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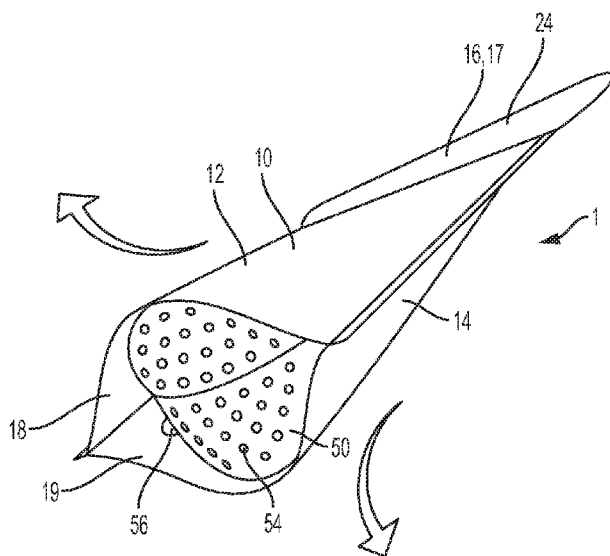


FIG. 2

(57) Abstract: Embodiments of a flexible pouch (1) comprise a pouch body (10), a collapsible perforated folded panel (50), an opening seal (60) disposed between the collapsible perforated folded panel (50) and the second ends (18, 19) of a front wall (12) and a rear wall (14), wherein the opening seal (60) adheres the second end (18) of the front wall (12) to the second end (19) of the rear wall (14) which thereby conceals the collapsible perforated folded panel (50). The release or removal of the opening seal (60) is operable to expose the collapsible perforated folded panel (50) and application of a pull force is operable to outwardly expand the collapsible perforated folded panel (50) to allow draining of liquid or dispensing of dry powder or flakes from the pouch chamber (52).



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FLEXIBLE PACKAGING WITH A STRAINING FEATURE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to European Patent Application No. 15382652.4 filed December 21, 2015, which is incorporated by reference herein in its entirety.

TECHNICAL FIELD

[0002] Embodiments of the present disclosure generally relate to flexible product packaging. More specifically, embodiments of the present disclosure relate to flexible packages comprising a straining feature for products stored and transported in a preserving liquid or for dispensing a dry powdered or flaked product.

BACKGROUND

[0003] A variety of foodstuffs and other consumer goods are packaged for storage or transport in a fluid. For example, fresh mozzarella cheese and pickles are commonly packaged in a liquid to maintain their quality and characteristics between manufacture and consumption by the consumer. Additionally, ball bearings or other machined parts may be packaged and transported in a preserving fluid, such as oil or alcohol, to prevent oxidation or other detrimental changes before use and/or installation. A vast array of other fields utilize products which are similarly stored, transported, or packaged in a fluid which needs to be drained before utilization of the product.

[0004] The difficulty for the consumer with packaging where a solid product is contained in a liquid is that it can be difficult for the consumer to access the product without risking an accidental spill of the liquid, and/or the solid product. Conventional containers for packaging a solid product in a liquid may not attempt to provide a means for separation of the liquid and solid product. For example, a glass jar of pickles with a standard twist off cap necessitates reaching into the pickling solution with a finger or fork to retrieve a pickle. Other solutions which have attempted to solve this problem include utilization of a second removable

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container with draining capabilities nested within a main outer container. However, such dual container arrangements present a more costly and complicated manufacturing process.

[0005] Accordingly, there remains a need for a flexible package that facilitates consumer access to a solid product stored in a liquid while minimizing the risk of an accidental spill of the liquid and/or solid product.

SUMMARY

[0006] Embodiments of the present disclosure are directed to flexible packages with a straining feature to allow drainage of a liquid from a flexible package, such as a stand-up pouch or a pillow pouch, while retaining solids therein. Embodiments of the present disclosure are also directed to flexible packages with a straining feature to allow dry powder or flaked products to be dispensed from a flexible package, such as a stand-up pouch or a pillow pouch.

[0007] In accordance with one embodiment, a pouch is provided. The pouch comprises a pouch body formed from a first flexible film. The pouch body includes a front wall and a rear wall, the front wall and the rear wall each having a first end, a second end, and side edges connecting the first end and the second end. The rear wall is adhered to the front wall at corresponding first ends to form a first end seal and corresponding side edges to form side seals. The pouch also comprises a collapsible perforated folded panel formed from a second flexible film. The collapsible perforated folded panel is attached to the front wall and the rear wall at interior portions of the front wall and rear wall, respectively. The attachment of the collapsible perforated folded panel to the front wall and the rear wall defines a pouch chamber. The pouch includes an opening seal disposed between the collapsible perforated folded panel and the second ends of the front wall and the rear wall. The opening seal adheres the second end of the front wall to the second end of the rear wall which thereby conceals the collapsible perforated folded panel. Release or removal of the opening seal is operable to expose the collapsible perforated folded panel by separating the front wall from the rear wall along the second ends. Application of a pull force to the second end of the front

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wall and to the second end of the rear wall is operable to outwardly expand the collapsible perforated folded panel to allow draining of liquid from the pouch chamber.

[0008] These and additional features provided by the embodiments of the present disclosure will be more fully understood in view of the following detailed description, in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The following detailed description of specific embodiments of the present disclosure can be best understood when read in conjunction with the drawings enclosed herewith.

[0010] FIG. 1 is a schematic view of a pouch according to one or more embodiments of the present disclosure.

[0011] FIG. 2 is a schematic view of a pouch with the opening seal opened according to one or more embodiments of the present disclosure.

