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(54) **COLLAPSIBLE ARTICLE CONTAINER**

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(57) **ABSTRACT**

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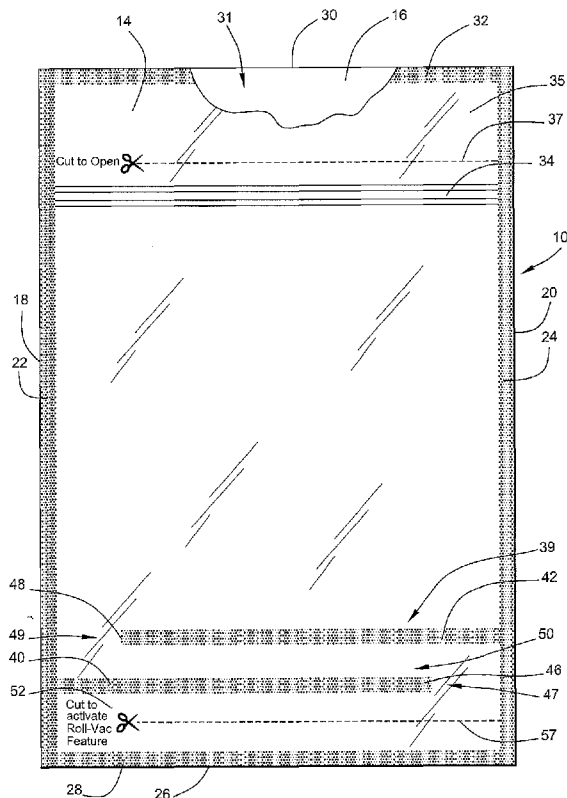
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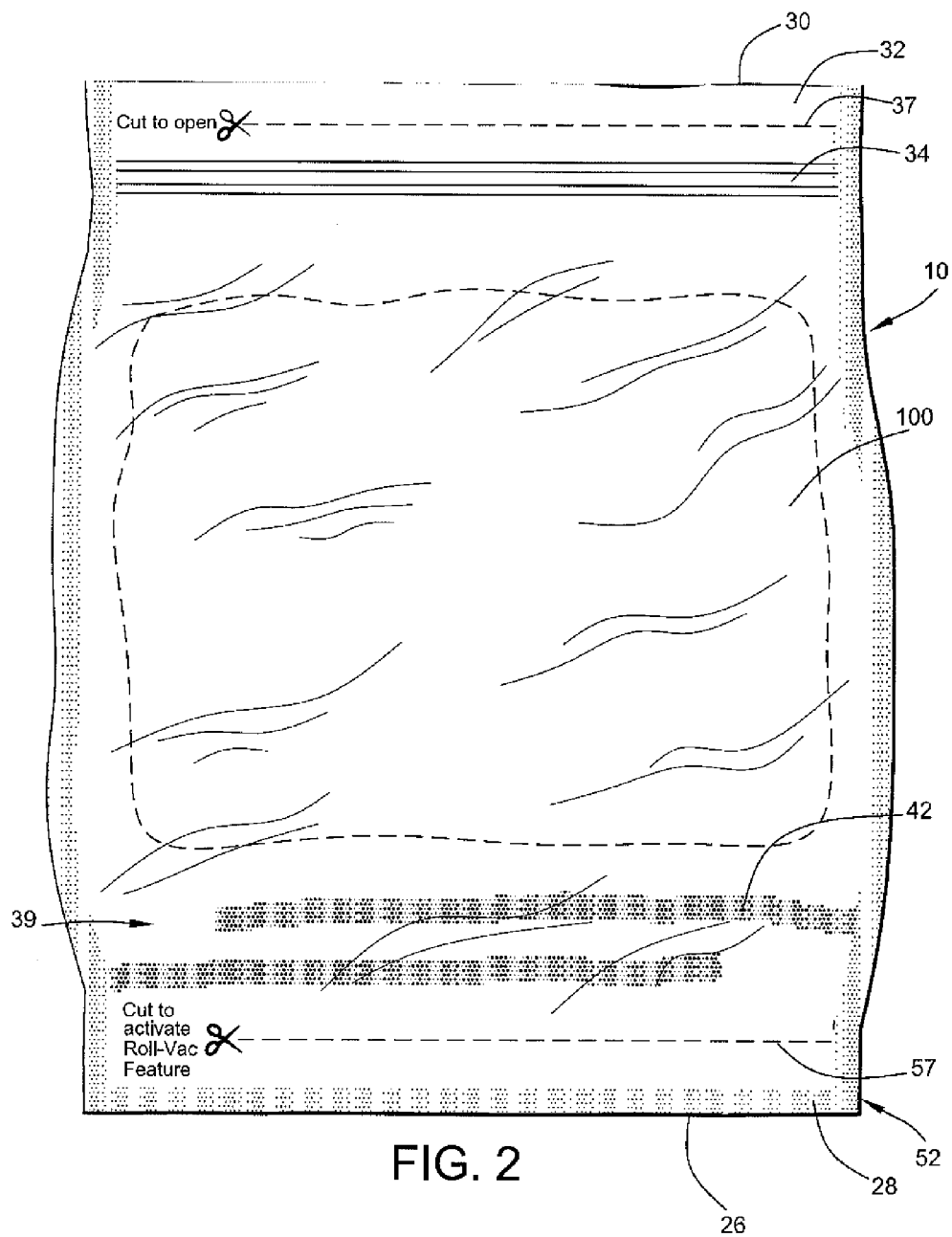
(51) **Int. Cl.**

