walls to the mouth structure. A plurality of unitized doses of a detergent composition is located within the containing volume of the tub. A lid is connected to tub using the fastening feature. The lid has an open position for allowing user access to the containing volume and a closed position for preventing user access to the containing volume. A flexible membrane may be connected to the underside of the lid



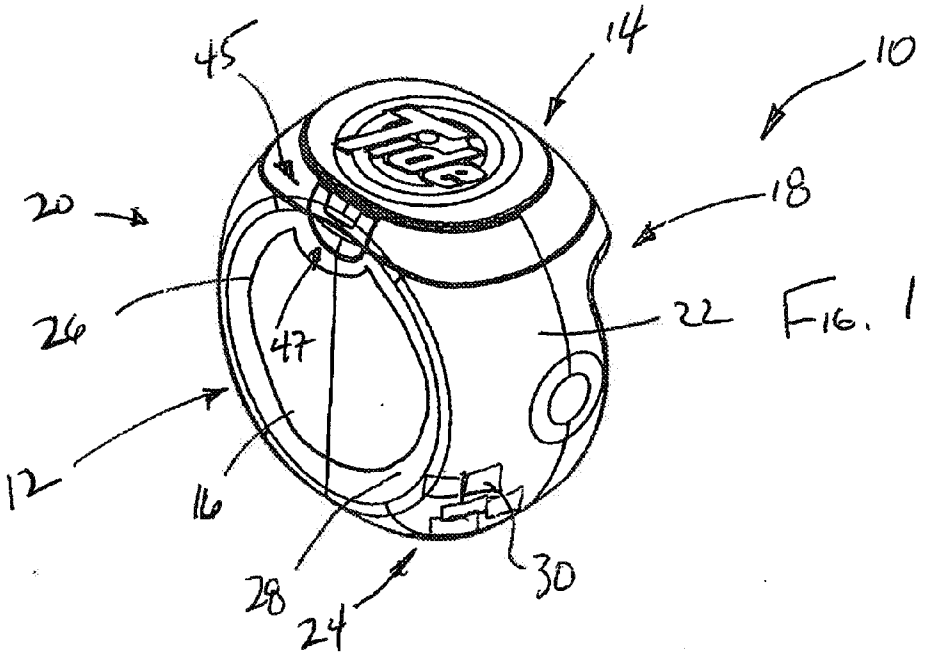

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FIG. 1

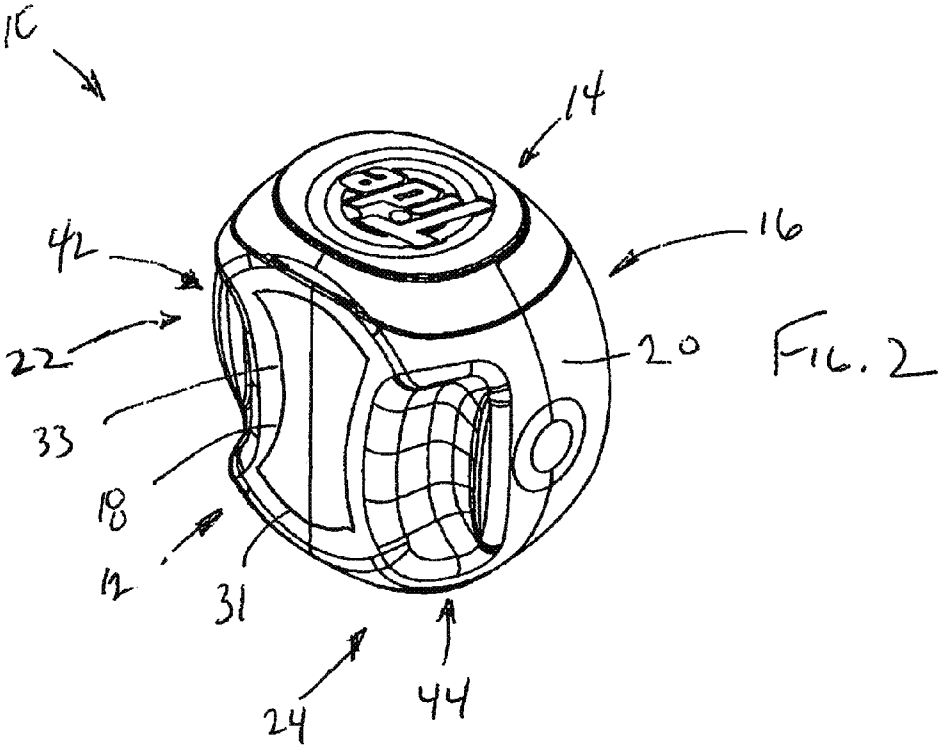
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FIG. 2