[0012] FIG. 3 is a schematic view of a pouch with the collapsible perforated folded panel shown in phantom view according to one or more embodiments of the present disclosure.

[0013] FIG. 4 is a schematic view of a pouch with slits for ease in removal of a portion of the pouch according to one or more embodiments of the present disclosure.

[0014] FIG. 5A is a schematic view of a first flexible film according to one or more embodiments of the present disclosure.

[0015] FIG. 5B is a schematic view of a second flexible film according to one or more embodiments of the present disclosure.

[0016] FIG. 5C is a schematic view of a first flexible film and a second flexible film mated together according to one or more embodiments of the present disclosure.

[0017] The embodiments set forth in the drawings are illustrative in nature and not intended to be limiting to the claims. Moreover, individual features of the drawings will be more fully apparent and understood in view of the detailed description.

DETAILED DESCRIPTION

[0018] Referring to FIGS. 1 and 2, one or more embodiments of a pouch **1** are shown. The depicted pouches **1** are rectangular; however, various additional sizes and shapes are contemplated herein and within the scope of this disclosure. As stated above, the pouch **1** could be a pillow pouch or a stand-up pouch. The pouch **1** includes a pouch body **10** formed from a front wall **12** and a rear wall **14**. The front wall **12** has a first end **16** and a second end **18** and the rear wall **14** has a first end **17** and a second end **19**. Further, side edges **20** connect the first ends **16, 17** and the second end **18, 19**. The rear wall **14** is adhered to the front wall **12** at corresponding first ends **16, 17** to form a first end seal **24**. Additionally, the rear wall **14** is adhered to the front wall **12** at corresponding side edges **20** to form side seals **26**. The pouch body **10** is formed from a first flexible film **30**. In one or more embodiments, the front wall **12** and the rear wall **14** are different compositions.

[0019] With reference to FIGS. 2 and 3, the pouch **1** also includes a collapsible perforated folded panel **50**. The collapsible perforated folded panel **50** is attached to the front wall **12** and the rear wall **14** at interior portions of the front wall **12** and the rear wall **14**. The attachment of the collapsible perforated folded panel **50** to the front wall **12** and the rear wall **14** defines a pouch chamber **52**. The collapsible perforated folded panel **50** is formed from a second flexible film **40**. In one or more embodiments, the collapsible perforated folded panel **50** is a gusset in an expandable pouch.

[0020] The pouch **1** also has an opening seal **60** disposed between the collapsible perforated folded panel **50** and the second ends **18, 19** of the front wall **12** and the rear wall **14**, respectively. The opening seal **60** adheres the second end **18** of the front wall **12** to the second end **19** of the rear wall **14**. The opening seal **60** conceals the collapsible perforated folded panel **50**. Release or removal of the opening seal **60** is operable to expose the collapsible perforated folded panel **50** by separating the front wall **12** from the rear wall **14**.

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along the second ends **18, 19**. Application of a pull force to the second end **18** of the front wall **12** and to the second end **19** of the rear wall **14** is operable to outwardly expand the collapsible perforated folded panel **50** to allow draining of liquid or dispensing of dry powder or flakes from the pouch chamber **52**. As will be described below, the opening seal **60** may be removed, for example, by tearing off a portion of the second ends **18, 19**, or the opening seal **60** may be released, for example, separated by overcoming the adhesion force between the second ends **18, 19**.

[0021] The pouch **1** may be configured as a stand-up pouch as illustrated in FIG. 2, for example. When configured as a stand-up pouch, the second ends **18, 19** of the front wall **12** and rear wall **14** support the pouch **1** in an upright orientation upon release of the opening seal **60** and expansion of the collapsible perforated folded panel **50**. Orientation in an upright position allows the pouch **1** to be placed in a sink or other receptacle and left to fully drain any liquid therein. Prior to releasing the opening seal **60**, the pouch **1** is collapsed into a pillow-pouch as illustrated in FIG. 1, for example.

[0022] In one or more embodiments, the pouch **1** comprises opening tabs **28** for application of a pull force to the second end **18** of the front wall **12** and to the second end **19** of the rear wall **14** to outwardly expand the collapsible perforated folded panel **50**. Outwardly expanding the collapsible perforated folded panel **50** facilitates draining of liquid from the pouch chamber **52** through the perforations **54**. In various embodiments, the opening tabs **28** are portions of the front wall **12** and the rear wall **14** extending beyond the opening seal **60**. The opening tabs **28** provide a point which may be grasped for tugging or pulling apart the front wall **12** and the rear wall **14** such that the collapsible perforated folded panel **50** expands and unfolds.

[0023] In one or more embodiments, the opening seal **60**, the first end seal **24**, and the side seals **26** may hermetically seal the pouch chamber **52** from an outside environment.

[0024] As stated previously, the collapsible perforated folded panel **50** includes perforations **54** configured to allow drainage of fluid or dispensing of a powder or flaked product from the pouch chamber **52**. In one or more embodiments, the perforations **54** are

circular or elliptical. In various other embodiments, the perforations **54** are slots, square, rectangular, or combinations of multiple shapes. One skilled in the art will appreciate that the perforations **54** may be formed from various other shapes, for example, perforations shaped substantially like letters to spell a word or product name of the contents of the pouch **1**. In one or more embodiments, the perforations **54** are spaced evenly across the collapsible perforated folded panel **50**. In further embodiments, the perforations **54** are located in only a portion of the collapsible perforated folded panel **50**. Perforations **54** in only a portion of the collapsible perforated folded panel **50** allows the pouch **1** to be slowly drained in a controlled manner or for powder or flaked product to be dispensed from a particular corner or region, for example, near one of the side seals **26**. The spacing between perforations **54** may vary depending on the volume of fluid to be drained from the pouch **1**, the size of the individual perforations, or other factors. In various embodiments, the collapsible perforated folded panel **50** has 2 to 100 perforations, or 4 to 75 perforations, or 15 to 50 perforations, or 20 to 30 perforations. The total number of perforations **54** may vary depending on the total size of the collapsible perforated folded panel **50**, the size of the individual perforations **54**, and the desired rate of fluid drainage or dispensing rate of a powder or flaked product.