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A collapsible article container includes a pair of side walls connected along side edges and a transverse bottom edge defining an interior pouch volume having a sealable entrance opening and an air purge mechanism in communication with the pouch to provide air evacuation from the pouch through a volume reduction port. The air purge mechanism includes truncated, transverse, seals defining a restricted flow path in communication with the pouch volume through one passage and in communication with a volume reduction port through another. The collapsible article container may be reused after removal of a contained article by insertion of an article into the pouch volume, exposing the volume reduction port to atmosphere, and expelling entrained air from the pouch volume through the passages and restricted flow path of the air purge mechanism. In one form the pouch includes a closable strip spaced inwardly from the top edge.





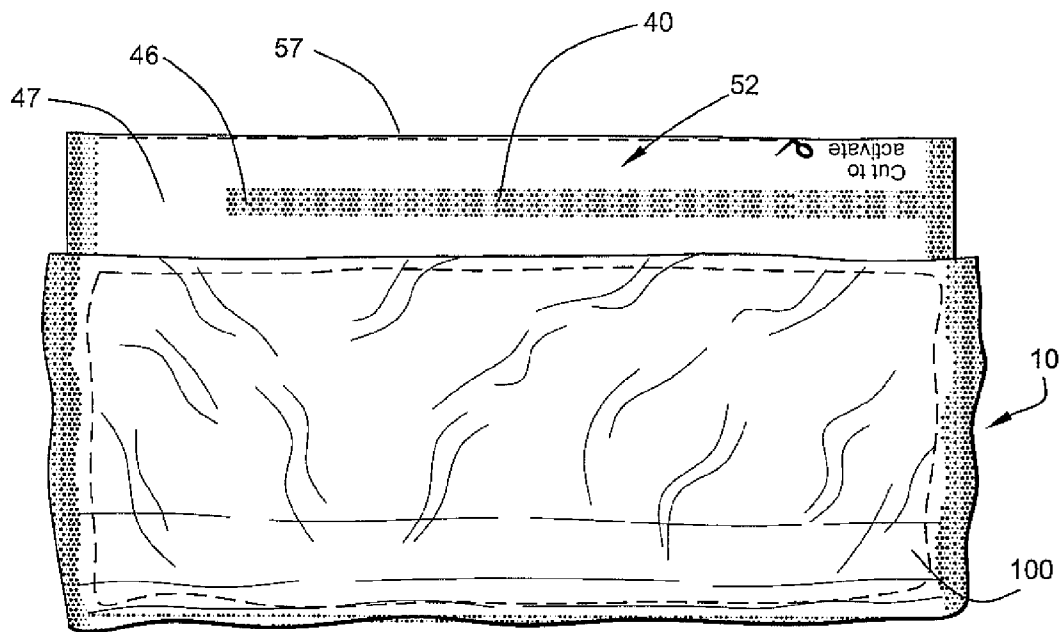


FIG. 3

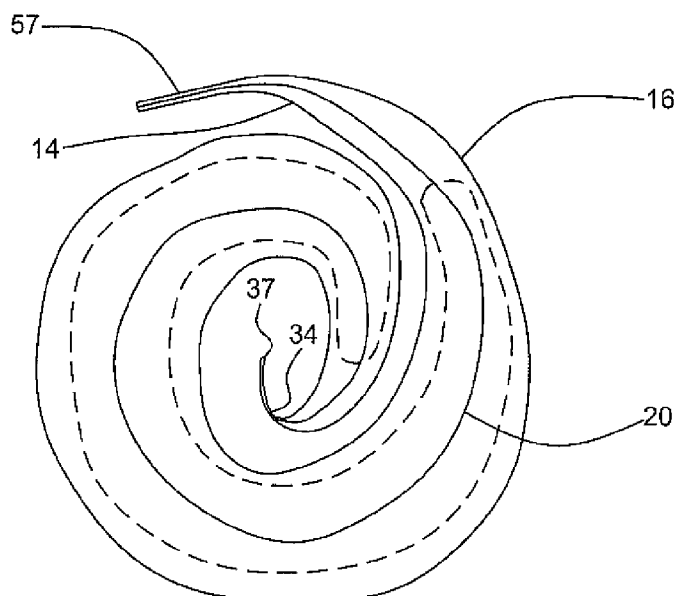


FIG. 4

COLLAPSIBLE ARTICLE CONTAINER

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This non-provisional application claims the benefit of, and priority from U.S. Provisional Application 61/426,607 filed Dec. 23, 2010, the contents of which is incorporated by reference herein in its entirety.

BACKGROUND

[0002] This disclosure relates to flexible walled, collapsible, article containers made of polymeric film and methods of use of such containers. More particularly, it relates flexible walled, collapsible, article containers made of polymeric film having multiple use capability.

[0003] Many forms of sealed article containers exist. One category, flexible walled collapsible article containers of polymeric film, plastic bags, represent a cost efficient packaging arrangement. Articles such as clothing are often packaged in sealed plastic bags for initial delivery to the consumer.

