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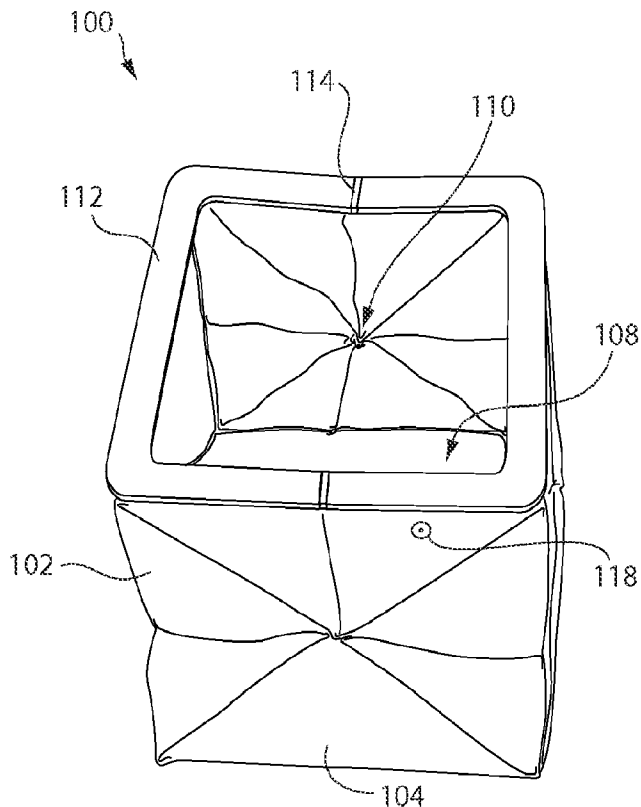
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(54) Title: SYSTEMS AND METHODS FOR WASTE DISPOSAL



(57) Abstract: In embodiments of the present invention improved capabilities are described for waste disposal. A waste disposal system may comprising a bag configured to receive waste; a frame attached to the bag at an opening, configured to close the opening when opposing sides of the frame are brought into contact with one another; a plurality of opposed tabs on the frame that engage to provide a resealable closure when opposing sides of the frame are brought into contact with one another; an adhesive disposed on at least one side of the frame to provide a seal when opposing sides of the frame are brought into contact with one another; a removable film disposed on the adhesive to prevent exposure of the adhesive until an airtight seal is desired; and a container for dispensing a plurality of bags. A disposal bag may comprise a bag configured to receive waste; a frame attached to the bag at an opening, configured to close the bag in a single-handed operation when opposing sides of the frame are brought into contact with one another; and a sealing facility disposed on the frame for providing a seal of the bag when opposing sides of the frame are brought into contact with one another.

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SYSTEMS AND METHODS FOR WASTE DISPOSAL**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims priority to the following US non-provisional application, which is hereby incorporated by reference in its entirety. US non-provisional application 11/738,363, filed April 20, 2007.

[0002] This application claims priority to the following US provisional applications, each of which is hereby incorporated by reference in its entirety: US provisional application 60/796,839, filed May 1, 2006; US provisional application 60/797,530, filed May 3, 2006; US provisional application 60/832,739, filed July 20, 2006; US provisional application 60/846,449, filed September 22, 2006; US provisional application 60/846,450, filed September 22, 2006; US provisional application 60/846,566, filed September 22, 2006; US provisional application 60/846,565, filed September 22, 2006; US provisional application 60/847,562, filed September 26, 2006; US provisional application 60/850,951, filed October 10, 2006; US provisional application 60/851,372, filed October 13, 2006; US provisional application 60/852,784, filed October 18, 2006; US provisional application 60/852,831, filed October 18, 2006; US provisional application 60/854,222, filed October 24, 2006; US provisional application 60/854,319, filed October 24, 2006; US provisional application 60/854,408, filed October 24, 2006; US provisional application 60/872,269, filed December 1, 2006; US provisional application 60/854,970, filed October 26, 2006; US provisional application 60/857,926, filed November 10, 2006; US provisional application 60/861,338, filed November 27, 2006; US provisional application 60/872,193, filed December 1, 2006; US provisional application 60/872,235, filed December 1, 2006; US provisional application 60/872,192, filed December 1, 2006; US provisional application 60/872,268, filed December 1, 2006; US provisional application 60/872,233, filed December 1, 2006; US provisional application 60/902,921, filed February 21, 2007; US provisional application 60/902,773, filed February 21, 2007; US provisional application 60/905,259, filed March 5, 2007; and US provisional application 60/905,151, filed March 5, 2007.

BACKGROUND

[0003] Field:

[0004] This invention generally relates to methods and systems of waste disposal, and specifically relates to a waste disposal system for the air-tight and odor-free disposal of waste.

[0005] Description of the Related Art:

[0006] Numerous household and industrial processes may generate odiferous and untidy waste whose disposal poses a problem because of the high odor that emanates from the refuse as it sits in a trash container over time and the untidy conditions of disposal when such disposal is not hands free. Existing disposal systems may be cumbersome to operate and may not contain odors.

[0007] A need exists for improved methods and systems for disposal of odiferous or messy waste, including methods and systems for disposal of odiferous waste by a hands-free operation.

SUMMARY

[0008] Provided herein may be methods and systems for waste disposal. In an aspect of the invention, a disposal bag comprises a bag configured to receive waste, a frame attached to the bag at an opening, the frame being configured to enable a user to close the bag in a single-handed operation when opposing sides of the frame are brought into contact with one another, and a sealing facility disposed on the frame for providing a resealable closure of the bag when opposing sides of the frame are brought into contact with one another. In an embodiment, the bag is configured to be detachably attached to a diaper. In an embodiment, the bag is glove-shaped. In an embodiment, the bag is free-standing. In an embodiment, the frame is hinged. In an embodiment, the frame of a first disposal bag provides support on its upper surface for the frame of a second disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag. In an embodiment, sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection. In an example of this embodiment, the adhesive is reusable. In an example of this

embodiment, the adhesive is permanent. In an embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the disposal bag further comprises a gasket mounted to the frame. In an embodiment, the disposal bag further comprises a release facility disposed on the disposal bag.

[0009] In an aspect of the invention, a method of providing a disposal bag comprises configuring a bag to receive waste, attaching a frame to the bag at an opening, the frame being configured to close the bag in a single-handed operation when opposing sides of the frame are brought into contact with one another, and disposing a sealing facility on the frame for providing a resealable closure of the bag when opposing sides of the frame are brought into contact with one another. In an embodiment, the bag is configured to be detachably attached to a diaper. In an embodiment, the bag is glove-shaped. In an embodiment, bag is free-standing. In an embodiment, the frame is hinged. In an embodiment, the frame of a first disposal bag provides support on its upper surface for the frame of a second disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag. In an embodiment, the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection. In an example of this embodiment, the adhesive is reusable. In an example of this embodiment, adhesive is permanent. In an embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the method further comprises mounting a gasket to the frame. In an embodiment, the method further comprises disposing a release facility on the disposal bag.

[0010] In an aspect of the invention, a disposal bag comprises a bag configured to receive waste, a frame attached to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another, and a release facility disposed on at least one of the frame and the bag

to remove excess volume of material from a sealed bag. In an embodiment, the release facility is a venting facility. In an embodiment, the release facility is a valve. In an embodiment, the excess volume is in vapor form. In an embodiment, the excess volume is in gas form. In an embodiment, the excess volume is in liquid form. In an embodiment, the release facility is at least one of a one-way vent, a two-way vent, a channel formed when opposing sides of the frame are brought into contact with one another, a channel formed on a single side of the frame, a gasket, a valve, and a vent tube removably affixed to the frame. In an embodiment, the release facility is mounted in the bag material. In an embodiment, the release facility is at least one of sealed, self-sealed, and plugged after the disposal bag is vented. In an embodiment, the bag is configured to be detachably attached to a diaper. In an embodiment, the bag is glove-shaped. In an embodiment, the bag is free-standing. In an embodiment, the frame is hinged. In an embodiment, a first disposal bag is configured to be nested in a second disposal bag. In an embodiment, the disposal bag further comprises a sealing facility disposed on the frame. In an example of this embodiment, the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection. In embodiments, the adhesive is reusable. In embodiments, the adhesive is permanent. In an example of this embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the disposal bag further comprises a gasket mounted to the frame.

[0011] In an aspect of the invention, a method of providing a disposal bag comprises configuring a bag to receive waste, attaching a frame to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another, and disposing a release facility on at least one of the frame and the bag to remove excess volume of material from a sealed bag. In an embodiment, the release facility is a venting facility. In an embodiment, the release facility is a valve. In an embodiment, the excess volume is in vapor form. In an embodiment, the excess volume is in gas form. In an embodiment, the excess volume is in liquid form. In an

embodiment, the release facility is at least one of a one-way vent, a two-way vent, a channel formed when opposing sides of the frame are brought into contact with one another, a channel formed on a single side of the frame, a gasket, a valve, and a vent tube removably affixed to the frame. In an embodiment, the release facility is mounted in the bag material. In an embodiment, the release facility is at least one of sealed, self-sealed, and plugged after the disposal bag is vented. In an embodiment, the bag is configured to be detachably attached to a diaper. In an embodiment, the bag is glove-shaped. In an embodiment, the bag is free-standing. In an embodiment, the frame is hinged. In an embodiment, a first disposal bag is configured to be nested in a second disposal bag. In an embodiment, the method further comprises disposing a sealing facility on the frame. In an example of this embodiment, the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection. In embodiments, the adhesive is reusable. In embodiments, the adhesive is permanent. In an example of this embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the method further comprises mounting a gasket to the frame.

[0012] In an aspect of the invention, a disposal bag comprises a bag configured to receive waste and a frame attached to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another, wherein the frame of a first disposal bag provides support on its upper surface for the frame of a second similar disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag. In an embodiment, the disposal bag is used in a hands-free operation. In an embodiment, the bag is glove-shaped. In an embodiment, the bag is free-standing. In an embodiment, the frame is hinged. In an embodiment, closure of the frame is configured for single hand operation. In an embodiment, the disposal bag further comprises a sealing facility disposed on the frame. In an example of this embodiment, the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular,

electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection. In embodiments, the adhesive is reusable. In embodiments, the adhesive is permanent. In an example of this embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the disposal bag further comprises a gasket mounted to the frame. In an embodiment, the disposal bag further comprises a release facility disposed on the disposal bag.

[0013] In an aspect of the invention, a method of providing a disposal bag comprises configuring a bag to receive waste and attaching a frame to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another, wherein the frame of a first disposal bag provides support on its upper surface for the frame of a second similar disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag. In an embodiment, the disposal bag is used in a hands-free operation. In an embodiment, the bag is free-standing. In an embodiment, the bag is glove-shaped. In an embodiment, the frame is hinged. In an embodiment, closure of the frame is configured for single hand operation. In an embodiment, the method further comprises disposing a sealing facility on the frame. In an example of this embodiment, the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connections. In embodiments, the adhesive is reusable. In embodiments, the adhesive is permanent. In an example of this embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the method further comprises mounting a gasket to the frame. In an embodiment, the method further comprises disposing a release facility on the disposal bag.

[0014] In an aspect of the invention, a waste disposal system comprises a bag configured to receive waste, a frame attached to the bag at an opening, the frame being

configured to close the opening when opposing sides of the frame are brought into contact with one another, a sealing facility disposed on the frame to provide a resealable closure when opposing sides of the frame are brought into contact with one another, an adhesive disposed on at least one side of the frame to provide a permanent seal when opposing sides of the frame are brought into contact with one another, and a container for dispensing a plurality of bags, wherein the bags nest one within the other in the container. In an embodiment, the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and a nanostructure-based connection. In an example of this embodiment, the adhesive is reusable. In an example of this embodiment, the adhesive disposed on the at least one side of the frame is reusable and the adhesive disposed on the opposing side of the frame is permanent. In an embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the frame is hinged. In an embodiment, closure of the frame is configured for single hand operation. In an embodiment, waste cleanup articles are positioned in a portion of the container. In an embodiment, the container is refillable. In an embodiment, the container is suspended. In an embodiment, the container is mounted near a location of a waste-making activity. In an embodiment, the waste disposal system further comprises a gasket mounted to the frame. In an embodiment, the waste disposal system further comprises a release facility disposed on the disposal bag.

[0015] In an aspect of the invention, a method of providing a waste disposal system comprises configuring a bag to receive waste, attaching a frame to the bag at an opening, the frame being configured to close the opening when opposing sides of the frame are brought into contact with one another, disposing a sealing facility on the frame to provide a resealable closure when opposing sides of the frame are brought into contact with one another, disposing an adhesive on at least one side of the frame to provide a permanent seal when opposing sides of the frame are brought into contact with one another, and providing a container for dispensing a plurality of bags, wherein the bags nest one within the other in the container. In an embodiment, the sealing facility is at

least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection. In an example of this embodiment, the adhesive is reusable. In an example of this embodiment, the adhesive disposed on the at least one side of the frame is reusable and the adhesive disposed on the opposing side of the frame is permanent. In an embodiment, the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge. In an embodiment, the frame is hinged. In an embodiment, closure of the frame is configured for single hand operation. In an embodiment, the method further comprises positioning waste cleanup articles in a portion of the container. In an embodiment, the container is refillable. In an embodiment, the container is suspended. In an embodiment, the container is mounted near a location of a waste-making activity. In an embodiment, the method further comprises mounting a gasket to the frame. In an embodiment, the method further comprises disposing a release facility on the disposal bag.

[0016] In an aspect of the invention, a waste container lid comprises an orifice for supporting a disposal bag container, an orifice for supporting waste clean-up articles, and an opening sized to allow articles for disposal to pass through it, including waste-containing disposal bags, wherein the waste container lid is configured to attach to a top portion of a waste container. In an embodiment, the waste container lid further comprises a cover of the waste container lid opening. In an embodiment, the cover is hinged. In an embodiment, the cover is opened by a spring-loaded release mechanism. In an embodiment, the cover is opened by a motion detection system. In an embodiment, the waste container lid further comprises a secondary disposal bag disposed within the waste container sized for receiving sealed disposal bags. In an embodiment, the waste clean-up articles are one or more of wet tissues, dry tissues, hand sanitizer, skin moisturizer, soap, water, cream, lotion, and medication. In an embodiment, the container supports the disposal bag by its frame. In an embodiment, the container dispenses the disposal bag in a pop-up configuration. In an embodiment, the container dispenses the disposal bag in a nesting configuration. In an embodiment, the container dispenses the disposal bag in a stacked configuration.

[0017] In an aspect of the invention, a method of providing a waste container lid comprises providing an orifice for supporting a disposal bag container, providing an orifice for supporting waste clean-up articles, and providing an opening sized to allow articles for disposal to pass through it, including waste-containing disposal bags, wherein the waste container lid is configured to attach to a top portion of a waste container. In an embodiment, the method further comprises providing a cover of the waste container lid opening. In an embodiment, the cover is hinged. In an embodiment, the cover is opened by a spring-loaded release mechanism. In an embodiment, the cover is opened by a motion detection system. In an embodiment, the method further comprises disposing a secondary disposal bag within the waste container sized for receiving sealed disposal bags. In an embodiment, the waste clean-up articles are one or more of wet tissues, dry tissues, hand sanitizer, skin moisturizer, soap, water, cream, lotion, and medication. In an embodiment, the container supports the disposal bag by its frame. In an embodiment, the container dispenses the disposal bag in a pop-up configuration. In an embodiment, the container dispenses the disposal bag in a nesting configuration. In an embodiment, the container dispenses the disposal bag in a stacked configuration

[0018] These and other systems, methods, objects, features, and advantages of the present invention will be apparent to those skilled in the art from the following detailed description of the preferred embodiment and the drawings. All documents mentioned herein are hereby incorporated in their entirety by reference.

BRIEF DESCRIPTION OF THE FIGURES

[0019] The invention and the following detailed description of certain embodiments thereof may be understood by reference to the following figures:

[0020] Fig. 1 depicts a free-standing disposal bag configured as a box.

[0021] Fig. 2 depicts the pattern for a free-standing disposal bag configured as a box.

[0022] Fig. 3 depicts an unstructured bag with a frame comprising tabs.

[0023] Fig. 4A depicts a frame for a disposal bag with an interference locking system; Fig. 4B depicts a frame for a disposal bag with an interference locking system and an alternative gasket solution.

[0024] Fig. 5 depicts a disposal bag with a frame formed from the material of the bag.

[0025] Fig. 6 depicts a frame for a disposal bag with handles.

[0026] Fig. 7 depicts adhesive disposed along the surface of the frame of a disposal bag.

[0027] Fig. 8 depicts a ball-type purse closure for a disposal bag frame.

[0028] Fig. 9 depicts a disposal bag with extended bag material in the form of a flap.

[0029] Fig. 10 depicts a sideways useable system with extended flap allowing for scooping or sweeping waste inside the bag.

[0030] Fig. 11A depicts a cross-section of the tissues and their dispenser disposed inside the disposal bag stack when the system is in the closed position; Fig. 11B depicts a cross-section of the system in the open position with both tissues and the disposal bags available for use.

[0031] Fig. 12 depicts a peel tab binding for a stack of nested bags.

[0032] Fig. 13 depicts a container with a channel.

[0033] Fig. 14 depicts a hinged lid with an opening for a disposal bag container.

[0034] Fig. 15 depicts a shaped wire for suspending a container of disposal bags.

[0035] Fig. 16 depicts a disposal bag system with an orifice for disposal bags, an orifice for a bottle, and an opening for trash.

[0036] Fig. 17 depicts a container and lid with mating threads.

[0037] Fig. 18 depicts a disposal bag configured to be worn as a glove.

[0038] Fig. 19 depicts a disposal bag attached to a diaper.

[0039] Fig. 20 depicts a channel formed in a frame with an attached plug.

[0040] Fig. 21 depicts a frame with discrete interlocking features.

[0041] Figs 22 – 24 depict use of the disposal bag configured as a box.

[0042] Fig. 25 depicts a disposal bag with a mechanical fastening at the edge of a frame.

[0043] Fig. 26 depicts a disposal bag with adhesive disposed on a frame with (A) and without (B) an odor reducing agent.

[0044] Figs. 27 – 32 depicts operation of a disposal bag with a rounded frame.

[0045] Fig. 33 depicts a disposal bag with a member containing an odor reducing agent.

[0046] Fig. 34 depicts two alternatives of flange design.

[0047] Figs. 35 and 36 depict operation of a disposal bag with adhesive along an integral closure member.

[0048] Fig. 37 depicts a sequence of steps for dispensing and using a disposal bag.

[0049] Figs. 38 and 39 depict an exemplary set of steps for using a disposal bag with an extended flap and sealing it.

[0050] Fig. 40 depicts a disposal bag type for a large secondary waste container.

[0051] Figs. 41 and 42 depict a circular frame and closing the frame along a hinge line.

[0052] Fig. 43 depicts a series of features of a rounded, resealable frame.

[0053] Figs. 44 and 45 depict a plurality of nested bags within each other and stacked above one another in a dispenser and the container with a cover.

[0054] Fig. 46 depicts placing waste into the top-most nested bag with a cover protector around the perimeter of the nested bag frames.

[0055] Fig. 47 depicts removing the top-most nested bag from the nested stack using tabs on its closure frame, one-handed closing of the disposal bag, and compressing the excess air from the used bag for compaction prior to storage or disposal.

[0056] Fig. 48 depicts a disposal bag system with disposal bags in the portion of the system on the left and tissues in the portion of the system on the right.

[0057] Fig. 49 depicts a disposal bag with an exemplary molded frame and closing the open bag with a single hand.

[0058] Fig. 50 depicts an exemplary disposal bag with a one-way collapsible valve, a fragrant member near a vent, and a portion of the bag for sealing the valve.

[0059] Fig. 51 depicts a disposal system with nested bags and a cross-section of the disposal system.

[0060] Figs. 52 – 54 depict a refill pack for a disposal bag dispenser.

[0061] Fig. 55 depicts a piece of furniture with a container of disposal bags clamped to an edge.

[0062] Fig. 56 depicts mounting devices for a container of disposal bags.

[0063] Fig. 57 depicts a disposal system.

[0064] Fig. 58 depicts opposing ball members that permit shutting and opening a disposal bag and the opposing ball members and an adhesive.

[0065] Fig. 59 depicts a flat pack disposal bag with adhesive for attachment to a diaper, and a container for flat pack disposal bags.

[0066] Fig. 60 depicts opening the disposal bag attached to the diaper, inserting the soiled diaper into the disposal bag, and the sealed disposal bag with soiled diaper contents.

[0067] Fig. 61 depicts opposed snap tabs coming into proximity and finger pressure being applied to deflect the snap tabs.

[0068] Fig. 62 depicts opposed snap tabs deflecting past one another and a hinged frame with snap tabs and an adhesive disposed on the frame protected by a peel away layer.

[0069] Fig. 63 depicts a sealed disposal bag being vented through a tube in the frame and the tube being removed after venting.

[0070] Fig. 64A depicts a sealed, vented disposal bag; Fig. 64B depicts a disposal bag with a hinged frame comprising opposed snap tabs and foam tape.

[0071] Fig. 65 depicts sealing a frame by deflecting opposed snap tabs, venting the sealed disposal bag through a tube, and removing the tube from the sealed, vented disposal bag.

[0072] Fig. 66 depicts a container with a safety lid.

[0073] Fig. 67 depicts a stack of nested bags in a container.

[0074] Fig. 68 depicts operation of a disposal bag container lid with spring loaded snap lock engaging features.

[0075] Fig. 69A depicts a glove or mitten shaped disposal bag and a frame for attachment to the bag; Fig. 69B depicts grasping waste with a hand placed inside a disposal bag.

[0076] Fig. 70A depicts inverting the disposal bag once waste has been placed within the disposal bag; Fig. 70B depicts removing a peel away layer from an adhesive disposed on the frame of the disposal bag.

[0077] Fig. 71A depicts shutting a disposal bag; Fig. 71B depicts a sealed disposal bag with a release facility.

DETAILED DESCRIPTION

[0078] Waste disposal methods and systems involve containment of the materials to be disposed of and may also involve containment of odor, use during waste-making activities, and use in an environmentally sound manner. An improvement that may be provided by the present invention relates to a waste disposal system comprising a disposal bag with a frame and related methods for inexpensive, compact, and convenient disposal of waste in an air-tight, odor-controlled, single-hand operable disposal bag. Waste may be placed in a disposal bag, which may be either free-standing or presented for use in a dispenser, and the frame may be folded at a hinge such that opposing sides of the frame are brought into contact with one another and the waste is sealed within the disposal bag. The frame may provide means for temporary and and/or permanent seal of the disposal bag in a substantially airtight and odor-free manner. The disposal bag may be stored for an extended period of time before final disposal in an odor-free manner.

[0079] Referring to Figure 1, an aspect 100 of the invention may involve a disposal bag with a frame. In an embodiment, the disposal bag 100 comprises a flexible material 102. The flexible material 102 may be plastic, polymers, paper, coated paper, fabric, a combination thereof, and the like. The plastic may comprise high density polyethylene, low density polyethylene, polypropylene, nylon, polylactic acid, a combination thereof, and the like. The flexible material 102 may be of any suitable gauge or thickness. The flexible material 102 may be biodegradable, chemical-resistant, waterproof, flame retardant, radioactivity-resistant, light-resistant, decorative, imprintable, and the like. The flexible material 102 may be impermeable to fluids and

gases, such as for example, by being naturally impermeable, by applying a thin impermeable or laminate sheet material to the surface of the paper or other permeable material, by applying a waterproofing treatment to the interior or the exterior of the material, and the like. The flexible material 102 may be unstructured, as in Fig. 3 (302), or structured. For example, the flexible material 102 may form a substantially cylindrical shape with an unstructured bottom, as in Figure 3. In another example, the flexible material 102 may form a box. The side walls 104 of the box may be constructed from a flexible material 102, as described herein, that may sustain a crease and be compliant enough to bend on moderate radii and return to the original plane. The crease in the side walls 104 may fold inwards or outwards.

[0080] The box may collapse to a compact form by creasing and folding the flexible material 102. In an embodiment, the disposal bag may be free-standing. The material and thickness of the bag walls may in part result in the free-standing capability. The cutting and arrangement of the sides of the bags may in part result in the free-standing capability. For example, the bottom surface 108 of the bag may be flat permitting the bag to stand on a flat surface. In this example, the bag may form a box with side walls 104 such as those described herein, a substantially cylindrical structure with a flat bottom surface 108, and the like. The exact geometrical configuration of the bag is not limiting for the present invention. In an embodiment, the side walls 104 of the box may be pre-folded 110 to create a collapsing structure that, when folded flat, may conform to a square. Storage of the box may be facilitated by stacking or arranging the collapsed structures. For example, multiple folded squares may be placed alongside one another in a storage cube. Preparing the folded box for use may involve unfolding the box by straightening the folded sides to a substantially vertical configuration such that the bottom is substantially flat and the frame is substantially parallel to the bottom. The box may be used for disposal with or without a frame 112 as described herein.

[0081] Referring to Figure 2, in an embodiment, the box may be constructed in the manner of a standard flat bottom bag in its lower portion. The line pattern 214 may be creased to preserve the fold pattern once the flexible material is attached to the frame 112 in its three-dimensional form. The first lap joint 202 may create a tube from the flat sheet and may be sealed so as to be fluid and air impermeable. The bottom diagonal

folds 218 may allow the flat bottom to be created as in other known flat bottom bag designs, first folding out in triangular double thickness ears on two opposing sides, creating the plane indicated with a heavy line from 204 to 208, with the central seam 210 overlapping by an amount that provides a water and airtight joint. Then, the ears may be folded under and attached to the square bottom surfaces. The top edge of the bag may be folded internally on all four sides with the corners double-folded over on each other on the diagonal lines 212 to form liquid/air tight corners. The third bonded seam may adhere the folded-in bag top to the perimeter frame in a fluid and air impermeable seal. Final folding on all of the other lines may compact the bag to a flat pack configuration. In this embodiment, the flat pattern for the box has a sealable valve 220 mounted in the material.

[0082] In an embodiment, the bag may be constructed from a continuous piece of material. Alternatively, the bag may be constructed from more than one piece of material. For example, the bag may be constructed from a single sheet of material that may have a cubic proportion. In another example, the bag is constructed from many pieces of material secured to one another through any conventional means. In an embodiment, the bag may be constructed using a sleeve-on-pipe manufacturing platform. The bag may be of any suitable size. In any event, the bag is constructed such that the material forms an opening in the bag.

[0083] In an embodiment, the bag may be clear, opaque, colored, patterned, and the like. The color may mark the contents within the disposal bag. The bag may include a written or graphical representation of the contents within the bag. For example, a marking of "Biohazard" with or without the recognized symbol for Biohazard may indicate that biohazardous content is contained within the disposal bag. In another example, the bag may be colored yellow and be marked "Radioactive Waste" with or without the recognized symbol for radioactive waste.

[0084] In an embodiment, the disposal bag may comprise a frame 112. The frame 112 may be associated with the bag at an opening in the bag. The frame 112 may be round, as in Fig.3, oval, ellipsoidal, circular, square as in Fig.1, rectangular, polygonal, molded, as in Fig.4, and the like. The exact geometrical configuration of the frame is not limiting for the present invention. The frame 112 may be substantially flat. The frame

112 may be attached at an opening of the bag along the inner surface of the bag, along an outer surface of the bag, or a combination thereof. The frame 112 may comprise a flexible material, a rigid material, or a semi-rigid material, such as cardboard, plastic, or a planar material. The rigid or semi-rigid material of the frame 112 may enable the bag to be held in a substantially open configuration. The open configuration may enable hands-free use of the disposal bag by simply depositing the waste material into an open disposal bag and either sealing the bag immediately or sealing the bag at some time after the waste-making activity. For example, disposal of a soiled baby diaper into the disposal bag may not require removal of both hands from the baby. This feature may enable a user to dispose of waste without contamination of their hands.

[0085] In an embodiment, the frame 112 may be separately formed and attached to a bag by any method of attachment, including adhesive, thermal, heat sealing, physical, chemical, magnetic, ultrasonic welding, and the like. The frame 112 may be a single piece or formed from more than one part. The frame 112 may be molded from various polymer resins in a high-pressure injection molding process to include a suitable mechanical closure in the frame. The closure may comprise an interference locking system comprising one male and one female element that when pressed together may engage by mechanical spring interference to create an airtight seal. The closure may comprise a tongue 404 on one portion of the frame 112 that may move into engagement with a receiving cavity 408 on another portion of the frame 112 when a pressure may be applied to opposed sides of the frame once brought into close contact. The opening of the receiving cavity 408 may be of a smaller dimension than the tongue portion 404 and pressure may cause sufficient deformation at the entry to enable the tongue 404 to pass the opening lip and be fully enclosed by the cavity resulting in a tight mechanical engagement that may require significant force to disengage. The frame 112 may be supplemented by a gasket 412 or some other compressible or gap-filling material, as described herein. The gasket 412 may be disposed on the frame 112 such that it does not overlap with the interference locking system. For example, the gasket 412 may be disposed along an outer perimeter of the frame 112, along an inner perimeter of the frame 112, along an outer perimeter of one half of the frame 112 and along an inner perimeter of the opposing side of the frame 112, and the like. An alternative gasket solution may

comprise a molded frame of diminishing dimension such that it may be relatively pliable at its outer surface 410 and may be formed to protrude toward the opposing feature 410 on an opposing side of the frame when in a closed configuration. When opposing sides of the frame may be brought into contact with one another, the compliant internal and external features 410 may deform one against the other creating an airtight and odor-proof seal along the perimeter of the frame 112.

[0086] In an embodiment, the frame 112 is integrally formed with the bag such as by using a chemical or manufacturing technique that forms a heavier frame 112 out of a portion of the bag near its opening. In an embodiment, the bag material may be extruded or otherwise formed from the heavier frame 112. For example, the technique may involve dipping the edge of the bag in a polymer liquid that may be heat or catalyst cured, a wax type material that may be applied and may be cooled, a paint type compound that may be air dried, a molding process such as insert injection molding wherein the frame 112 is formed to the edge of the material, and the like. There may be other materials and processes that may create a stiffness of the frame 112 and a smoothness of the frame surface that may facilitate the sealing function. For example, the top perimeter may be dipped or otherwise treated with a liquid or powder that may adhere to the edge inside and out, the application depth may be approximately that of the desired width of the frame. The liquid or powder may be capable of being formed, dried, and/or cured so that it may create a rigid surface that may incorporate the original material of the bag. Prior to forming, drying, and/or curing and while the material is still pliant, the material may be folded in any configuration so as to provide a frame 112 of suitable dimension. For example, a frame 502 may be formed by applying pressure on the inside and outside edge of the treated portion of the bag such that the material may be folded inward by a dimension desired for the width of the frame. The corners 504 may be folded to create an inward facing gusset that may be folded over upon itself so as to minimize the flat-folded dimension of the bag when stored or shipped. The corner joints may be filled in by chemical material or bag material so as to ensure a waterproof seal. A crease 508 may be formed as the frame 502 is created on the centerline creating a hinge point.

[0087] In an embodiment, the frame 112 may comprise a handle 604. The handle 604 may be constructed as part of the frame 112. The handles 604 on opposing sides of the frame 112 may be offset one to the other or may overlap. The handles 604 may facilitate opening and closing the disposal bag. The handle 604 may comprise a hole. The hole in the handle 604 may facilitate hanging or otherwise temporarily suspending or storing the disposal bag and its contents between uses. The handle 604 may be located on only one side of the frame 112. The handle 604 may facilitate alignment of one or more frames 112 with one another and/or in a container.