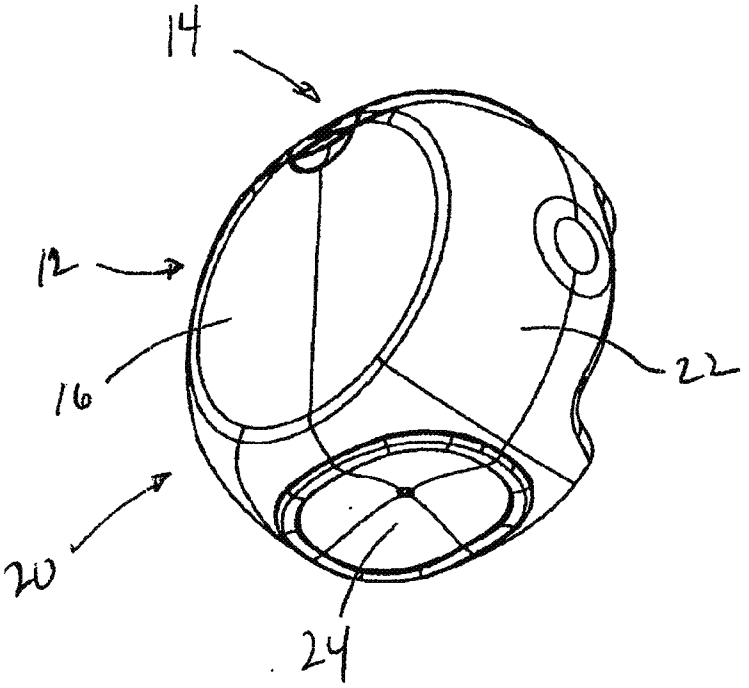

FIG. 3

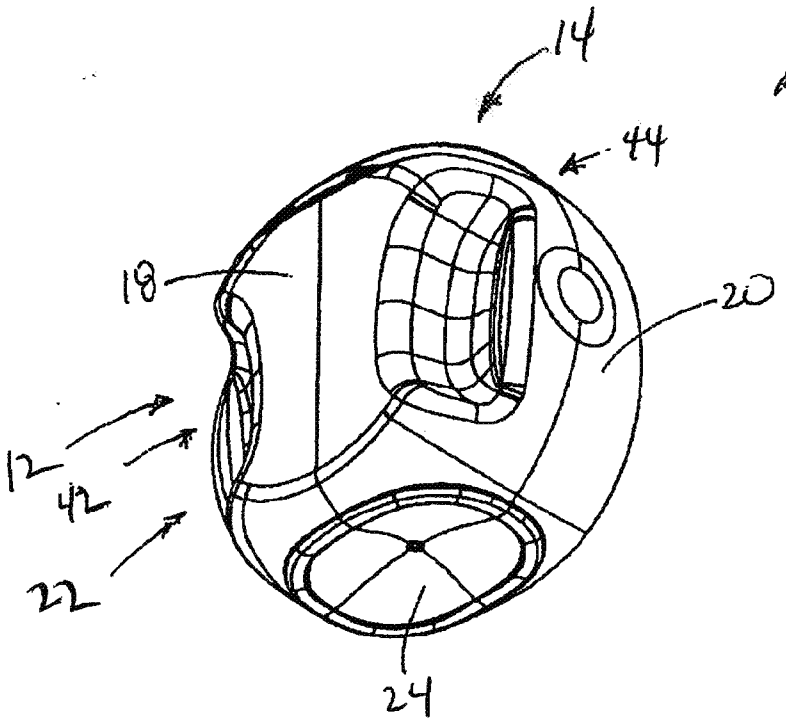

FIG. 4

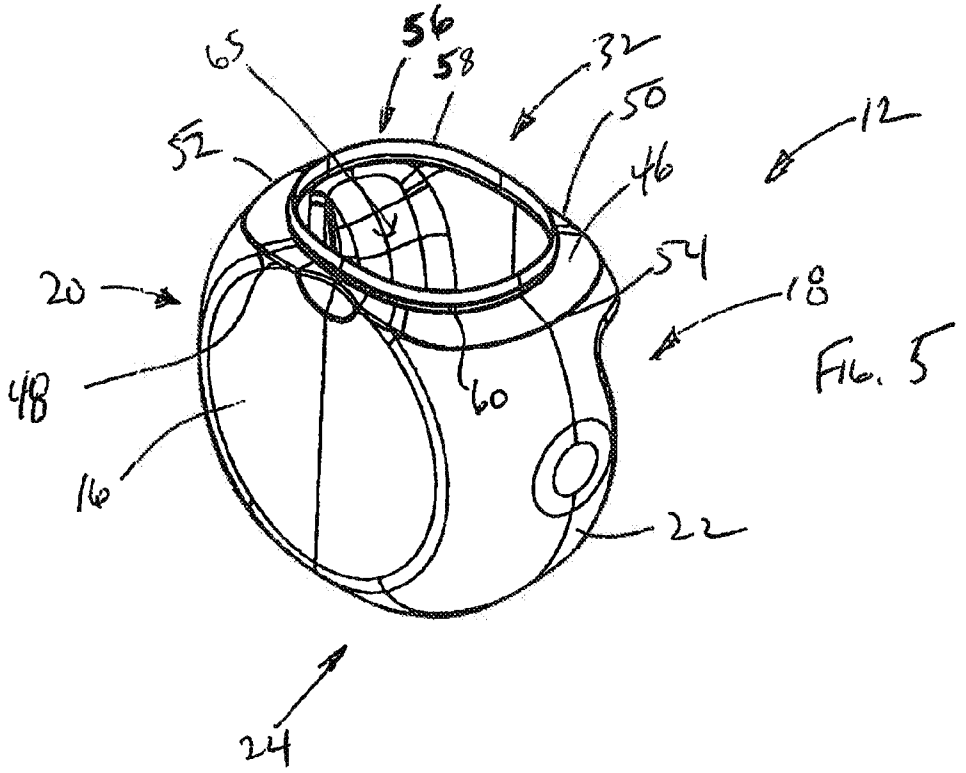
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FIG. 5