[0025] With reference to FIGS. 2 and 3, in one or more embodiments, the collapsible perforated folded panel **50** has a release member **56** extending outside the pouch chamber. Application of a pull force to the release member **56** is operable to release the collapsible perforated folded panel **50** from at least one of the front wall **12** or the rear wall **14**. Releasing the collapsible perforated folded panel **50** from at least one of the front wall **12** or the rear wall **14** allows the solid contents of the pouch chamber **52** to be accessed and removed from the pouch **1**. In an embodiment, the release member **56** is a pull tab which, when tugged, pulls the collapsible perforated folded panel **50** away from the front wall **12** and/or the rear wall **14** by breaking the attachment and seal between the collapsible perforated folded panel **50** and the front wall **12** or the rear wall **14**. The release member **56** may also be an extra section of the second flexible film **40** extending beyond the point of attachment between the collapsible perforated folded panel **50** and the front wall **12** and/or the rear wall **14**. The extra section of the second flexible film **40** provides a point which may

be grasped for tugging or tearing away of the collapsible perforated folded panel **50** from the front wall **12** and the rear wall **14**.

[0026] As stated previously, the opening seal **60** may be removed as an alternative to being released. The pouch **1** may include a tearable portion for opening the pouch **1**. In one or more embodiments, the opening seal **60** is physically removed from the pouch body **10** by tearing the second ends **18, 19** of the front wall **12** and the rear wall **14** between the opening seal **60** and the collapsible perforated folded panel **50** away from the remainder of the front wall **12** and the rear wall **14** respectively. With reference to FIG. 4, in one embodiment, the positioning of the tearing removal of the opening seal **60** may be achieved by placement of a slit **72** in one or both of the side seals **26** at the desired location(s).

[0027] In one or more further embodiments, the first end seal **24** is physically removed from the pouch body **10** by tearing the first ends **16** of the front wall **12** and the rear wall **14** away from the remainder of the front wall **12** and the rear wall **14** respectively. Removal of the first end seal **24** allows the pouch chamber **52** to be accessed without removal of the collapsible perforated folded panel **50**. The fluid contents of the pouch **1** may be drained and then the solid contents of the pouch **1** may be accessed through the first end **16, 17** subsequent to removal of the first end seal **24**. Similar to removal of the opening seal **60**, with reference to FIG. 4, in one embodiment, the positioning of the tearing removal of the first end seal **24** may be achieved by placement of a slit **72** in one or both of the side seals **26** at the desired location(s).

[0028] In further embodiments, the pouch **1** may be resealable. In one or more embodiments, the second ends **18, 19** of the front wall **12** and the rear wall **14** may be resealable. Non-limiting examples for resealing the second ends **18** may include utilization of a sealing adhesive in the opening seal **60** which remains sticky and can be resealed, or may include placement of a zipper seal between the collapsible perforated folded panel **50** and the opening seal **60** to reversibly seal the front wall **12** to the rear wall **14**. In one or more additional embodiments, the first ends **16, 17** of the front wall **12** and the rear wall **14** may also be resealable. Similarly, non-limiting examples for resealing the first ends **16** may include utilization of a sealing adhesive in the first end seal **24** which remains sticky and can

be resealed, or may include the placement of a zipper seal in the pouch chamber **52** proximal the first end seal **24** to reversibly seal the front wall **12** to the rear wall **14**.

[0029] In various embodiments, the first flexible film **30**, the second flexible film **40**, or both may be monolayer films, multilayer films, or combinations thereof. While the multilayer embodiments described herein focus on two layers, it is contemplated to have many more layers in the first flexible film **30** and/or the second flexible film **40**. The multilayer structure of the first flexible film **30** and the second flexible film **40** may each comprise a sealant layer to form a seal with adjoining media and a substrate layer to provide desired structural, environmental, or other material properties. Referring to the embodiments of FIGS. 5A and 5C, the first flexible film **30** has a first sealant layer **32** and a first substrate layer **34**. The first substrate layer **34** may be thicker than the first sealant layer **32**. In various embodiments, the first substrate layer **34** is 8 times as thick as the first sealant layer **32**, 4 times as thick as the first sealant layer **32**, or 2 times as thick as the first sealant layer **32**. With reference to the embodiments of FIGS. 5B and 5C, the second flexible film **40** has a second sealant layer **42** and a second substrate layer **44**. In one or more embodiments, the first flexible film **30** and the second flexible film **40** are the same composition with the sole difference between the pouch body **10** and the collapsible perforated folded panel **50** being the perforations **54** in the collapsible perforated folded panel **50**.

