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(54) PERMANENTLY SEALABLE ODOR CONTAINMENT SYSTEM

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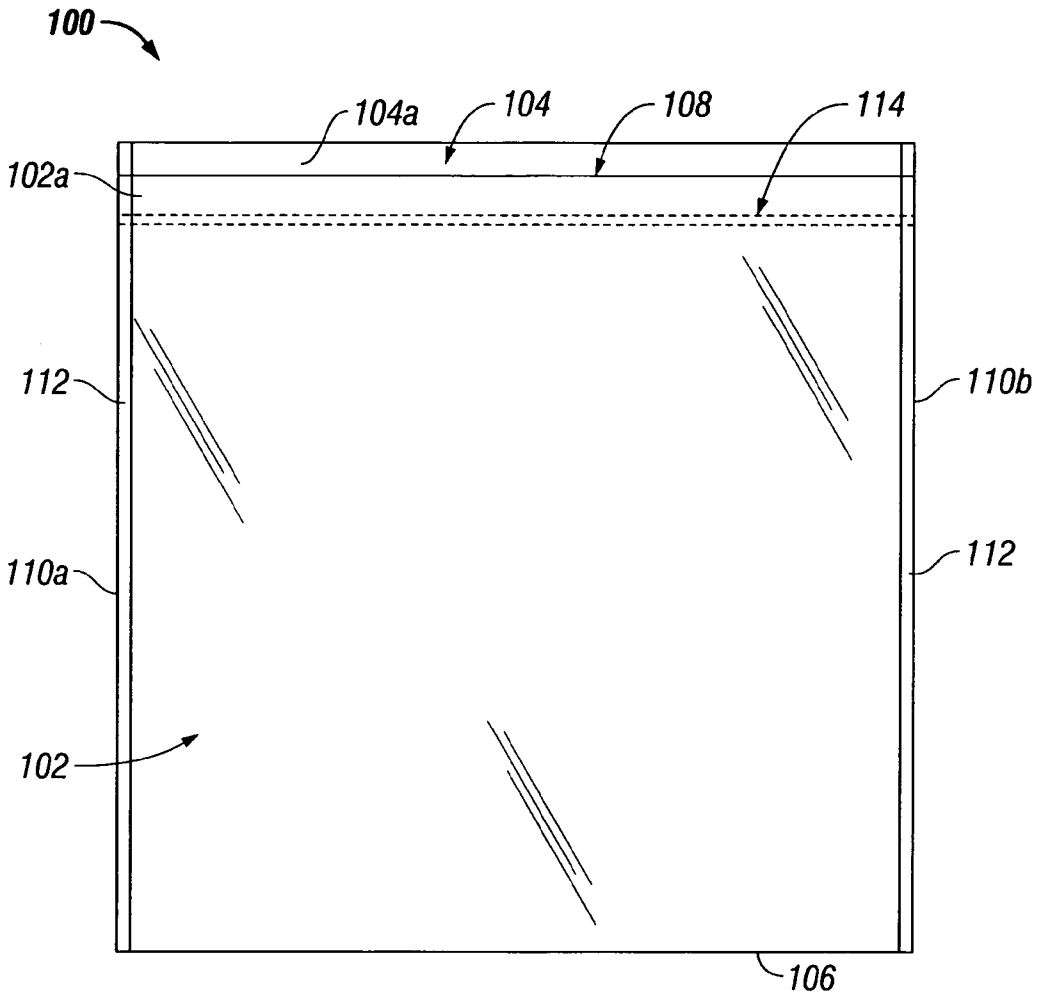
(57) **ABSTRACT**

A containment system for selectively receiving and containing an odor emanating object therein such that an odor of said odor emanating object is not sensed at a location outside of the containment system when said odor emanating object is placed within the containment system is provided. The containment system includes a bag having a front wall and a rear wall. The bag has a monolithically formed bottom edge, sealed left and right side edges, and a selectively openable top edge. The bag defines a compartment therein. The containment system further includes a closure device extending between the side edges along an inner surface of at least one of said front and rear walls for selectively opening and closing the compartment. Each of said front and rear walls is fabricated from a multilayered material including an outer layer, an intermediate layer, and an inner layer.