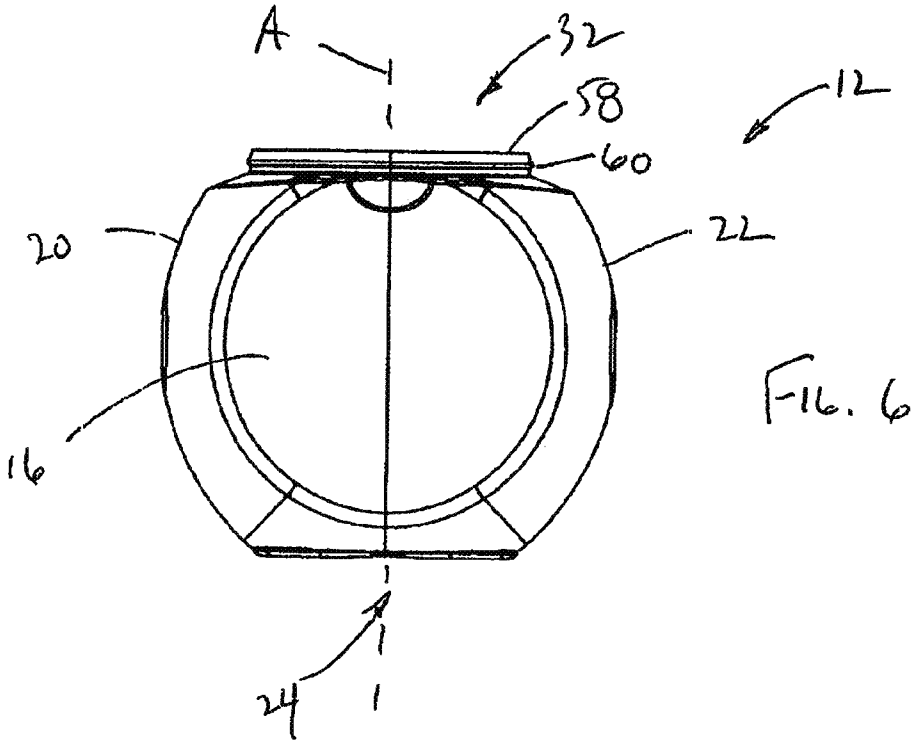
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FIG. 6