[0004] In some instances, the packages are filled with an article to be delivered, evacuated to minimize volume and sealed. Such an arrangement eliminates entrained air in the packaged article and minimizes the volume of the package. Such containers are used to transport garments or other articles in a waterproof and contaminant free environment. The usefulness of such containers is diminished on opening by the consumer and the container usually then discarded.

[0005] Also, plastic bag configurations are commercially available with a sealable entrance opening. Such bags include a releasable latching mechanism sometimes in the form of connectible channels that interengage to form a seal. Examples are found in U.S. Pat. Nos. 5,070,584, 5,664,299 and 5,647,100.

[0006] Evacuatable, flexible walled collapsible storage containers are also known. They are made from heavy duty plastic film and include a valve or port for connection to an evacuation device.

[0007] Such containers are arranged for reuse and include a closure mechanism to reestablish a sealed enclosure for contained articles. They are arranged for evacuation of entrained air from the defined chamber to minimize volume and maximize space utilization. "Space Bags" for example, available from ITW, San Diego, Calif., and are sold empty, in packages of multiple bags.

[0008] While these various configurations of flexible walled collapsible article containers are individually available, none are known to accomplish all of these desired functions.

SUMMARY

[0009] The article container of this disclosure provides the desired capabilities of initial use as a sealed article container, and subsequent use as a reclosable, general purpose article container that possess the capability to provide space conservation through overall volume reduction after filling, all in a single container structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a plan view, partially broken away, of the collapsible article container of the present disclosure.