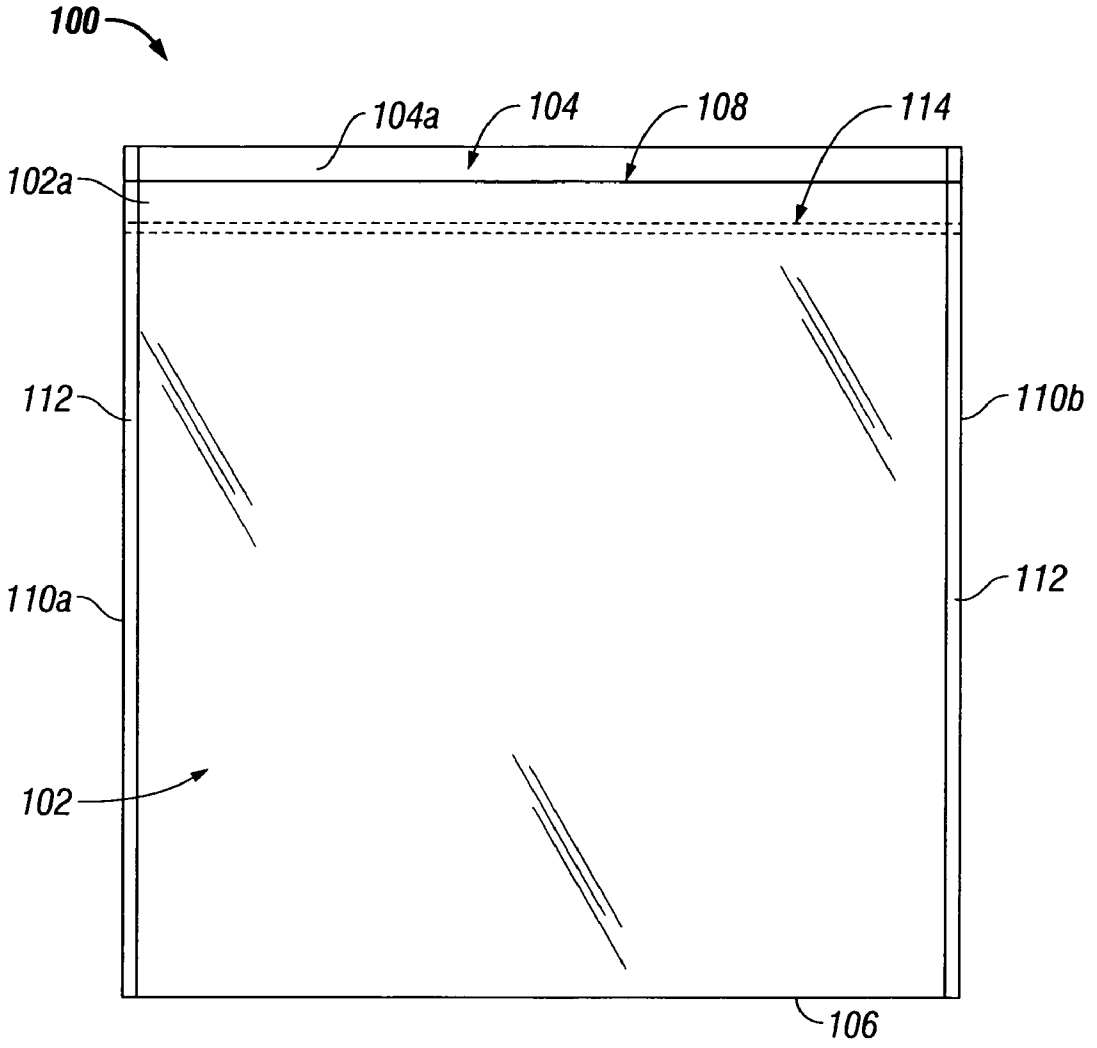


FIG. 1

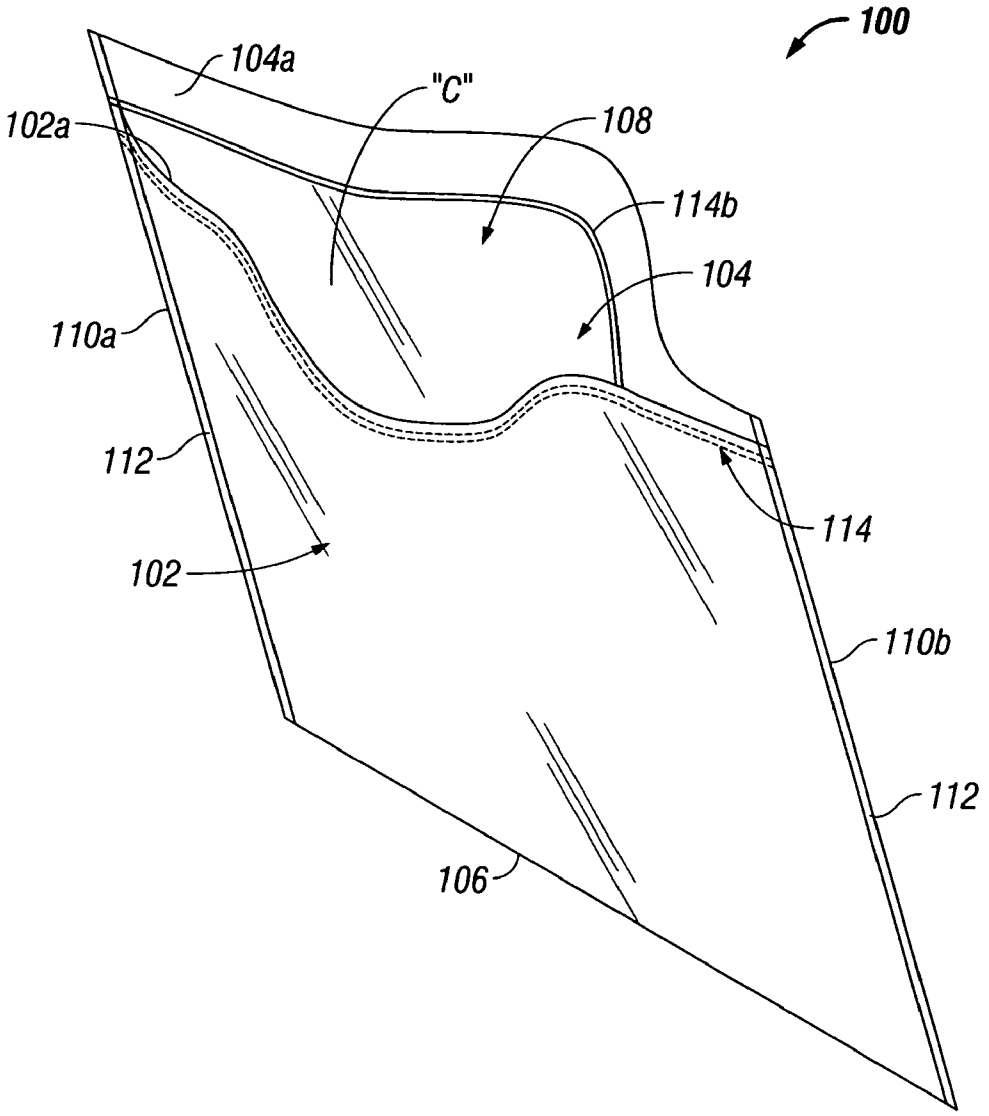


FIG. 2

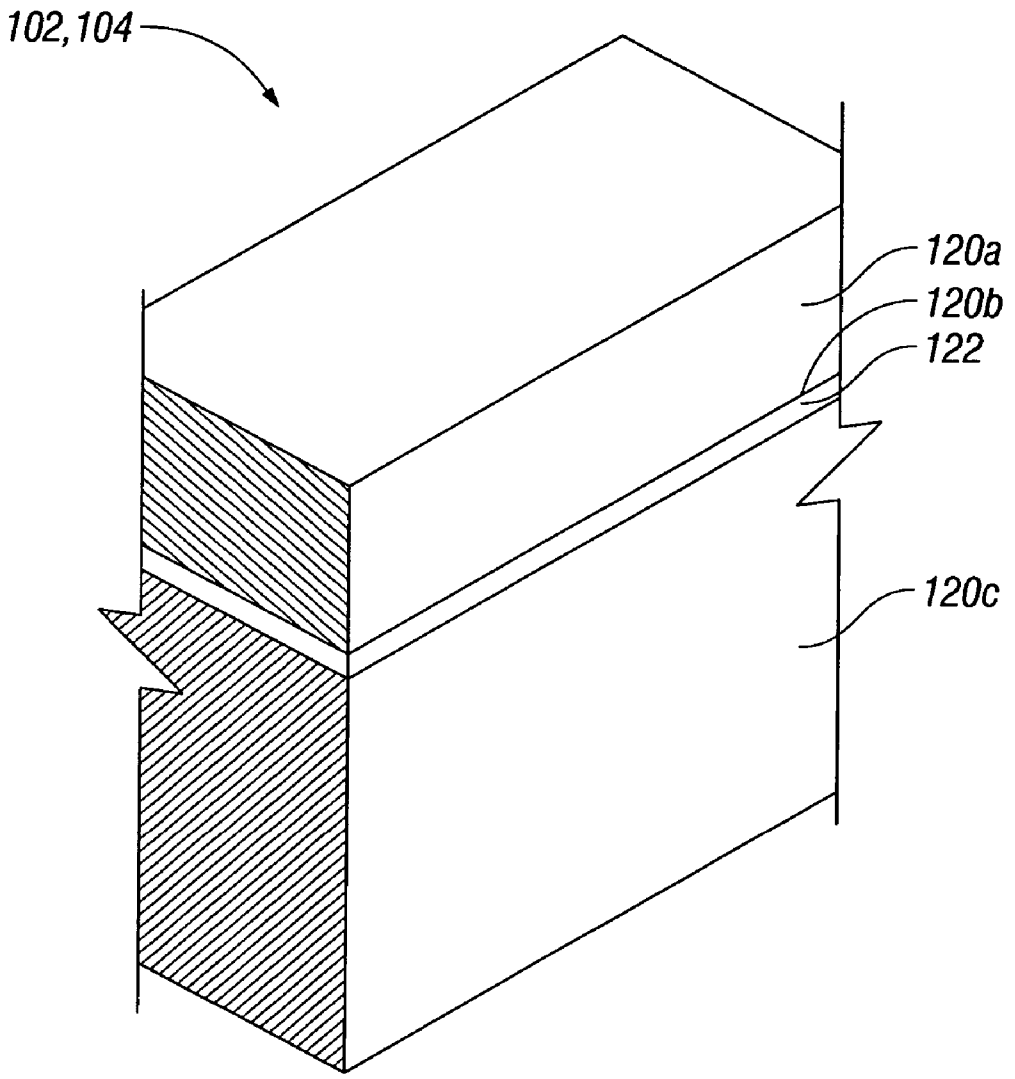


FIG. 3

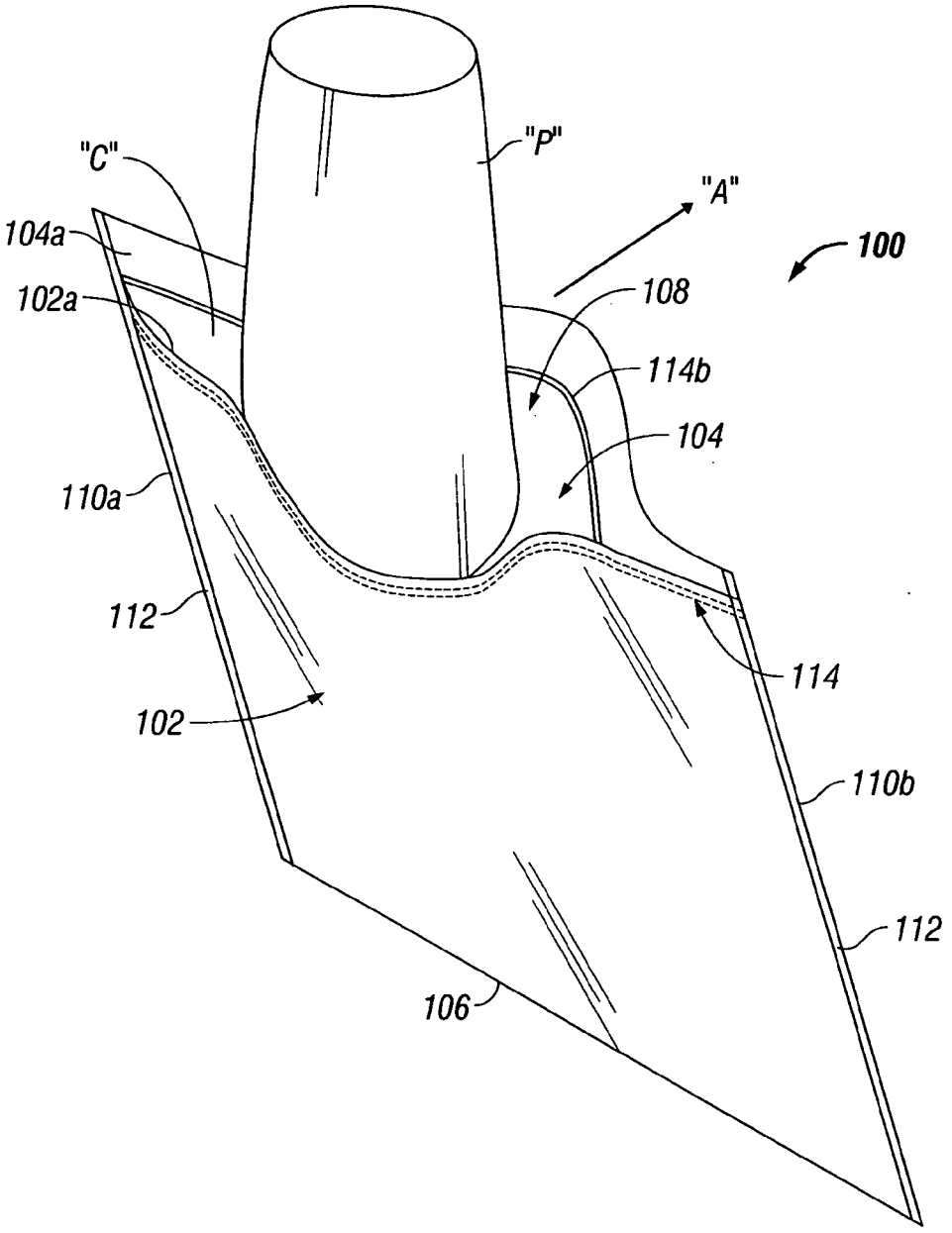


FIG. 4

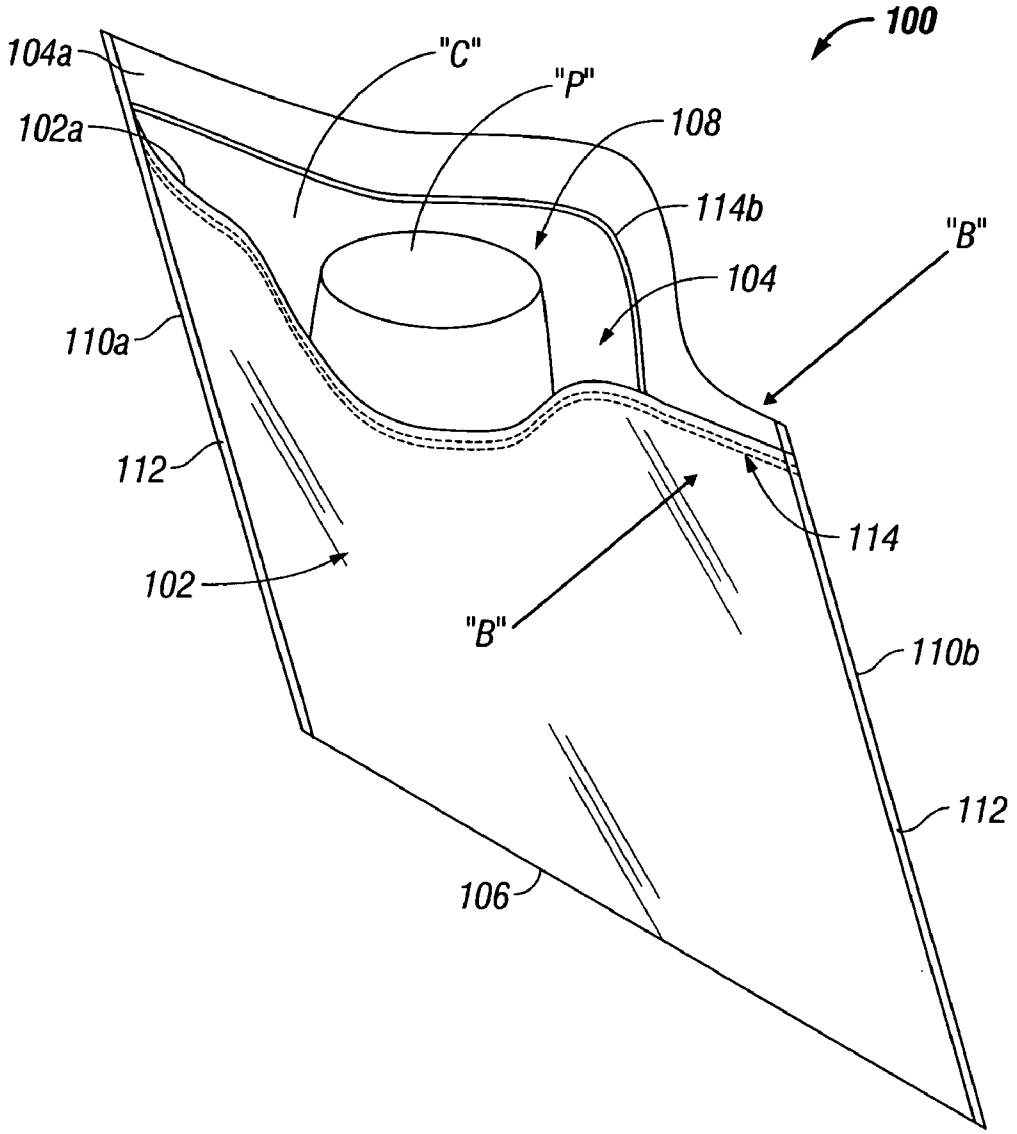


FIG. 5

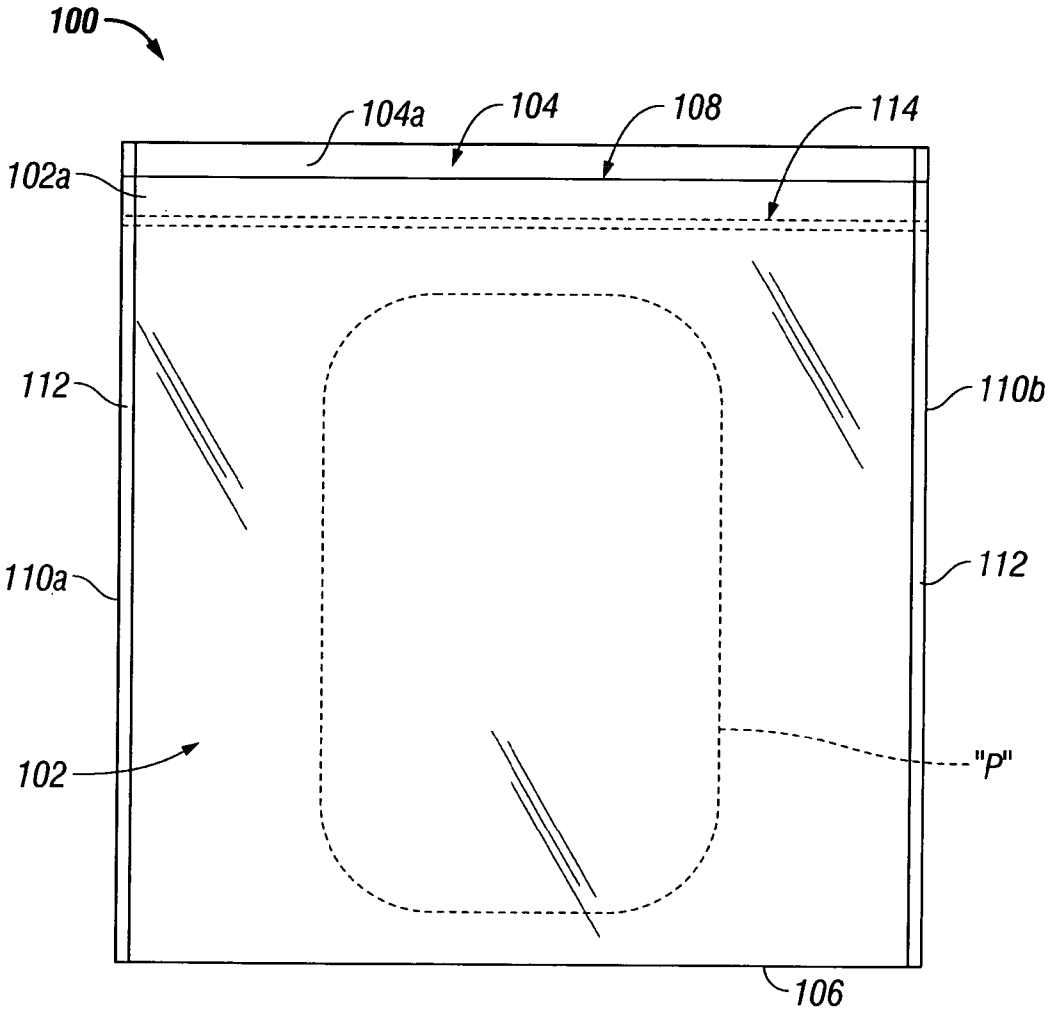


FIG. 6

PERMANENTLY SEALABLE ODOR CONTAINMENT SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application claims the benefit of and priority to U.S. Provisional Application No. 60/626,804, filed Nov. 10, 2004, the entire content of which is incorporated herein by reference.

BACKGROUND

[0002] 1. Technical Field

[0003] The present disclosure relates to articles, systems and methods for preventing odors from contaminating the air, and more particularly, to selectively and/or permanently