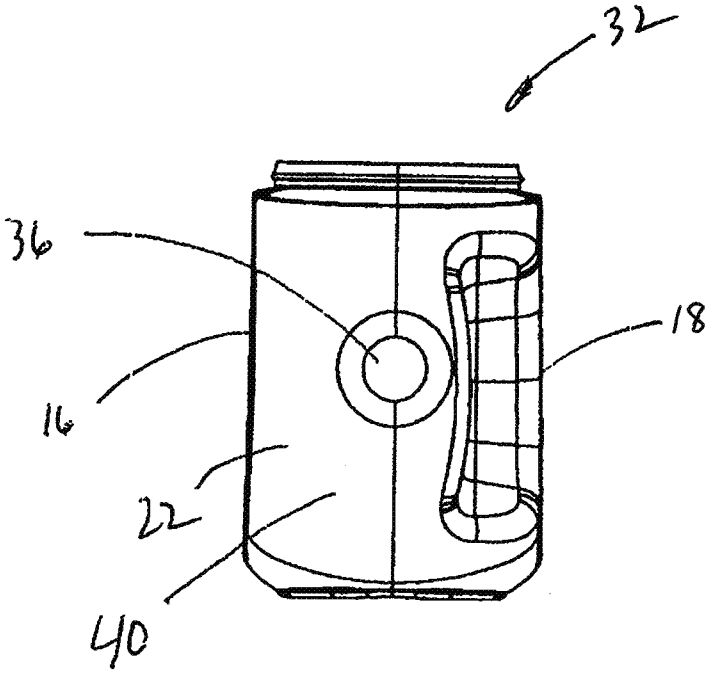

FIG. 7

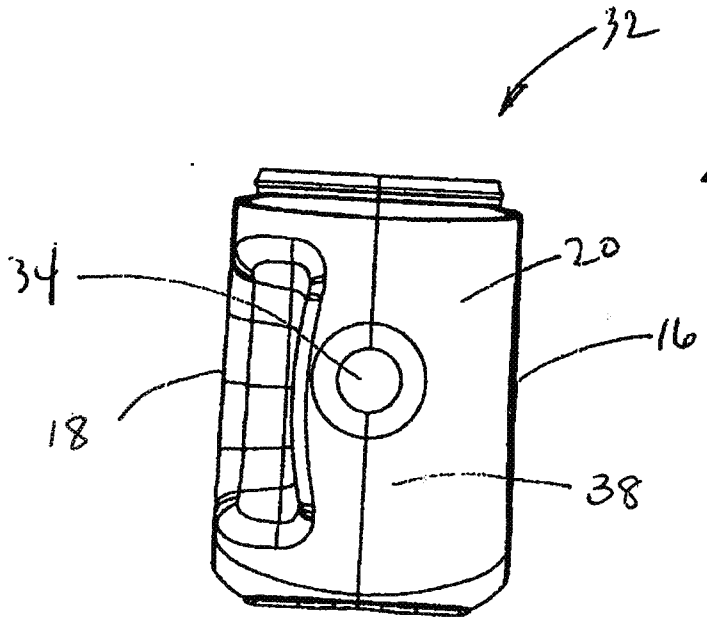

FIG. 8

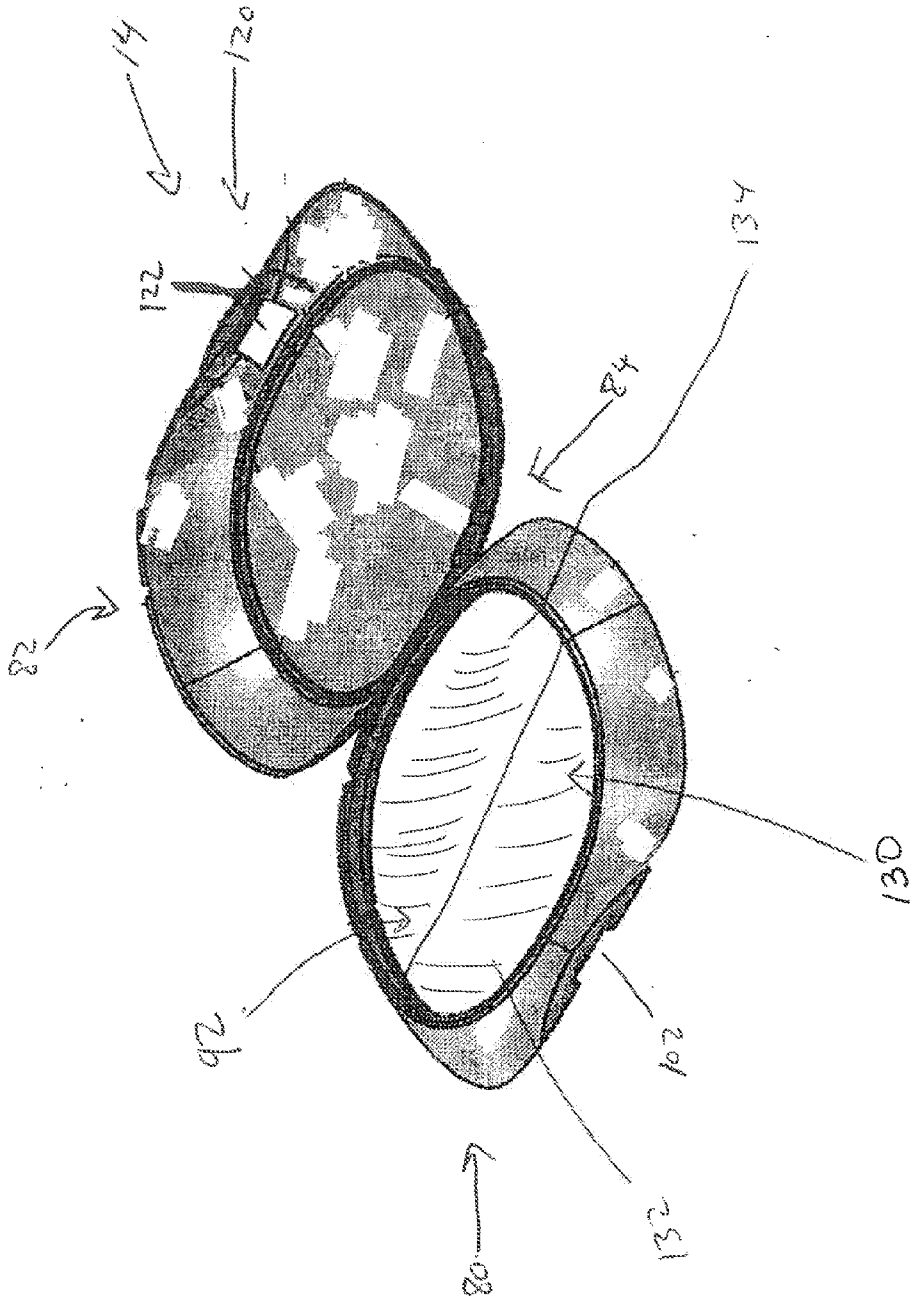

FIG. 9

CONTAINER SYSTEMS WITH LIDS FOR UNIT DOSE DETERGENT COMPOSITIONS

FIELD OF THE INVENTION

[0001] One or more embodiments shown and described herein are generally directed to container systems and their lids for unit dose detergent compositions.

BACKGROUND

[0002] Detergent compositions, such as laundry detergent, may often be found in various forms such as powders, granules, liquids and gels, which are typically contained in a box-like container. Such containers may be perforated to allow formation of an openable lid to gain access to the detergent, or such containers may have a dispensing closure, such as a "push-pull" type of dispensing closure that can be selectably opened to allow a consumer to dispense the detergent from the container.

[0003] Accordingly, improved detergent container systems are continually desirable.

SUMMARY

[0004] In certain embodiments detergent compositions in "unit dose" form may be provided. For example, detergent compositions may be provided in a single dose of compacted powdered detergent contained within a sealed, flexible membrane to form such "unit dose". During a wash cycle, the unit dose may be placed in water, wherein it disperses within the water of the wash cycle. Such unit dose detergent compositions may generally be sold in box-like plastic containers and a user may typically extract a unit dose for use by removing the lid of the container and then removing the desired unit dose through an opening of the container. Because unit dose compositions and the flexible outer membrane may be formulated to dissolve or otherwise break down in water, the lids of the container may inhibit entrance of water into the container. However, in order to inhibit the entrance of water into the container, the lids may typically have a resistance to their removal such that it takes both hands to remove the lid, i.e., one hand on the container and one hand removing the lid. It has been surprisingly discovered that certain packages as shown and described herein enable a container for unit doses of a detergent composition that is easy to handle, versatile and/or provides sufficient sealing function against moisture.