[0088] In an embodiment, the frame 112 may comprise a hinge 114. The hinge 114 may be formed in the frame 112 by a process that enables the rigid material to bend, such as by creasing, embossing, scoring, molding, perforating, stamping, cutting, breaking, and the like. The hinge 114 may extend partly or completely through the material of the frame. The hinge 114 may be located substantially at a centerline of a frame 112. The hinge 114 may be located at a bisecting point on a frame 112. The frame 112 may be able to fold at a hinge 114 such that one portion of the frame 112 may be brought in contact with another portion of the frame 112. Contact between opposing sides of the frame may be substantially uniform and airtight. When opposing sides of the frame are brought into contact with one another by pinching the hinge 114 or pulling up on opposing sides of the frame 112, the bag opening may be sealed. The opposing sides of the frame 112 may be brought into contact with one another in a single-handed operation or with two hands. In an example, if the disposal bag is in the form of a box, the side walls 104 may follow the motion of the frame 112 when it may be folded to close the bag opening.

[0089] In an embodiment, the frame 112 may comprise a sealing facility. Adhesive 702 may be used to form a temporary or permanent seal. For example, an adhesive 702 may be disposed along the surface of a frame. The adhesive 702 may be protected from accidental contact or contamination by a peel-away protective layer 704, a slippery interlayered separation sheet, by micro-encapsulation of the adhesive 702, by a two-part chemistry that is activated when adhesive layers on both sides of the frame 112 are brought into contact with one another, a combination thereof, and the like. For example, a peel-away protective layer 704 may be peeled away by grasping a portion of

the layer not adherent to adhesive 702 and pulling, by physically separating the layer from the adhesive to 702 reveal a gap and continuing to extend that gap by pulling on the layer at the gap, and the like. A peel-away protective layer 704 may not be necessary for micro-encapsulated adhesives or adhesives with two-part chemistry. After exposure of the adhesive 702, opposing sides of the frame 112 may be brought in contact with one another such that the adhesive 702 on at least one side of the frame 112 makes contact with the opposing side of the frame 112 to form a seal. A pressure may be applied to form the seal.

[0090] In an embodiment, the adhesive 702 may be disposed along the top edge of a bag where a frame may not otherwise be attached. For example, the bag may be in the form of a box wherein the side walls of the box may be creased and are able to fold inwards or outwards. As described herein, a low-tack adhesive 708 may be disposed along one side of the bag from a mid-point fold line on one side around to the mid-point fold line on the other side. The opposite side may be coated with a high-tack adhesive 702 between these fold lines. The box may be sealed, either temporarily or permanently, with the side walls folded inward or the side walls folded outward such that there may be a single crease at an outer edge of the adhesive band.

[0091] In an embodiment, the adhesive 702 may be low-tack, high-tack, and the like. For example, a low-tack adhesive 708 may provide a temporary seal. The bag may be re-opened after sealing the frame with a low-tack adhesive 708. When the bag is re-opened, the adhesive 708 may be available for resealing the frame. The low-tack adhesive 708 may continue to provide a resealable closure until the tackiness of the adhesive 708 may wear off. In another example, a high-tack adhesive 702 may provide a permanent seal. A high-tack adhesive 702 may be gap filling. For example, a gap filling permanent adhesive may fill the hinge joint when the frame is sealed.

[0092] In an embodiment, the adhesive 702 may be disposed on the surface of one side of the frame 112, both sides of the frame 112, a portion of either side of the frame 112, and the like. For example, the adhesive 702 disposed on one side of the frame 112 may be low-tack 708 and the adhesive disposed on the opposing side of the frame may be high-tack 702. In this example, exposure of a low-tack adhesive 708 may provide a resealable closure of the disposal bag until a permanent seal is desired. The

low-tack adhesive 708 may provide a resealable closure against the protective film 704 covering the high-tack adhesive 702 on the opposing side of the frame 112. When a permanent seal may be desired, a high-tack adhesive 702 on the opposing side of the frame 112 may be exposed. A permanent seal may be formed when the high-tack adhesive layer 702 may be brought in contact with the low-tack adhesives 708 on the opposing side of the frame 112. The adhesion of the two different adhesives 702 to one another may fill the gaps of the sealed frame 112 and provide an airtight seal. For example, a portion of the adhesive 702 may be low-tack and a portion of the adhesive may be high-tack. A low-tack adhesive 708 may be disposed alongside a high-tack adhesive 702 on one or both sides of the frame 112. The adhesive layers may form stripes of adhesive 702 alongside one another. Multiple stripes of either adhesive 702 may be disposed along the surface of a frame 112. Each stripe of adhesive 702 may be protected as described herein. Exposure of a low-tack adhesive 708 may provide a resealable closure of the disposal bag until a permanent seal is desired. At that time, a high-tack adhesive 702 on the frame 112 may be exposed. A permanent seal may be formed when the high-tack adhesive layer 702 may be brought in contact with the opposing side of the frame 112.

[0093] In an embodiment, the sealing facility may be mechanical. Referring to Figure 3, the sealing facility may be a tab 304. The sealing facility may be a ball 802 or otherwise smooth geometric solid. For example, a tab 304 or ball 802 on one side of the frame 112 may engage a tab 304 or ball 802 on the opposing side of the frame 112 when opposing sides of the frame 112 are brought into contact with one another to provide closure of the disposal bag. The opposed tabs 304 or balls 802 may deflect past one another such that when the deflected members may be past the centerline of both, they may engage such that their surfaces create a pressure between both that exerts a pressure on the two faces of the hinged top frame 112 keeping them in tight engagement. The closure of the disposal bag may be resealable by deflecting the tabs 304 or balls 802 past one another in the opposite direction to release the tabs' 304 or balls' 802 engagement. A single set or a plurality of opposed tabs 304 or balls 802 may be disposed anywhere along the perimeter of the frame 112. One or more sets of tabs 304 or balls 802 may be engaged to provide a resealable closure. In embodiments, the tabs 304 or

balls 802 may facilitate handling of the disposal bag. The tabs 304 or balls 802 may be offset from one another such that opposed tabs 304 may not engage one another. In this example, the tabs 304 or balls 802 may not be intended for use as a sealing facility but may still facilitate handling of the disposal bag. A frame 112 with tabs 304 or balls 802 may be fabricated as a die- or laser-cut piece from flat stock.

[0094] In another example, the sealing facility may be a snap fit mechanism. The entire perimeter edge of the frame may comprise a zipper edge wherein the zipper edge of one side of the frame may compatibly engage the zipper edge of the opposing side of the frame to form a seal. In another example, the snap fit mechanism is a clip affixed to the edge of the frame. When opposing sides of the frame are brought into contact with one another, the clip may engage the opposing side of the frame to form a seal. In another example, the snap fit mechanism is a hook and eye. When opposing sides of the frame are brought into contact with one another, a hook affixed to the edge of one side of the frame may engage an eye that may be constructed as part of the frame. The eye may be located within the perimeter of the frame or may extend beyond the perimeter of the frame. In embodiments, the sealing facility may be a clasp, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a spring-locking hinge, an electrostatic potential, a combination thereof, and the like. In another example, the mechanical closure may comprise discrete interlocks 2102. In an embodiment, discrete interlocking features 2102 on opposing sides of the frame 112 may engage to form a mechanical seal. The interlocking feature 2102 may comprise a barb on one side of the frame 112 and a geometrically engaging receptor cavity on an opposing side of the frame 112. In another embodiment, the interlocking feature 2102 may comprise a ball on one side of the frame 112 and a detent on an opposing side of the frame 112. In another embodiment, the interlocking feature may comprise a snap hook on one side of the frame and a recessed edge on an opposing side of the frame. In another embodiment, the interlocking feature may comprise a snap on one side of the frame and a receiver on an opposing side of the frame. When the interlocking features engage 2102, a constant pressure may be applied on a gasket surface disposed along the frame 112 such that the gasket maintains an airtight seal. It may be understood by one of skill in the art that

many different types of mechanical sealing facilities may be utilized in the present invention.

[0095] In an embodiment, the sealing facility may be magnetic (not shown). For example, a magnetically charged material may be disposed on one side of the frame 112 and a magnetically compatible material, such as iron, may be disposed on the opposing side of the frame 112. As opposing sides of the frame 112 approach one another, an attractive magnetic force may arise that may strengthen as opposing sides of the frame 112 are brought into closer contact to form a magnetically engaged configuration.

[0096] In an embodiment, the sealing facility may be thermal (not shown). A thermoplastic film may be disposed on at least one side of the frame 112. When opposing sides of the frame 112 are brought into contact with one another and a heat sealing tool is used to apply heat to the frame 112, the thermoplastic film may fuse to form a seal.

[0097] In an embodiment, there may be a plurality of sealing facilities on the frame 112. For example, a frame 112 may comprise tabs for a temporary seal and a high-tack adhesive may be disposed on the frame to provide a permanent seal. It may be understood by one of skill in the art that many different types of sealing facilities such as mechanical, molecular, chemical, electrical, electromagnetic, nanofiber, nanostructure-based connections, and the like may be used in the present invention. In any event, either a temporary or a permanent seal formed by any sealing facility described herein may be an airtight seal.

[0098] In an embodiment, a disposal bag may comprise a release facility. The disposal bag may be vented by applying a pressure to a sealed disposal bag to expel residual air through a release facility. Preventing the expelled air from reentering the disposal bag enables the waste to occupy a minimal volume for storage until ultimate disposal of the disposal bag. The release facility may comprise a vent tube 312 attached to the frame 112. The tube 312 may be straw-shaped, funnel-shaped, and the like. Upon sealing the frame 112, the tube 312 may remain lightly trapped in the frame 112. After sealing and venting the disposal bag, the tube 312 may be removed to allow an adhesive that may be adjacent to the vent tube 312 to make contact and complete the seal.

Alternatively, the tube 312 may be plugged or sealed with a separate member. The tube 312 may be plugged or sealed with material that is part of the frame 112 or bag or separate from the frame 112 or bag. The material may be coated with an adhesive to facilitate a tight seal. The release facility may comprise a channel 2002 in the surface of at least one side of the frame 112, formed by the joining of the opposing sides of the frame 112, formed in a gasket, and the like. After sealing and venting the disposal bag, the channel 2002 may be plugged 2004, sealed, self-sealed, and the like. The channel 2002 may be plugged 2004 or sealed with material that is part of the frame 112, gasket, or bag or separate from the frame 112, gasket, or bag. The material may be coated with an adhesive to facilitate a tight seal. The release facility may comprise a vent, valve or a hole 118. The vent, valve or hole 118 may be mounted anywhere in the bag, such as in a portion close to the bottom of the bag, a portion close to the frame 112, a portion of the bag midway between the frame 112 and the bottom, and the like. The vent, valve or hole 118 may be formed into the material that may comprise the bag. The vent, valve or hole 118 formed from the material comprising the bag may protrude from the bag, as in Fig. 50. The vent, valve or hole 118 may be longer than it is wide which may facilitate collapse of the channel as a result of normal atmospheric pressure being greater than within the evacuated bag and inhibition of the entry of air into an outside portion of the channel, as in Fig. 50. The valve 118 may be a one-way valve or a two-way valve. After sealing and venting the disposal bag, the vent, valve or hole 118 may be plugged, sealed, self-sealed, and the like. The vent, valve or hole 118 may be plugged or sealed with material that is part of the frame 112 or bag or separate from the frame 112 or bag. The material may be coated with an adhesive to facilitate a tight seal. In any event, the sealing material may further comprise a microencapsulated adhesive that is activated by a pressure applied during sealing. A porous element impregnated with a fragrance may be placed inside a disposal bag such that air may pass over the fragrant material as it is being vented, as in Fig. 50. In embodiments, the release facility may have a minimum release pressure, in that a minimum differential between the pressure within and without the bag may be required for actuation to vent air from the bag. In embodiments, the release facility may be filled with a fluid substance that may form a seal except when the bag may be pressurized. In any event, a plug may be tethered to the frame, tethered to the

bag, or may be a separate member. The plug may be permanently shaped or may be shaped from malleable materials that deform to fit the release facility.

[0099] In an embodiment, the disposal bag may comprise a gasket 310. The gasket 310 may facilitate formation of an airtight seal. The gasket 310 may be any compressible or gap-filling material that provides an airtight seal, such as foam, rubber, elastic, closed cell foam, solid soft elastomeric material, void filling glue, spring material, folded plastic or paper, and the like. The gasket 310 may be disposed on the surface of at least one side of a frame 112, on both sides of the frame 112, inside a sealing facility, outside a sealing facility, and the like. The gasket 310 may protrude just past the hinge 114 line such that when the frame 112 may be folded on a centerline, the gasket 310 may fill the small void that may form at the hinge 114 line. An adhesive may be disposed along the surface of the gasket 310. The adhesive may be low-tack, high-tack, microencapsulated, and the like. The adhesive may be protected by a peel away protective layer. An odor reducing agent may be disposed in the gasket. An anti-microbial agent may be disposed in the gasket. The gasket may be used in combination with any of the disposal bag embodiments described herein.

[00100] In an embodiment, the disposal bag may comprise an internal extension to the bag volume that may form a flap 902. The flap 902 may extend over a frame 904. The flap 902 may provide improved protection of the frame 904 from contamination during filling of the disposal bag. For example, an implement 1002 may be used to sweep material towards and into the bag without contaminating the frame 904. The flap 902 may be folded back into the bag prior to sealing the bag. The flap 902 may be attached to the frame 112 or may be integral to the bag.

[00101] In an embodiment, the disposal bag may comprise an odor reducing agent. The odor reducing agent may mitigate unpleasant odors associated with the disposed contents contained within the disposal bag. The odor reducing agent may provide a mood- or experience-enhancing effect, such as by providing a pleasant scent. The odor reducing agent may be a deodorant, odor neutralizer, air sanitizer, fragrance, scent, aroma, and the like. The odor reducing agent may be in the form of a liquid, an oil, a solid, a solid particle, a pellet, a capsule embedded in liquid, a powder, a talcum, and the like. The odor reducing agent may be disposed in one or more of an adhesive, a

removable film, a frame, an exterior surface of the bag, an inner surface of the bag, a separate member, an attached member, a waterproofing treatment, and the like. For example, a fragrance may be disposed in a foil-wrapped pouch that may be separate from the disposal bag. The odor reducing agent may be embedded. The odor reducing agent may be microencapsulated. The odor reducing agent may be activated by removal of a removable film. For example, removal of a removable film protecting an adhesive may expose a microencapsulated fragrance and the adhesive. The fragrance may be released when pressure applied during the sealing of the frame breaks the encapsulation. Alternatively, a pressure may be directly applied to the adhesive to release a microencapsulated fragrance. The adhesive may be low-tack or high-tack.

[00102] In an embodiment, the disposal bag may comprise an anti-microbial agent. The anti-microbial agent may kill or inhibit the growth of microbes. The anti-microbial agent may prevent microbial contamination. The anti-microbial agent may be in the form of a liquid, an oil, a solid, a solid particle, a pellet, a capsule embedded in liquid, a powder, a talcum, and the like. The anti-microbial agent may be disposed in one or more of an adhesive, a removable film, a frame, an exterior surface of the bag, an inner surface of the bag, a separate member, an attached member, a waterproofing treatment, and the like. The anti-microbial agent may be embedded. The anti-microbial agent may be microencapsulated. The anti-microbial agent may be activated by removal of a removable film. For example, removal of a removable film protecting an adhesive may release a microencapsulated anti-microbial agent and expose the adhesive. The adhesive may be low-tack or high-tack.

[00103] Referring now to Figure 11, the frame 112 of the disposal bag may enable nesting 1102. For example, nesting may be where the frame of a first disposal bag may provide support on its upper surface for the frame of a second disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag. A plurality of bags may be successively nested 1102 and the frames 112 may be successively stacked, one upon the other. The stack of nested bags 1102 may be contained in a container 1104 for storing and dispensing the bags. The container 1104 may facilitate a user using and/or pulling out one bag at a time. For example, waste may

be placed into a top most nested bag 1102 while it is being supported by the stacked frames beneath it. In an embodiment, a top most nested bag 1102 may protect the frame 112 of a nested bag 1102 situated below it such that a peel-away adhesive protective layer may not be required on each subsequently nested bag below a top most nested bag 1102. The top surface of the frame 112 may be coated with adhesive while the underside may be provided with a non-stick backing surface that may protect the adhesive of the bag frame 112 underneath but that may easily release the bag frame 112 above when a user may pick it up from a stack of nested bags 1102.

[00104] In an embodiment, the container 1104 may have an upper lip portion that may be flanged to support a frame 112 of a disposal bag. The container 1104 may be a cylinder, a canister, a box, a dispenser, a tub, a can, a bucket, and the like. The container may be made from plastic, cardboard, paper, polymers, metal, and the like. The container 1104 may be round, square, rectangular, or any suitable shape. The container 1104 may act as a holder to support a bag while in use. The container 1104 may have a channel 1302 along an edge that may expose an aligned row of nested bag handles. The container 1104 may have a lid 1304. The lid 1304 may have a corresponding channel 1308 that may cover the aligned row of handles. The container 1104 may be sized to take up minimal space. The container 1104 may be sized to be easily located near a site of waste disposal, such as on a kitchen countertop, near a baby changing table, and the like. A stack of nested bags 1102 may be secured to one another and/or in the container 1104, such as for during shipping or storage. For example, a peel tab 1202 disposed along the vertical stack of bags 1204 at an outer perimeter of their frames may be used to secure the stack. The peel tab 1202 may comprise a low-tack adhesive, a wax/plastic binding, or other substance that may allow the peel tab 1202 to be removed all at once or gradually as the stack of bags is used. In another example, a stripe of adhesive or wax/plastic binding may be disposed along the vertical stack without a peel tab 1202. In another example, the frames, tabs, or handles may have a slight interference feature that engages one to the next and holds the stack assembled until the individual selection and disengagement of the top most bag. It may be understood by one of skill in the art that many different types of stack securing methods, such as wax beads, plastic beads, and the like, may be utilized in the present invention.

[00105] In an embodiment, once the initial supply of nested bags 1102 in the container is exhausted, the container 1104 may be refilled with a new stack of nested bags. The refill stack of nested bags may be contained in a refill pack 1314. The nested bags in the refill pack 1314 may be compressed for shipping and/or in-store display. The refill pack 1314 may be wrapped in a disposable container. The refill stack 1314 of nested bags may be secured to one another as described herein.

[00106] In an embodiment, the container 1104 may have a lower portion that substantially holds the nested bags and an upper portion that may act as a lid 1108. The lid 1108 may fit over a container 1104. The lid 1108 may have a lip that engages with a lip or indent on the container 1104. The attachment of the lid 1108 to the lower container 1104 may be accomplished by a close fit of the lid 1108 creating an outer sleeve fit over the inner similar profile of the container 1104. The lid 1108 may be attached to the container by a hinging mechanism. In an embodiment, the lid 1402 may swing open at a hinge 1404 to reveal the top most bag of a stack of nested bags 1408. The lid 1108 may have a locking feature. In an embodiment, the locking feature may be mating threads 1702, as in Figure 17. Mating threads 1702 may be formed in both the lid 1108 and the base of the container 1104 so that when the lid 1108 is positioned in a sleeve fit over the upward extending side wall of the container 1104 and pushed into full engagement, the outward protruding threads 1702 of the container 1104 will intercept the inward protruding threads of the lid 1108 so that by twisting the lid 1108 relative to the container 1104, the lid 1108 may be drawn down into locked engagement with the container 1104. A further downward twisting force on the lid 1108 against the top edge of the container 1104 or against another designed spring feature within the top or bottom of the container 1104 may cause an interference engagement at the end of the thread. There may be a protrusion 1704 out of the line of the formed thread against a similar counter-protrusion that provides a locking feature so that without downward pressure the reverse twisting motion will not disengage the thread. In another embodiment, the locking feature may be a spring loaded snap lock engagement 1412. Spring loaded snap lock engagement features 1412 may be formed in the base of the container so that when the lid is closed in a sleeve fit over the upward extending side wall of the base, an opening in the side wall of the lid may accept the protruding snap lock button feature 1412 to lock the lid in the

closed position. The deflection of the material of the side wall of the base may provide the spring pressure required to engage the snap lock feature or another discrete physical spring may be used. Opening the container may involve depressing a snap lock button 1412 formed into the base wall of the container through holes in the lid of the container, so that lifting the cover disengages the lid from the base of the container. In any event, the edges of the top frames of the nested bags may be exposed by an opening in the side wall of the dispensing container and prior to use this opening may be protected by a removable film or other device that inhibits contamination of the bags.

[00107] In an embodiment, the lid 1108 may have a lid opening, as seen in Fig. 14, such that the top most bag may be filled without removal of the lid 1108. The lid opening may be created during manufacturing, removal of a portion of the lid 1108 such as by tearing along a perforation, peeling away a cover material, and the like. The lid opening may expose only the bag opening while the remainder of the lid 1108 may protect the frame from contamination. After filling the top most disposal bag, the lid 1108 may be opened, removed, or otherwise moved out of the way in order to expose the filled bag such that the filled bag may be removed and sealed for ultimate disposal. Once the bag containing the disposed items may be removed, the next bag may be available for use. In an embodiment, the lower portion of the container may not be sized to allow the disposal bags to hang such that the bags may be filled while supported in the container. The bags may need to be removed one at a time prior to use. Alternatively, all of the bags may be removed and placed into a larger container for storage and use as described herein.

[00108] In an embodiment, the disposal system may comprise a mounting system. For example, the mounting system may be a shaped wire 1502 that may attach to an object, such as the rear of a car seat, a wall, a crib, and the like. The wire 1502 may be shaped so that the diameter of the shape may be smaller than the diameter of a frame such that a frame may rest upon the wire. The bags may be protected from contamination by a lid. For example, a mounting device 1502 may encircle a container to snugly hold it in position while an adjustable clamp 1504 firmly attaches the device to a piece of furniture such as a baby changing table, a kitchen counter, a work surface, a piece of furniture, and the like. Other securement options may include hook-and-loop, adhesives, snaps, suction

cups, and the like. A fabric strap-like material, optionally with further securing features or textures such as zip-tie or hook-and-loop material may assist in securing the system around an irregular or over-sized object. In any event, the mounting system may be modular and may provide for both vertical and horizontal clamp attachment in various forms. The encircling portion of a mounting system may be common to several mounting geometries, but may also be accomplished by a feature that may be part of the container itself and therein a direct connection to the clamping portion of the mounting system. In the case of mounting to a horizontal element, there may be provided a U-shaped clamp body that may accommodate a wide range of dimensions for a horizontal edge feature and a clamping screw driven by a knob that may tighten firmly onto that element. In the case of mounting to a vertical element, there may be provided a U-shaped clamp body that may accommodate a wide range of dimensions for a vertical feature and a clamping screw driven by a knob that may tighten firmly onto that element.

[00109] Referring now to Figure 11, a waste disposal system 1100 may comprise a disposal bag 1112, a container 1104, waste clean-up articles 1118, and other materials that may facilitate disposal and/or clean-up of waste. A dispenser for waste clean-up articles 1114 may be integrated into the disposal bag container 1104. For example, a tissue dispenser 1114 may be integrated into the lid 1108 of a container 1104. The dispenser 1114 may be located on an exterior surface of the lid 1108 or an interior surface of the lid 1108. The tissues 1118 may be wet, such as for a baby wipe, or dry. The tissues 1118 may be used to wipe, wash, disinfect, cleanse, and the like. When the tissue dispenser 1114 is mounted on an interior surface of the lid, the dispenser 1114 may extend into a cavity created by the stacked disposal bag openings 1102. The tissue dispenser 1114 may have a removable lid with an orifice that may permit the tissues 1118 to be sequentially pulled out one at a time. The last pulled tissue 1118 may engage the next in line to present an edge through the opening. The waste disposal system 1100 may be intended to match the number of tissues 1118 to the number of disposal bags 1102 or may match the number of tissues 1118 and bags 1102 in some other proportion. The tissue dispenser 1114 may be refillable. Other materials that may be conveniently included in the waste disposal system 1100 may be one or more of hand sanitizers, skin

moisturizers, creams, lotions, rash medication, and the like. These materials may be included in packets similar to disposable condiment packets.

[00110] In an embodiment, the waste disposal system 1600 may be integrated in or attached to a secondary waste container 1602. For example, a secondary waste container lid 1603 may have an orifice 1608 of a diameter that is slightly smaller than the diameter of a frame 112 such that a stack of nested bags 1102 may be inserted in the orifice 1608 and the stacked frames may rest upon the secondary waste container lid 1604. The nested bags 1102 may extend into the secondary waste container 1602. In another example, a secondary waste container lid 1604 may have an orifice 1608 that may accommodate a container 1104 of nested bags 1102 as described herein. The secondary waste container lid 1604 may also comprise an orifice 1610 to insert a tissue dispenser, a bottle of lotion, a tube of cream, and the like. The secondary waste container lid 1604 may have a built-in tissue dispenser that may be refillable. The secondary waste container lid 1604 may have an opening 1612 to insert trash, including sealed, waste-containing disposal bags 1614. The opening 1612 of the secondary waste container 1602 may have a cover. The cover may be hinged. The cover may be opened by any mechanical means such as a spring-loaded release mechanism, a push, a pull, and the like. The cover may be opened by a motion detection system. Auxiliary items, such as cleaning wipes, lotions, creams, medications, and the like, may also be supported or included in the secondary waste container. For example, the lid 1604 or top portion of the secondary waste container may be adapted for supporting, holding, containing, or including the auxiliary items and primary disposal bags. A larger, secondary disposal bag may be contained within the secondary waste container 1602 for receiving the smaller, primary disposal bags. The lid 1604 or top portion of a secondary waste container 1602 with the features described herein may be provided for mounting to an existing secondary waste container, such as a trash can. Alternatively, a complete system for disposal 1600 including a secondary waste container with the features described herein may be provided.

[00111] In an embodiment, the disposal bag may be wearable. For example, the disposal bag may be configured to be worn on a hand 1802. For example, the bag may be configured to be inside-out and a user may insert 1804 a hand into the bag 1802.

The user may then grasp waste 1808 with the inside-out bag 1802 and then invert the bag to remove it from their hand such that the waste remains in the interior of the bag, as shown in Figs. 69 and 70. The disposal bag 1802 may then be sealed as described herein.

[00112] In an embodiment, the disposal bag 1904 may be attached to a diaper 1902. The disposal bag 1904 may be attached to a diaper 1902 on an exterior surface that may not touch skin. The disposal bag 1904 may be secured to the diaper 1902 with adhesive such as glue, heat-activated polymer, double stick tape, microencapsulated adhesive, and the like. The adhesive may be protected by a peel away protective layer that may be peeled away to expose the underlying adhesive and prepare the disposal bag 1904 for securing to a diaper 1902. The disposal bag 1904 may be secured to the diaper 1902 with a mechanical coupling such as snaps, zippers, zip-tight style connections, spot welds, perforated seams, stitching, hook-and-loop fastening patches, mechanical fasteners, safety pins, and the like. A cleaning wipe or cloth or tissue may be folded and inserted into the disposal bag 1904 to be used in wiping a child when changing the diaper 1902. The used wipe may be stuffed into the disposal bag 1904 along with the diaper 1902. Hand cleaning cloths, sanitizing napkins, diaper rash creams, moisturizers, ointments, scented fluids, and the like may be carried along with or included in the package. For example, a skin ointment may be provided in a single-use package and may be attached to the diaper 1902 or contained within the disposal bag 1904. All of the used waste and packaging may be placed inside the disposal bag 1904 and stored or discarded upon use. The disposal bag 1904 may remain attached to the diaper 1902 and inverted onto the used diaper 1902 for disposal. The disposal bag 1904 may be completely detached from the diaper 1902 and the diaper 1902 may be placed into the bag 1904 after it is detached. As described herein, a user may invert the disposal bag 1904 and place it upon a hand in order to reach through the bag 1904 and grasp the diaper 1902 and waste. The diaper 1902 and waste may then be pulled into the bag 1904. In some embodiments, the disposal bag 1904 may be configured to be or may be contained in a flat pack. The flat pack may be accessed via tab or other graspable feature that may enable opening of the flat pack to deploy the disposal bag 1904 to prepare it for receiving the used diaper 1902 and waste. The bag 1904 may remain attached to the diaper 1902. Deployment of the disposal bag 1904 may be similar to the unfurling of a parachute. The disposal bag

1904 stored in the flat pack may have a thin dimension and may be stacked in large numbers in a container for distribution, sales, on-site storage, and selection. The disposal bag 1904 may further comprise a frame 112. The frame 112 may be sealed as described herein. Alternatively, the disposal bag 1904 may be sealed by one or more of a formed plastic zipper mechanism, an attached tie material such as a strip of plastic, string, or fabric, microencapsulated adhesive, an adhesive tab, a knot, and the like.

[00113] In an embodiment, the disposed waste may be baby diapers, incontinence products, feminine products, pet waste, kitchen waste, household waste, garage or automotive waste, paint- or oil- saturated rags, medical waste, biohazardous and hazardous material, industrial shop waste, camping waste, waste generated in a car or during travel, radioactive materials, other materials or waste with an objectionable odor, and the like.

[00114] It may be appreciated by one of skill in the art that the present invention may be applied in the storing, keeping, sealing, preserving, collecting and the like of non-offensive materials, and may in some cases be used to hold, seal, collect, and preserve fresh goods, food, samples, and the like.

[00115] Many other systems, methods, object, features, and advantages of the present invention will be appreciated. All such systems, methods, object, features, and advantages are within the scope of the present disclosure.

[00116] While the invention has been disclosed in connection with certain preferred embodiments, those of ordinary skill in the art may recognize other embodiments, and all such variations, modifications, and substitutions may be intended to fall within the scope of this disclosure. Thus, the invention may be to be understood in the broadest sense allowable by law.

CLAIMS

What is claimed is:

1. A disposal bag comprising:
a bag configured to receive waste;
a frame attached to the bag at an opening, the frame being configured to enable a user to close the bag in a single-handed operation when opposing sides of the frame are brought into contact with one another; and
a sealing facility disposed on the frame for providing a resealable closure of the bag when opposing sides of the frame are brought into contact with one another.
2. The disposal bag of claim 1 wherein the bag is configured to be detachably attached to a diaper.
3. The disposal bag of claim 1 wherein the bag is glove-shaped.
4. The disposal bag of claim 1 wherein the bag is free-standing.
5. The disposal bag of claim 1 wherein the frame is hinged.
6. The disposal bag of claim 1 wherein the frame of a first disposal bag provides support on its upper surface for the frame of a second disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag.
7. The disposal bag of claim 1 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection.
8. The disposal bag of claim 1 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
9. The disposal bag of claim 6 wherein the adhesive is reusable.
10. The disposal bag of claim 6 wherein the adhesive is permanent.
11. The disposal bag of claim 1 further comprising, a gasket mounted to the frame.