sealable containment articles, systems and methods for the containment of odors and for the prevention of the propagation of the odors therefrom.

[0004] 2. Background of Related Art

[0005] Various containment systems are known and used to store, ship and/or dispose of food products, non-food products, medical supplies, waste material, and the like. Resealable containment systems are convenient in that they can be closed and released after the initial opening to preserve the enclosed contents.

[0006] Resealable containment systems typically utilize a closure mechanism that is positioned along the mouth thereof. The closure mechanism often includes profile elements or closure profiles that engage one another when pressed together.

[0007] Some types of resealable packages are opened and closed using a slider-type device. While the use of a slider in convenient in terms of opening and closing the containment system, the presence of a separator of plow, between the profile elements, may inhibit full engagement of the closure profiles, leading to the possibility of product or odor escaping from the containment system. This is a significant concern when the product is a liquid or an odor which can escape through even the smallest opening in the containment system.

[0008] Gas permeability is an important factor in containment systems used to store, ship and/or dispose of malodorous or foul smelling food products (e.g., spoiled food), non-food products, medical supplies, waste material (e.g., used or soiled baby diapers, pet droppings, etc.), and the like.

[0009] In addition to leakage of gases and odor through the resealable closure, gases and odor may seep through the film of a bag of the containment system. When considered in connection with malodorous or foul smelling products, the less the degree of seepage of gases or odor, the better. In other words, the less permeable the film of the bag of the containment system the less the amount of gases and odor therethrough.

[0010] It is therefore desirable to provide a containment system that can be fully sealed and that can prevent or reduce the escape or seepage of liquid, gases and/or odor therefrom.

SUMMARY

[0011] The present disclosure relates sealable containment articles, systems and methods for the containment of odor emanating objects and for the prevention of the propagation of the odors therefrom.