[0005] In one embodiment, a container system includes a tub including a front wall, a back wall opposite the front wall and side walls extending between the front wall and the back wall. A bottom extends between the front wall, back wall and side walls. A mouth structure includes a fastening feature configured for connecting to a lid. The mouth structure has an opening therethrough that provides access to a containing volume of the tub. A shoulder extends inwardly from the side walls to the mouth structure. A plurality of unitized doses of a detergent composition is located within the containing volume of the tub. A lid is connected to tub using the fastening feature. The lid has an open position for allowing user access to the containing volume and a closed position for preventing user access to the containing volume. A flexible membrane may be connected to the underside of the lid.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The following detailed description of specific embodiments of the present invention can be best understood when read in conjunction with the drawings enclosed herewith.

[0007] FIG. **1** is a perspective front view of an embodiment of a container system for containing unit doses;

[0008] FIG. **2** is a perspective rear view of the container system of FIG. **1**;

[0009] FIG. **3** is another perspective front view of the container system of FIG. **1**;

[0010] FIG. **4** is another perspective rear view of the container system of FIG. **1**;

[0011] FIG. **5** is a perspective front view of an embodiment of a tub for use with the container system of FIG. **1**;

[0012] FIG. **6** is a front view of the tub of FIG. **5**;

[0013] FIG. **7** is a side elevational view of the tub of FIG. **5**;

[0014] FIG. **8** is a side elevational view of the tub of FIG. **5**; and

[0015] FIG. **9** is a perspective top view of an embodiment of a lid with flexible membrane for use with the container system of FIG. **1**.

[0016] The embodiments set forth in the drawings are illustrative in nature and not intended to be limiting of the invention defined by the claims. Moreover, individual features of the drawings and invention will be more fully apparent and understood in view of the detailed description.

DETAILED DESCRIPTION

[0017] The following text sets forth a broad description of numerous different embodiments of the present invention. The description is to be construed as exemplary only and does not describe every possible embodiment since describing every possible embodiment would be impractical, if not impossible, and it will be understood that any feature, characteristic, component, composition, ingredient, product, step or methodology described herein can be deleted, combined with or substituted for, in whole or part, any other feature, characteristic, component, composition, ingredient, product, step or methodology described herein. Numerous alternative embodiments could be implemented, using either current technology or technology developed after the filing date of this patent, which would still fall within the scope of the claims. All publications and patents cited herein are incorporated herein by reference.

[0018] It should also be understood that, unless a term is expressly defined in this specification using the sentence "As used herein, the term '_____' is hereby defined to mean . . . " or a similar sentence, there is no intent to limit the meaning of that term, either expressly or by implication, beyond its plain or ordinary meaning, and such term should not be interpreted to be limited in scope based on any statement made in any section of this patent (other than the language of the claims). No term is intended to be essential to the present invention unless so stated. To the extent that any term recited in the claims at the end of this patent is referred to in this patent in a manner consistent with a single meaning, that is done for sake of clarity only so as to not confuse the reader, and it is not intended that such a claim term be limited, by implication or otherwise, to that single meaning. Finally, unless a claim element is defined by reciting the word "means" and a function without the recital of any structure, it is not intended that the scope of any claim element be interpreted based on the application of 35 U.S.C. §112, sixth paragraph.

[0019] Embodiments described herein generally relate to container systems for holding a number of unitized doses of a detergent composition, such as a laundry detergent composition. As used herein, the term 'detergent composition' is

hereby defined to mean any of the agents conventionally used for removing soil, such as general household detergents or laundry detergents of the synthetic or soap type. The term may also include other cleaning agents. The container systems may include a number of features providing, among others, ease of handling, versatility and/or sealing functions to protect the unitized doses from exposure to water while in the container system. As used herein, the terms 'unitized dose' and 'unit dose' are hereby defined to mean a dose of detergent product incorporating one or more laundry detergent compositions sufficient for a single wash cycle. Suitable unit dose forms include capsules, sachets and pouches any of which can have single or multiple compartments. Suitable unit dose forms for use herein include water-soluble, water-dispersible and water-permeable capsules, sachets and pouches. Suitable water soluble pouches may be based on partially hydrolysed polyvinyl alcohol as pouch material. An example of a water-soluble substrate is discussed in, for example, U.S. Ser. No. 11/824,703, entitled "Water-Soluble Substrate with Resistance to Dissolution Prior to Being Immersed in Water," filed Jul. 2, 2007. Detergent compositions can be in liquid, gel, powder and/or paste form, which is herein incorporated by reference in its entirety.

[0020] Referring to FIGS. **1-4**, an embodiment of a container system **10** is shown. The container system **10** generally includes a tub **12** and a lid **14**. The tub **12** may include a front wall **16**, a rear wall **18** opposite the front wall **16** and side walls **20** and **22** extending between the front wall **16** and the rear wall **18**. A bottom **24** may provide a base structure for the container system **10** that extends between the front wall **16**, rear wall **18** and side walls **20** and **22**. The bottom **24** may provide the base structure for supporting the container system **10** in an upright, standing position, as illustrated by FIG. **1**, when resting on a support surface. While the front wall **16**, rear wall **18** and side walls **20** and **22** are illustrated as having a somewhat rounded configuration, they may be flat. Further, while the bottom **24** is illustrated as being arcuate (e.g., concave curvature), it may be flat.