[0011] FIG. 2 is a plan view of the collapsible article container of FIG. 1 showing it as a sealed and evacuated container initially filled with an article for delivery to a consumer.

[0012] FIG. 3 is a view of the collapsible article container, refilled and employed by the user to provide short term compression of the container and contents to a minimum volume condition for storage or packing with other articles.

[0013] FIG. 4 is a side view of the collapsible article container of FIG. 3.

DETAILED DESCRIPTION

[0014] FIGS. 1 to 4 illustrate a flexible walled collapsible article container 10 used for packaging of manufactured goods for initial delivery to a consumer and subsequent reuse as a general purpose sealable container or a compressible storage container for minimum volume configuration. It is made of thermoplastic polymeric film.

[0015] A film suitable for container 10 is low density polyethylene film, though other polymeric films could be used. In the illustrated form, the container is about fourteen inches (14") wide. The film contemplated for this type of article container is from two (2) to ten (10) mils thick. It is illustrated as a pouch to contain, for example, a garment, miscellaneous toiletries or other articles.

[0016] The specific size of the container 10 and thickness of the film is illustrative only and may be varied as desired for specific applications. Since the collapsible article container may reside in any orientation, the terms top, bottom, side, upper, lower, etc., are used to describe the embodiment of the illustrations and are not intended to limit the scope of the disclosure. Similarly as used herein for purposes of understanding of the disclosure the term "inner" or "inward" as used herein means toward the interior of the pouch formed by the collapsible article container.

[0017] In the illustrated embodiments, container 10 is formed by a pair of polymeric side wall sheets 14 and 16 sealed together along side edges 18 and 20 by side seal strips 22 and 24. Side seal strips 22 and 24 illustrated are about one-quarter inch (1/4") wide and formed by heat sealing together the interior surfaces of sheets 14 and 16. Alternatively, the side walls 14 and 16 of container 10 could be formed, for example, from a single sheet, folded in half upon itself and sealed along one edge. In another form, side walls 14 and 16 could be formed by a continuous tubular sheet of film flattened upon itself to form side walls 14 and 16. The manner of forming the side walls or the number or width of the seal strips are not significant to the features of the disclosure.

[0018] Container or pouch 10 is sealed along transverse bottom edge 26 by a bottom transverse seal strip 28 which is formed similarly to side seal strips 22 and 24. A transverse top edge 30 defines an open mouth entrance opening 31 for filling. It is later closed by transverse top seal strip 32 during the process of filling as will be explained. The defined volume within the container or pouch 10 is thereby completely isolated from the surrounding atmosphere.

[0019] Transverse top seal strip 32 and transverse bottom seal strip 28 are formed by heat sealing and are also about one-quarter inch (1/4") in width though this dimension, like the others, is for illustration and is not limiting.

[0020] In the illustrated embodiment, spaced inwardly from transverse top edge 30, that is, toward transverse bottom edge 26, there is provided a closure mechanism 34. The longitudinal spacing between transverse top edge 30 and

closure mechanism **34** provides a tubular portion **35** for connection to evacuation equipment for evacuation of the internal void area or container volume. After evacuation, the top edge **30** is closed with transverse top seal strip **32** to create an evacuated container **10** of minimum internal volume. Thereafter, access to the content of the package **10** is accomplished by rupture of the film sheets **14** or **16** in the tubular portion **35** for example by cutting along dotted line **37** which thereafter defines the top edge of container **10**.

[0021] The closure mechanism **34** is illustrated is a dual channel, "press to close" arrangement in common use for reusable polymeric collapsible article containers. Examples can be found in U.S. Pat. Nos. 5,070,584 and 5,647,100 though numerous seals of this general type exist and would be suitable.

[0022] The illustrated closure mechanism **34** includes "U" shaped channel elements adhered to the interior surface of each sheet **14** and **16** with the legs of the "U" shape facing the legs of the "U" shape of the channel on the opposing interior sheet surface. The channels are aligned such that the legs of the channels can be pressed into releasable engagement to form a seal across the width of the container **10**. Resealable closure mechanism **34** may be connected together to form a tight seal across the container **10** near its upper end.