[0012] According to an aspect of the present disclosure, a containment system for selectively receiving and containing an odor emanating object therein such that an odor of said odor emanating object is not sensed at a location outside of the containment system when said odor emanating object is placed within the containment system is provided. The containment system includes a bag having a front wall and a rear wall. The bag has a monolithically formed bottom edge, sealed left and right side edges, and a selectively openable top edge. The bag defines a compartment therein. The containment system further includes a closure device extending between the side edges along an inner surface of at least one of said front and rear walls for selectively opening and closing the compartment. Each of said front and rear walls is fabricated from a multilayered material including an outer layer, an intermediate layer, and an inner layer.

[0013] The outer layer may be a polyester film having a thickness of about 48 ga. The inner layer may be a linear low density polyethylene film having a thickness of about 2.0 mils. The intermediate layer may be a metallized film.

[0014] The metallized film may be selected from the group consisting of a laminate of two metallized polyethylene terephthalate films and a polyethylene-based sealant; an aluminum metallized oriented polypropylene film including a sealable layer; a coextruded polyethylene terephthalate (PET)/polyethylene naphthalate (PEN) substrate metallized by vacuum deposition with an aluminum metal layer; a 0.50 mil aluminum metallized biaxially oriented polypropylene; an aluminum metallized polyethylene terephthalate; and an aluminum metallized biaxially oriented polypropylene.

[0015] Each of the front and rear walls may have a water vapor permeability of about 0.09 gm/100 $in.^2$. Each of the front and rear walls has an oxygen (O_2) gas permeability of about 0.10 cc/100 in^2.

[0016] The containment system may further include an adhesive layer interposed between the intermediate layer and the inner layer. The adhesive layer may be fabricated from an adhesive selected from the group consisting of a solvent-based laminating adhesive; and a solvent-based adhesive consisting of 46.7% Adcote 532A, a polyester urethane, 9.4% Adcote 532B, a catalyst, and 43.9% ethyl acetate. The adhesive layer may have a thickness of about 0.1 mils.

[0017] According to another aspect of the present disclosure, a containment system is provided which includes a bag having a front wall and a rear wall defining a compartment therebetween, wherein the bag has a selectively openable end for providing access to the compartment and for closing off the compartment. Each of the front and rear walls is fabricated from a multilayered material including an outer layer, an intermediate layer, and an inner layer. Accordingly, when an odor emanating object is placed within the compartment and the open end of the bag is closed, an odor of the odor emanating object is not sensed at a location exterior of the containment system.

[0018] The containment system further includes a closure device extending completely across the selectively openable end of the bag.

[0019] The outer layer may be a polyester film, the inner layer may be a linear low density polyethylene film, and the intermediate layer may be a metallized film.

[0020] It is envisioned that each of the front and rear walls has at least one of a water vapor permeability of about 0.09 gm/100 $in.^2$ and an oxygen (O_2) gas permeability of about 0.10 cc/100 in^2.

[0021] The metallized film may be selected from the group consisting of a laminate of two metallized polyethylene terephthalate films and a polyethylene-based sealant; an aluminum metallized oriented polypropylene film including a sealable layer; a coextruded polyethylene terephthalate (PET)/polyethylene naphthalate (PEN) substrate metallized by vacuum deposition with an aluminum metal layer; a 0.50 mil aluminum metallized biaxially oriented polypropylene; an aluminum metallized polyethylene terephthalate; and an aluminum metallized biaxially oriented polypropylene.

[0022] The closure device may include a first element disposed on an inner surface of the front wall and a second element, complementary of the first element, disposed on an inner surface of the rear wall. The first element of the closure device may have a male transverse cross-sectional profile, and the second element of the closure device may have a female cross-sectional profile.

BREIF DESCRIPTION OF THE DRAWINGS

[0023] The various features and benefits of the present disclosure are apparent in light of the following detailed description and the accompanying drawings, in which:

[0024] **FIG. 1** is a front elevational view of an embodiment of containment system according to the present disclosure;

[0025] **FIG. 2** is a perspective view of the containment system of **FIG. 1** shown in an open condition;

[0026] **FIG. 3** is an enlarged broken-away cross-sectional view of a wall of the containment system of **FIGS. 1 and 2**;

[0027] **FIG. 4** is a perspective view of the containment system of **FIGS. 1-3**, illustrating a stage in the use thereof;

[0028] **FIG. 5** is a perspective view of the containment system of **FIGS. 1-4**, illustrating another stage in the use thereof; and

[0029] **FIG. 6** is a perspective view of the containment system of **FIGS. 1-5**, illustrating yet another stage in the use thereof.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0030] Containment systems come in a variety of shapes, sizes and configurations, and serve a variety of different purposes. In accordance with the present disclosure, one type of containment system is shown in **FIGS. 1-3** and is generally designated **100**. As used herein, and as is generally understood in the art, the terms "male" and "female" elements refer to closure elements wherein the closure element that interlocks or enters into the other closure element is referred to as the "male", and the other closure element, which receives the closure element, is referred to as the "female".

[0031] As seen in **FIGS. 1 and 2**, containment system **100** is in the form of a plastic bag including a front wall and a rear wall **102**, **104**, respectively, having an integral or monolithically formed bottom edge **106** and an open top **108**. Front and rear walls **102**, **104** are joined to one another along left and right side edges **110***a*, **110***b*, respectively, to define sealed edges **112** and to define a compartment "C" (see **FIG. 2**).

[0032] Containment system **100** further includes a closure device **114**, extending between side edges **110**, along the inner surface of front and rear walls **102**, **104**, to selectively open and close compartment "C". Desirably, front wall **102** and rear wall **104** extend beyond closure device **114** to define a front flap **102***a* and a rear flap **104***a*. Flaps **102***a*, **104***a* enable a user to grip containment system **100** in a manner to more conveniently be able to selectively open closure device **114** and, in turn, open compartment "C" of containment device **100**.