[0030] In one or more embodiments the second sealant layer **42** and the second substrate layer **44** have different sealing initiation temperatures. The different sealing initiation temperatures allows the second sealant layer **42** or the second substrate layer **44** to form a seal first or exclusively. For example, the second sealant layer **42** may seal with the front wall **12** and the rear wall **14**, but the second substrate layer **44** does not seal to another layer or itself at a given sealing temperature and pressure. This arrangement allows a multilayer stack of multilayer films to be heat sealed in a single operation with only the desired layers adhering together. In various embodiments, the temperature delta for the seal initiation temperatures between the second sealant layer **42** or the second substrate layer **44** may be 15 °C, 20 °C, 30 °C, or 40 or more °C. For example, the second sealant layer **42** may have a seal initiation temperature of 95 °C and the second substrate layer **44** may have a seal initiation

temperature of 130 °C. Similarly, in one or more embodiments the first sealant layer **32** and the first substrate layer **34** have different sealing initiation temperatures allowing the first sealant layer **32** or the first substrate layer **34** to form a seal first or exclusively.

[0031] In one or more embodiments, the pouch body **10** comprises indicia. Non-limiting examples of the indicia include printing to indicate the contents of the pouch **1**, instructions for opening the pouch **1**, and marketing slogans and graphics.

[0032] In yet another embodiment, the opening seal **60** is a peelable seal. Peelable seals are heat sealable and peelable. As used herein, “peelable” generally refers to an ability to separate two materials without compromising the integrity of either of the two. In the case of the pouch **1**, this means the front wall **12** may be separated from the rear wall **14** in the region of the opening seal **60** without compromising the integrity of the front wall **12** or rear wall **14**.

[0033] As a heat sealable seal, a peelable seal is generally formed by applying heat to a multilayer film product, with at least one layer comprising a structural film layer (which may also be called a substrate layer or a backing layer) and a separate layer forming a sealant layer. Application of the heat causes heat to transfer through the structural layer(s) and melt and fuse the sealant layer to form a seal. As such, while the sealant layer is melted to form a seal, the structural layer or layers does not melt. Subsequently, the multilayer film product is cooled to room temperature and the sealant layer solidifies to form the completed seal.

[0034] The force required to pull a seal apart is called the seal strength. The adhesion strength can be measured in accordance with ASTM F88-94 (100 mm/min pull speed and clamped 30 mm from seal), for example. In one or more embodiments, the seal strength of the opening seal **60** is less than 25 N/15mm (9.5 lb/in). In further embodiments, the seal strength of the opening seal **60** is less than 20 N/15mm (7.6 lb/in). In yet further embodiments, the seal strength of the opening seal **60** is less than 10 N/15mm (3.8 lb/in). The adhesion strength varies depending on the material of the sealant layer as well as the temperature and pressure applied during seal formation.

[0035] In one or more embodiments, the first end seal **24** may be a peelable seal. Similar to the opening seal **60**, the seal strength of the first end seal **24** may be less than 25 N/15mm (9.5 lb/in) when measured in accordance with ASTM F88-94 (100 mm/min pull speed and clamped 30 mm from seal), or less than 20 N/15mm (7.6 lb/in), or less than 10 N/15mm (3.8 lb/in).

[0036] Moreover, the attachment of the collapsible perforated folded panel **50** to the front wall **12** and the rear wall **14** is with a peelable seal. In one or more embodiments, the seal strength of the attachment of the collapsible perforated folded panel **50** to the front wall **12** and the rear wall **14** is less than 10 N/15mm (3.8 lb/in) when measured in accordance with ASTM F88-94 (100 mm/min pull speed and clamped 30 mm from seal), or less than 8 N/15mm (3.0 lb/in), or less than 4 N/15mm (1.5 lb/in).

[0037] The adhesion strength may be adjusted by adjusting the temperature, pressure, or dwell time of a fusing nip configured to form the seals in the desired locations. For example, increasing the pressure applied by the fusing nip during a sealing operation generally results in a seal with an increased adhesion strength. Similarly, increasing the temperature of the fusing nip also generally results in an increased adhesion strength until such an elevated temperature is reached that the integrity of the film structure is damaged. For example, a peelable seal may be expected to form with a fusing nip pressure of 3 bars and a temperature in the range of 100 to 130 °C for a ½ second dwell time, whereas a lock-up (or non-peelable) seal may be expected to form with a fusing nip pressure of 5 bars and a temperature in excess of 150 °C for a ½ second dwell time. The particular materials and structure of the films determine the specific seal strength profile for varying temperatures and/or pressures. Besides temperature and pressure, the sealing bar geometry may influence seal strength. A flat sealing bar, in general, tends to promote peelability. Conversely, a serrated or non-flat sealing bar tends to promote a lock-up or non-peelable seal. It should be appreciated that each parameter may be varied in conjunction or separately to promote the desired sealing behavior and seal strength. For example low temperature, low pressure, and flat sealing bars will produce differing seal characteristics than high temperature, high pressure, and serrated

sealing bars, which will both produce differing seal characteristics than very high temperature, low pressure, and flat bars.

[0038] The sealant layer of peelable seals is generally made from one or more polymeric resins. The resulting characteristics of the peelable film and the sealant layer depend largely upon the type of the resins used to form the multilayer film. United States Patent 7,863,383, incorporated by reference herein in its entirety, discloses a variety of heat sealable and peelable seals. It is contemplated that other peelable seals may be utilized in forming a peelable seal for the opening seal **60**, the first end seal **24**, or both.

[0039] While the first sealant layer **32** and the second sealant layer **42** form the peelable seals, the first substrate layer **34** and the second substrate layer **44** may provide other desirable characteristics to the first flexible film **30** and the second flexible film **40** respectively. The first substrate layer **34** and the second substrate layer **44** may provide tearing or stretching strength, oxygen barrier properties, opacity, or other desirable material properties to the first flexible film **30** and second flexible film **40**.