[0023] The closure mechanism **34** is useful to close the container **10** after initial access to the contained article by the recipient through the rupture of the sealed container **10** at tubular portion **35**. The container in this configuration serves as a resealable plastic bag for subsequent storage of the original contained article, or other sundries.

[0024] In accordance with the disclosure, spaced inwardly from transverse bottom seal strip **28**, container **10** includes an air purge mechanism generally designated **39**. As illustrated it includes a pair of spaced apart, truncated, transverse seal strips **40** and **42**. These truncated transverse seal strips **40** and **42** are parallel to the bottom and top transverse seal strips **28** and **32** and extend respectively from one side seal strip **22** or **24** partially toward the other side seal strip.

[0025] As illustrated, truncated transverse seal strip **40** extends from side seal strip **22** at lateral edge **18** nearly the entire distance to side seal strip **24** at edge **20** to a terminus **46**. It defines a passage **47** between its terminus **46** and side seal strip **24**.

[0026] Similarly, truncated transverse seal strip **42** spaced inward from truncated transverse seal strip **40** extends from side seal strip **24** at edge **20** nearly the entire distance to side seal strip **22** at edge **18** to a terminus **48**. It defines passage **49** between its terminus **48** and side seal strip **22**. The space between truncated transverse seal strips **40** and **42** defines a restricted flow path **50**.

[0027] The transverse bottom seal strip **28** and truncated seal strip **40** define a tubular area **52** denominated a volume reduction port in communication with the contained volume within pouch **10** through restricted flow path **50** and passages **47** and **49**. As such, these areas are evacuated by the evacuation device connected at tubular portion **35**. Its function as a volume reduction port is explained below.

[0028] While a particular air purge mechanism **39** is illustrated, it is contemplated that numerous alternative arrangements are suitable. For example, the air purge mechanism could comprise a small "one-way" plastic check valve secured in one of the side walls **14** or **16**. Also, one or more

additional layers of plastic film, optimized for air evacuation could be secured by adhesive or heat welding to one of the side walls **14** or **16**.

[0029] It is contemplated that the pouch **10** may be made from aligned, continuous rolls or webs of film in a well-known process. They could be made by other processes. The webs are cut into individual pieces which comprise individual containers **10**. Multiple containers **10** are packaged together for delivery to the initial commercial user.

[0030] The commercial user inserts an article **100**, seen in FIG. 2, in the interior volume or space of package or container **10** within the confines of side walls **14** and **16**. A vacuum device is introduced into the interior of the container at the open mouth entrance opening **31** at edge **30** which withdraws entrained air and collapses the sheets **14** and **16** onto the article to create a minimum volume package (best seen in FIG. 2). Transverse top seal strip **32** is then formed by heat sealing to retain the evacuated condition. Multiple packages are then packaged with other similar packages for storage and shipment to ultimate users of the contained articles.

[0031] The available features of the flexible walled collapsible article container **10** of the present disclosure are utilized in the following exemplary sequence. As previously described, multiple units of container **10** are delivered to the initial commercial user. For example, a garment manufacturer inserts an article **100** into container **10** and evacuates the container volume. The container is sealed at seal strip **32** to complete the package. It is evacuated and thus represents a minimum volume. Container **100**, and others like it are packed into shipping containers such as cardboard boxes, stored and shipped to distributors of the packaged articles. These represent a minimal space requirement and reduce the expense of these various handling functions.

[0032] On distribution of the articles to an ultimate user, the side wall sheets **14** and **16** of a container **10** are cut along line **37** to remove transverse top seal strip **32** above the closure mechanism **34**. Manual separation of closure mechanism **34** provides access to interior volume for removal of article **100**.

[0033] On removal of article **100** as described, the container **10** is usable as a flexible storage container. The closure mechanism **34** provides a means for resealing the otherwise open top end of container **10**.