12. The disposal bag of claim 1 further comprising, a release facility disposed on the disposal bag.
13. A method of providing a disposal bag comprising:
 - configuring a bag to receive waste;
 - attaching a frame to the bag at an opening, the frame being configured to close the bag in a single-handed operation when opposing sides of the frame are brought into contact with one another; and
 - disposing a sealing facility on the frame for providing a resealable closure of the bag when opposing sides of the frame are brought into contact with one another.
14. The method of claim 13 wherein the bag is configured to be detachably attached to a diaper.
15. The method of claim 13 wherein the bag is glove-shaped.
16. The method of claim 13 wherein the bag is free-standing.
17. The method of claim 13 wherein the frame is hinged.
18. The method of claim 13 wherein the frame of a first disposal bag provides support on its upper surface for the frame of a second disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag.
19. The method of claim 13 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection.
20. The method of claim 13 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
21. The method of claim 19 wherein the adhesive is reusable.
22. The method of claim 19 wherein the adhesive is permanent.
23. The method of claim 13 further comprising, mounting a gasket to the frame.
24. The method of claim 13 further comprising, disposing a release facility on the disposal bag.

25. A disposal bag comprising:
 - a bag configured to receive waste;
 - a frame attached to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another; and
 - a release facility disposed on at least one of the frame and the bag to remove excess volume of material from a sealed bag.
26. The disposal bag of claim 25 wherein the release facility is a venting facility.
27. The disposal bag of claim 25 wherein the release facility is a valve.
28. The disposal bag of claim 25 wherein the excess volume is in vapor form.
29. The disposal bag of claim 25 wherein the excess volume is in gas form.
30. The disposal bag of claim 25 wherein the excess volume is in liquid form.
31. The disposal bag of claim 25 wherein the release facility is at least one of a one-way vent, a two-way vent, a channel formed when opposing sides of the frame are brought into contact with one another, a channel formed on a single side of the frame, a gasket, a valve, and a vent tube removably affixed to the frame.
32. The disposal bag of claim 25 wherein the release facility is mounted in the bag material.
33. The disposal bag of claim 25 wherein the release facility is at least one of sealed, self-sealed, and plugged after the disposal bag is vented.
34. The disposal bag of claim 25 wherein the bag is configured to be detachably attached to a diaper.
35. The disposal bag of claim 25 wherein the bag is glove-shaped.
36. The disposal bag of claim 25 wherein the bag is free-standing.
37. The disposal bag of claim 25 wherein the frame is hinged.
38. The disposal bag of claim 25 wherein a first disposal bag is configured to be nested in a second disposal bag.
39. The disposal bag of claim 25 further comprising a sealing facility disposed on the frame.
40. The disposal bag of claim 39 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection.

41. The disposal bag of claim 39 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
42. The disposal bag of claim 40 wherein the adhesive is reusable.
43. The disposal bag of claim 40 wherein the adhesive is permanent.
44. The disposal bag of claim 25 further comprising, a gasket mounted to the frame.
45. A method of providing a disposal bag comprising:
 - configuring a bag to receive waste;
 - attaching a frame to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another; and
 - disposing a release facility on at least one of the frame and the bag to remove excess volume of material from a sealed bag.
46. The method of claim 45 wherein the release facility is a venting facility.
47. The method of claim 45 wherein the release facility is a valve.
48. The method of claim 45 wherein the excess volume is in vapor form.
49. The method of claim 45 wherein the excess volume is in gas form.
50. The method of claim 45 wherein the excess volume is in liquid form.
51. The method of claim 45 wherein the release facility is at least one of a one-way vent, a two-way vent, a channel formed when opposing sides of the frame are brought into contact with one another, a channel formed on a single side of the frame, a gasket, a valve, and a vent tube removably affixed to the frame.
52. The method of claim 45 wherein the release facility is mounted in the bag material.
53. The method of claim 45 wherein the release facility is at least one of sealed, self-sealed, and plugged after the disposal bag is vented.
54. The method of claim 45 wherein the bag is configured to be detachably attached to a diaper.
55. The method of claim 45 wherein the bag is glove-shaped.
56. The method of claim 45 wherein the bag is free-standing.
57. The method of claim 45 wherein the frame is hinged.

58. The method of claim 45 wherein a first disposal bag is configured to be nested in a second disposal bag.
59. The method of claim 45 further comprising disposing a sealing facility on the frame.
60. The method of claim 59 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection.
61. The method of claim 59 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
62. The method of claim 60 wherein the adhesive is reusable.
63. The method of claim 60 wherein the adhesive is permanent.
64. The method of claim 45 further comprising, mounting a gasket to the frame.
65. A disposal bag comprising:
 - a bag configured to receive waste; and
 - a frame attached to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another;wherein the frame of a first disposal bag provides support on its upper surface for the frame of a second similar disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag.
66. The disposal bag of claim 65 wherein the disposal bag is used in a hands-free operation.
67. The disposal bag of claim 65 wherein the bag is free-standing.
68. The disposal bag of claim 65 wherein the bag is glove-shaped.
69. The disposal bag of claim 65 wherein the frame is hinged.
70. The disposal bag of claim 65 wherein closure of the frame is configured for single hand operation.
71. The disposal bag of claim 65 further comprising a sealing facility disposed on the frame.

72. The disposal bag of claim 71 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection.
73. The disposal bag of claim 71 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
74. The disposal bag of claim 72 wherein the adhesive is reusable.
75. The disposal bag of claim 72 wherein the adhesive is permanent.
76. The disposal bag of claim 65 further comprising, a gasket mounted to the frame.
77. The disposal bag of claim 61 further comprising, a release facility disposed on the disposal bag.
78. A method of providing a disposal bag comprising:
configuring a bag to receive waste; and
attaching a frame to the bag at an opening, the frame being configured to close the bag when opposing sides of the frame are brought into contact with one another;
wherein the frame of a first disposal bag provides support on its upper surface for the frame of a second similar disposal bag when a second bag is positioned on top of the first bag such that the lower surface of the second bag's frame rests on the upper surface of the first bag's frame and the second bag extends into the first bag.
79. The method of claim 78 wherein the disposal bag is used in a hands-free operation.
80. The method of claim 78 wherein the bag is free-standing.
81. The method of claim 78 wherein the bag is glove-shaped.
82. The method of claim 78 wherein the frame is hinged.
83. The method of claim 78 wherein closure of the frame is configured for single hand operation.
84. The method of claim 78 further comprising disposing a sealing facility on the frame.

85. The method of claim 84 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connections.
86. The method of claim 84 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
87. The method of claim 85 wherein the adhesive is reusable.
88. The method of claim 85 wherein the adhesive is permanent.
89. The method of claim 78 further comprising, mounting a gasket to the frame.
90. The method of claim 78 further comprising, disposing a release facility on the disposal bag.
91. A waste disposal system comprising:
 - a bag configured to receive waste;
 - a frame attached to the bag at an opening, the frame being configured to close the opening when opposing sides of the frame are brought into contact with one another;
 - a sealing facility disposed on the frame to provide a resealable closure when opposing sides of the frame are brought into contact with one another;
 - an adhesive disposed on at least one side of the frame to provide a permanent seal when opposing sides of the frame are brought into contact with one another; and
 - a container for dispensing a plurality of bags, wherein the bags nest one within the other in the container.
92. The waste disposal system of claim 91 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and a nanostructure-based connection.
93. The waste disposal system of claim 91 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
94. The waste disposal system of claim 92 wherein the adhesive is reusable.

95. The waste disposal system of claim 92 wherein the adhesive disposed on the at least one side of the frame is reusable and the adhesive disposed on the opposing side of the frame is permanent.
96. The waste disposal system of claim 91 wherein the frame is hinged.
97. The waste disposal system of claim 91 wherein closure of the frame is configured for single hand operation.
98. The waste disposal system of claim 91 wherein waste cleanup articles are positioned in a portion of the container.
99. The waste disposal system of claim 91 wherein the container is refillable.
100. The waste disposal system of claim 91 wherein the container is suspended.
101. The waste disposal system of claim 91 wherein the container is mounted near a location of a waste-making activity.
102. The waste disposal system of claim 91 further comprising, a gasket mounted to the frame.
103. The waste disposal system of claim 91 further comprising, a release facility disposed on the disposal bag.
104. A method of providing a waste disposal system comprising:
 - configuring a bag to receive waste;
 - attaching a frame to the bag at an opening, the frame being configured to close the opening when opposing sides of the frame are brought into contact with one another;
 - disposing a sealing facility on the frame to provide a resealable closure when opposing sides of the frame are brought into contact with one another;
 - disposing an adhesive on at least one side of the frame to provide a permanent seal when opposing sides of the frame are brought into contact with one another; and
 - providing a container for dispensing a plurality of bags, wherein the bags nest one within the other in the container.
105. The method of claim 104 wherein the sealing facility is at least one of a mechanical, chemical, magnetic, thermal, adhesive, molecular, electrical, electromagnetic, electrostatic, nanofiber, and nanostructure-based connection.
106. The method of claim 104 wherein the sealing facility is at least one of an interference locking system, a tab, a ball closure, discrete interlocks, a snap fit, a

- clasp, a clip, a zipper, a snap, a gasket, an O-ring type closure, a hook-and-loop, a hook-and-eye, and a spring-locking hinge.
107. The method of claim 105 wherein the adhesive is reusable.
108. The method of claim 105 wherein the adhesive disposed on the at least one side of the frame is reusable and the adhesive disposed on the opposing side of the frame is permanent.
109. The method of claim 104 wherein the frame is hinged.
110. The method of claim 104 wherein closure of the frame is configured for single hand operation.
111. The method of claim 104 further comprising positioning waste cleanup articles in a portion of the container.
112. The method of claim 104 wherein the container is refillable.
113. The method of claim 104 wherein the container is suspended.
114. The method of claim 104 wherein the container is mounted near a location of a waste-making activity.
115. The method of claim 104 further comprising, mounting a gasket to the frame.
116. The method of claim 104 further comprising, disposing a release facility on the disposal bag.
117. A waste container lid, comprising:
an orifice for supporting a disposal bag container;
an orifice for supporting waste clean-up articles; and
an opening sized to allow articles for disposal to pass through it, including waste-containing disposal bags;
wherein the waste container lid is configured to attach to a top portion of a waste container.
118. The waste container lid of claim 117 further comprising, a cover of the waste container lid opening.
119. The waste container lid of claim 118 wherein the cover is hinged.
120. The waste container lid of claim 118 wherein the cover is opened by a spring-loaded release mechanism.

121. The waste container lid of claim 118 wherein the cover is opened by a motion detection system.
122. The waste container lid of claim 117 further comprising, a secondary disposal bag disposed within the waste container sized for receiving sealed disposal bags.
123. The waste container lid of claim 117 wherein the waste clean-up articles are one or more of wet tissues, dry tissues, hand sanitizer, skin moisturizer, soap, water, cream, lotion, and medication.
124. The waste container lid of claim 117 wherein the container supports the disposal bag by its frame.
125. The waste container lid of claim 117 wherein the container dispenses the disposal bag in a pop-up configuration.
126. The waste container lid of claim 117 wherein the container dispenses the disposal bag in a nesting configuration.
127. The waste container lid of claim 117 wherein the container dispenses the disposal bag in a stacked configuration
128. A method of providing a waste container lid, comprising:
 - providing an orifice for supporting a disposal bag container;
 - providing an orifice for supporting waste clean-up articles; and
 - providing an opening sized to allow articles for disposal to pass through it,including waste-containing disposal bags;
 - wherein the waste container lid is configured to attach to a top portion of a waste container.
129. The method of claim 128 further comprising, providing a cover of the waste container lid opening.
130. The method of claim 129 wherein the cover is hinged.
131. The method of claim 129 wherein the cover is opened by a spring-loaded release mechanism.
132. The method of claim 129 wherein the cover is opened by a motion detection system.
133. The method of claim 128 further comprising, disposing a secondary disposal bag within the waste container sized for receiving sealed disposal bags.

134. The method of claim 128 wherein the waste clean-up articles are one or more of wet tissues, dry tissues, hand sanitizer, skin moisturizer, soap, water, cream, lotion, and medication.
135. The method of claim 128 wherein the container supports the disposal bag by its frame.
136. The method of claim 128 wherein the container dispenses the disposal bag in a pop-up configuration.
137. The method of claim 128 wherein the container dispenses the disposal bag in a nesting configuration.
138. The method of claim 128 wherein the container dispenses the disposal bag in a stacked configuration

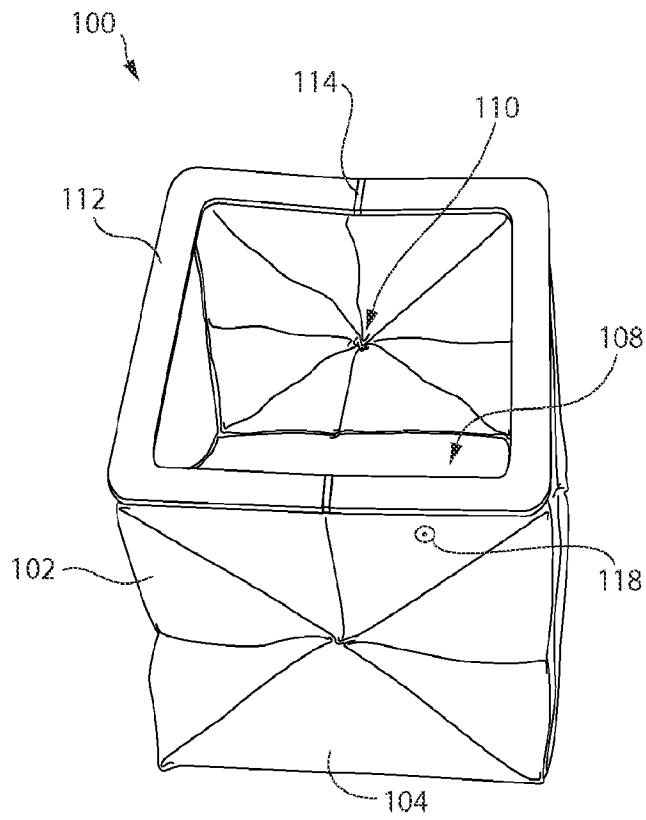


Fig. 1

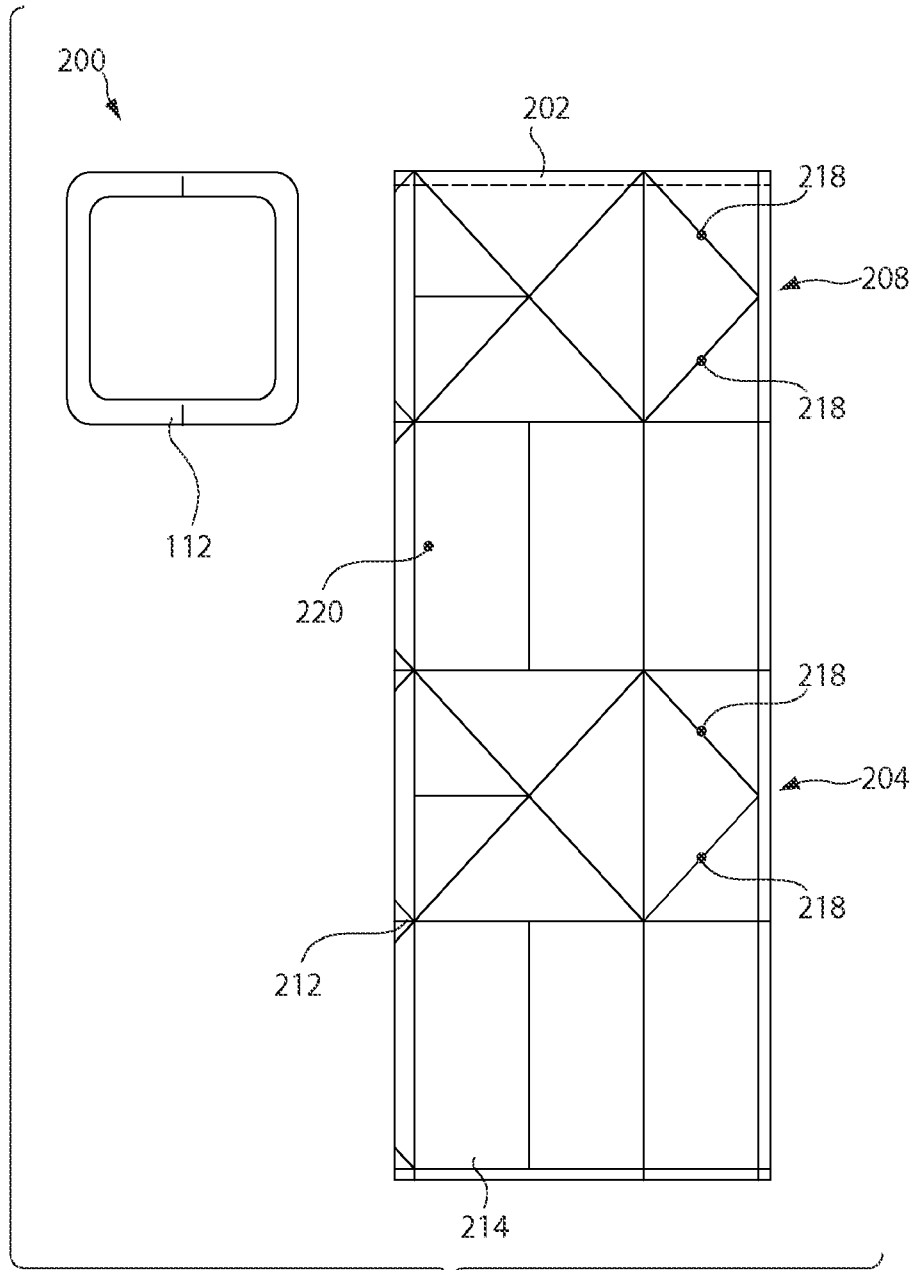


Fig. 2

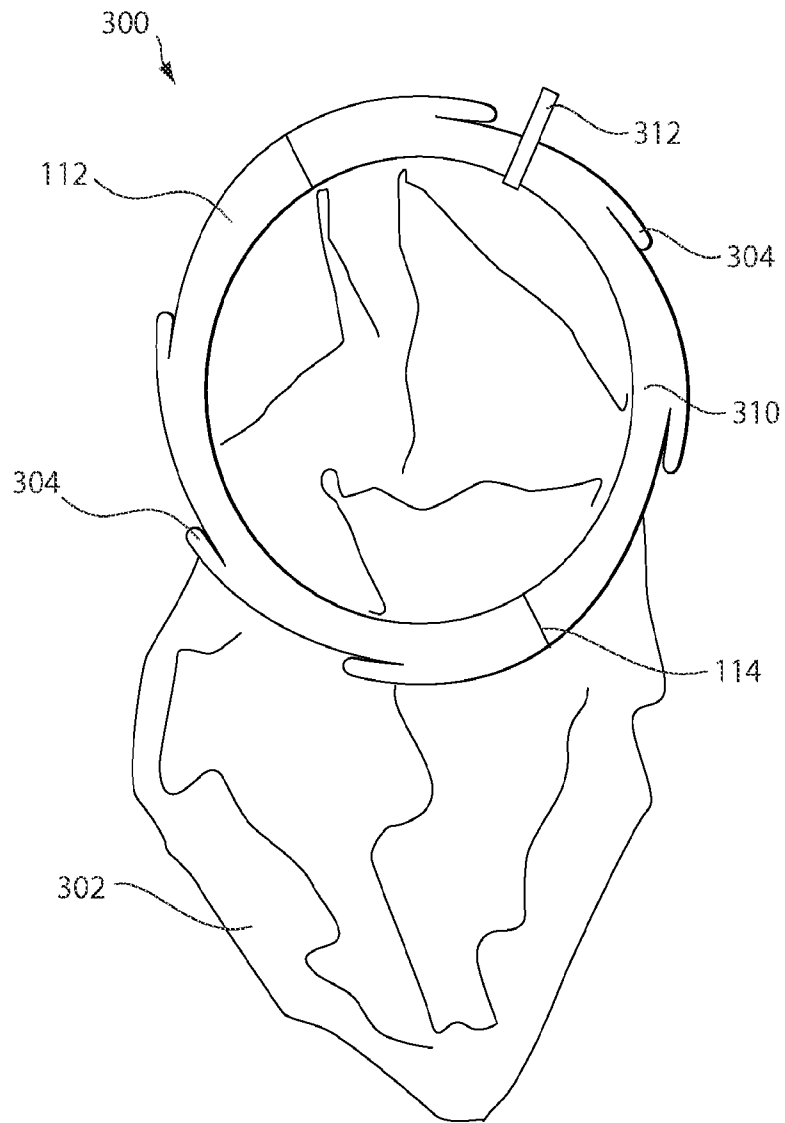
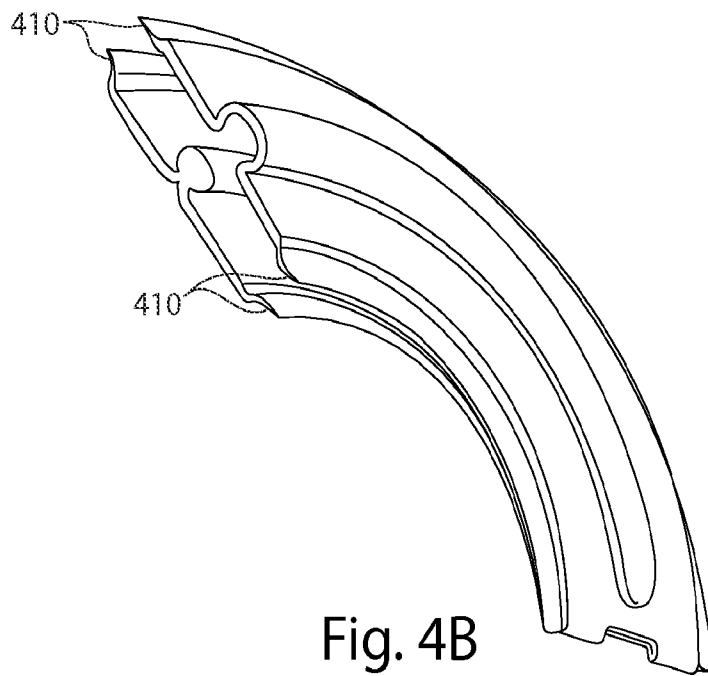
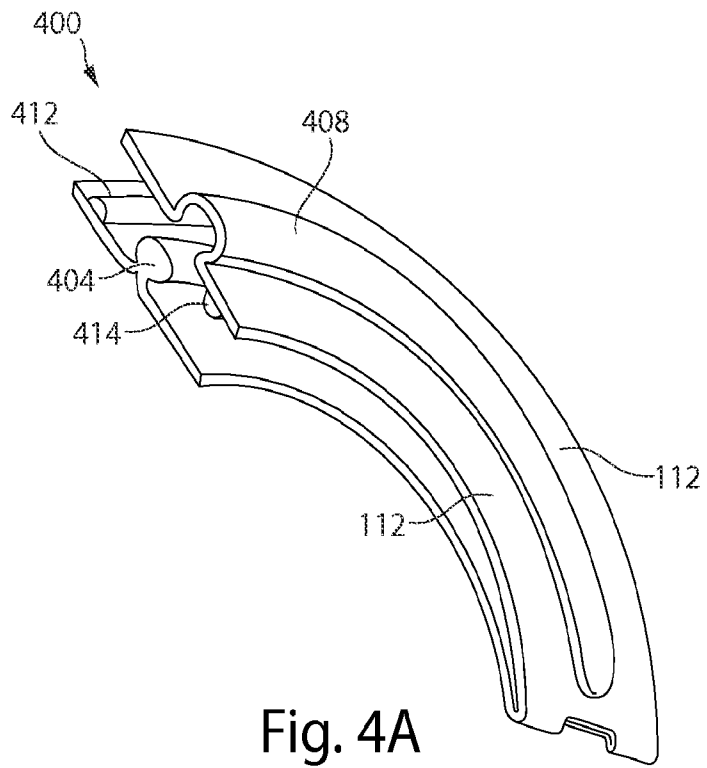


Fig. 3

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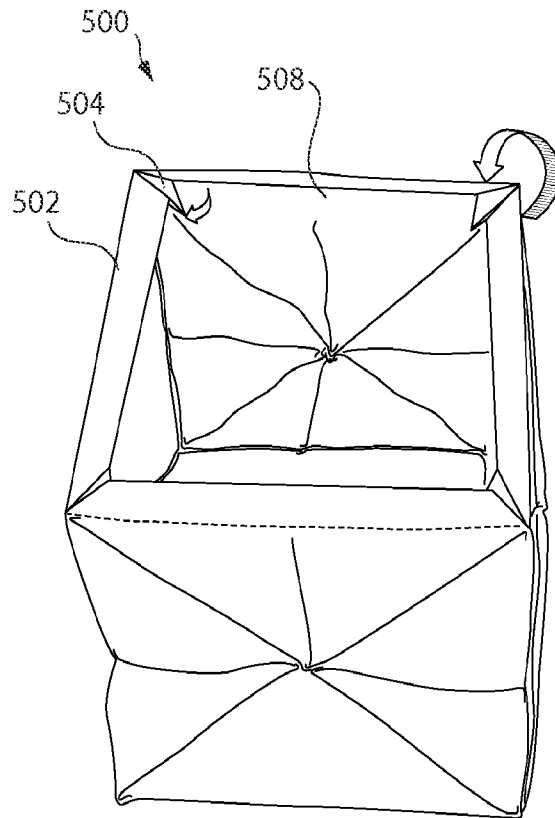


Fig. 5

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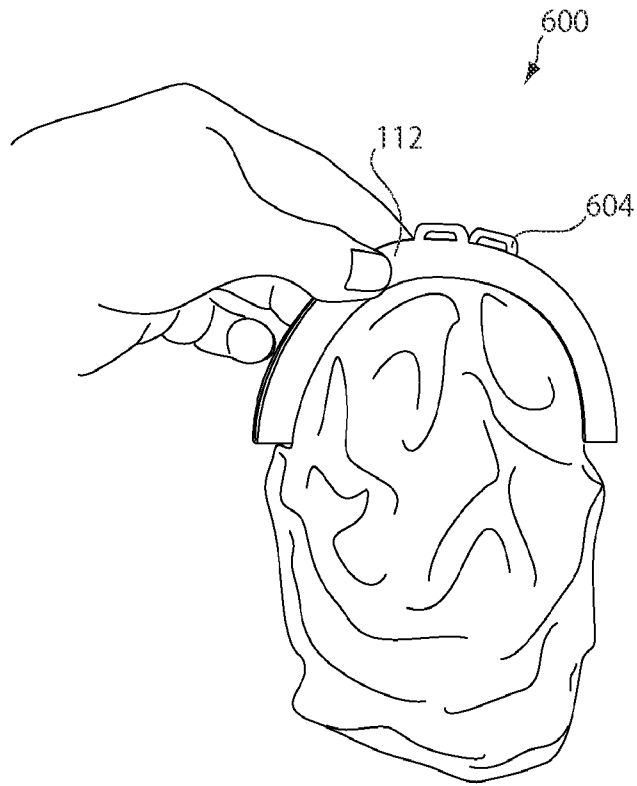


Fig. 6

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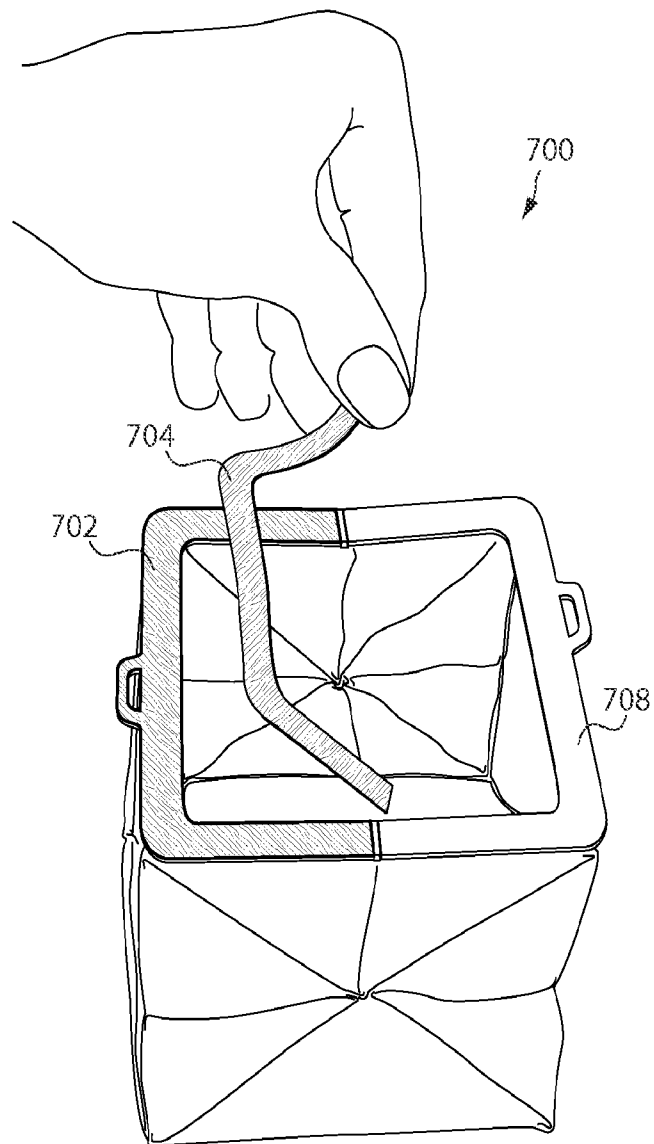


Fig. 7

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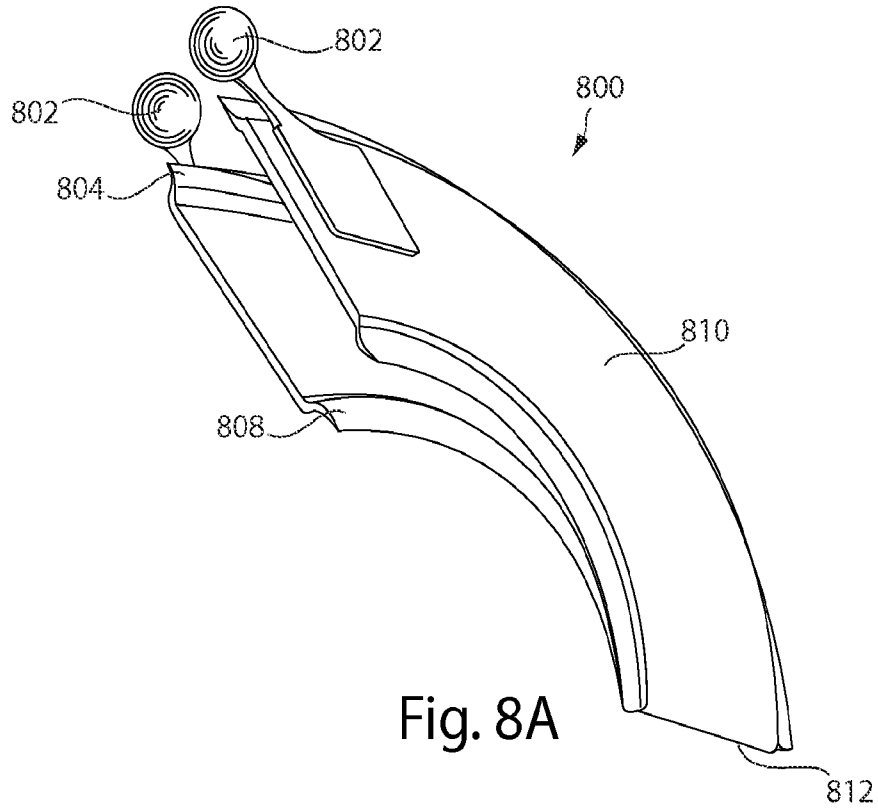