[0040] In one or more embodiments, the first flexible film **30**, the second flexible film **40** or both may comprise polyolefins, polystyrenes, or combinations thereof. These polyolefins may include, but are not limited to, polyolefin plastics, polyolefin elastomers, polyolefin plastomers, or combinations thereof. In one or more embodiments, the first sealant layer **32**, the second sealant layer **42**, or both may comprise a blend of a propylene based plastomer or elastomer, and at least one of a polyethylene or a polystyrene based polymer. In further embodiments, the first sealant layer **32**, the second sealant layer **42**, or both may comprise ethylene vinyl acetate (EVA) and ethylene methyl acrylate (EMA) copolymers, polybutylene mixed with an EVA polymer, polyolefins (including plastomers) mixed with an EVA polymer, and ionomers, such as SURLYN® (E. I. du Pont de Nemours and Company), mixed with EVA. Suitable commercial products for use in the first sealant layer **32** and/or the second sealant layer **42** may include the SEALUTION™ product line of peel polymers from The Dow Chemical Company (Midland, MI). These SEALUTION™ products may include but are not limited to SEALUTION™140, SEALUTION™220, or SEALUTION™230.

[0041] The first substrate layer **34** and/or the second substrate layer **44** may include polyolefins, polyolefins, such as high-density polyethylene (HDPE), polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET), polyamides (PA), aluminum foils, or combinations thereof. In one or more embodiments, the polymers may be biaxially oriented (i.e., stretched) and may include, for example, biaxially oriented polyethylene terephthalate (BOPET), or biaxially oriented polypropylene (BOPP), biaxially oriented polyamide (BOPA), or other materials used in flexible packaging.

[0042] It should be understood that the first flexible film **30** and the second flexible film **40** may contain various additives. Examples of such additives include antioxidants, ultraviolet light stabilizers, thermal stabilizers, slip agents, antiblock pigments or colorants, processing aids (such as fluoropolymers), crosslinking catalyst, flame retardants, fillers, foaming agents, and combinations thereof.

[0043] It is further noted that terms like “preferably,” “generally,” “commonly,” and “typically” are not utilized herein to limit the scope of the claimed invention or to imply that certain features are critical, essential, or even important to the structure or function of the claimed invention. Rather, these terms are merely intended to highlight alternative or additional features that may or may not be utilized in a particular embodiment of the present disclosure.

[0044] It will be apparent that modifications and variations are possible without departing from the scope of the disclosure defined in the appended claims. More specifically, although some aspects of the present disclosure are identified herein as preferred or particularly advantageous, it is contemplated that the present disclosure is not necessarily limited to these aspects.

CLAIMS

1. A pouch comprising:

a pouch body formed from a first flexible film and comprising a front wall and a rear wall, the front wall and the rear wall each comprising a first end, a second end, and side edges connecting the first end and the second end, wherein the rear wall is adhered to the front wall at corresponding first ends to form a first end seal and corresponding side edges to form side seals;

a collapsible perforated folded panel formed from a second flexible film and attached to the front wall and the rear wall at interior portions of the front wall and the rear wall, respectively, such that the attachment of the collapsible perforated folded panel to the front wall and the rear wall define a pouch chamber; and

an opening seal disposed between the collapsible perforated folded panel and the second ends of the front wall and the rear wall, wherein the opening seal adheres the second end of the front wall to the second end of the rear wall which thereby conceals the collapsible perforated folded panel,

wherein release or removal of the opening seal is operable to expose the collapsible perforated folded panel by separating the front wall from the rear wall along the second ends and application of a pull force to the second end of the front wall and to the second end of the rear wall is operable to outwardly expand the collapsible perforated folded panel to allow draining of liquid or dispensing of dry powder or flakes from the pouch chamber,

wherein the collapsible perforated folded panel comprises a release member extending outside the pouch chamber, wherein application of a pull force to the release member is operable to release the collapsible perforated folded panel from at least one of the front wall or the rear wall.

2. The pouch of claim 1, wherein the first flexible film, the second flexible film, or both are multilayer films.

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3. The pouch of any of claims 1 or 2, wherein the first flexible film comprises a first sealant layer and a first substrate layer.
4. The pouch of any of claims 1 through 3, wherein the second flexible film comprises a second sealant layer and a second substrate layer.
5. The pouch of claim 4, wherein the second sealant layer and the second substrate layer have different sealing initiation temperatures.
6. The pouch of any of claims 1 through 4, wherein the first flexible film and the second flexible film are the same composition.
7. The pouch of any of claims 1 through 6, wherein the opening seal, the first end seal, and the side seals hermetically seal the pouch chamber.
8. The pouch of any of claims 1 through 7, wherein the release member extending outside the pouch chamber is an extra section of the second flexible film extending beyond the point of attachment between the collapsible perforated folded panel and the front wall, the collapsible perforated folded panel and the rear wall, or the collapsible perforated folded panel and both the rear wall and the front wall.
9. The pouch of any of claims 1 through 7, wherein the release member extending outside the pouch chamber is a release tab.
10. The pouch of any of claims 1 through 9, wherein the opening seal has a seal strength of less than 10 N/15mm when measured according to ASTM F88-94 at a pull speed of 100 mm/minute.