[0034] Should it be desirable to accomplish minimization of volume, as in the initial use by the packaging entity, it is only necessary to render the air purge mechanism **39** operational. This is accomplished by cutting the side wall sheets **12** and **14**, within volume reduction port **52** for example, along dotted line **57** to provide communication to the atmosphere at passage **47** through restricted flow path **50** and passage **49**. Cut line **57** thereafter defines the bottom edge of container **10**.

[0035] To use the volume minimization function, an article **100** is placed in container **10** through the open mouth entrance opening **31** of the container **10**. The "press to close" seal mechanism **34** is manually closed to form a seal above the article which is positioned between mechanism **34** and truncated transverse seal strip **42**. The container **10**, with contents **100**, is then rolled from its top edge represented by cut line **37** toward its bottom edge represented by cut line **57** to reduce internal volume. Air within the container is forced out through air purge mechanism **39** along restricted flow path **50**, which communicates with the atmosphere at volume reduction port **52**. Though an opening remains at passage **47**, it is only necessary to hold the container **10** in its compressed, minimum volume condition, until inserted into a confined

position, such as in a packed suitcase. It will remain compressed and in its minimum volume condition until removed by the user to again retrieve the contents through the open mouth at cut line 37 by manually opening closure mechanism 34.

[0036] Variations and modifications of the foregoing are within the scope of the present invention. It is understood that the invention disclosed and defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text and/or drawings. All of these different combinations constitute various alternative aspects of the present invention. The embodiments described herein explain the best modes known for practicing the invention and will enable others skilled in the art to utilize the invention. The claims are to be construed to include alternative embodiments to the extent permitted by the prior art.

1. A collapsible article container, comprising a pair of side walls connected along side edges and a transverse bottom edge to define an interior pouch volume having an entrance opening along a transverse sealable top edge,

an air purge mechanism in communication with said pouch volume to provide air evacuation from said pouch.

2. A collapsible article container as claimed in claim 1 wherein at least one of said side walls may be ruptured to place said air purge mechanism in communication with the atmosphere.

3. A collapsible article container as claimed in claim 2 wherein said air purge mechanism includes a first truncated seal connecting said side walls spaced from said bottom edge toward said entrance opening extending from one of said side edges and having a terminus spaced from the other of said side edges to define a passage therebetween.

4. A collapsible article container as claimed in claim 3 wherein said air purge mechanism includes a second truncated seal connecting said side walls spaced toward said entrance opening from first truncated seal extending from the other of said side edges and having a terminus spaced from said first one of said side edges to define a passage therebetween.

5. A collapsible article container as claimed in claim 4 wherein said first truncated seal and said second truncated seal of said air purge mechanism define a restricted flow path communicating with said pouch volume through said passage defined by said terminus of said second truncated seal and said side edge from which it is spaced.

6. A collapsible article container as claimed in claim 5 wherein said bottom edge and said at first truncated seal define a tubular volume reduction port in communication with said restricted flow path between said truncated seals of said air purge mechanism through said passage defined by said terminus of said first truncated seal and said side edge from which it is spaced.

7. A collapsible article container as claimed in claim 6 wherein said volume reduction port is in communication with said pouch volume through said passages and said restricted flow path and said air purge mechanism is placed in communication with the atmosphere by rupturing said side wall at said volume reduction port.

8. A collapsible article container as claimed in claim 1 wherein said pouch includes a closure mechanism spaced from said top edge toward said bottom edge, said side walls define a tubular portion between said transverse top seal and said closure mechanism and said tubular portion may be

ruptured to provide access to said interior pouch volume through said closure mechanism.

9. A collapsible article container as claimed in claim 8 wherein said closure includes a generally “U” shaped channel element secured to each of said side walls, each said channel facing the channel on the other said side wall, said channels aligned for releasable engagement with each other.

10. A collapsible article container as claimed in claim 2 wherein said pouch includes a closure mechanism spaced from said top edge toward said bottom edge, said side walls define a tubular portion between said transverse top seal and said closure mechanism and said tubular portion may be ruptured to provide access to said interior pouch volume through said closure mechanism.