Fig. 8A

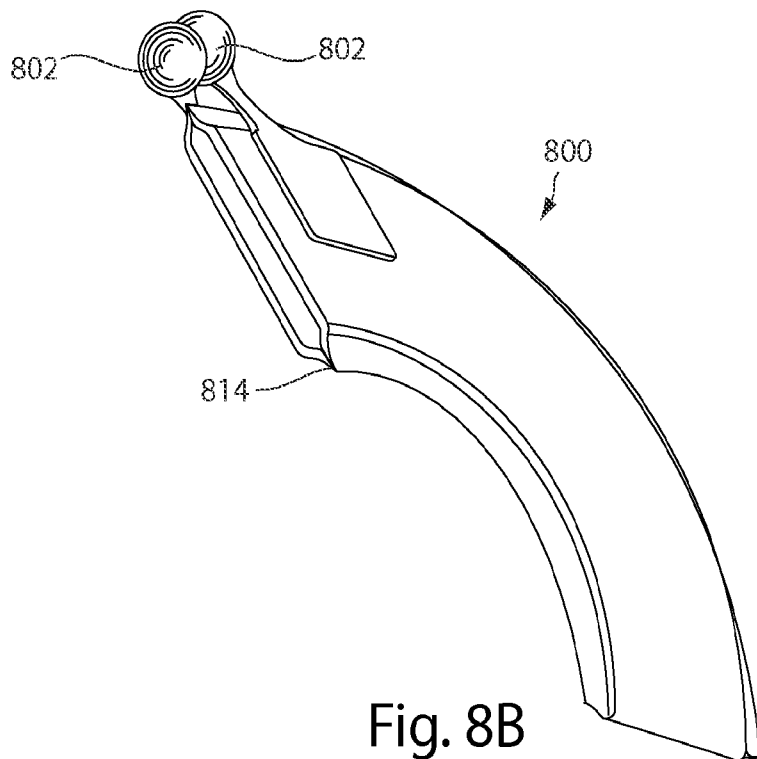


Fig. 8B

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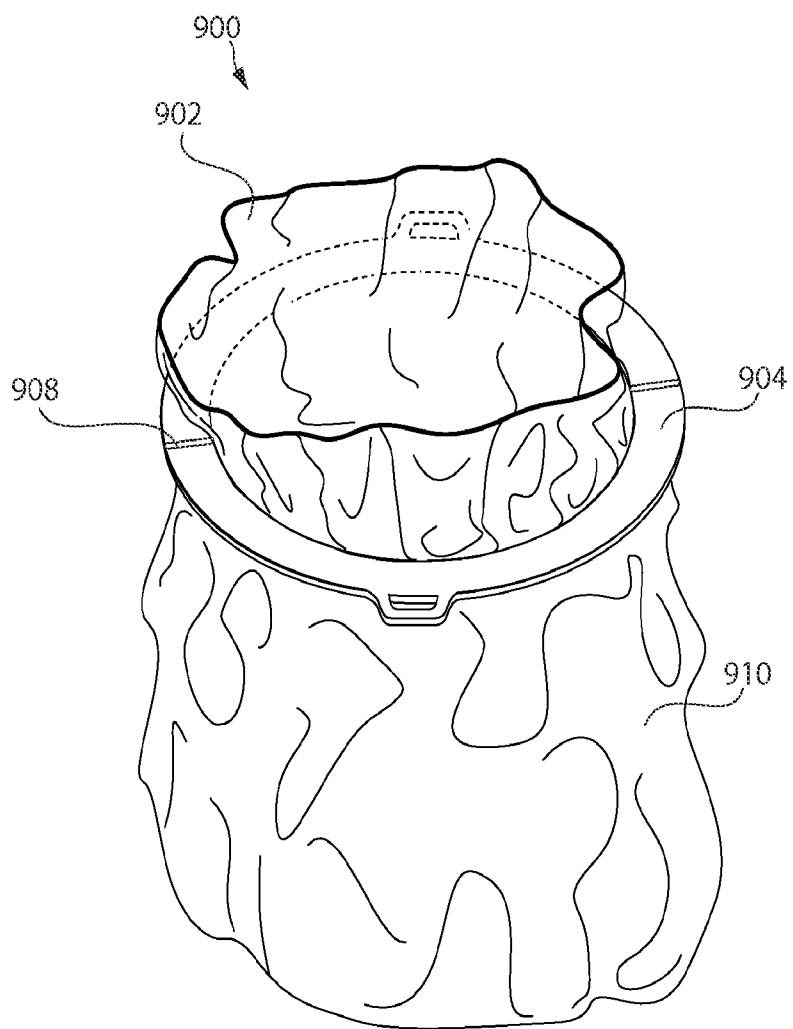


Fig. 9

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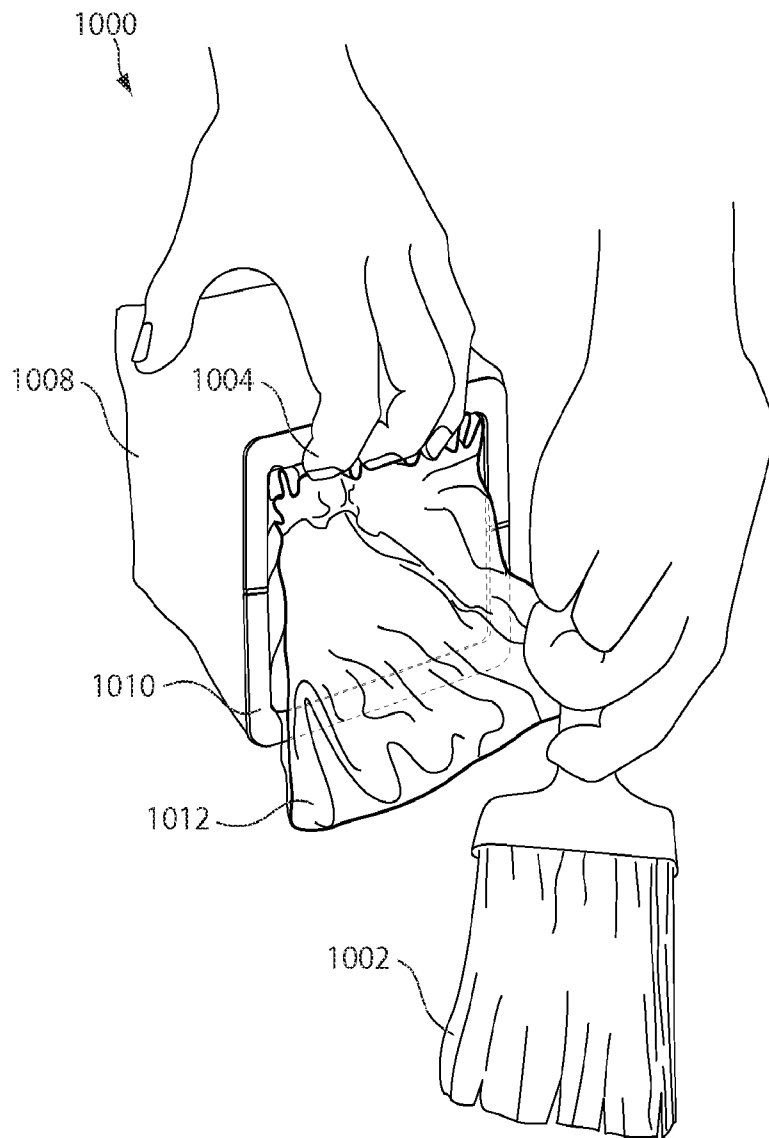


Fig. 10

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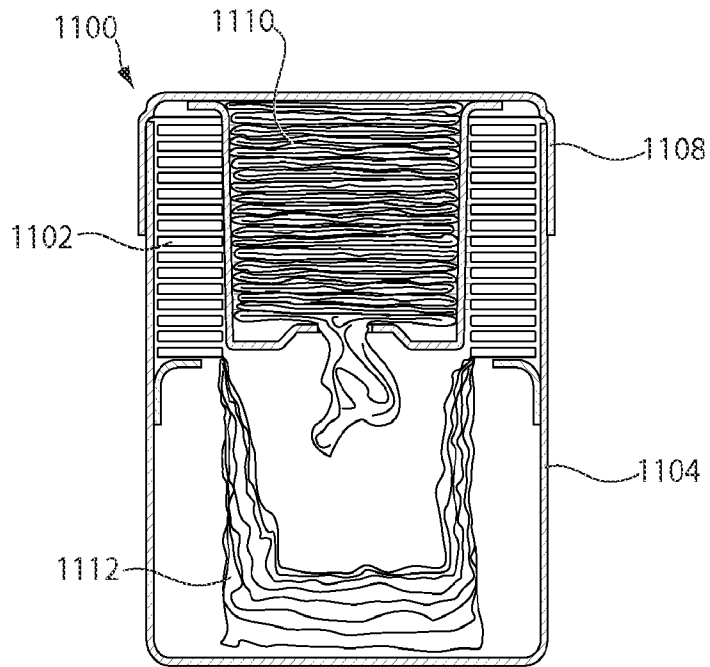


Fig. 11A

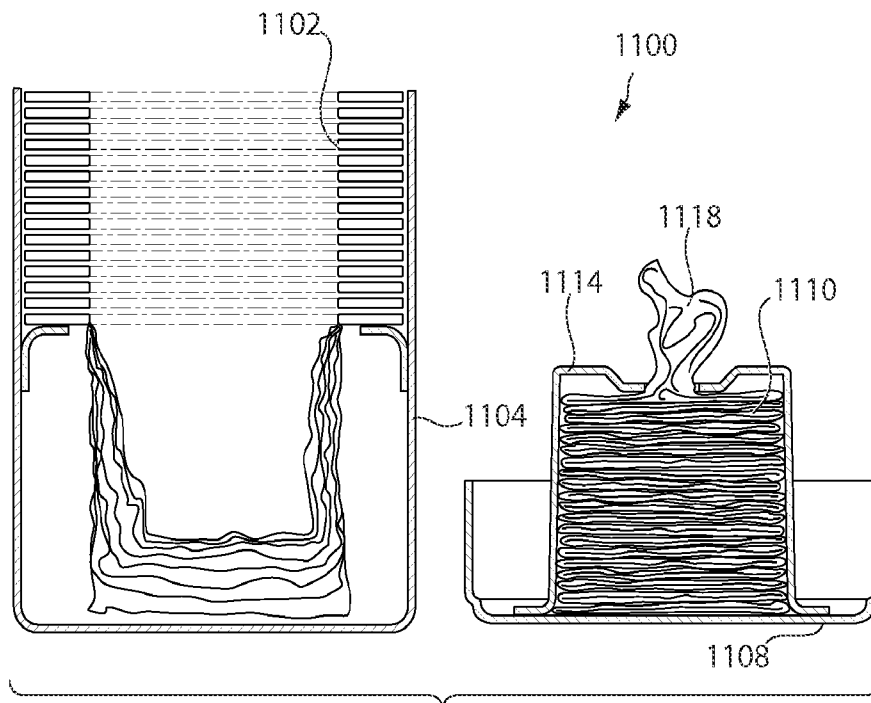


Fig. 11B

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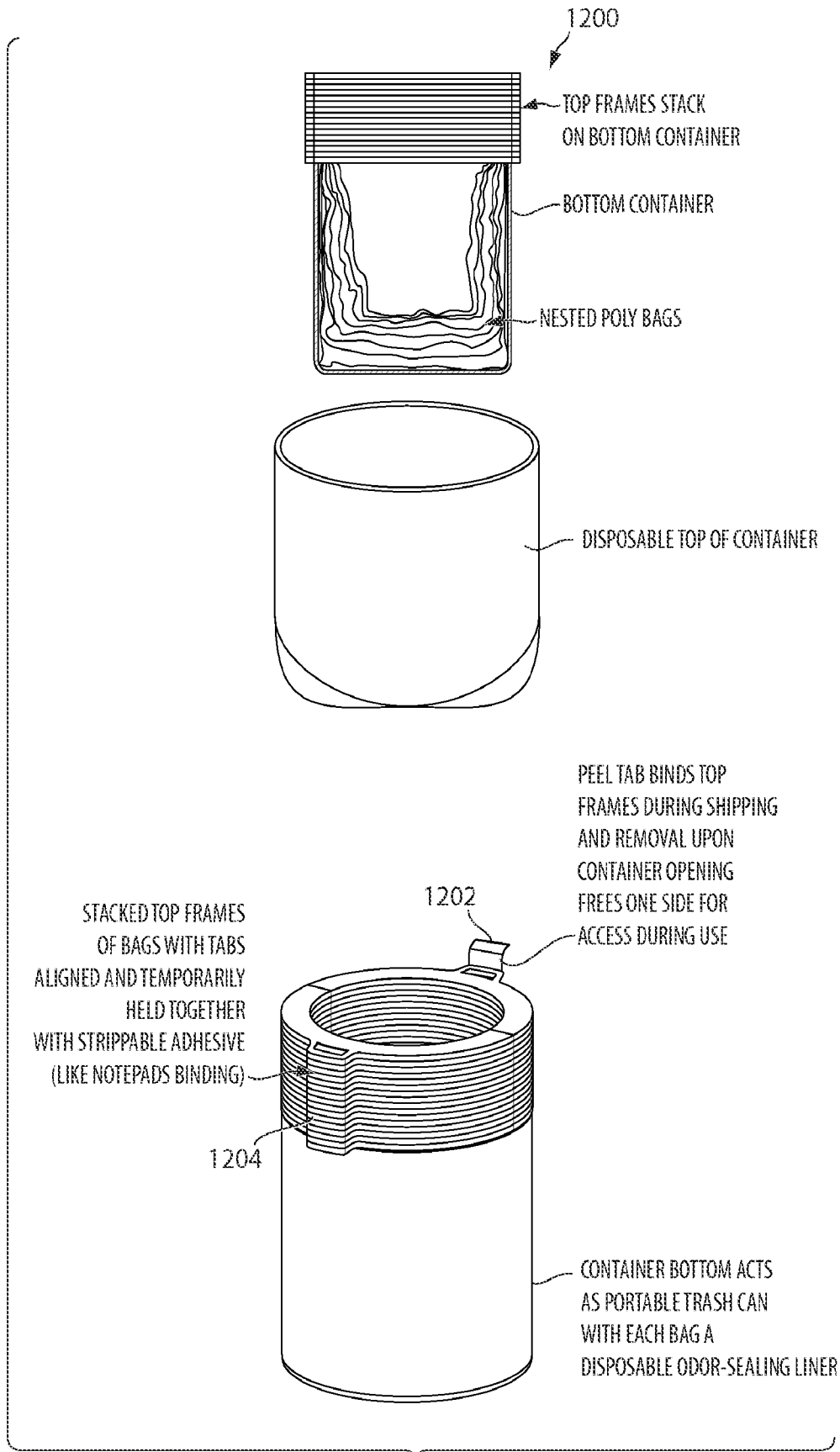


Fig. 12

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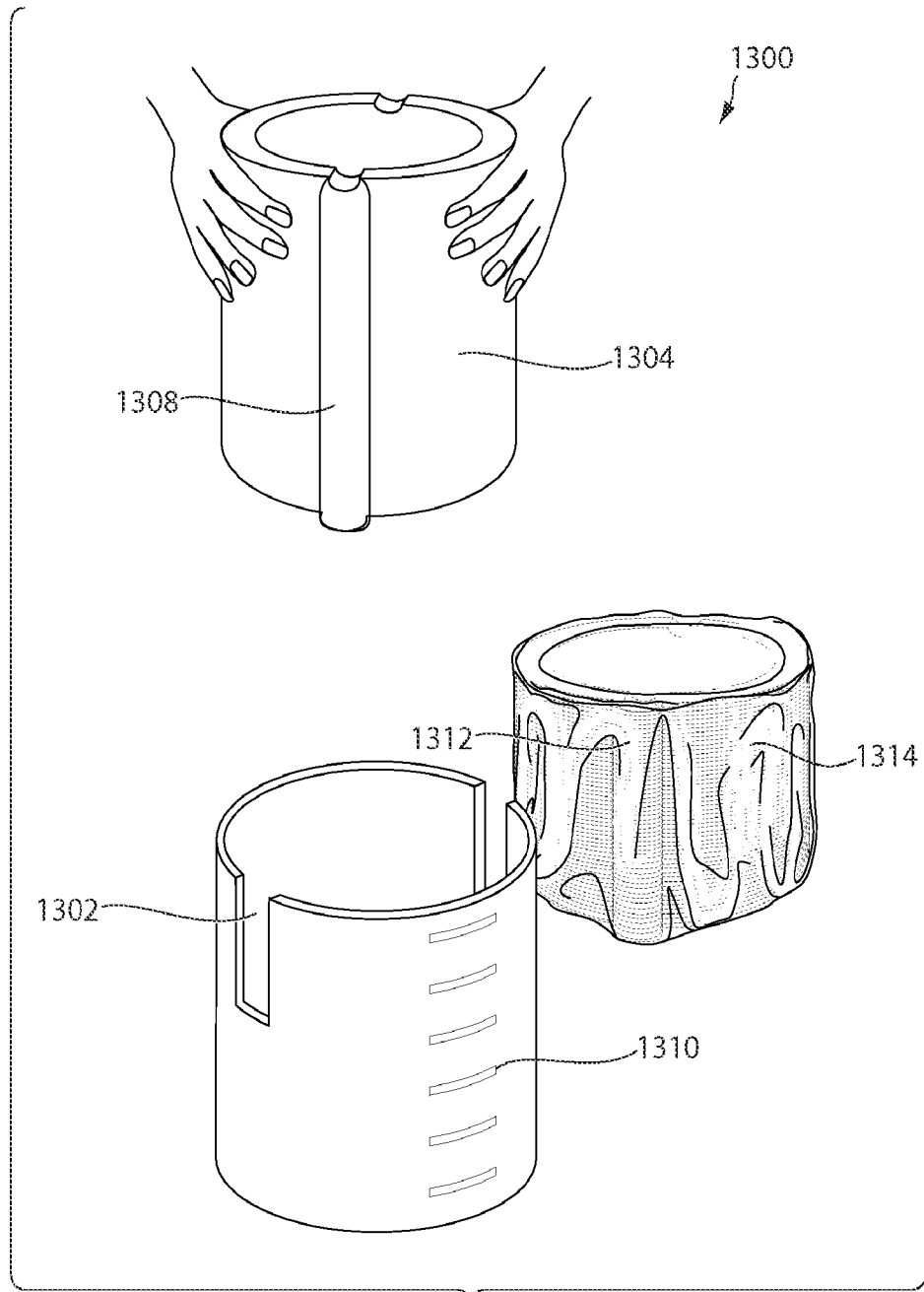


Fig. 13

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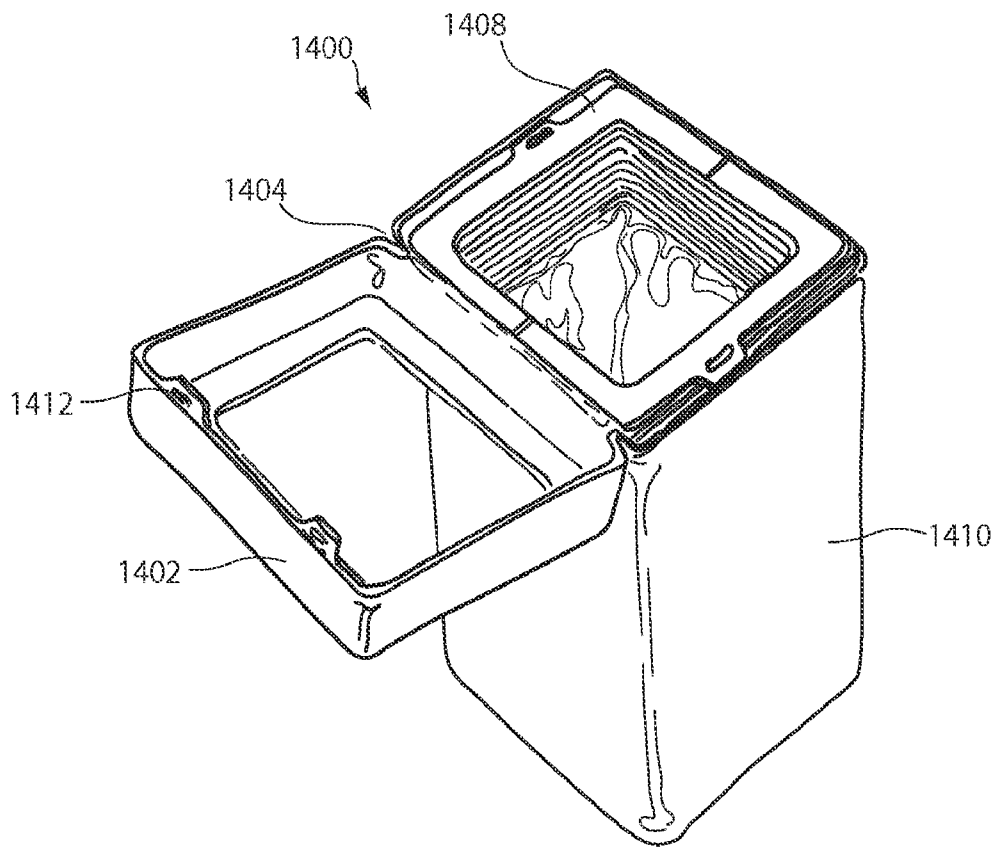


Fig. 14

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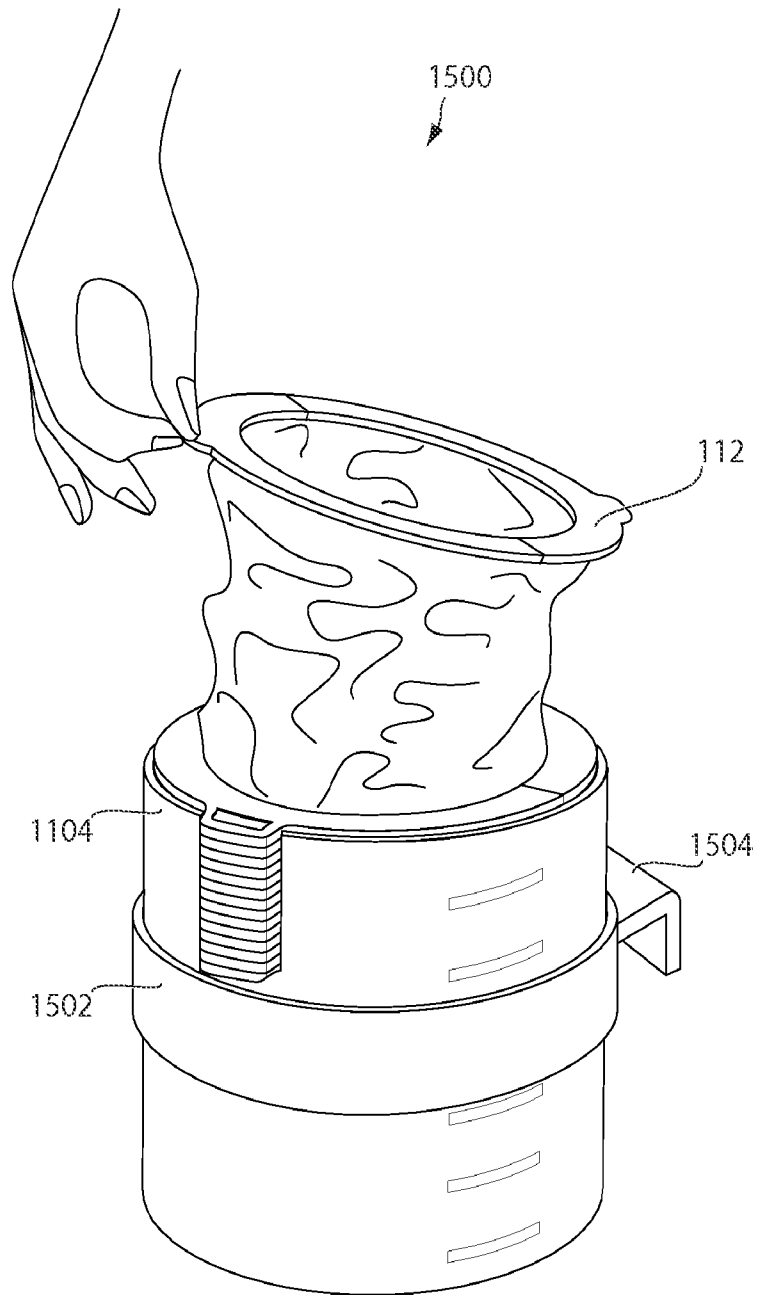


Fig. 15

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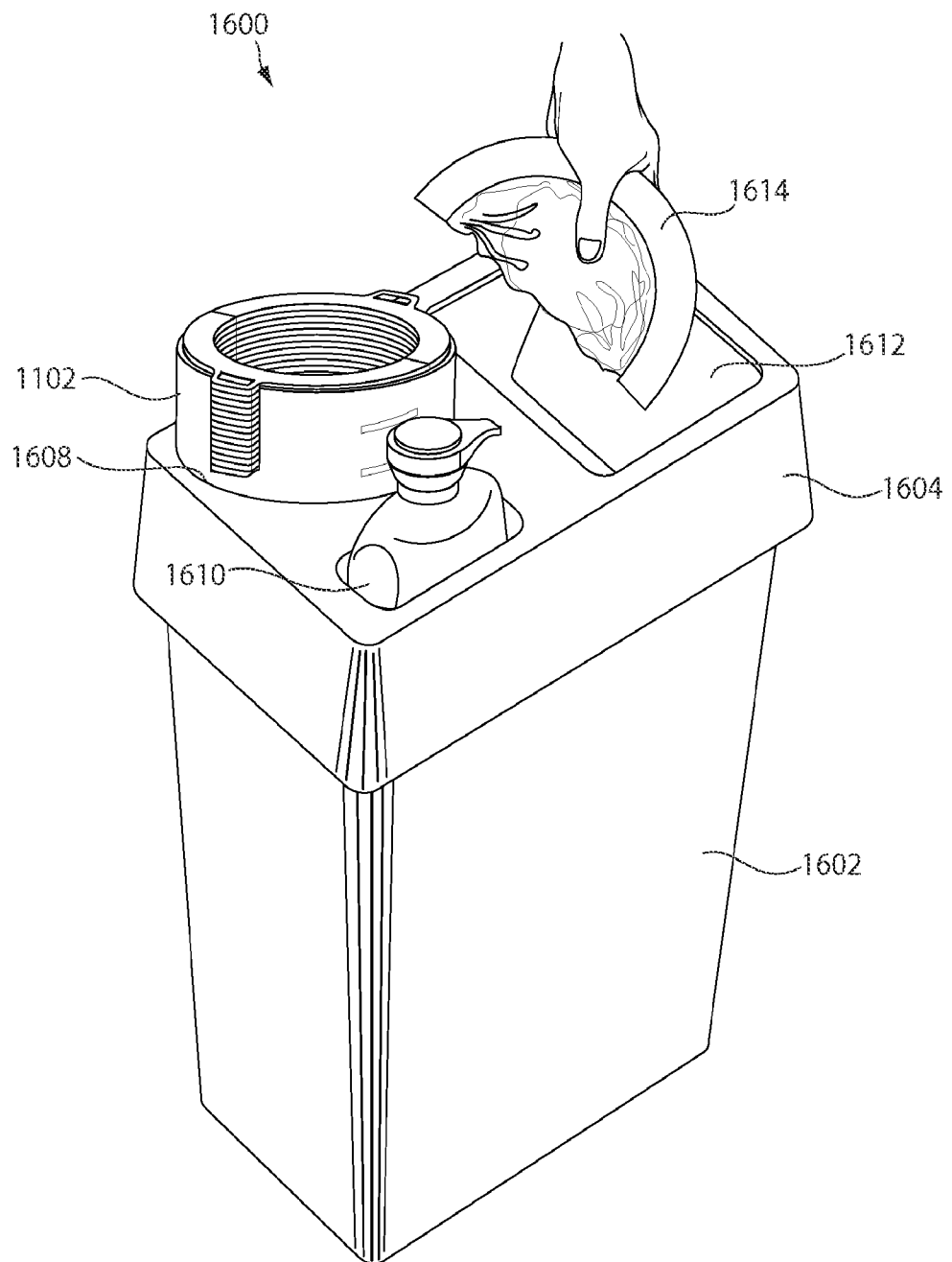


Fig. 16

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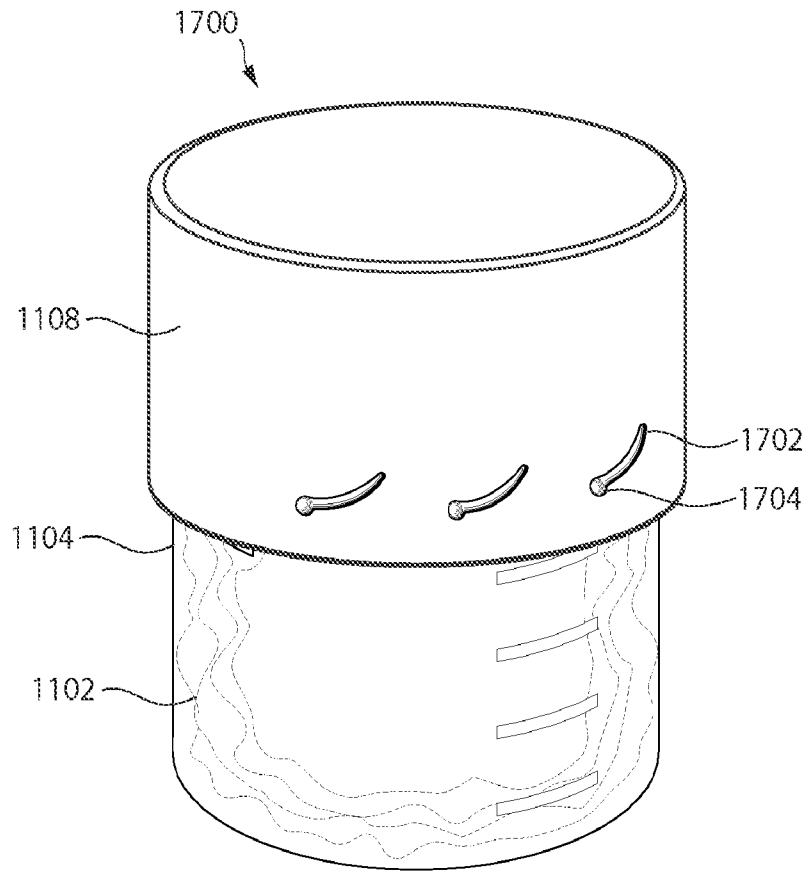