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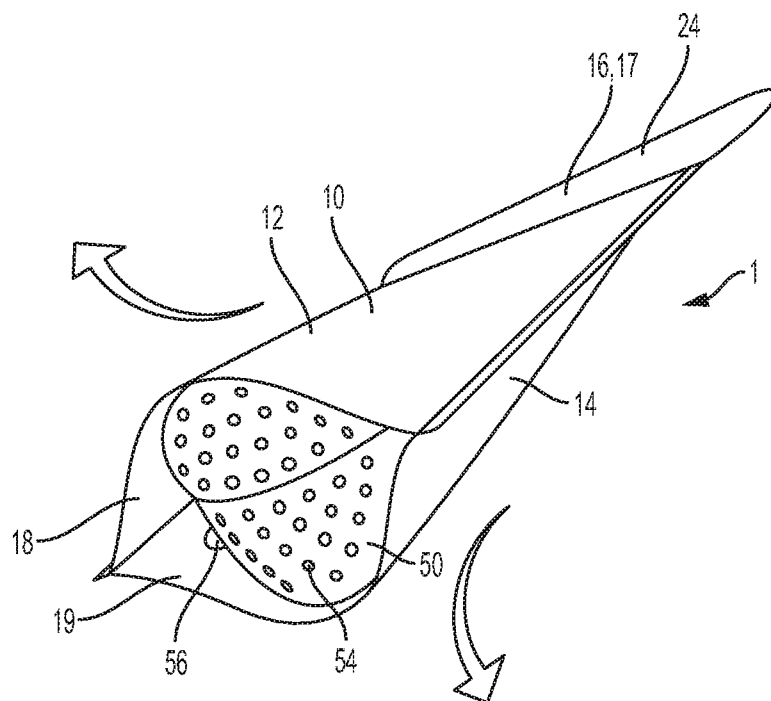
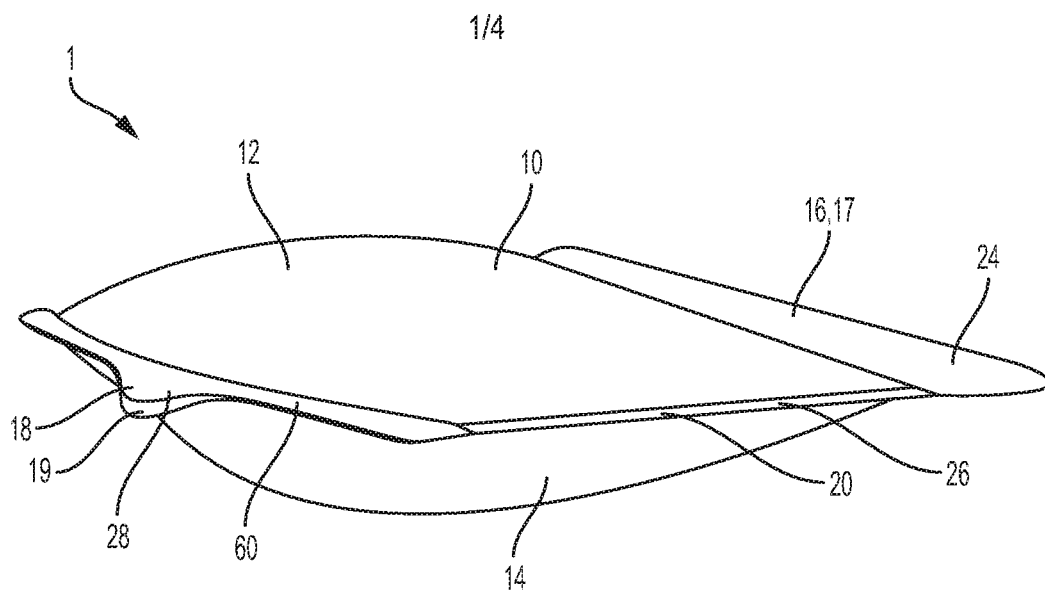
11. The pouch of any of claims 1 through 10, wherein the second ends comprise opening tabs for application of a pull force to the second end of the front wall and to the second end of the rear wall to outwardly expand the collapsible perforated folded panel.

12. The pouch of any of claims 1 through 11, wherein the first flexible film comprises polyethylene terephthalate (PET), biaxially oriented polyethylene terephthalate (BOPET), or biaxially oriented polypropylene (BOPP), polyamide (PA), or an aluminum foil.

13. The pouch of any of claims 1 through 12, wherein the second flexible film comprises polyolefins.

14. The pouch of any of claims 1 through 13, wherein the first end seal has a seal strength of less than 10 N/15mm when measured according to ASTM F88-94 at a pull speed of 100 mm/minute.

15. The pouch of any of claims 1 through 14, wherein the opening seal, the first end seal, the side seals, or both comprises a propylene based plastomer or elastomer and at least one of a polyethylene or a polystyrene based polymer.