[0021] As can be seen by FIG. **1**, a label **26** may be located at a front face **28** of the front wall **16**. The label **26** may be formed of any one or more suitable materials, such as paper, plastic film, combinations thereof, etc. The label **26** may be adhered (e.g., using a pressure sensitive adhesive), shrink fit or otherwise attached to the tub **12** by any suitable manner. The label **26** may have an identifier (e.g., printed thereon) that identifies a source of the container system **10**. In some embodiments, the label **26** may have a dimension (e.g., width and/or height) that is less than a dimension (e.g., width and/or height) of the front face **28**. In embodiments where the tub **12** is formed of a transparent or semi-transparent material, such a smaller dimensioned label **26** can facilitate viewing of unitized doses **30** of detergent compositions through the front wall **16** of the container system **10** (e.g., along areas adjacent the periphery of the label **26**). Such viewing capability may be desirable, for example, so that consumers can see contents of the container systems **10** when placed on a shelf for consumer purchase. In other embodiments, the tub **12** or one or more portions thereof may be formed of an opaque material, such that the contents of the container system **10** may not be seen through the tub **12**. In still other embodiments, a portion or all of the front wall **16** may be transparent and/or semi-transparent and the label **26** may be configured to include one or more windows and/or openings (not shown) therein (i.e., portions where there is not label material) in order to facilitate viewing of the unitized doses **30** of detergent compositions through both the label and the front wall **16**. In addition, the one or more windows may comprise a transparent and/or semi-transparent material.

[0022] Referring to FIG. **2**, a label **31** may also be located at a rear face **33** of the rear wall **18**. The label **31** may be located between handle structures **42** and **44**, which will be described in greater detail below. In the embodiment of FIG. **2**, the label **31** may comprise a shape that approximates an hourglass shape or be substantially hourglass shaped to fit between the handle structures **42** and **44**, however, other shapes and sizes are possible.

[0023] Referring back to FIG. **1**, the container system **10** may include a latching system **45** that can be used to secure the lid **14** in the illustrated closed position. The tub **12** may include a feature, such as a recess **47** that can facilitate latching and unlatching of the latching system **45** in order to open and close the lid **14**. Additionally, the provision of the latching system **45** facilitates the opening of the container system **10** with one hand, thus facilitating access to the enclosed articles by both left-handed and right-handed users, as well as by a user whose one hand is occupied in a task, such as holding a child, and who therefore must use his or her free hand, which may be left or right, to reach for the enclosed articles. Additional details of the latching system **45** will be described in greater detail below.

[0024] Referring now to FIGS. **5-8**, the tub **12** is illustrated in isolation with the lid **14** removed. As shown, the tub **12** may have a somewhat rounded configuration with the front wall **16** and rear wall **18** being flat or planar. It will be understood, however, that the tub **12** may have any shape as known in the art and, in one embodiment, may have a more rectangular or boxed configuration. In some embodiments, although flat, one or both the front wall **16** and the rear wall **18** may be slanted at an angle relative to the vertical (e.g., five degrees or less), which can reduce contact between adjacent tubs **12** and reduce scuffing or otherwise rubbing contact against any labels affixed to the respective wall. The side walls **20** and **22** (or at least portions thereof) may be rounded. In the illustrated embodiment, the side walls **20** and **22** curve outwardly from a lid-receiving portion **32** of the tub **12** and then curve inwardly to the bottom **24** (e.g., convex or substantially convex curvature). In some embodiments, the radius of curvature of both side walls **20** and **22** may be about the same along the lengths of the side walls **20** and **22** or the radius of curvature of the side walls **20** and **22** may be different. In embodiments where the curvatures are the same, the tub **12** may be symmetric about a vertical axis A extending through a center of the tub **12**.

[0025] Referring particularly to FIGS. **7** and **8**, one or both of the side walls **20** and **22** may include a flat portion **34** and **36** that is bounded by curved portions **38** and **40**. The flat portions **34** and **36** are illustrated as being somewhat circular and oriented vertically, substantially parallel with axis A; however other shapes and orientations may be used such as various polygonal shapes. The curved portions **38** and **40**, as noted above, curve from the lid receiving portion **32** to the bottom **24** and may also curve from the front wall **16** to the rear wall **18** (see FIG. **9**). In other words, each of the side walls **20** and **22** may curve bi-directionally (e.g., bi-directional radii of curvature) and include an island or discrete flat portions **34** and **36**. As will be described in greater detail below, the flat portions **34** and **36** may provide contact regions where filled container systems **10** may come into side-by-side contact, for

example, during a conveying process. In some embodiments, the flat portions **34** and **36** may be located at about a position along the side walls **20** and/or **22**, respectively, that is horizontally aligned with the center of gravity of the container system **10**. In other embodiments, the flat portions **36** and/or **36** may be located at and/or above a position along the side walls **20** and/or **22**, respectively, that is horizontally aligned with the center of gravity of the container system **10**.

[0026] Referring to FIGS. **5** and **6**, the lid receiving portion **32** includes a shoulder **46** that extends inwardly from upper edges **48**, **50**, **52** and **54** of the front wall **16**, rear wall **18** and side walls **20** and **22**, respectively, to a mouth structure **56**. The mouth structure **56** extends upwardly from the shoulder **46**, terminating at an upper mouth edge **58**. A fastening feature in the form of a rib **60** extends about a periphery of the mouth structure **56** as shown, for example, in FIG. **6**. In some embodiments, the rib **60** is a single, continuous rib that extends about the entire periphery of the mouth structure **56**. Other configurations are possible, however, such as, for example, multiple or discontinuous rib structures.