Fig. 17

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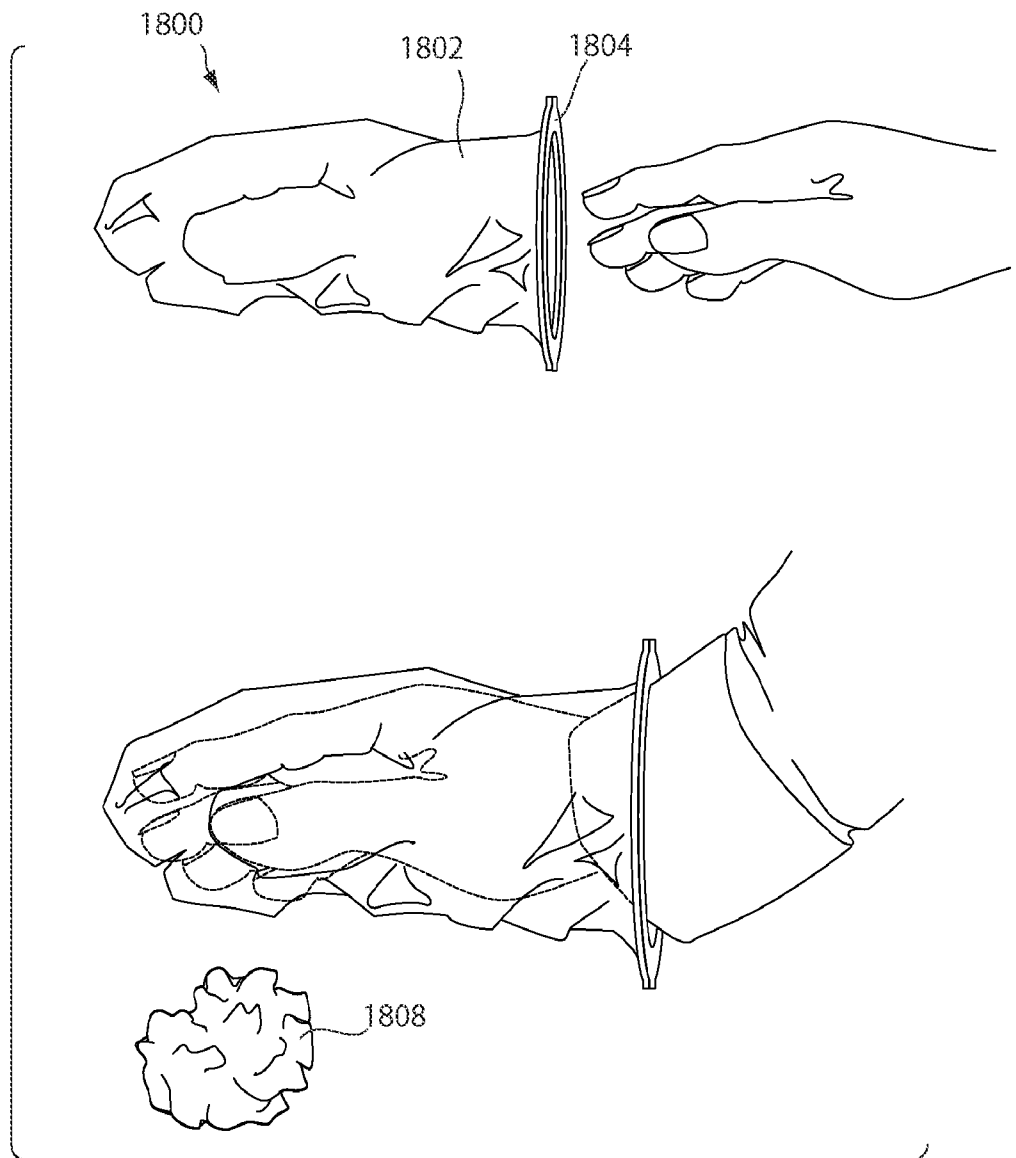


Fig. 18

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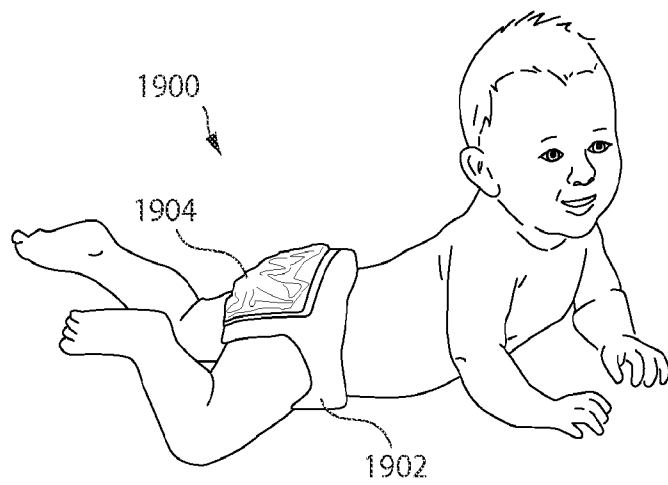


Fig. 19

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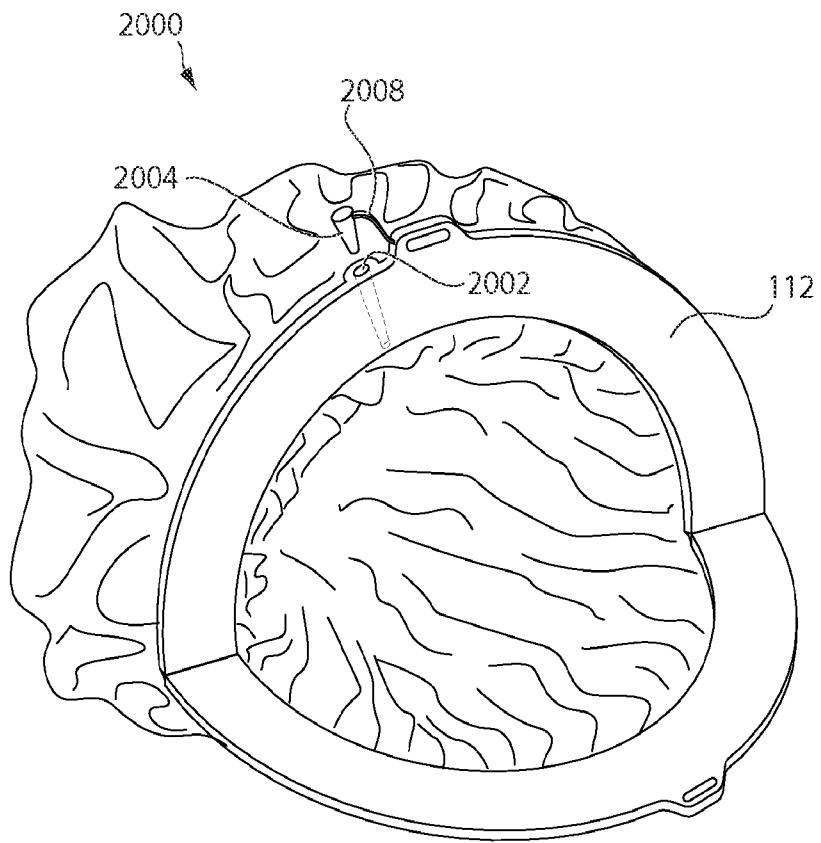


Fig. 20

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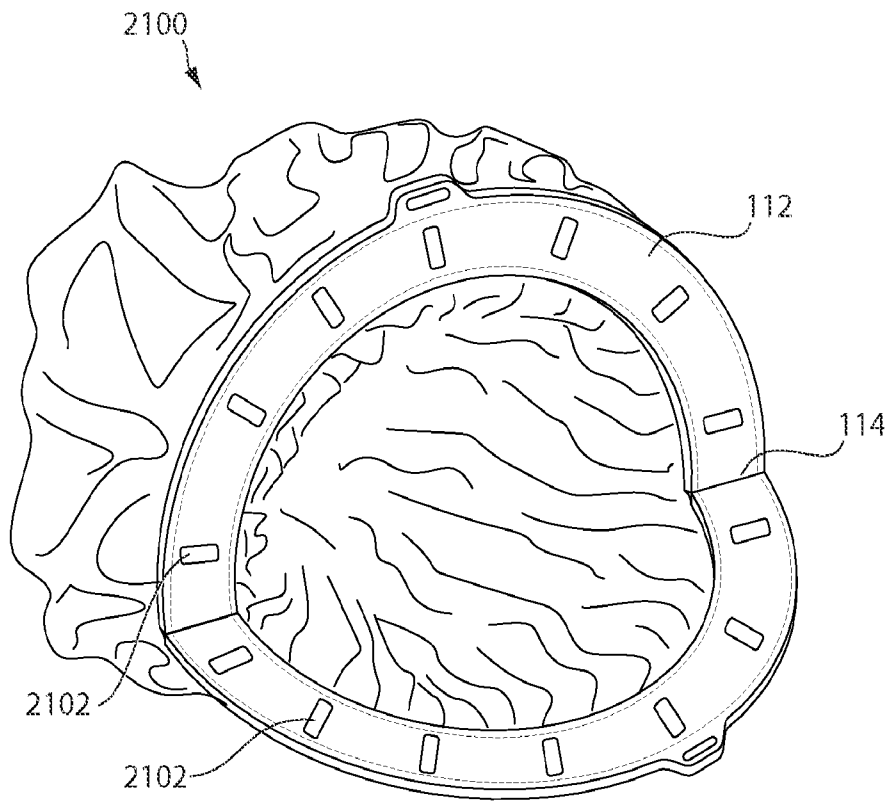


Fig. 21

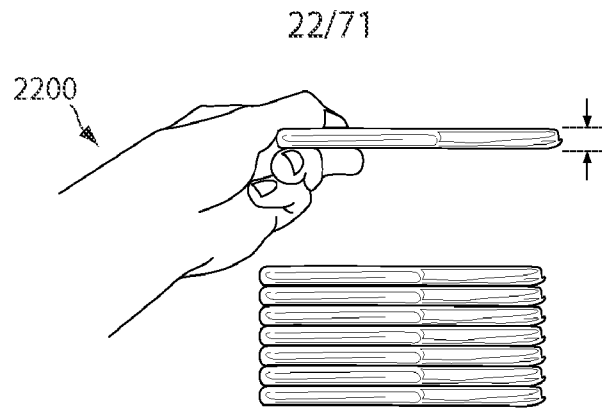


Fig. 22A

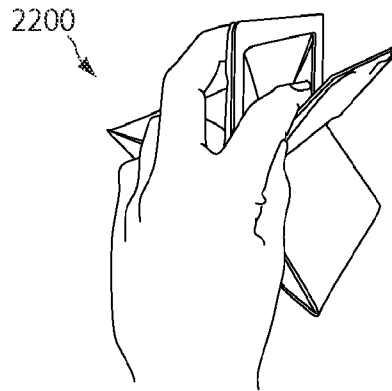


Fig. 22B

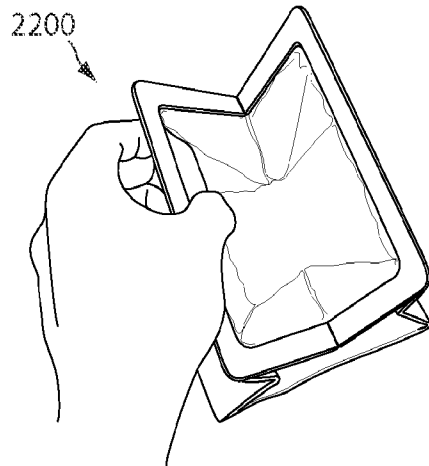


Fig. 22C

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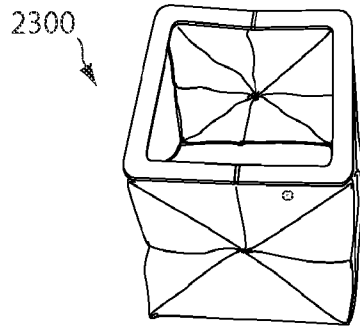


Fig. 23A

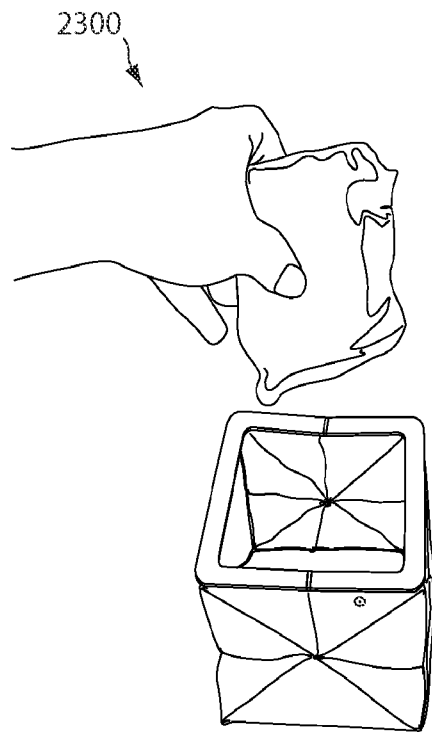


Fig. 23B

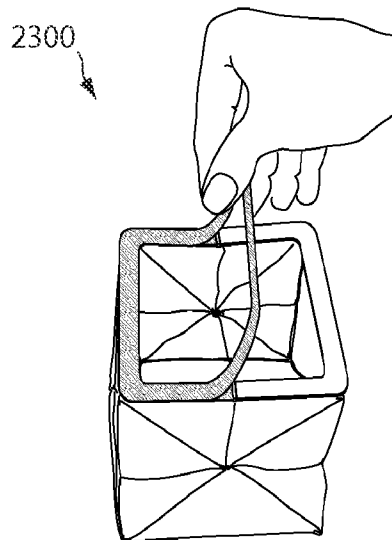


Fig. 23C

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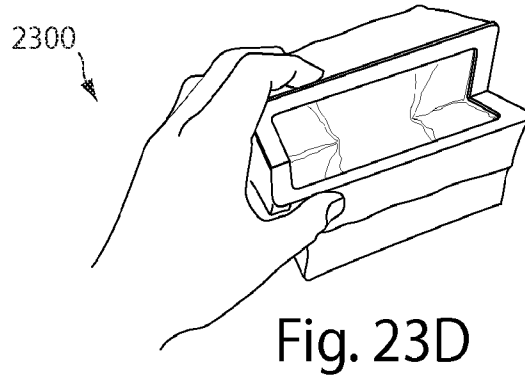


Fig. 23D

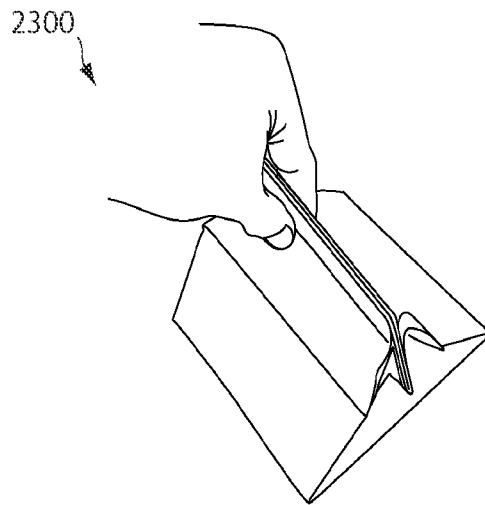


Fig. 23E

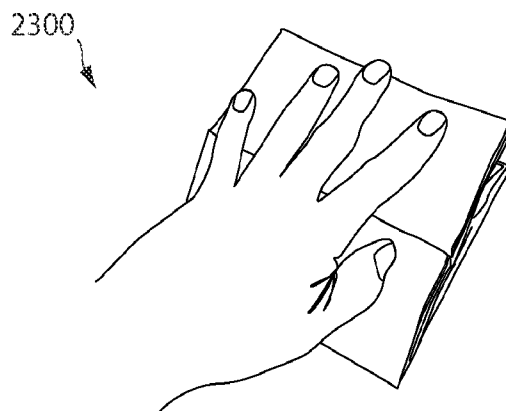


Fig. 23F

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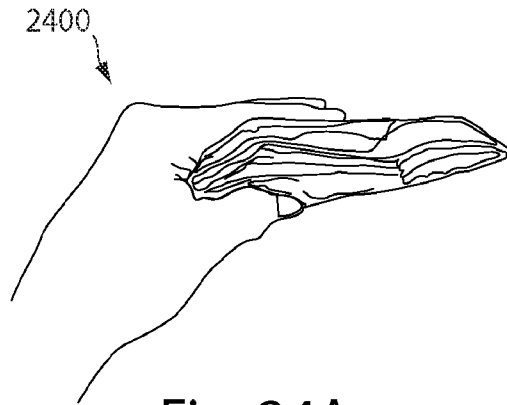


Fig. 24A

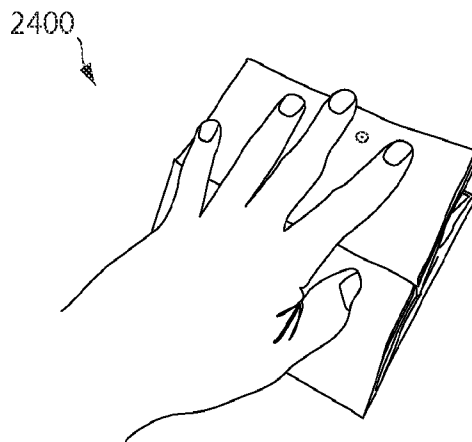


Fig. 24B

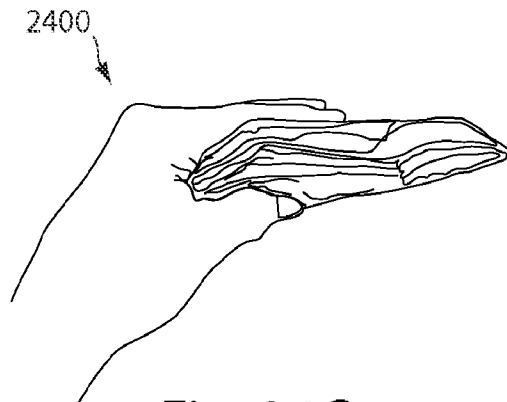


Fig. 24C

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2500

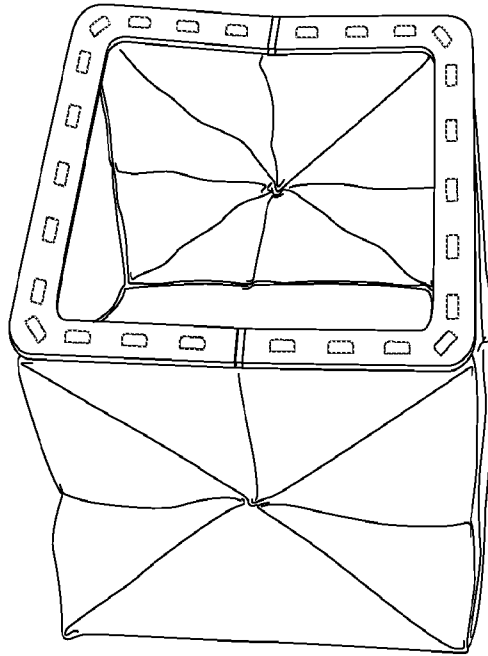
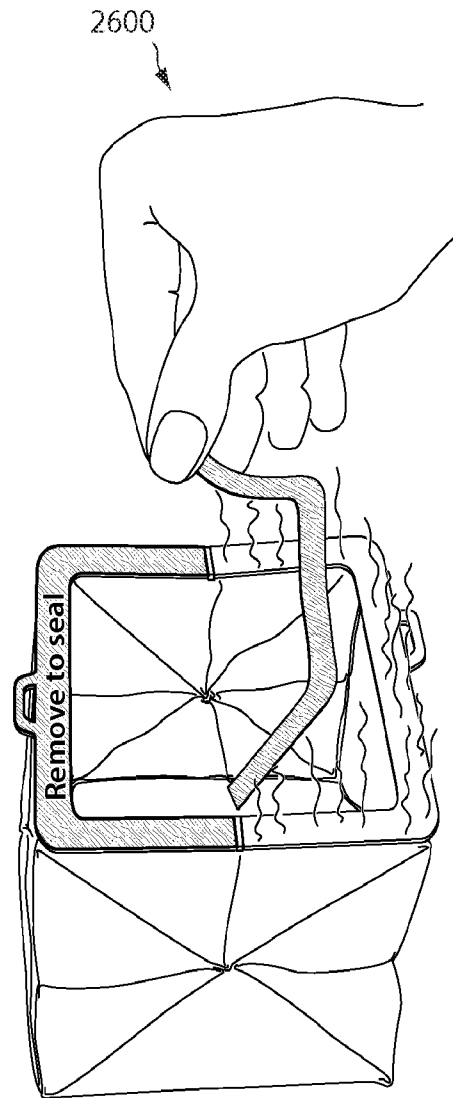
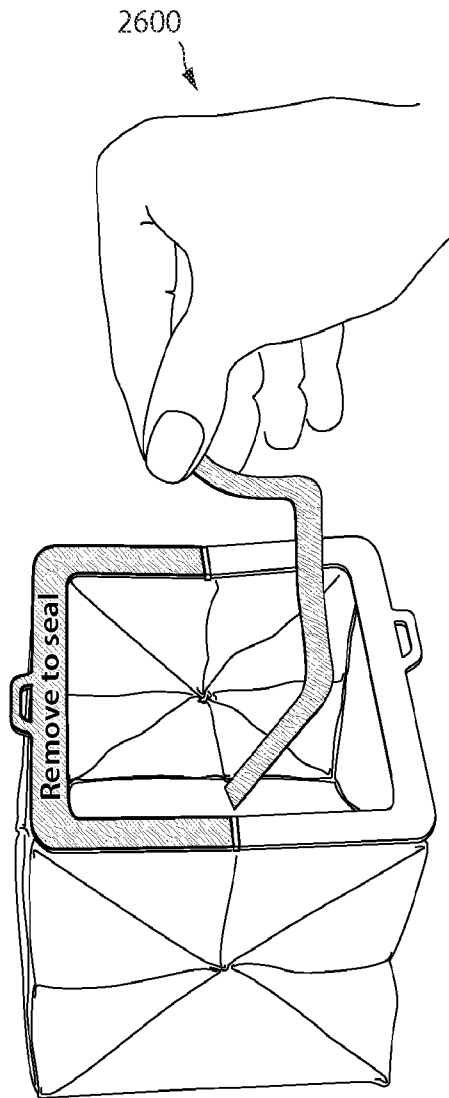


Fig. 25

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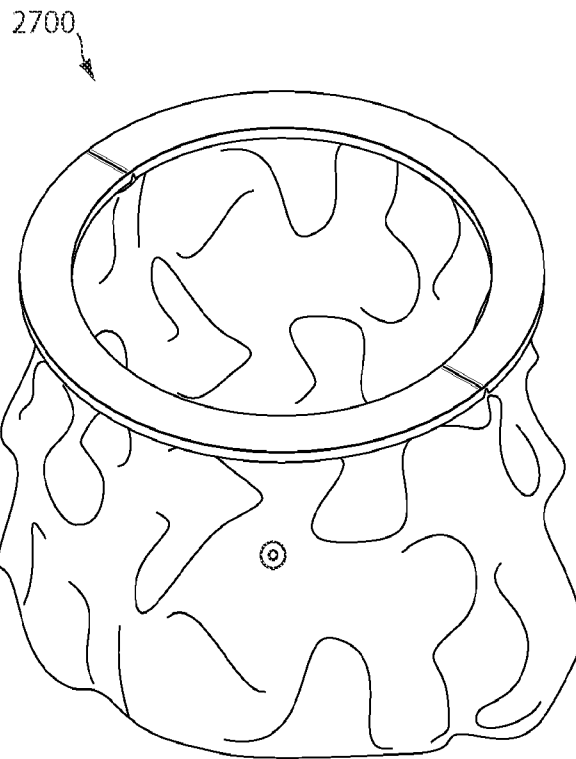


Fig. 27

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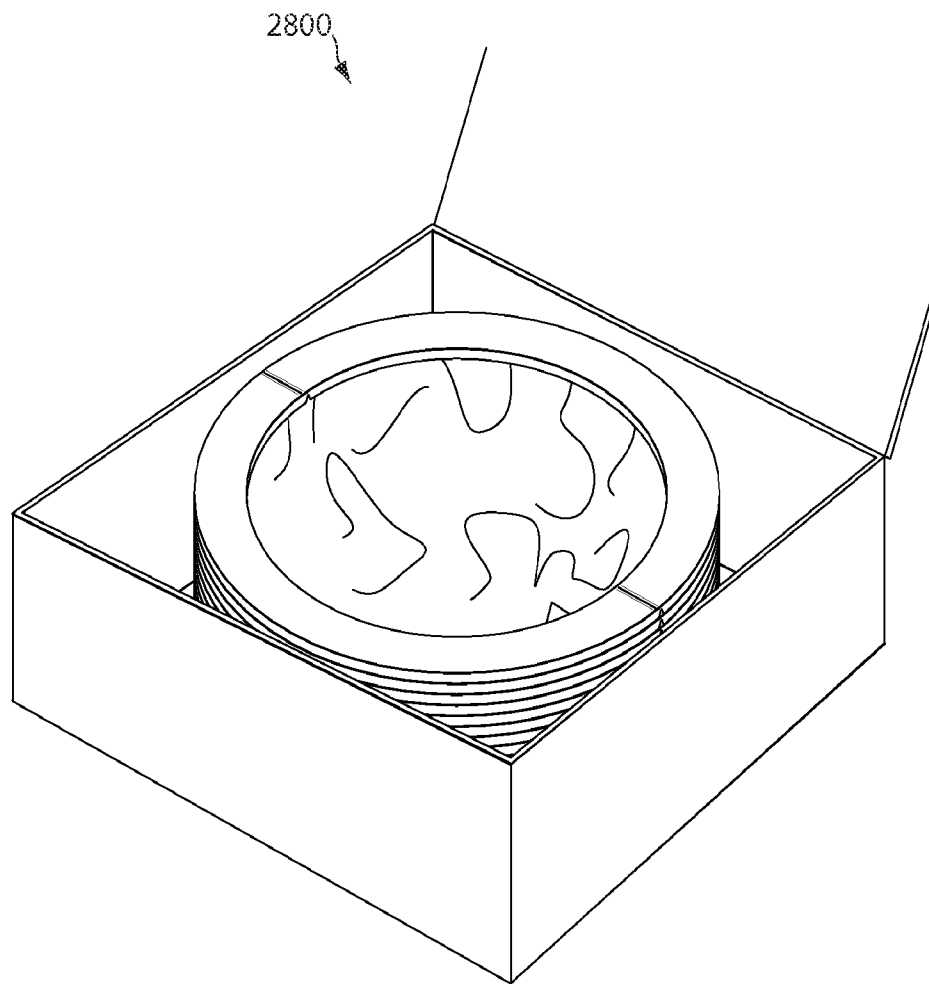


Fig. 28

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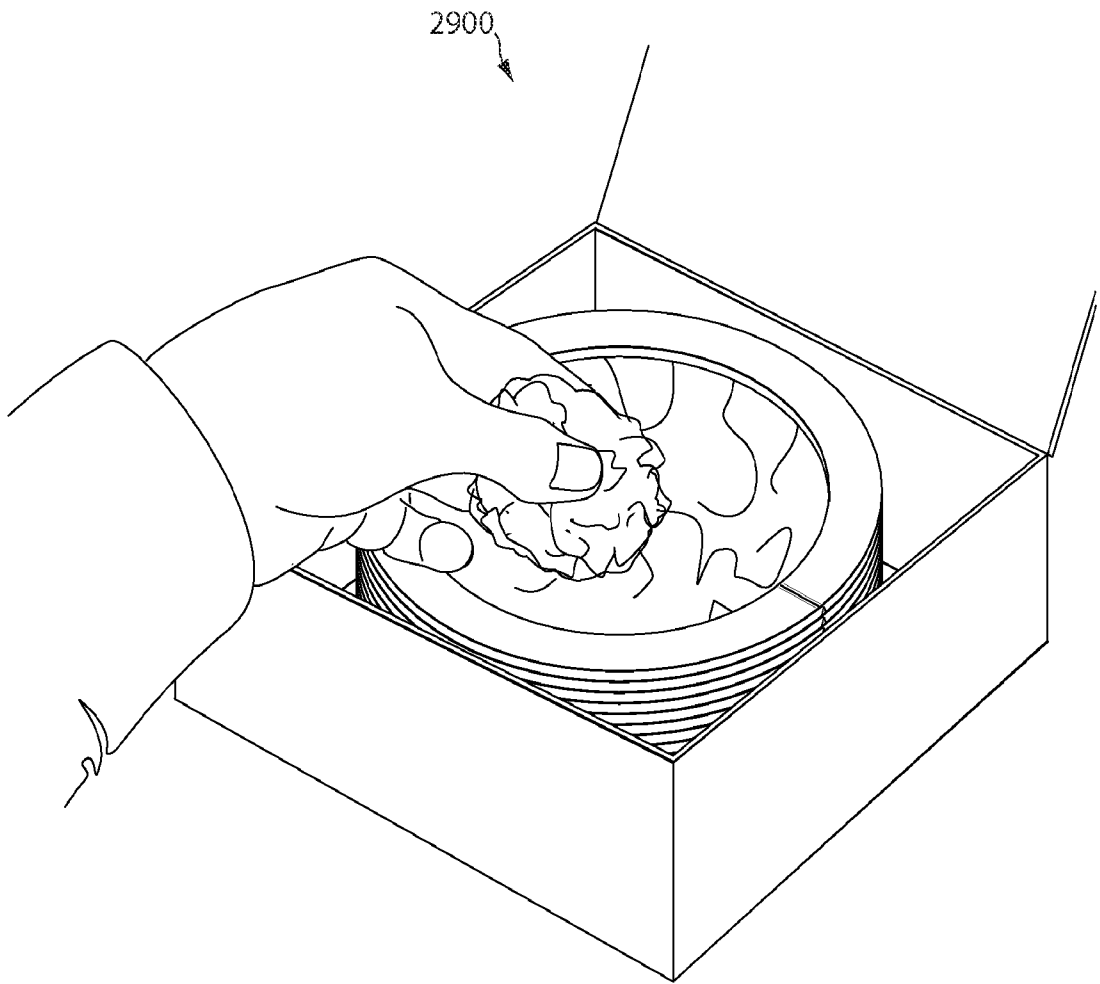


Fig. 29

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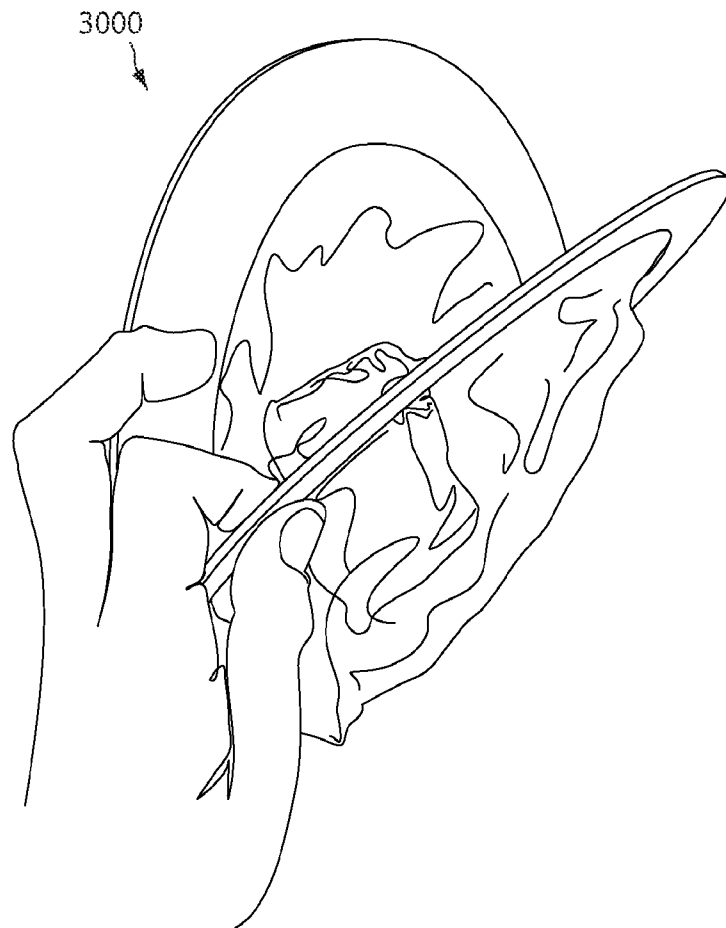