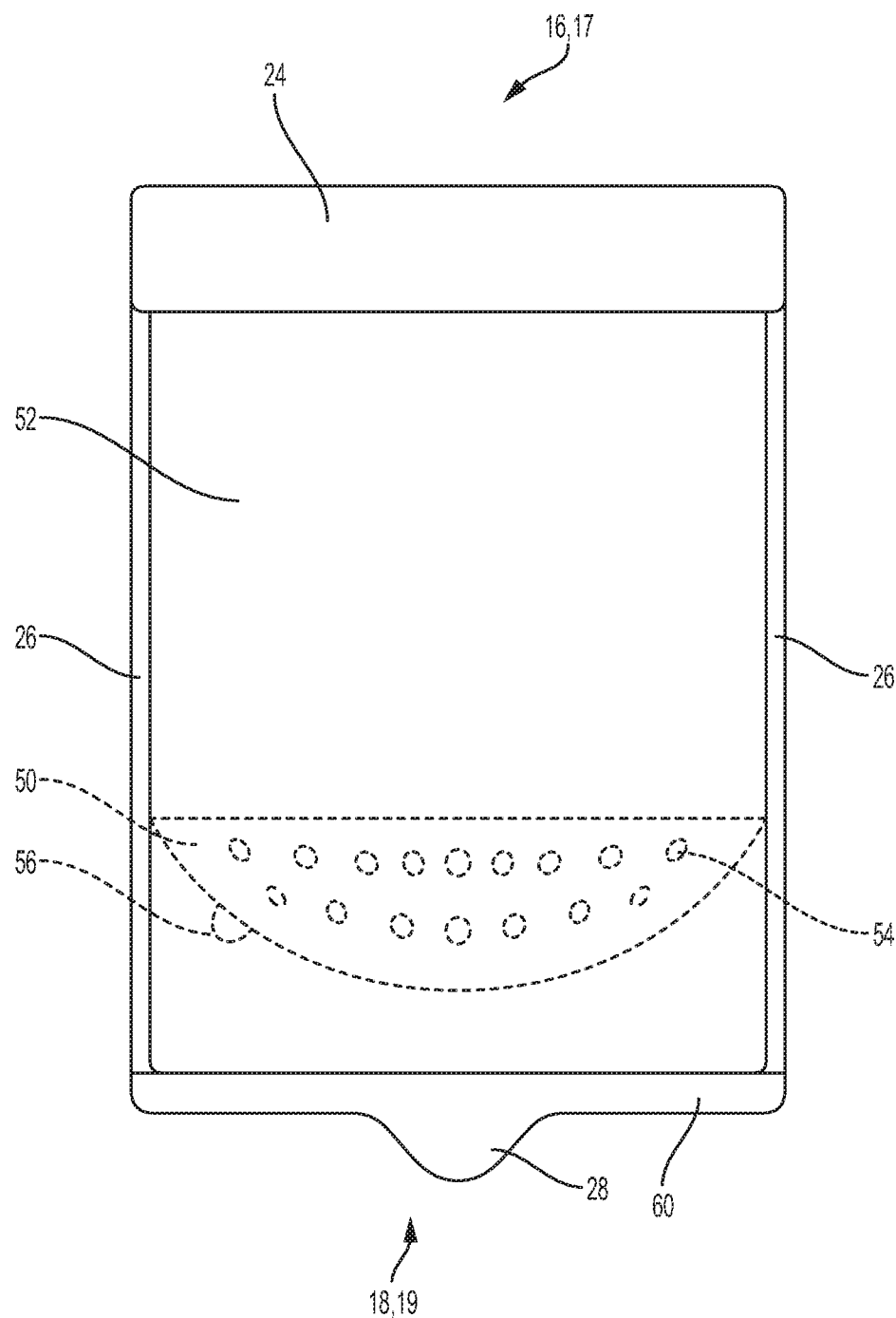


FIG. 3

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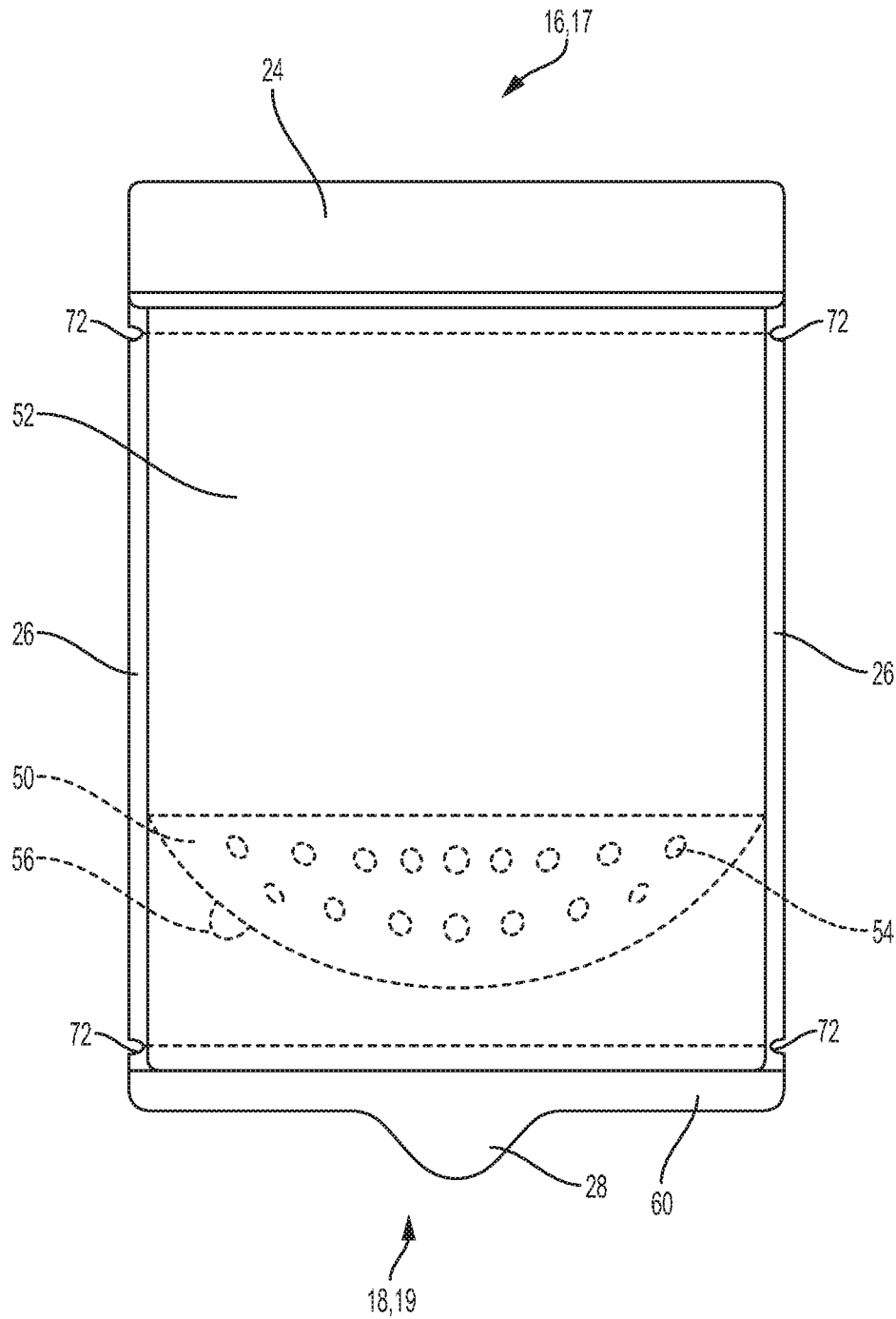