[0033] As seen in **FIG. 2** and as is conventional, closure device **114** includes a first element **114***a* disposed on the inner surface of one of front and rear walls **102**, **104**, and a complementary second element **114***b* disposed on the inner surface of the other of front and rear walls **102**, **104**. It is envisioned that first element **114***a* of closure device **114** may have a male transverse cross-sectional profile, and second element **114***b* of closure device **114** may have a complementary female transverse cross-sectional profile.

[0034] According to the present disclosure, closure device **114** may be integrally formed with front and rear walls **102**, **104** of containment system **100**, or connected to containment system **100** by the use of any of a number of methods. For example, a thermoelectric device may be applied to a film in contact with a flange portion (not shown) of a closure element or the thermoelectric device may be applied to a film in contact with a base portion (not shown) of a closure element having no flange portion, to cause a transfer of heat through the film to produce melting at the interface of the film and a flange portion of base portion of closure element **114**. The thermoelectric device can be heated rotary discs, traveling heater bands, resistance-heated slide wires, or the like.

[0035] The connection between the film and closure element **114** can also be established by the use of hot melt adhesives, hot jets of air to the interface, ultrasonic heating, or other known methods. The bonding of closure element **114** to the film stock may be carried out either before or after the film is U-folded to form a bag. In any event, such bonding is done prior to the formation of sealed edges **112** of containment system **100**.

[0036] Examples of suitable closure devices **114** are disclosed in U.S. Pat. No. 5,774,955 to Borchart et al. and U.S. Pat. No. 5,839,831 to Mazocchi, the entire contents of each of which being incorporated herein by reference.

[0037] Preferably, sealed edges **112** are formed in such a manner to create a fluid (e.g., liquid or gas) tight seal between front and rear walls **102**, **104**. It is envisioned that seals **112** may be formed by adhering, welding and/or fusing

front wall **102** and rear wall **104** to one another. Desirably, sealed edges **112** are at least about 0.25 inches wide.

[**0038**] While it is desirable for bottom edge **106** to be integral with front wall **102** and rear wall **104** (i.e., containment system **100** is fabricated by folding front wall **102** over rear wall **104**, or vise-a-versa), it is possible for front wall **102** to be a separate element from rear wall **104** and for the bottom edges thereof to be joined to one another to define a sealed bottom edge.

[**0039**] With reference now to **FIG. 3**, front wall **102** and rear wall **104** of containment system **100** is preferably fabricated from a heat sealable material. Preferably, each wall **102**, **104** of containment system **100** is fabricated from a multi-layered material, including a first or outer layer **120***a*, a second or intermediate layer **120***b*, and a third or inner layer **120***c*. Desirably, outer layer **120***a* is a polyester film (i.e., PET) having a thickness of about 48 ga, and inner layer **120***c* is a linear low density polyethylene film (i.e., LLDPE) having a thickness of about 2.0 mils. Inter-mediate layer **120***b* is desirably a metallized film or surface laminated between outer layer **120***a* and inner layer **120***c*.

[**0040**] Examples of metallized films suitable for use in the present disclosure include the HB Laminate supplied by Rexam Metallising in Thetford, UK, a laminate of two metallized polyethylene terephthalate films and a polyethylene-based sealant; Oppalyte 35MU842, an aluminum metallized oriented polypropylene film including a sealable layer, supplied by Mobil Chemical Co., Macedon, N.Y. Other suitable metallized films for use in the present disclosure include a coextruded polyethylene terephthalate (PET)/polyethylene naphthalate (PEN) substrate metallized by vacuum deposition with an aluminum metal layer. The substrate is sold by Mitsubishi, Wiesbaden, Germany (formerly Hoechst Diafoil) under the tradename RHB12 and is metallized by Rexam Metallising and sold under the tradename Campak 3800. Other metallized films which may be employed in accordance with the present disclosure include a 0.50 mil aluminum metallized biaxially oriented polypropylene sold under the trade designation MLB by Applied Extrusion Technologies of New Castle, Del.; an aluminum metallized polyethylene terephthalate sold under the tradename Melinex D841 by DuPont; and an aluminum metallized biaxially oriented polypropylene sold by Toray.

[**0041**] The multi-layered front and rear walls **102**, **104** of containment system **100** exhibits a water vapor permeability of about 0.09 gm/100 in.^{2}, and an oxygen (O_2) gas permeability of about 0.10 cc/100 in.^{2}.

[**0042**] Desirably, as seen in **FIG. 3**, a layer of adhesive **122** may be disposed between inter-mediate layer **120***b* and inner layer **120***c* to facilitate adhesion of outer layer **120***a* and inter-mediate layer **120***b* to inner layer **120***c*. It is contemplated that a solvent-based laminating adhesive may be used to perform the adhesion, however, other known adhesives, known by those having skill in the art, may be used as well. An example of a solvent-based adhesive which may be used is obtainable from Rohm & Haas, Woodstock, Ill., and consists of 46.7% Adcote 532A, a polyester urethane, 9.4% Adcote 532B, a catalyst, and 43.9% ethyl acetate. Desirably, adhesive layer **122** has a thickness of about 0.00010 inches or 0.1 mil.

[**0043**] With reference to **FIGS. 4-6**, a desired method of use of containment system **100**, to store, ship and/or dispose of products, is shown and described. As seen in **FIG. 4**, compartment "C" of containment system **100** is opened by grabbing front and rear flaps **102***a*, **104***a* and separating them from one another by pulling them in opposite directions, as indicated by arrows "A". Front and rear flaps **102***a*, **104***a* are separated by an amount sufficient to separate first and second elements **114***a*, **114***b* of closure device **114** from one another.