Fig. 30

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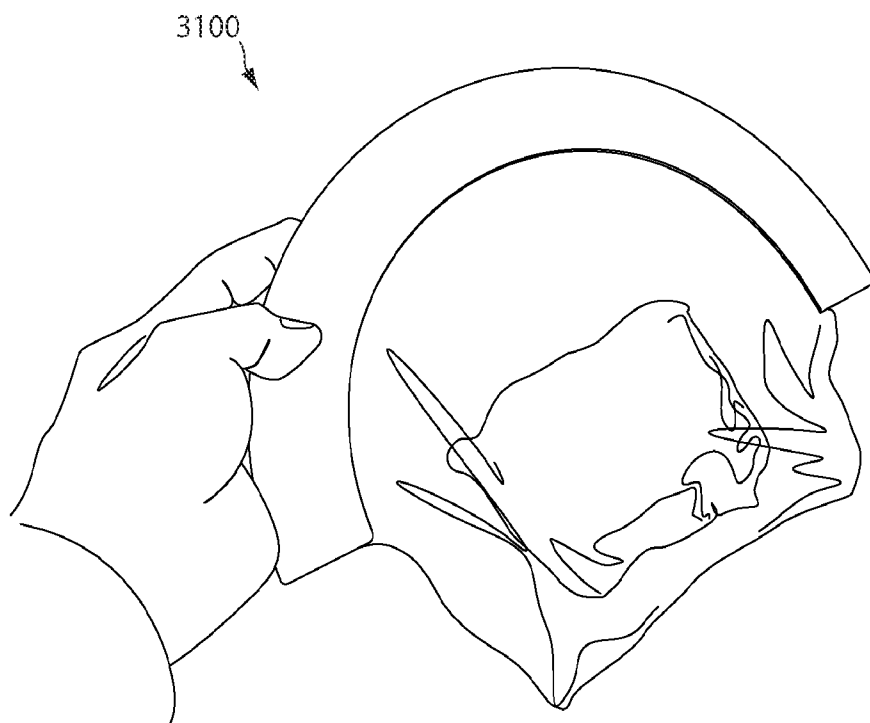


Fig. 31

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Fig. 32

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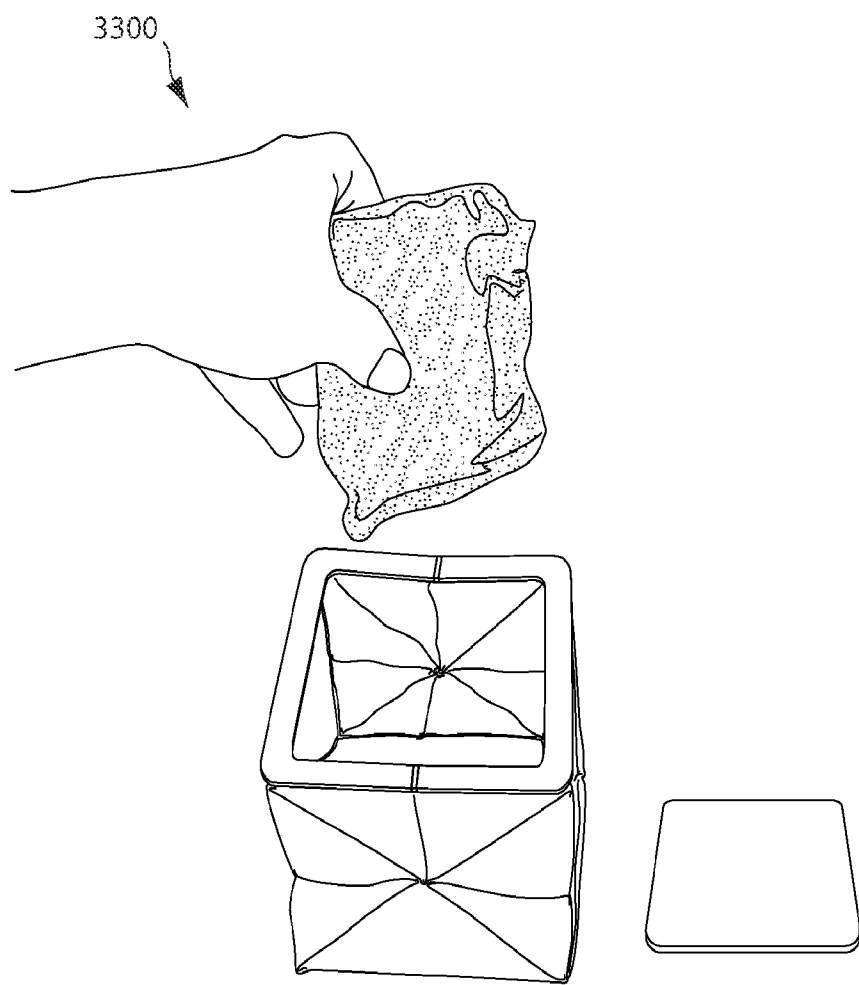


Fig. 33

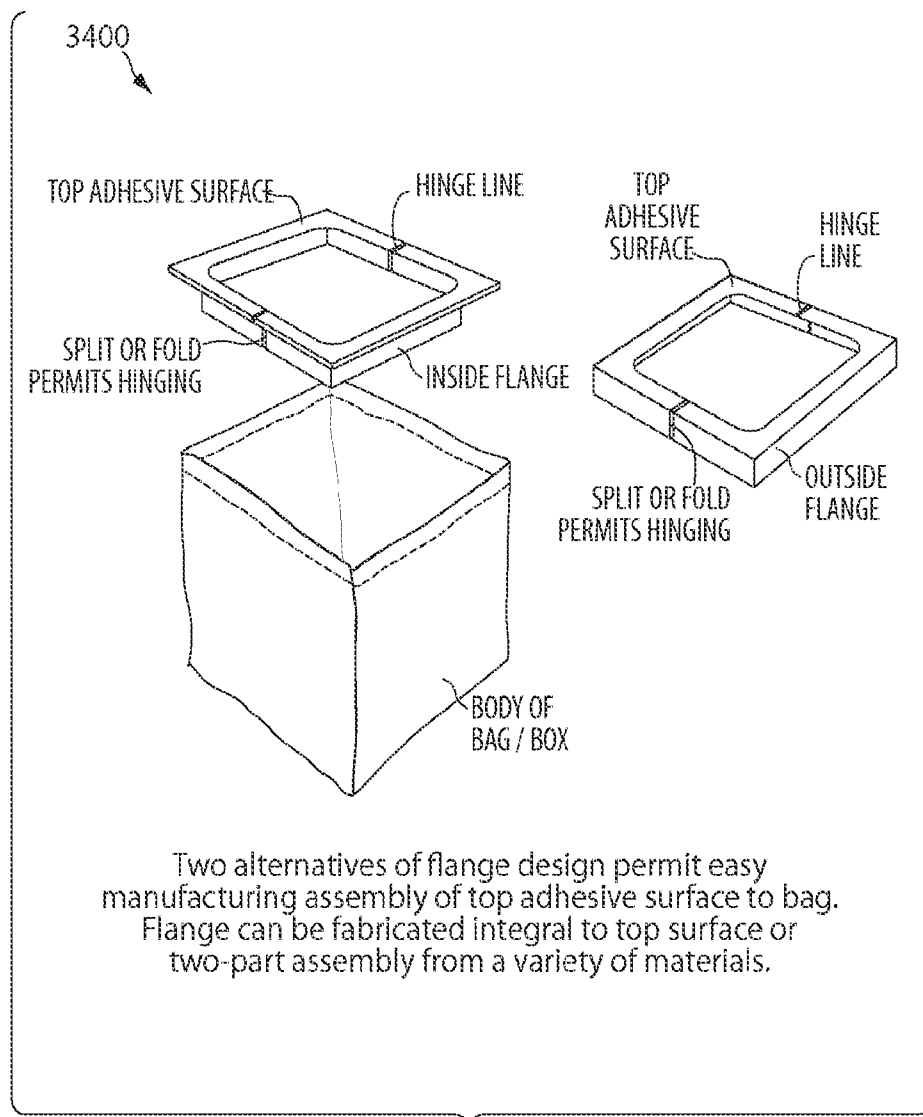


Fig. 34

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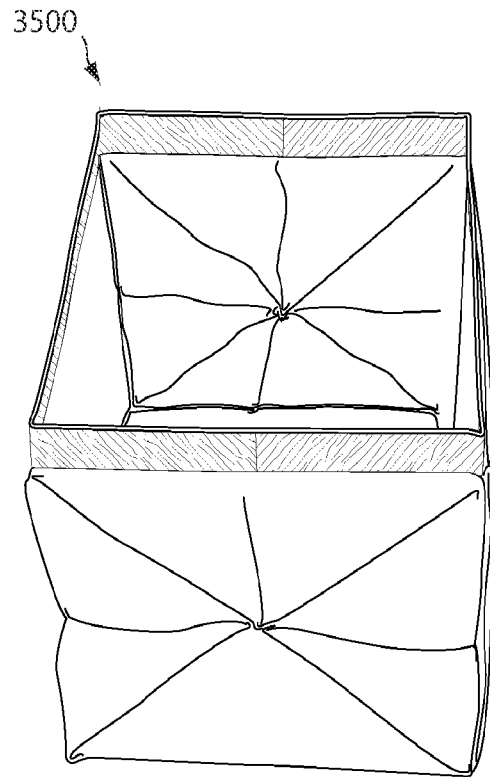


Fig. 35A

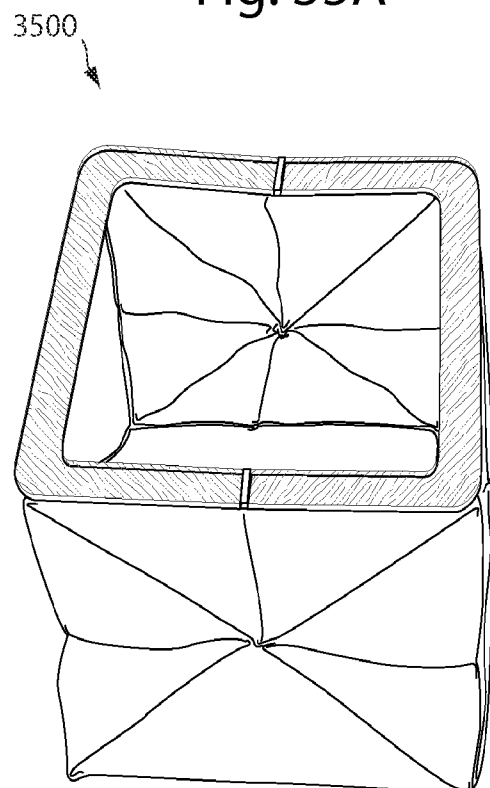


Fig. 35B

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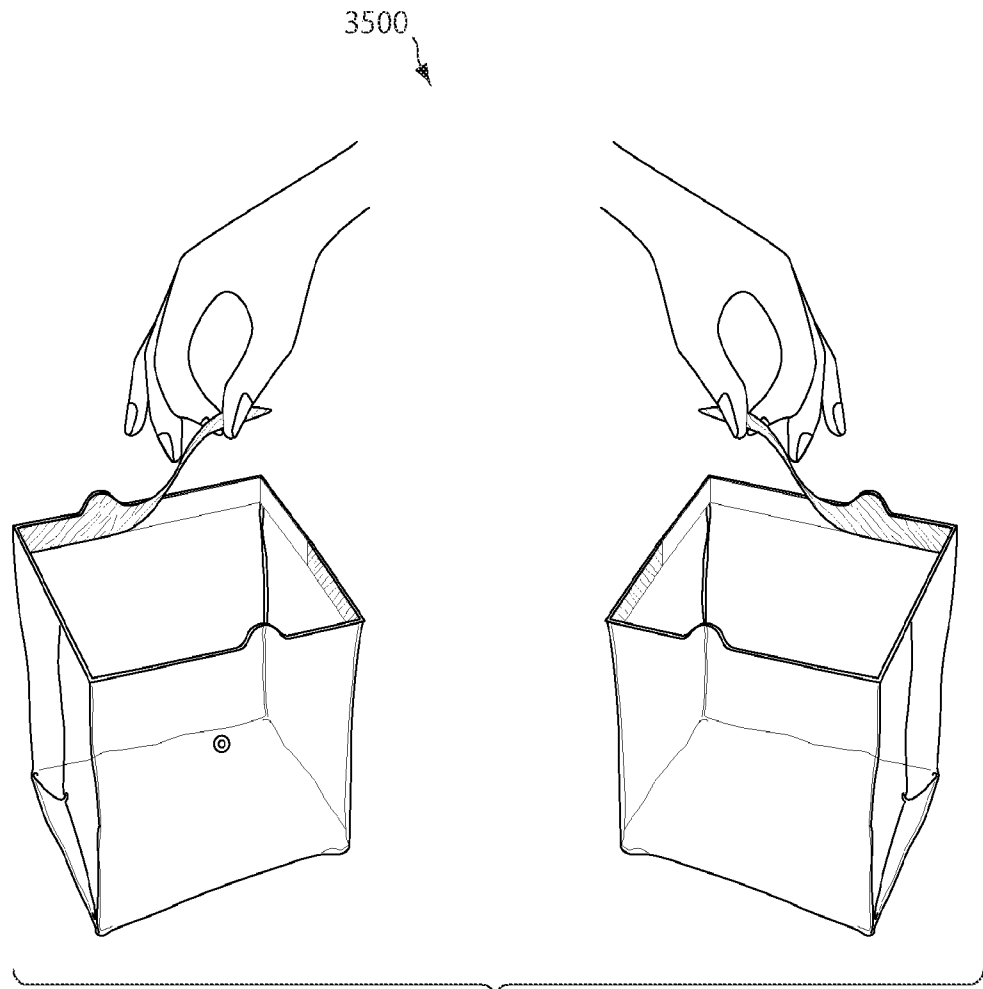


Fig. 35C

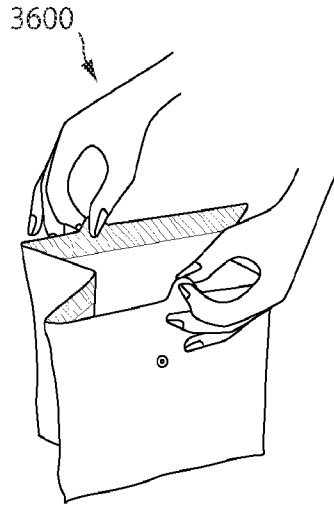


Fig. 36A

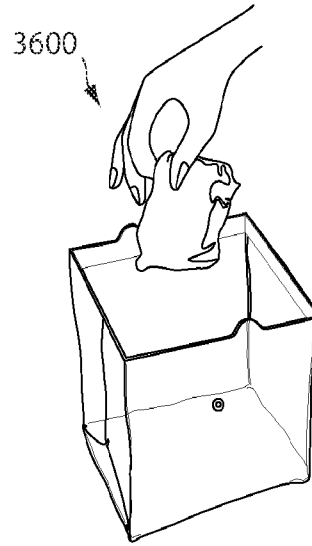


Fig. 36B

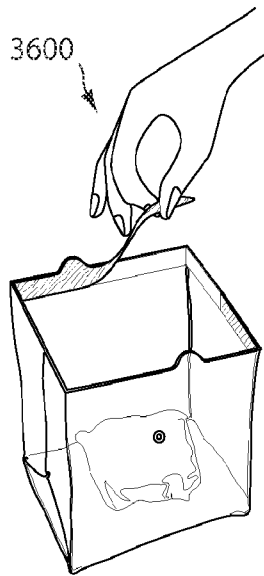


Fig. 36C



Fig. 36D

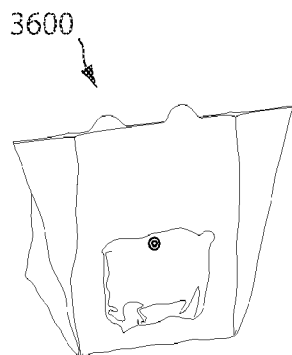


Fig. 36E

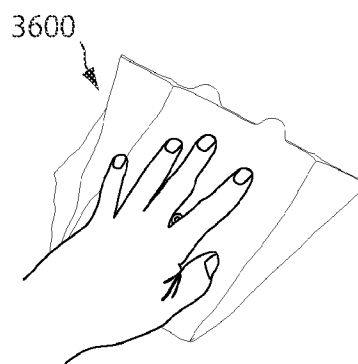


Fig. 36F

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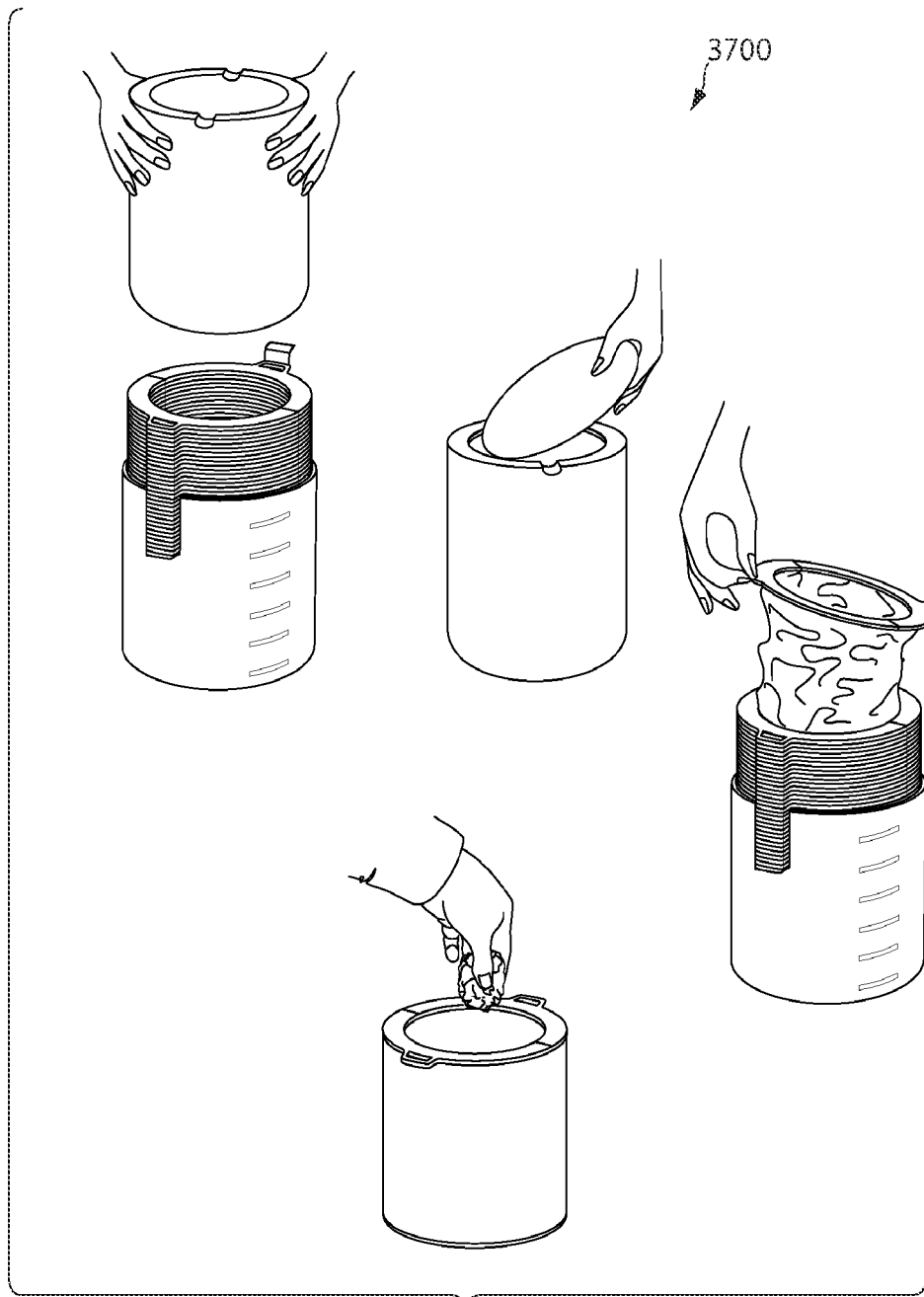


Fig. 37

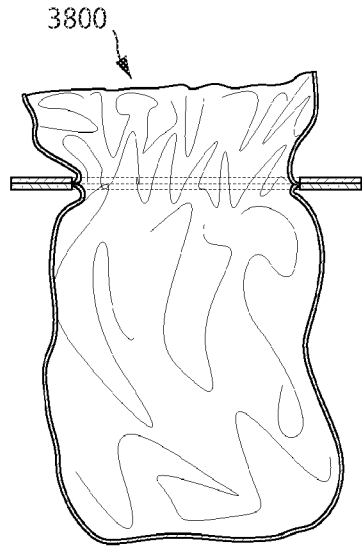


Fig. 38A

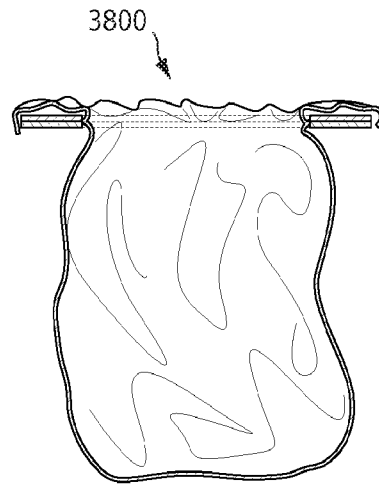


Fig. 38B

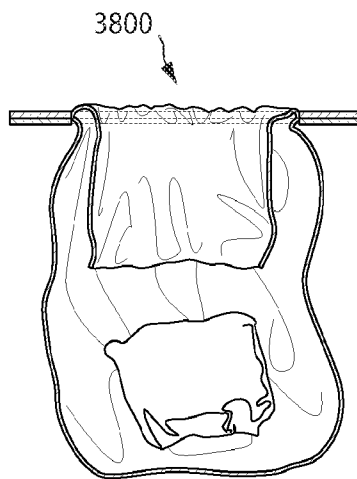


Fig. 38C

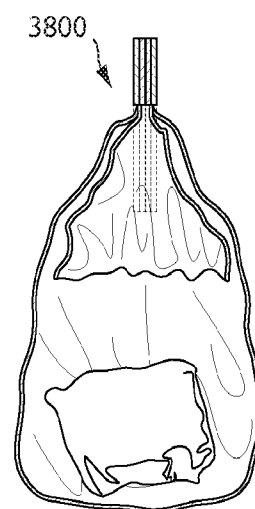


Fig. 38D

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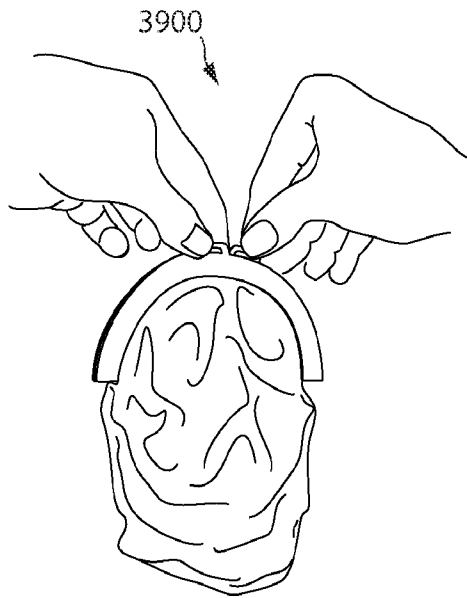


Fig. 39A

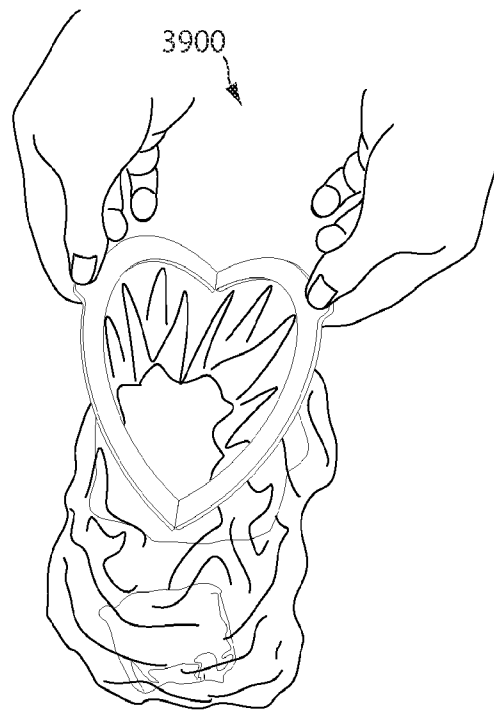


Fig. 39B

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Fig. 40

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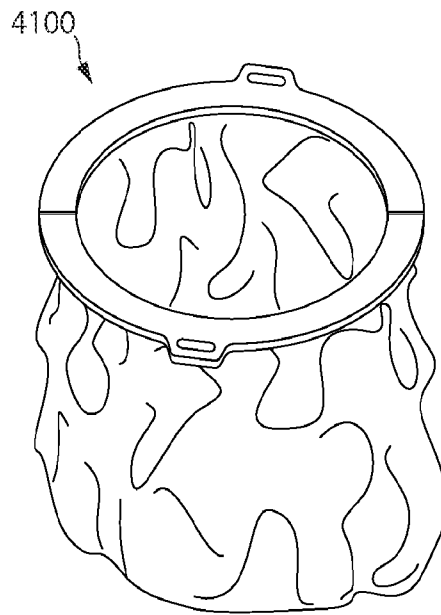


Fig. 41



Fig. 42

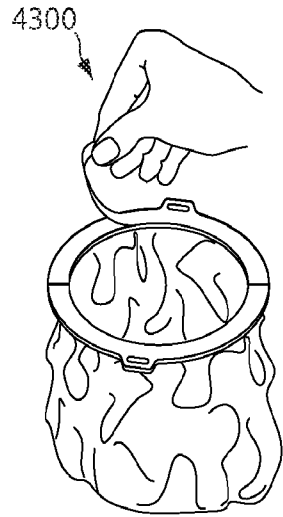


Fig. 43A

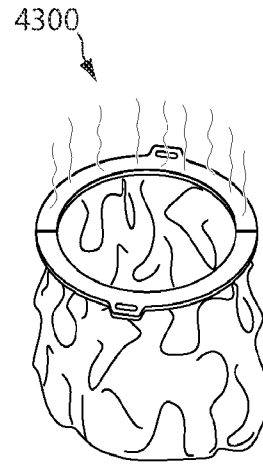


Fig. 43B

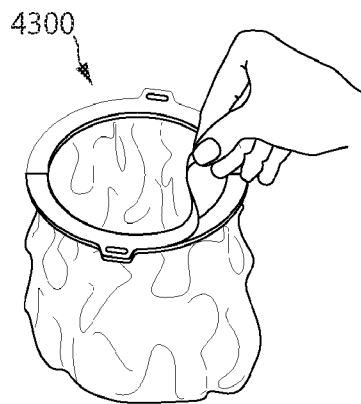


Fig. 43AC

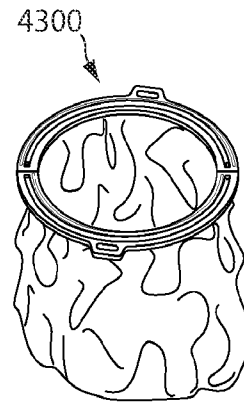


Fig. 43D

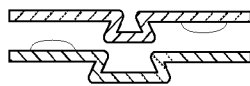


Fig. 43E

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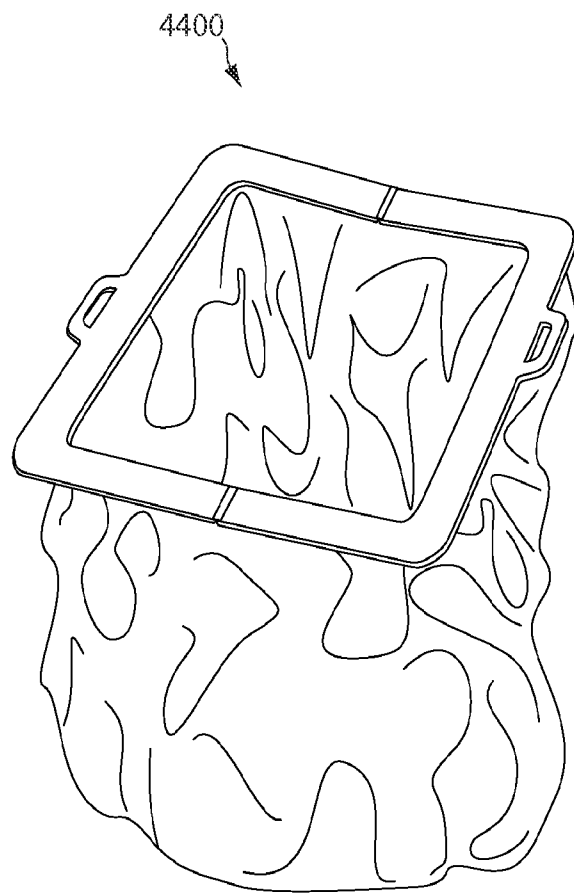