FIG. 4

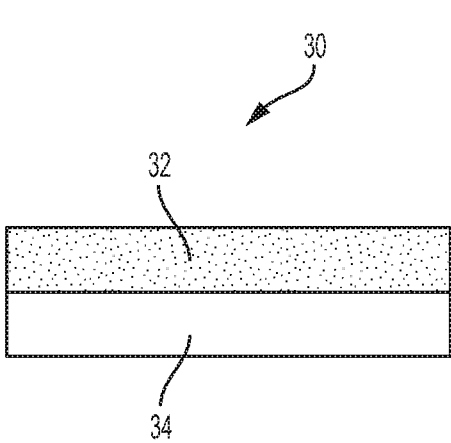


FIG. 5A

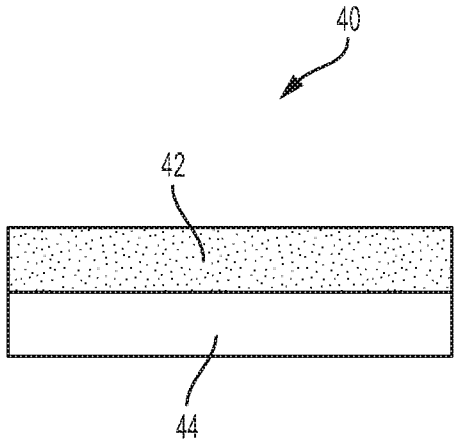


FIG. 5B

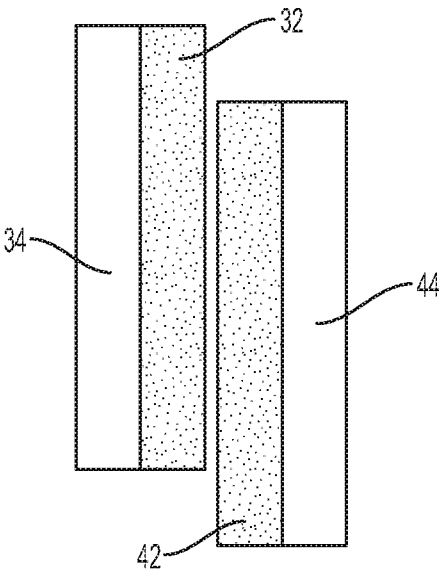


FIG. 5C

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2016/066819

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65D33/01 B65D81/26 B65D75/58
 ADD. B65D81/22 B65D75/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 B65D

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 971 613 A (BELL GARY M [US]) 26 October 1999 (1999-10-26) column 3, line 1 - column 14, line 22 figure 4	1-15
A	----- US 5 709 479 A (BELL GARY M [US]) 20 January 1998 (1998-01-20) column 1, line 39 - column 8, line 26 figures 1-10	1-15
A	----- WO 2014/181129 A1 (MARS INC [US]; WICKS DAVID [GB]) 13 November 2014 (2014-11-13) page 1 - page 20 figures 4, 5	1-15
A	----- US 5 785 428 A (MAZZOCCHI RANDOLPH A [US]) 28 July 1998 (1998-07-28) figures 1-11	1-15



Further documents are listed in the continuation of Box C.



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Date of the actual completion of the international search

24 January 2017

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/066819

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5971613	A	26-10-1999	US 5971613 A	26-10-1999
			US 6224528 B1	01-05-2001

US 5709479	A	20-01-1998	AT 209594 T	15-12-2001
			AU 4251397 A	26-03-1998
			CA 2264922 A1	12-03-1998
			DE 69708675 D1	10-01-2002
			DE 69708675 T2	22-08-2002
			EP 0932559 A1	04-08-1999
			JP 2001500093 A	09-01-2001
			US 5709479 A	20-01-1998
			US 5882120 A	16-03-1999
			US 6126318 A	03-10-2000
			WO 9809884 A1	12-03-1998

WO 2014181129	A1	13-11-2014	CA 2910551 A1	13-11-2014
			CN 105377720 A	02-03-2016
			EP 2994399 A1	16-03-2016
			JP 2016525899 A	01-09-2016
			US 2016096681 A1	07-04-2016
			WO 2014181129 A1	13-11-2014

US 5785428	A	28-07-1998	NONE	