11. A collapsible article container as claimed in claim 10 wherein said closure includes a generally “U” shaped channel element secured to each of said side walls, each said channel facing the channel on the other said side wall, said channels aligned for releasable engagement with each other.

12. A collapsible article container as claimed in claim 10 wherein said air purge mechanism includes a first truncated seal connecting said side walls spaced from said bottom edge toward said entrance opening extending from one of said side edges and having a terminus spaced from the other of said side edges to define a passage therebetween,

13. A collapsible article container as claimed in claim 13 wherein said air purge mechanism includes a second truncated seal connecting said side walls spaced toward said entrance opening from first truncated seal extending from the other of said side edges and having a terminus spaced from said first one of said side edges to define a passage therebetween.

14. A collapsible article container as claimed in claim 13 wherein said first truncated seal and said second truncated seal of said air purge mechanism define a restricted flow path communicating with said pouch volume through said passage defined by said terminus of said second truncated seal and said side edge from which it is spaced.

15. A collapsible article container as claimed in claim 14 wherein said bottom edge and said at first truncated seal define a tubular volume reduction port in communication with said restricted flow path between said truncated seals of said air purge mechanism through said passage defined by said terminus of said first truncated seal and said side edge from which it is spaced.

16. A collapsible article container as claimed in claim 15 wherein said volume reduction port is in communication with said pouch volume through said passages and said restricted flow path and said air purge mechanism is placed in communication with the atmosphere by rupturing said side wall at said volume reduction port.

17. A method of packaging an article using a collapsible article container comprising:

a pair of side walls connected along side edges and a transverse bottom edge to define an interior pouch volume having an entrance opening along a transverse top edge,

an air purge mechanism in communication with said pouch volume to provide an air evacuation from said pouch,

a closure mechanism spaced from said top edge toward said bottom edge, said side walls define a tubular portion between said transverse top seal and said closure mecha-

nism and said tubular portion may be ruptured to provide access to said interior pouch volume through said closure mechanism,
 providing an article,
 inserting said article into said pouch volume through said entrance opening,
 evacuating said pouch volume through said entrance opening,
 sealing said transverse top edge of said container.

18. A method of repackaging articles using a collapsible article container containing an article, said container comprising:

a collapsible article container comprising a pair of side walls connected along side edges and a transverse bottom edge to define an interior pouch volume having an entrance opening along a transverse top edge,
 an air purge mechanism in communication with said pouch volume to provide air evacuation from said pouch
 a closure mechanism spaced from said top edge toward said bottom edge, said side walls define a tubular portion between said transverse top seal and said closure mechanism and said tubular portion may be ruptured to provide access to said interior pouch volume through said closure mechanism,
 a removable article disposed in said pouch volume and a transverse top seal sealing said entrance opening,
 a volume reduction port in at least one of said side walls closed to the atmosphere and in communication with said pouch volume, the steps comprising

rupturing at least one of said side walls at said tubular portion and removing said article originally disposed in said pouch volume,
 inserting an article within said pouch volume,
 closing said closure mechanism,
 rupturing at least one of said side walls in said volume reduction port to communicate said volume reduction port to atmosphere,
 compressing said pouch volume from said closure mechanism toward said truncated seals to cause air contained within said pouch volume to exit through said passages and said restricted flow path.

19. A method of repackaging an article using a flexible article container as claimed in claim **18** the steps further comprising securing said container in said compressed condition to maintain a minimum pouch volume.

20. A collapsible article container, comprising a pair of side walls connected along side edges and a transverse bottom edge to define an interior pouch volume having an entrance opening along a transverse sealable top edge, a seal sealing said top edge,

an air purge mechanism in communication with said pouch volume to provide air evacuation from said pouch wherein said pouch includes a closure mechanism spaced from said sealed top edge toward said bottom edge, said side walls define a tubular portion between said transverse top seal and said closure mechanism and said tubular portion may be ruptured to provide access to said interior pouch volume through said closure mechanism.

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