[**0044**] With containment system **100** open, a product "P" may be placed into compartment "C" through open top **108**. Product "P" include and are not limited to food products, non-food products, medical products, waste products, and the like. Preferably, as is intended according to the present disclosure, product "P" is a malodorous or foul smelling product, including and not limited to food products (e.g., spoiled food), waste products (e.g., used or soiled baby diapers, pet droppings, etc.), and the like.

[**0045**] As seen in **FIG. 5**, with product "P" placed within compartment "C" of containment system **100**, first and second elements **114***a*, **114***b* of closure device **114** are approximated toward one another, as indicated by arrows "B". First and second elements **114***a*, **114***b* of closure device **114** are then squeezed and/or pinched together, along the entire length thereof, until closure device **114** is completely closed. Preferably, first and second elements **114***a*, **114***b* of closure device are squeezed together beginning from left or right side edge **110***a*, **110***b* of containment system **100** and advanced through to the other of the left or right side edge **110***a*, **110***b* of containment system **100**. Closure of closure device **114**, in turn, closes compartment "C" and prevents the escape of or leakage of product "P" therefrom.

[**0046**] As seen in **FIG. 6**, with product "P" fully contained within compartment "C" of containment system **100**, due to the impermeability of front and rear walls **102**, **104**, and the air tight seal provided by sealed edges **112** and closure device **114**, the leakage and/or seepage of liquid or gases (in the form of odors and the like) from containment system **100** is reduced and/or eliminated.

[**0047**] Although the present disclosure has been described in connection with preferred embodiments, it is to be understood that modifications and variations may be utilized without departing from the principles and scope of the present disclosure, as those skilled in the art will readily understand.

What is claimed is:

1. A containment system for selectively receiving and containing an odor emanating object therein such that an odor of said odor emanating object is not sensed at a location outside of the containment system when said odor emanating object is placed within the containment system, wherein the containment system comprises:

a bag having a front wall and a rear wall, the bag having a monolithically formed bottom edge, sealed left and right side edges, and a selectively openable top edge, said bag defining a compartment therein; and

a closure device extending between said side edges along an inner surface of at least one of said front and rear walls for selectively opening and closing said compartment;

wherein each of said front and rear walls is fabricated from a multilayered material including an outer layer, an intermediate layer, and an inner layer.

2. The containment system according to claim 1, wherein the outer layer is a polyester film.

3. The containment system according to claim 2, wherein the outer layer has a thickness of about 48 ga.

4. The containment system according to claim 2, wherein the inner layer is a linear low density polyethylene film.

5. The containment system according to claim 4, wherein the inner layer has a thickness of about 2.0 mils.

6. The containment system according to claim 4, wherein the intermediate layer is a metallized film.

7. The containment system according to claim 6, wherein the metallized film is selected from the group consisting of a laminate of two metallized polyethylene terephthalate films and a polyethylene-based sealant; an aluminum metallized oriented polypropylene film including a sealable layer; a coextruded polyethylene terephthalate (PET)/polyethylene naphthalate (PEN) substrate metallized by vacuum deposition with an aluminum metal layer; a 0.50 mil aluminum metallized biaxially oriented polypropylene; an aluminum metallized polyethylene terephthalate; and an aluminum metallized biaxially oriented polypropylene.

8. The containment system according to claim 1, wherein each of the front and rear walls has a water vapor permeability of about 0.09 gm/100 $in.^2$.

9. The containment system according to claim 8, wherein each of the front and rear walls has an oxygen (O_2) gas permeability of about 0.10 cc/100 $in.^2$.

10. The containment system according to claim 1, further comprising an adhesive layer interposed between said intermediate layer and said inner layer.

11. The containment system according to claim 10, wherein the adhesive layer is fabricated from an adhesive selected from the group consisting of a solvent-based laminating adhesive; and a solvent-based adhesive consisting of 46.7% Adcote 532A, a polyester urethane, 9.4% Adcote 532B, a catalyst, and 43.9% ethyl acetate.

12. The containment system according to claim 10, wherein the adhesive layer has a thickness of about 0.1 mils.

13. A containment system, comprising:

a bag having a front wall and a rear wall defining a compartment therebetween, wherein the bag has a selectively openable end for providing access to the compartment and for closing off the compartment;

wherein each of the front and rear walls is fabricated from a multilayered material including an outer layer, an intermediate layer, and an inner layer,

wherein when an odor emanating object is placed within the compartment and the open end of the bag is closed, an odor of the odor emanating object is not sensed at a location exterior of the containment system.

14. The containment system according to claim 13, further comprising a closure device extending completely across the selectively openable end of the bag.

15. The containment system according to claim 13, wherein the outer layer is a polyester film, the inner layer is a linear low density polyethylene film, and the intermediate layer is a metallized film.

16. The containment system according to claim 13, wherein each of the front and rear walls has at least one of a water vapor permeability of about 0.09 gm/100 $in.^2$ and an oxygen (O_2) gas permeability of about 0.10 cc/100 $in.^2$.

17. The containment system according to claim 16, wherein the metallized film is selected from the group consisting of a laminate of two metallized polyethylene terephthalate films and a polyethylene-based sealant; an aluminum metallized oriented polypropylene film including a sealable layer; a coextruded polyethylene terephthalate (PET)/polyethylene naphthalate (PEN) substrate metallized by vacuum deposition with an aluminum metal layer; a 0.50 mil aluminum metallized biaxially oriented polypropylene; an aluminum metallized polyethylene terephthalate; and an aluminum metallized biaxially oriented polypropylene.

18. The containment system according to claim 17, wherein the closure device includes a first element disposed on an inner surface of the front wall and a second element, complementary of the first element, disposed on an inner surface of the rear wall.

19. The containment system according to claim 18, wherein the first element of the closure device has a male transverse cross-sectional profile, and the second element of the closure device has a female cross-sectional profile.

* * * * *