[0027] Referring back to FIGS. **2** and **4**, the exemplary handle structures **42** and **44** can provide multiple grasping possibilities for a user. For example, the user may grasp the container system **10** at any one of the handle structures **42** or **44** to hold the container system **10** in a single hand. In another instance, the user may grasp the container system **10** with both hands, one hand grasping handle structure **42** and **44**. Thus, multiple grasping positions can be used in utilizing the handle structures **42** and **44**.

[0028] Referring now to FIG. **9**, the lid **14** is illustrated in isolation, removed from the tub **12**. The lid **14** generally includes a tub connecting portion **80** that connects the lid **14** to the tub **12** and a lid closure portion **82** that is moveable relative to the tub connecting portion **80** between open and closed configurations. In some embodiments, the lid closure portion **82** may be moveably connected to the tub connecting portion **80** (e.g., by a hinge structure **84** such as one or more living hinges) such that the lid closure portion **82** may be moved (e.g., pivoted) relative to the tub connecting portion **80** between the open and closed configurations while remaining connected to the tub connecting portion **80**. In other embodiments, the lid closure portion **82** may be removably connected to the tub connecting portion **80** such that the lid closure portion **82** can be completely separated from the tub connecting portion **80**. An opening **92** extends through the tub connecting portion **80** that is sized and arranged to align with the opening **65** of the tub **12**. While FIG. **9** illustrates a continuous tub connecting portion **80**, other configurations are contemplated such as a segmented tub connecting portion **80**.

[0029] A notch **102** may be provided at the front of the tub connecting portion **80**. The notch **102** may provide a latch engaging feature of the latch system **45** for latching the lid closure portion **82** in the closed configuration. In other embodiments, the notch **102** may not be provided. For example, a bottom edge of the tub connecting portion **80** may provide the latch engaging feature.

[0030] The lid closure portion **82** is provided with a latch engaging feature **120** of the latch system **45**. In the illustrated exemplary embodiment, the latch engaging feature **120** includes a cantilevered latch member **122** that is configured for movement between latched and unlatched positions. In some embodiments, the latch member **122** may be formed of the same material forming the adjacent portions, which may have sufficient flexibility and resiliency to allow the latch member **122** to be repeatedly moved between the latched and unlatched positions. In some embodiments, the material forming the latch member **122** may have sufficient resiliency to bias the latch member toward the illustrated latched position. A self closing latch system **45** may also be provided where enough biasing force is provided by the material to automatically return the latch member **122** to the latched position. While the latch member **122** may be formed of material forming the adjacent portions, the latch member **122** may also be formed of a different material.

[0031] Referring back to FIG. **9**, a flexible membrane **130** is illustrated as being connected to the underside of the lid **14**. It will be understood, however, that in other embodiments the flexible membrane **130** may be connected to the lid receiving portion **32** or any other portion of the tub **12** so long as the flexible membrane **130** at least partially blocks the opening **65** of the tub **12**. It will further be understood that in some embodiments the flexible membrane **130** may substantially or completely block the opening **65** of the tub **12**. The flexible membrane **130** may be connected to the underside of the lid **14** in any suitable manner as known in the art. In one preferred embodiment the flexible membrane **130** may be heat sealed to the underside of the lid **14**. In yet other embodiments the flexible membrane **130** may be glued to the underside of the lid **14**. The flexible membrane **130** may include at least two portions **132**, **134** having an opening there through that provides access to the containing volume of the tub **12**. In one preferred embodiment, the two portions **132**, **134** overlap and in yet another embodiment the leading edges of the two portions abut each other. It will be further understood that the flexible membrane **130** may include any number of portions and the leading edges may be formed into any shape, such as in a wavy configuration, or design as known in the art. In yet another embodiment, the flexible membrane **130** may be one unitary piece that includes a perforation or line of weakness that when broken forms the at least two portions **132**, **134** and provide access to the containing volume of the tub **12**.

[0032] The above tub **12**, lid **14** and flexible membrane **130** may be formed by any suitable method utilizing any suitable materials. In some embodiments, the tub **12** may be molded (e.g., injection stretch blow molded) from a suitable plastic material such as polyethylene terephthalate. Any suitable polyolefins and/or polyesters may be used. The lid **14**, flexible membranes **130** or portions thereof may be formed partially or wholly of a moldable thermoplastic material, such as polypropylene, polyethylene, polystyrene, acrylonitryl butadiene styrene (ABS), polyester, polyvinyl chloride, polycarbonate or elastomer, or a blend of these materials. In some embodiments, the tub **12** is formed of a clear, transparent or semi-transparent material, while the lid **14** and/or flexible membrane **130** is formed of an opaque material. In another embodiment, the lid **14** and/or flexible membrane **130** may be formed translucent. In one embodiment, the lid closure portion **82** may be formed using differential mold half temperatures to pre-shape (or pre-warp) the lid closure portion **82**. In such embodiments, the lid closure portion **82** may impart a sealing force once the lid closure portion **82** is in the closed configuration.