Fig. 44

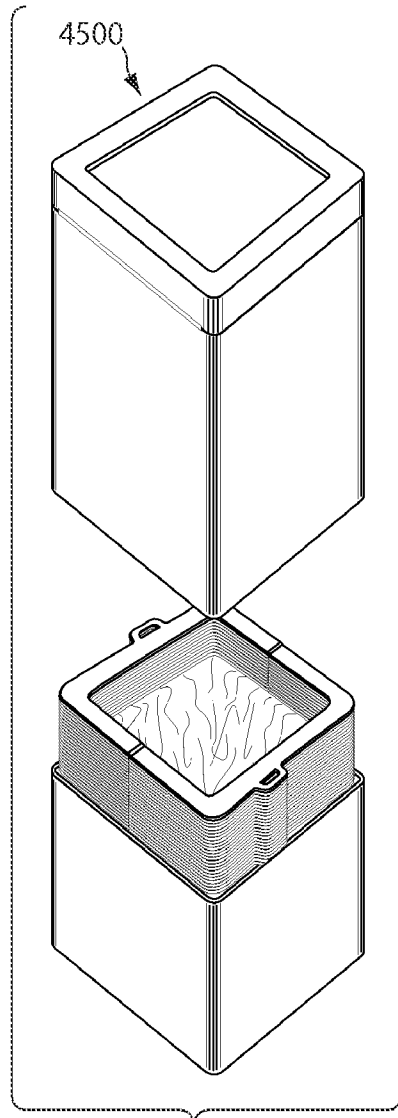


Fig. 45A

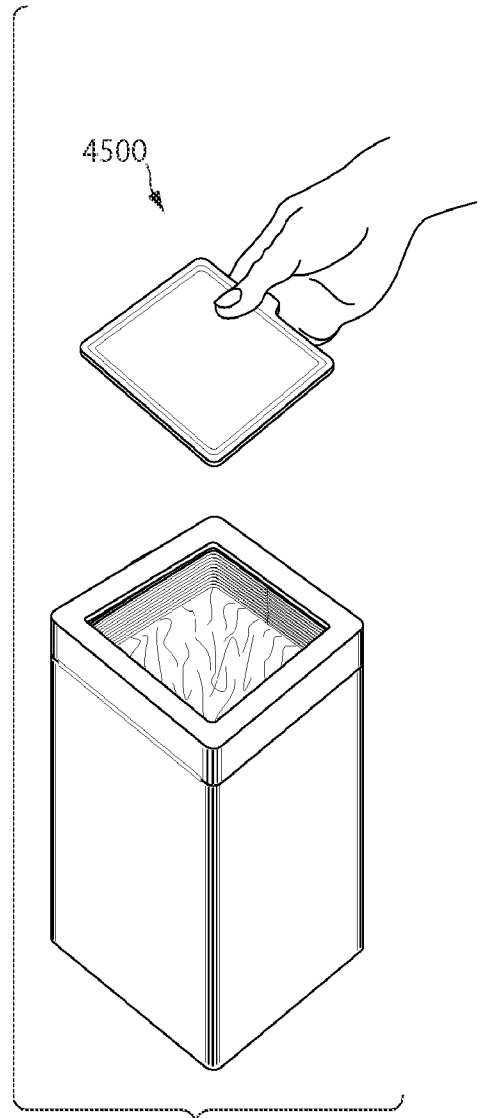


Fig. 45B

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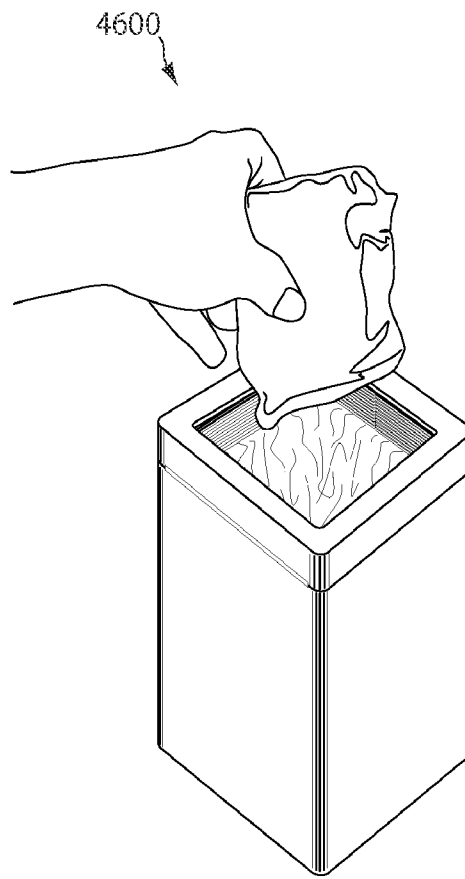


Fig. 46

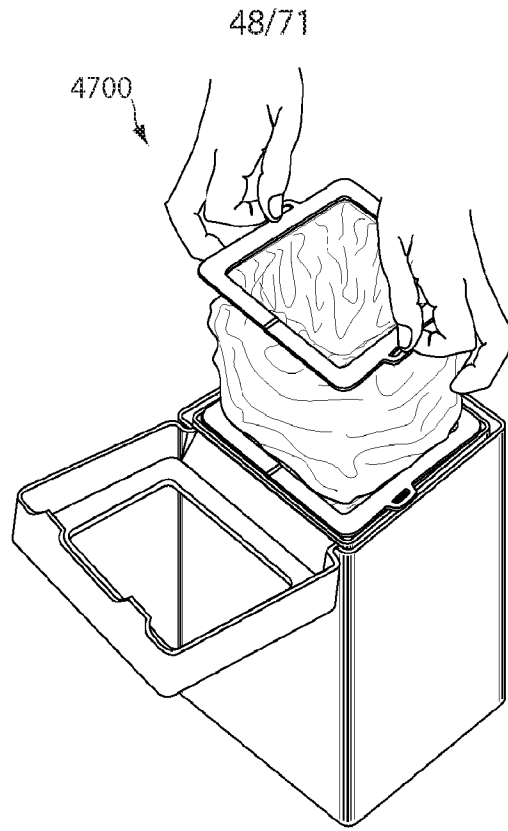


Fig. 47A

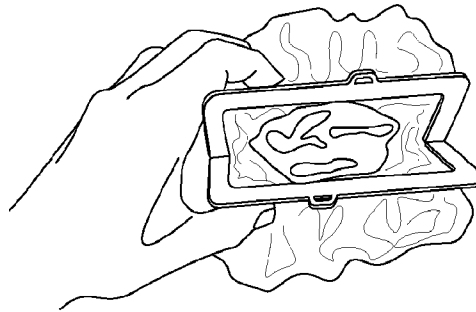


Fig. 47B

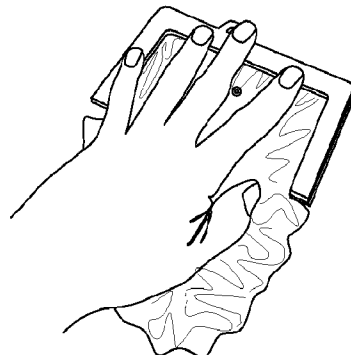


Fig. 47C

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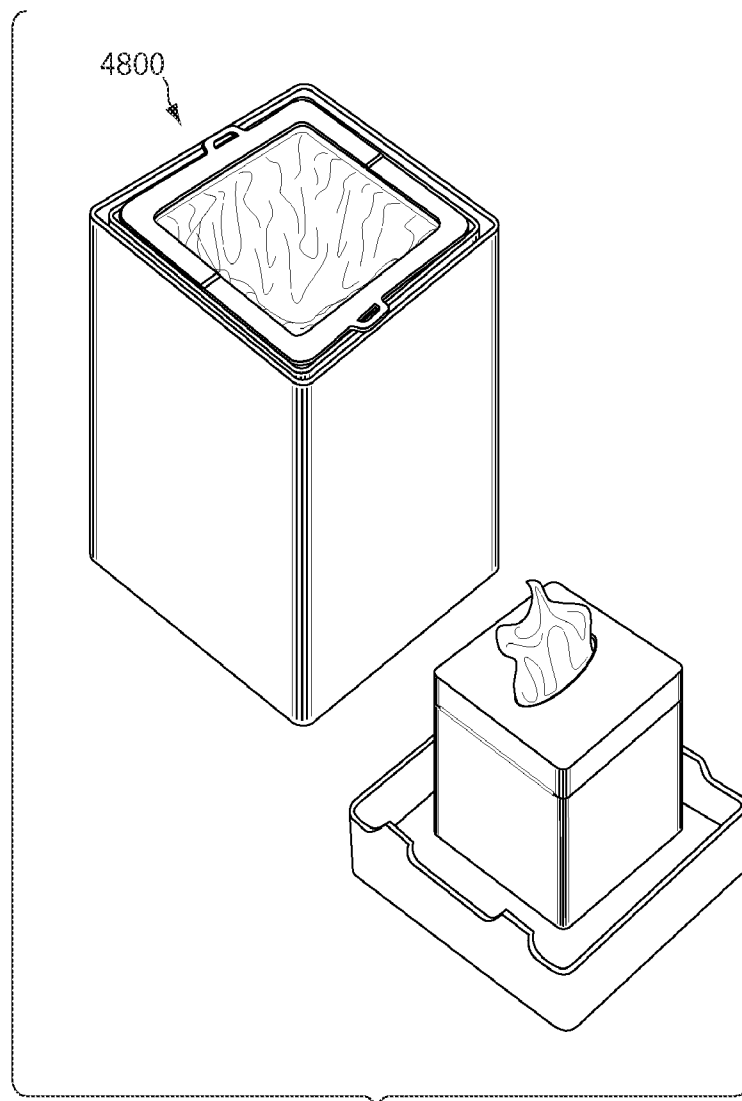


Fig. 48

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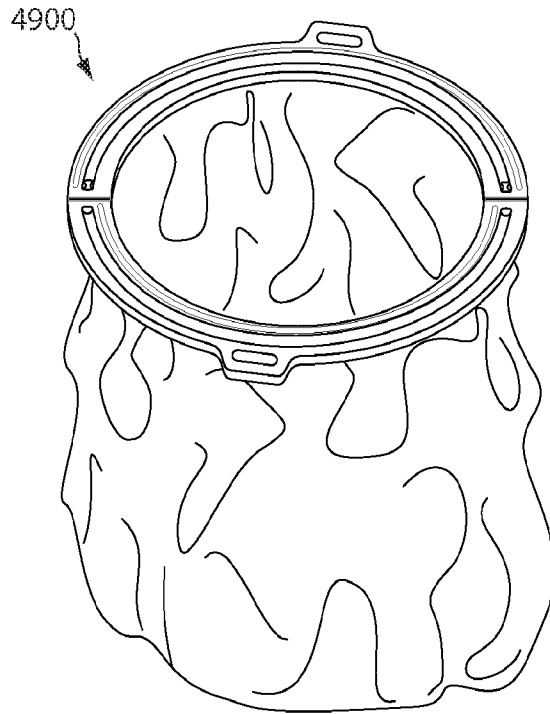


Fig. 49A

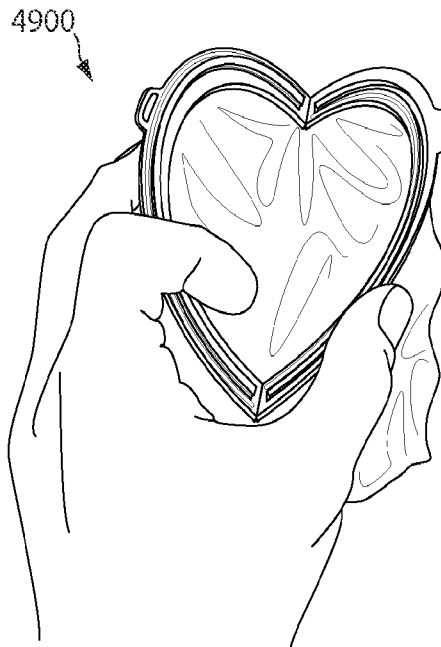


Fig. 49B

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Fig. 50A

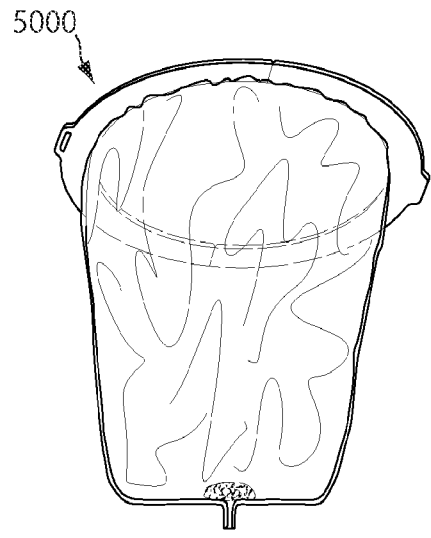


Fig. 50B



Fig. 50C

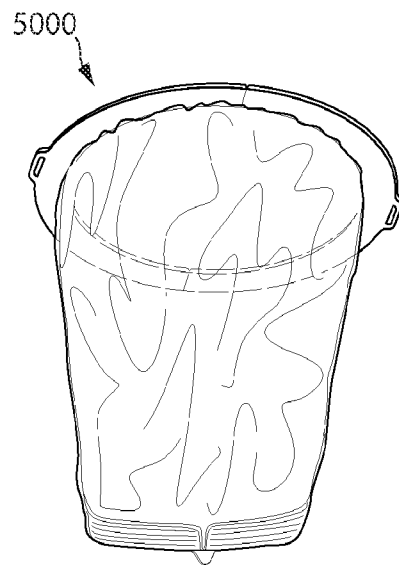


Fig. 50D

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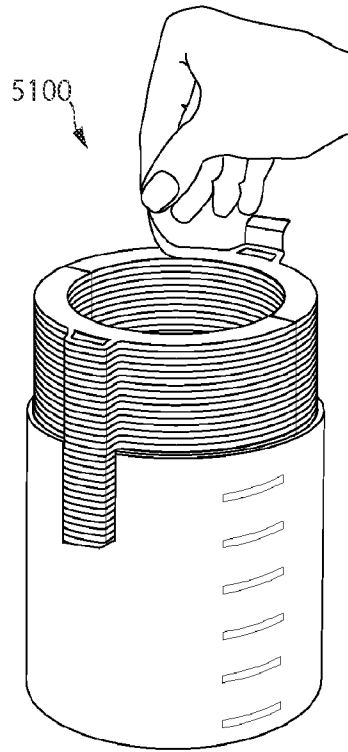


Fig. 51A

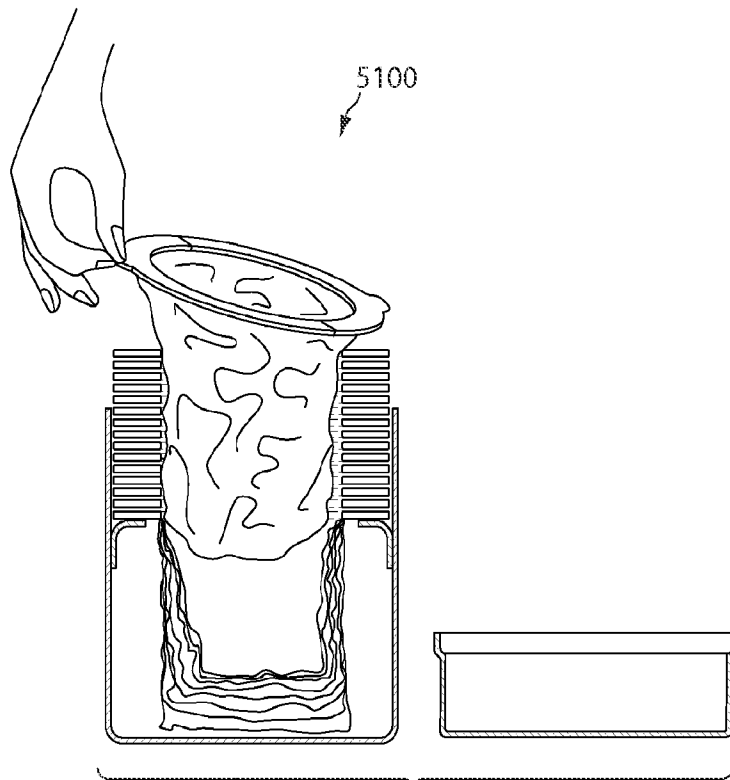


Fig. 51B

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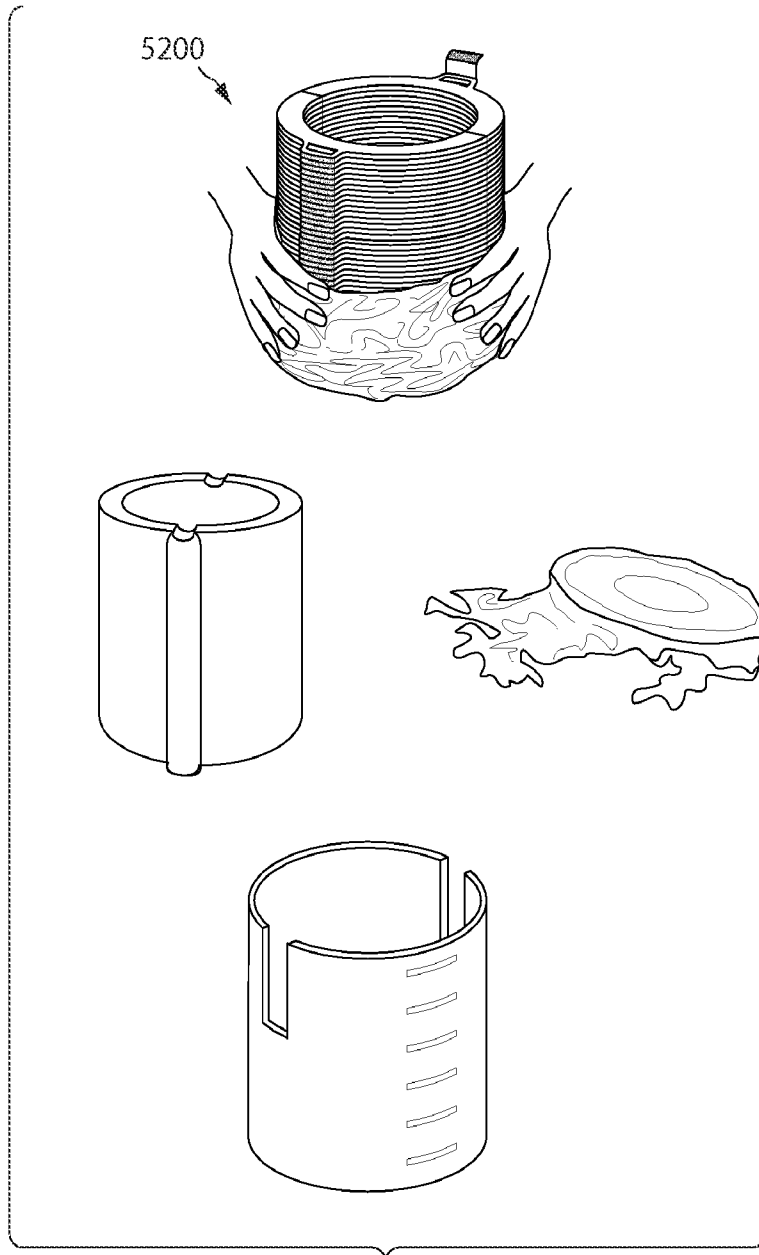


Fig. 52

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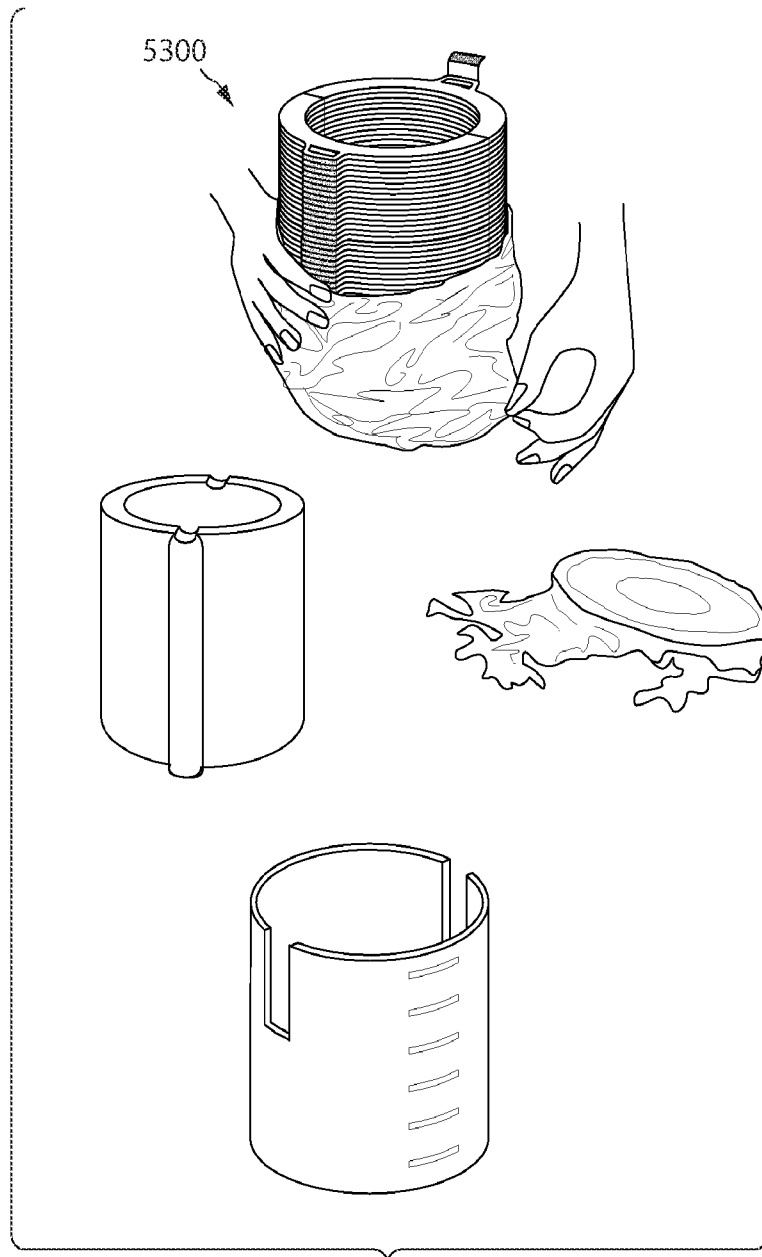


Fig. 53

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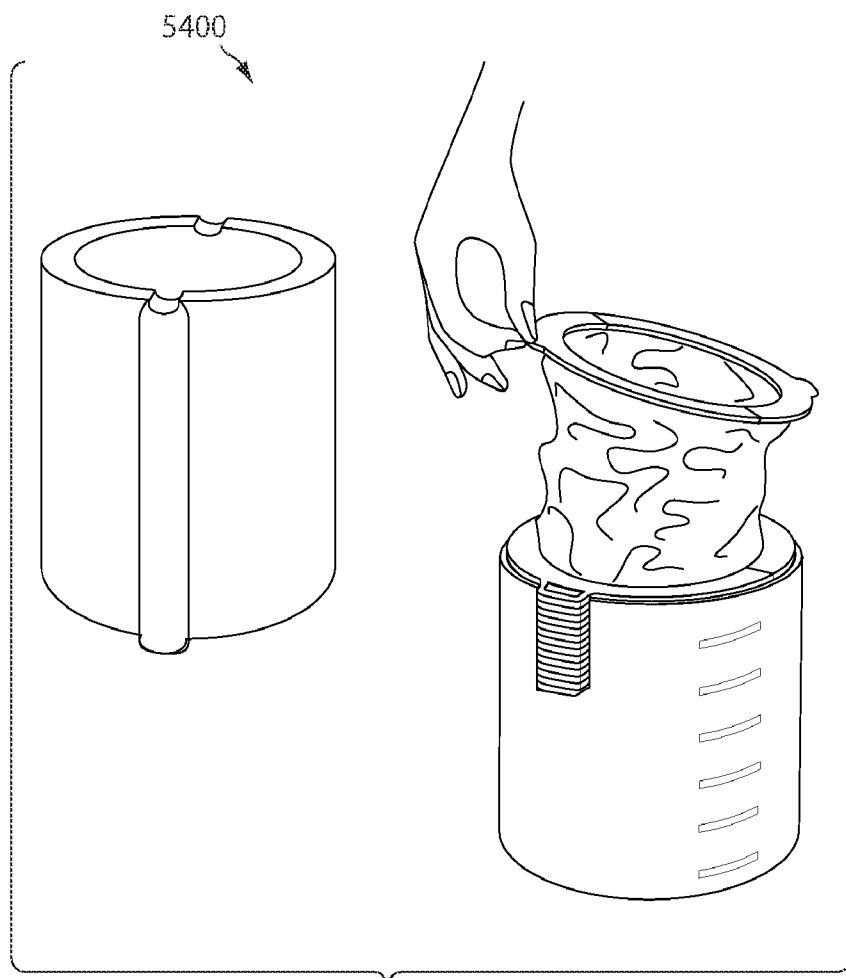
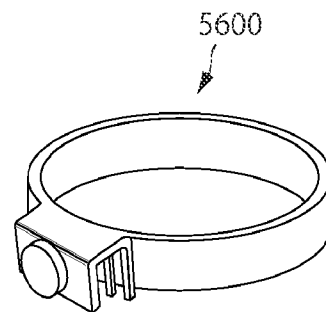
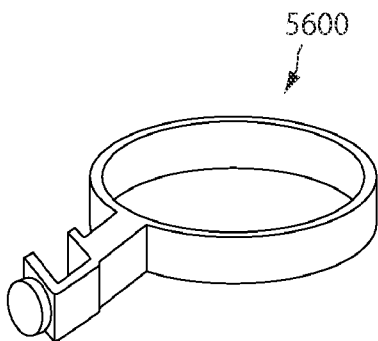
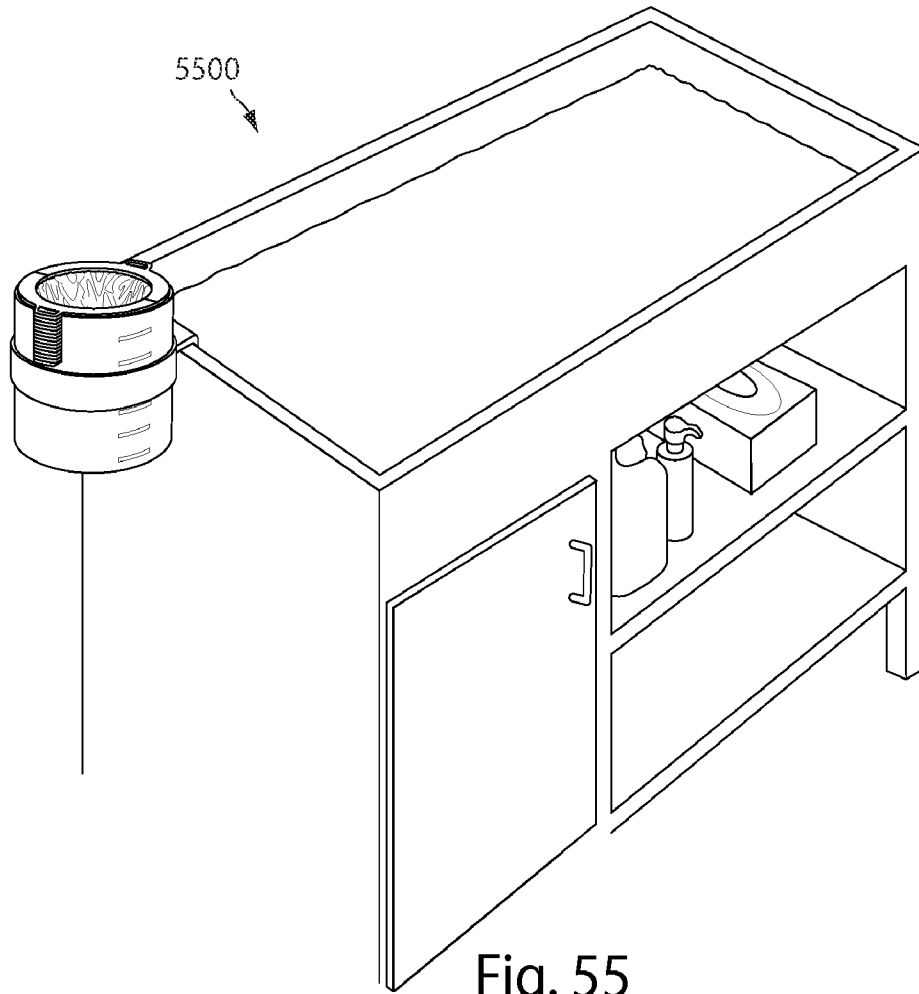


Fig. 54

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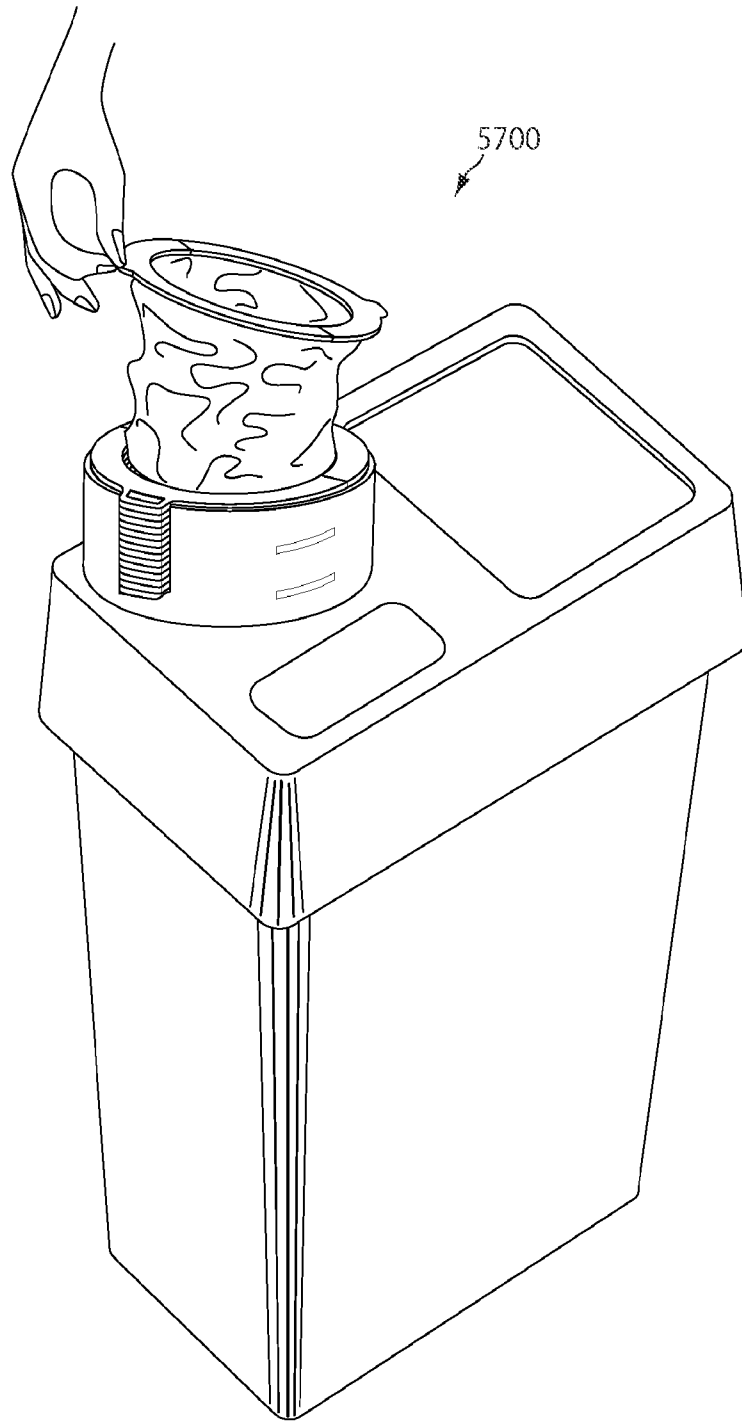


Fig. 57

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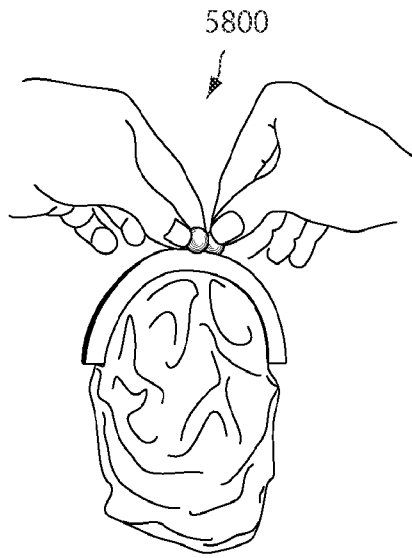