[0033] As indicated above, the above-described container systems **10** may contain unitized doses (e.g., counts of 50, 56, 84, 96, etc.) of a laundry detergent composition. In some instances, the unitized doses **30** may be pouches. The pouches may be a single compartment or include multiple compartments. The pouches may contain various compositions,

which may be of varying colors that may be seen from outside of the pouch. A multi-compartment pouch may contain the same or different compositions in each separate compartment. This multi-compartment feature may be utilized to keep compositions containing incompatible ingredients (e.g., bleach and enzymes) physically separated or partitioned from each other. It is believed that such partitioning may expand the useful life and/or decrease physical instability of such ingredients. Additionally or alternatively, such partitioning may provide aesthetic benefits as described in European Patent Application Number 09161692.0 (filed Jun. 2, 2009 and assigned to the Procter & Gamble Company), which is herein incorporated by reference in its entirety.

[0034] Non-limiting examples of useful compositions include light duty and heavy duty liquid detergent compositions, hard surface cleaning compositions, detergent gels commonly used for laundry, and bleach and laundry additives, shampoos, body washes, and other personal care compositions. Compositions of use in the present pouches may take the form of a liquid, solid or a powder. Liquid compositions may comprise a solid. Solids may include powder or agglomerates, such as micro-capsules, beads, noodles or one or more pearlized balls or mixtures thereof. Such a solid element may provide a technical benefit, through the wash or as a pre-treat, delayed or sequential release component; additionally or alternatively, it may provide an aesthetic effect.

[0035] In pouches comprising laundry compositions, the compositions may comprise one or more of the following non-limiting list of ingredients: opacifier; antioxidant; fabric care benefit agent; detersive enzyme; deposition aid; rheology modifier; builder; bleaching agent; bleach precursor; bleach catalyst; perfume; whitening agent; pearlescent agent; enzyme stabilizing systems; scavenging agents including fixing agents for anionic dyes, complexing agents for anionic surfactants, and mixtures thereof; optical brighteners or fluorescers; soil release polymers; dispersants; suds suppressors; dyes; colorants; hydrotropes such as toluenesulfonates, cumenesulfonates and naphthalenesulfonates; color speckles; colored beads, spheres or extrudates; clay softening agents. Each of these ingredients is described in European Patent Application Number 09161692.0 (filed Jun. 2, 2009 and assigned to the Procter & Gamble Company), which is hereby incorporated by reference in its entirety. Additionally or alternatively, the compositions may comprise surfactants and/or solvent systems.

[0036] The above described container systems may provide a number of features such as ease of handling, versatility and/or sealing functions to protect the unitized doses from exposure to water while in the container system. The container systems may also be provided in a variety of sizes, for example, depending on the number of united doses to be contained therein. The lid, when formed of an opaque material, can mask some of the empty volume at the top of the tub when the tub is formed of a clear material. For example, the lid may mask about five percent or more of the empty volume of the filled tub, such as about 10 percent or more.

[0037] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

[0038] Every document cited herein, including any cross referenced or related patent or application, is hereby incorporated herein by reference in its entirety unless expressly excluded or otherwise limited. The citation of any document is not an admission that it is prior art with respect to any invention disclosed or claimed herein or that it alone, or in any combination with any other reference or references, teaches, suggests or discloses any such invention. Further, to the extent that any meaning or definition of a term in this document conflicts with any meaning or definition of the same term in a document incorporated by reference, the meaning or definition assigned to that term in this document shall govern.

[0039] While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

What is claimed is:

1. A container system comprising:

a. a tub comprising:
  a front wall;
  a back wall opposite the front wall;
  side walls extending between the front wall and the back wall;
  a bottom extending between the front wall, back wall and side walls;
  a mouth structure connected to the front, back, and side walls, the mouth structure including a fastening feature configured for connecting to a lid and having an opening there through that provides access to a containing volume of the tub; and
  a shoulder extending inwardly from the side walls to the mouth structure;
  a plurality of unitized doses of a detergent composition within the containing volume of the tub;
b. a lid connected to the tub using the fastening feature, the lid having an open position for allowing user access to the containing volume and a closed position for preventing user access to the containing volume; and
c. a flexible membrane.

2. The container system of claim **1**, wherein the flexible membrane is connected to the underside of the lid.

3. The container system of claim **1**, wherein the tub comprises a lid receiving portion and the flexible membrane is connected to the lid receiving portion.

4. The container system of claim **1**, wherein at least one side wall is curved from the shoulder to the bottom and the side wall has a vertically oriented flat portion.

5. The container system of claim **1**, wherein the tub includes a handle structure formed integrally with the tub.

6. The container system of claim **5**, wherein the handle structure includes an inwardly extending portion extending inwardly from the rear wall toward the front wall of the tub and an outwardly extending portion that extends outwardly toward one of the side walls of the tub.

7. The container system of claim **1**, wherein the lid comprises:

a tub connecting portion including an engaging feature configured to engage the fastening feature of the mouth structure; and

a lid closure portion configured for movement relative to the tub connecting portion between the open position and the closed position.

8. The container system of claim **7**, wherein the lid closure portion is hingedly connected to the tub connecting portion such that the lid closure portion moves between the open position and the closed position while remaining connected to the tub connecting portion.

9. The container system of claim **8**, wherein the lid further comprises a latching system configured to latch the lid closure portion to the tub connecting portion with the lid closure portion in the closed position.

10. The container system of claim **1**, wherein the flexible membrane comprises at least two portions having an opening there through that provides access to the containing volume of the tub.

11. The container system of claim **1**, wherein the flexible membrane comprises polypropylene.

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