Fig. 58A

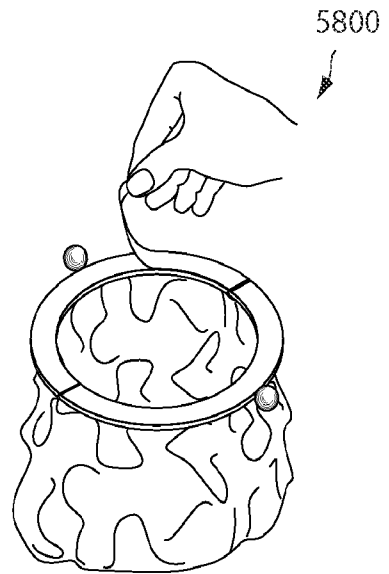


Fig. 58B

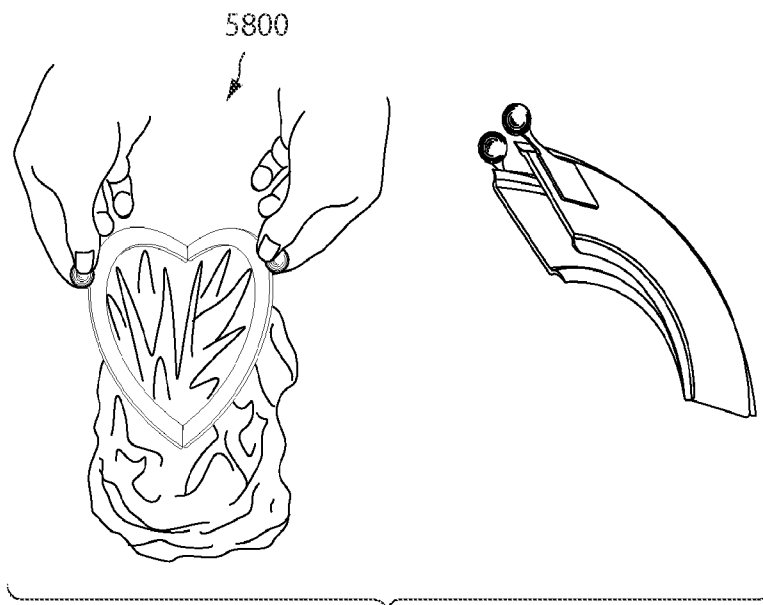


Fig. 58C

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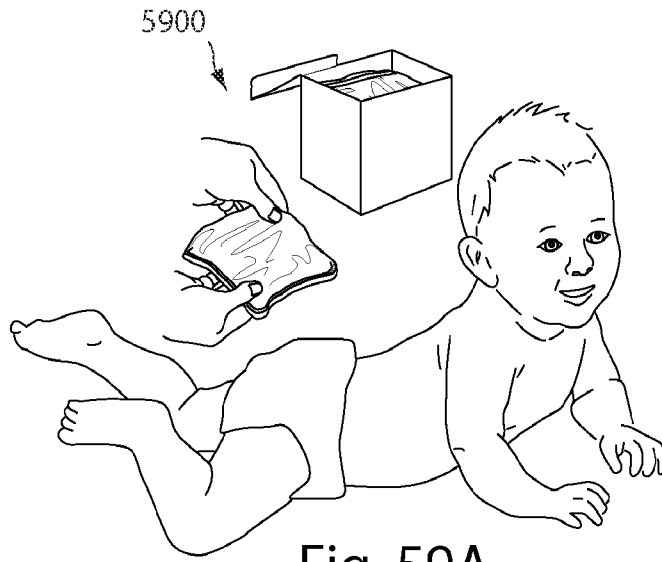


Fig. 59A

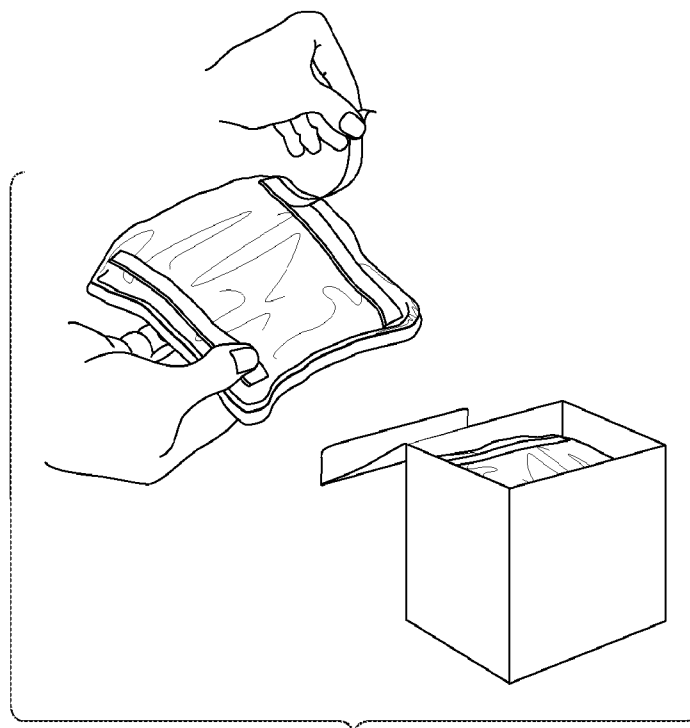


Fig. 59B

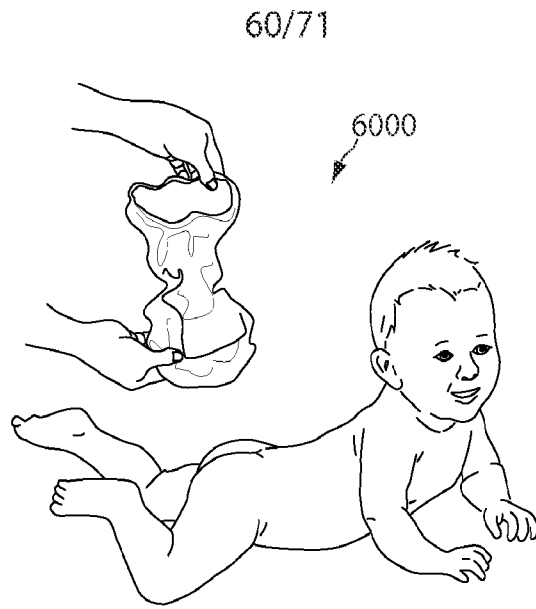


Fig. 60A

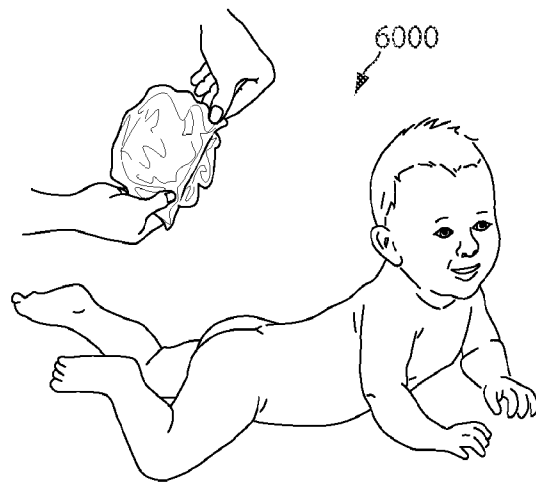


Fig. 60B

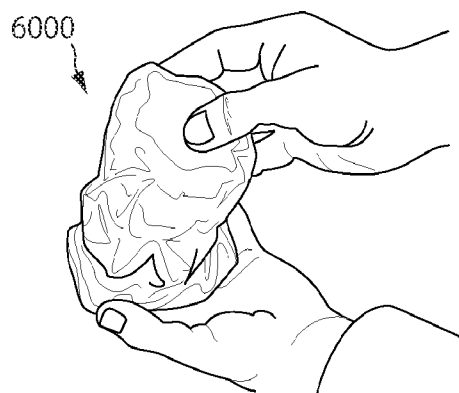


Fig. 60C

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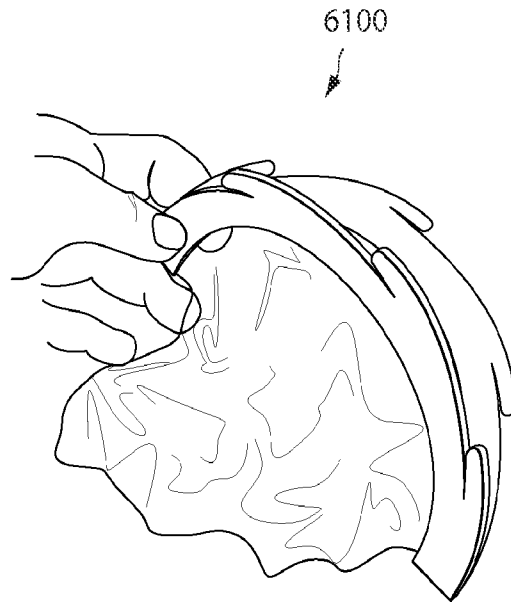


Fig. 61A

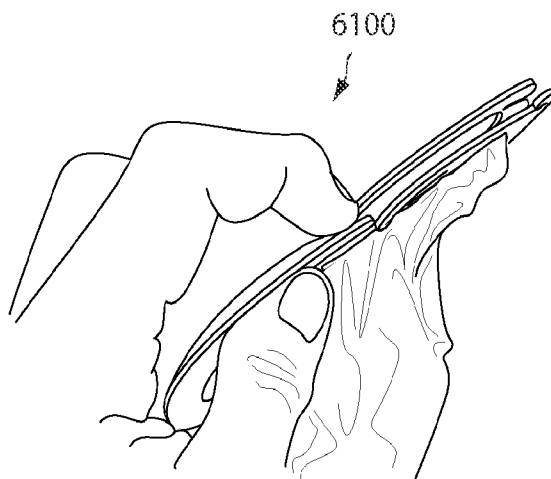


Fig. 61B

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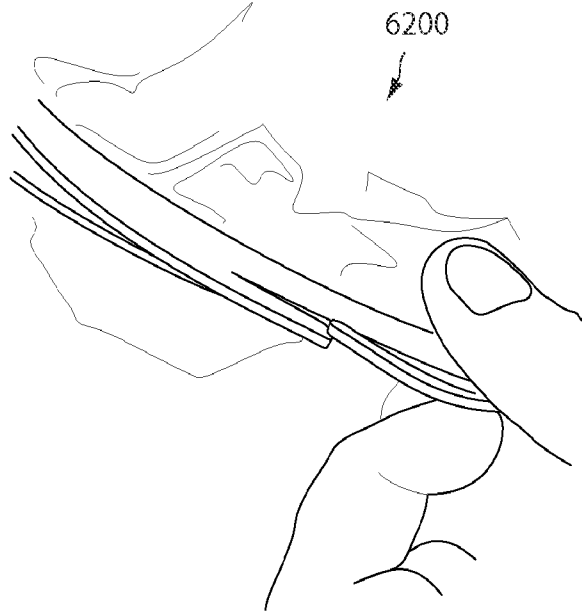


Fig. 62A

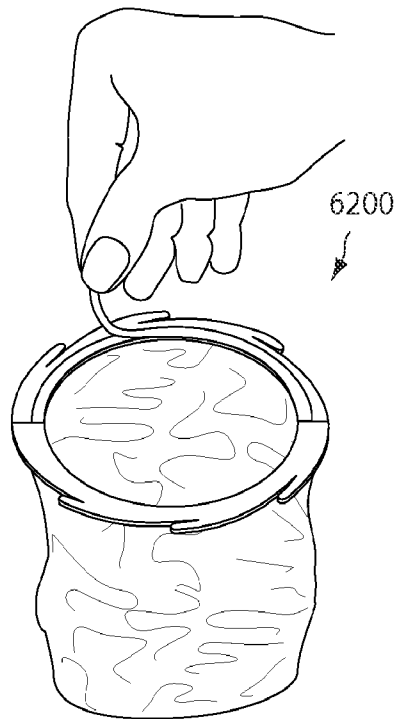


Fig. 62B

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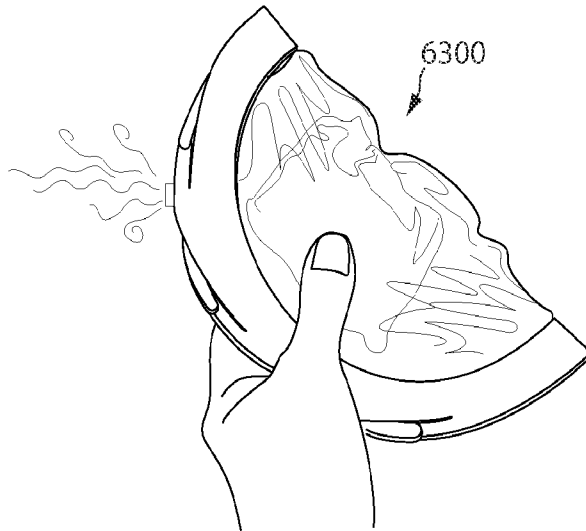


Fig. 63A

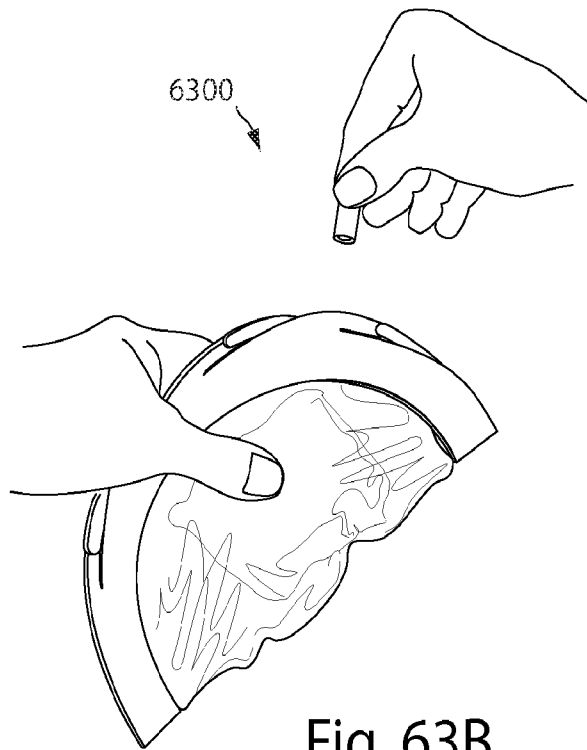


Fig. 63B

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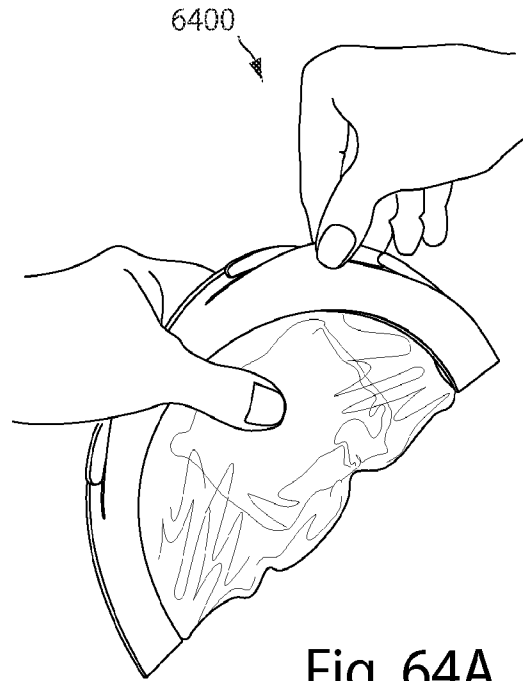


Fig. 64A

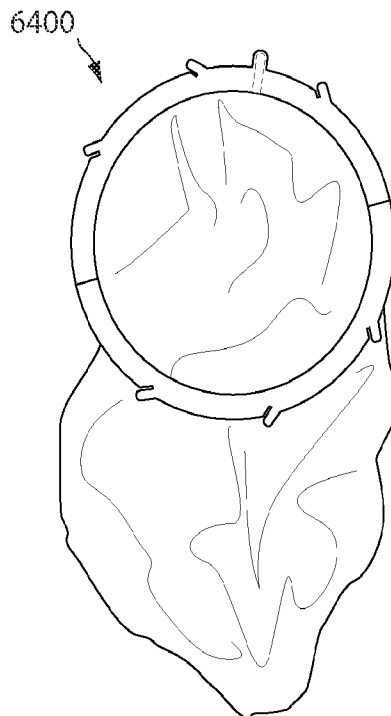


Fig. 64B

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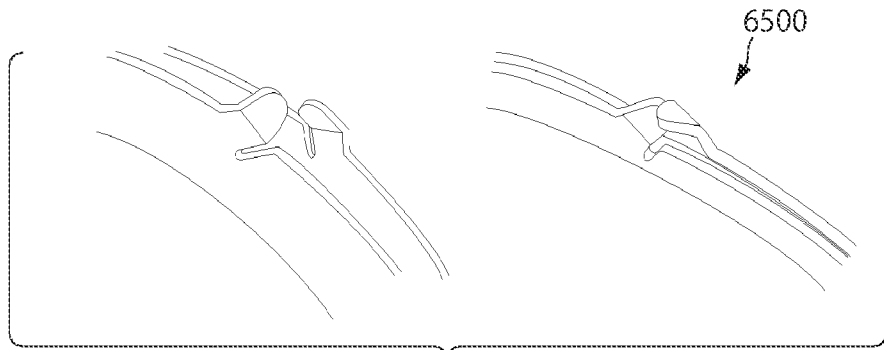


Fig. 65A

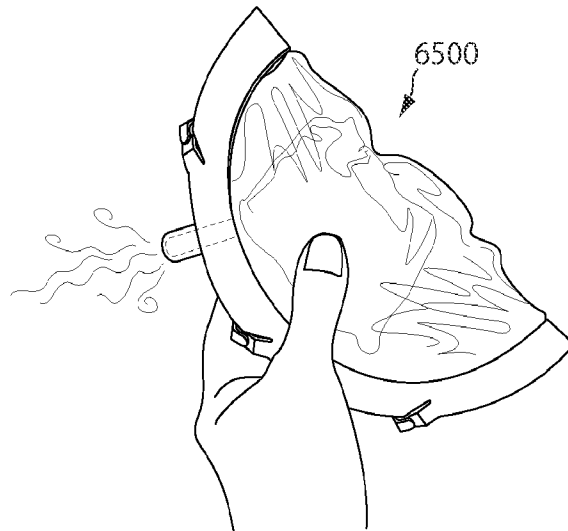


Fig. 65B

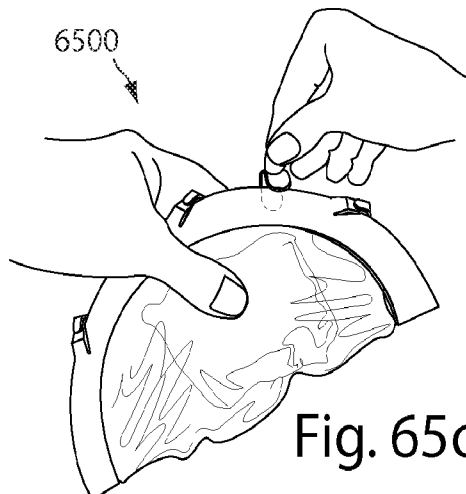


Fig. 65c

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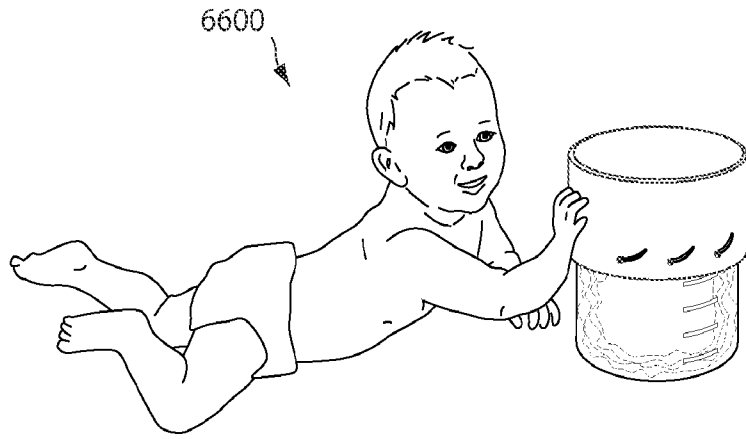


Fig. 66A

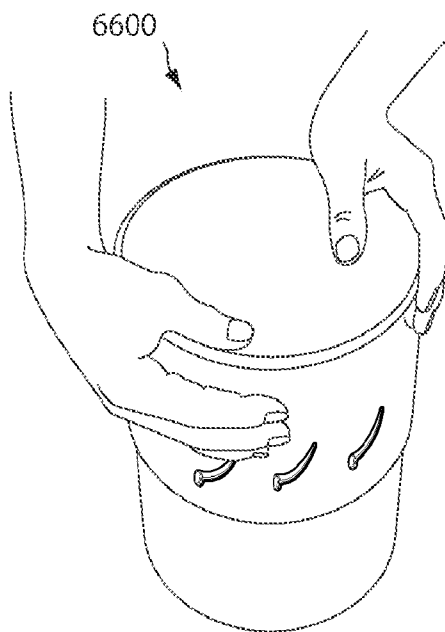


Fig. 66B

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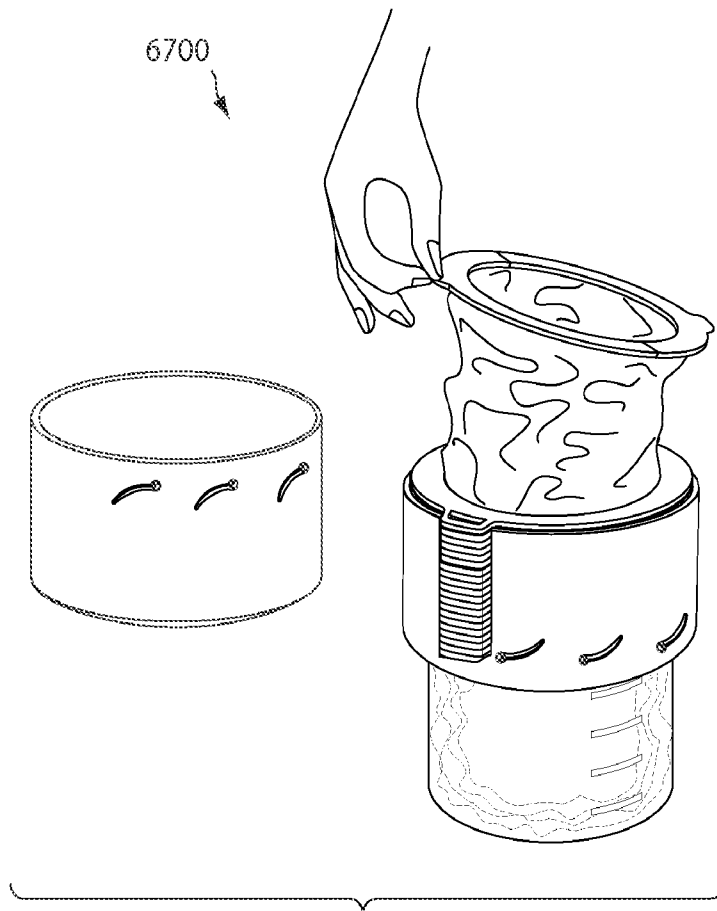


Fig. 67

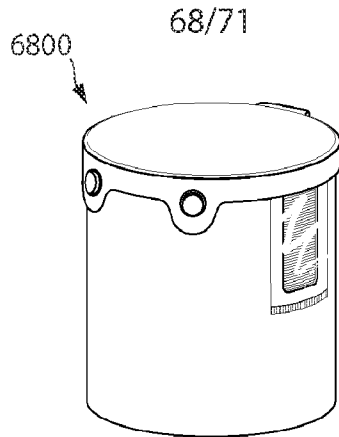


Fig. 68A

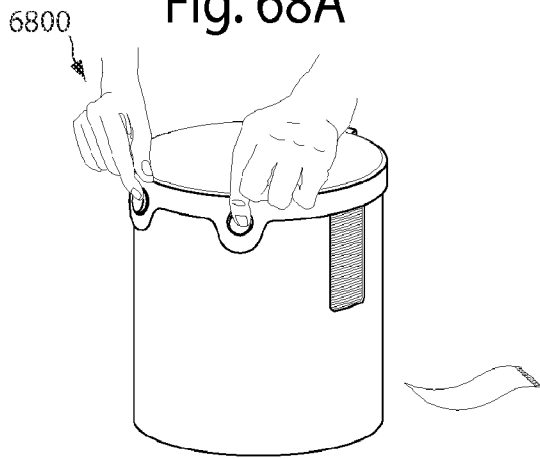


Fig. 68B

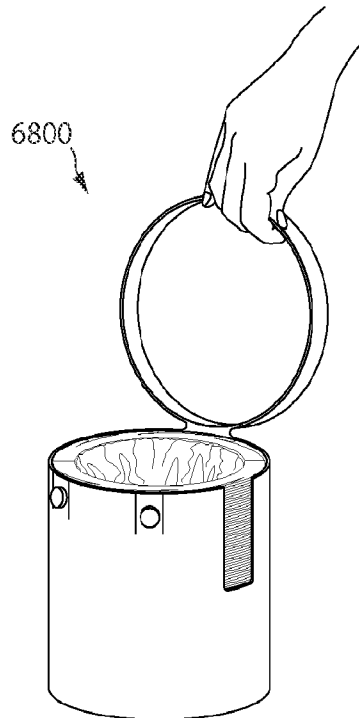


Fig. 68C

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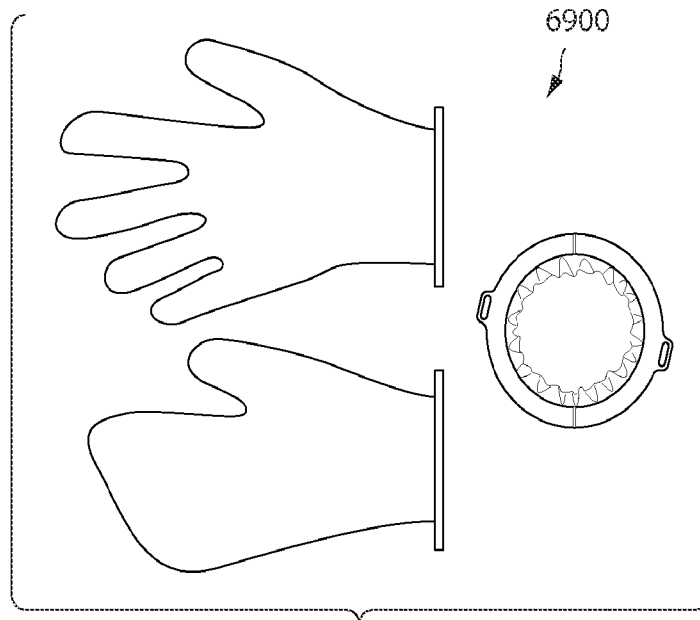


Fig. 69A

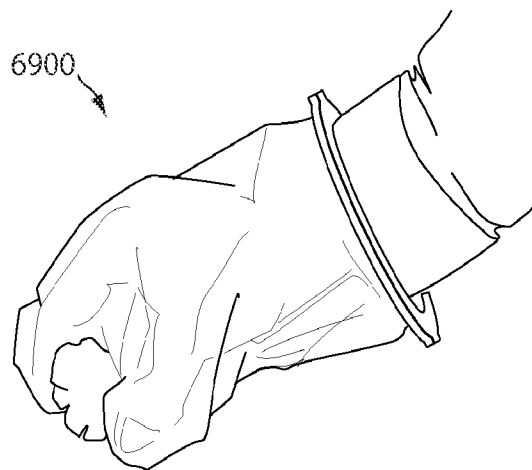


Fig. 69B

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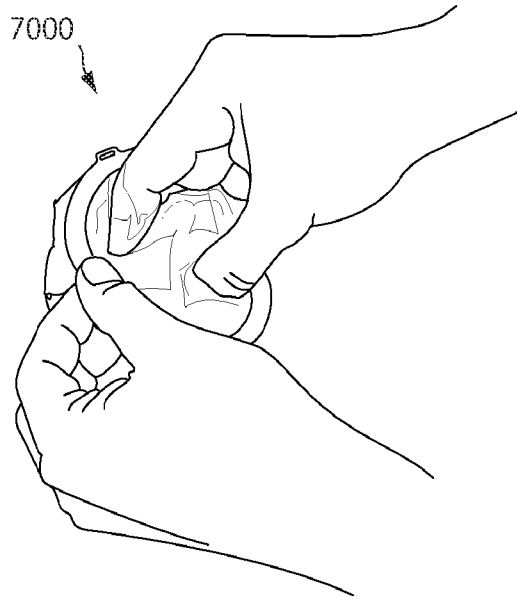


Fig. 70A

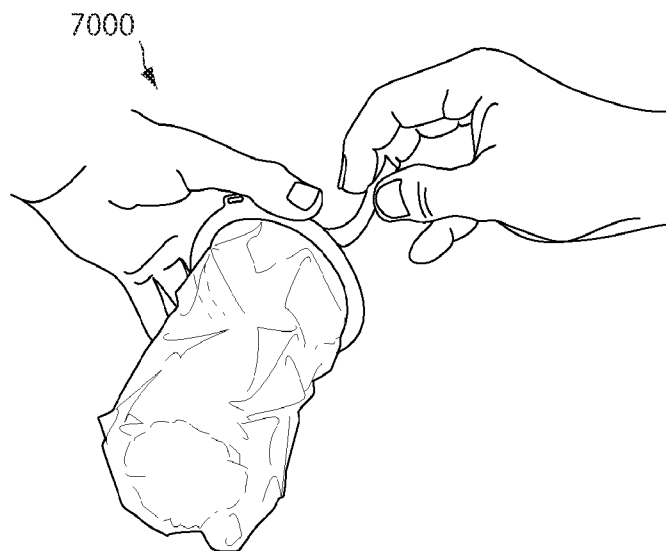


Fig. 70B

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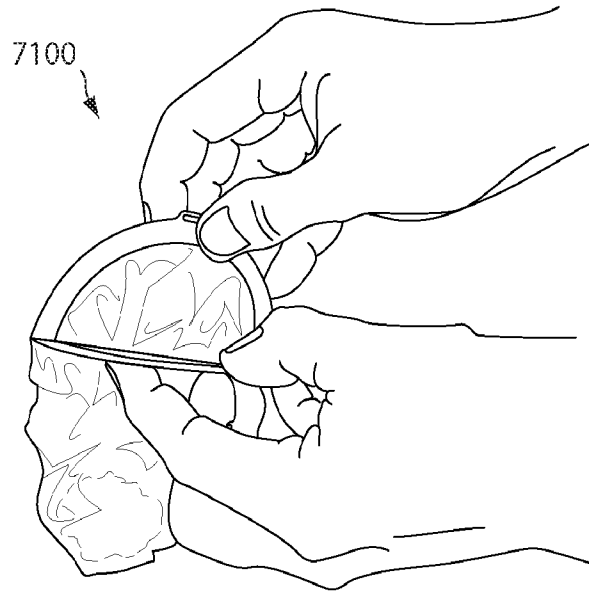


Fig. 71A

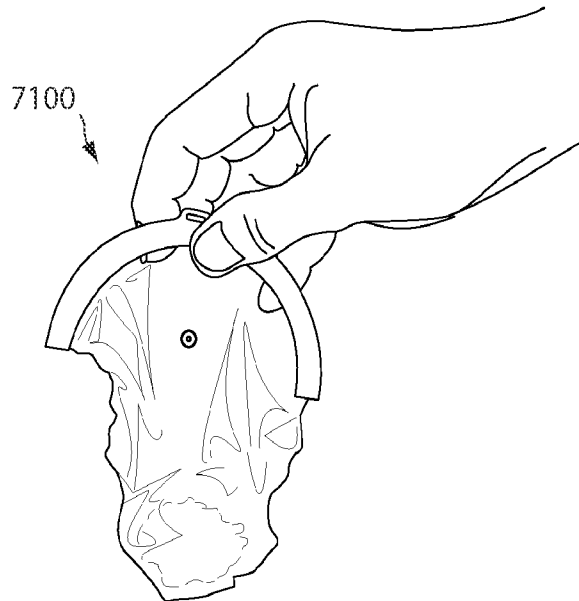


Fig. 71B