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(54) **PRODUCE AND FRUIT PACKAGING
CONTAINERS AND ASSEMBLIES**

Publication Classification

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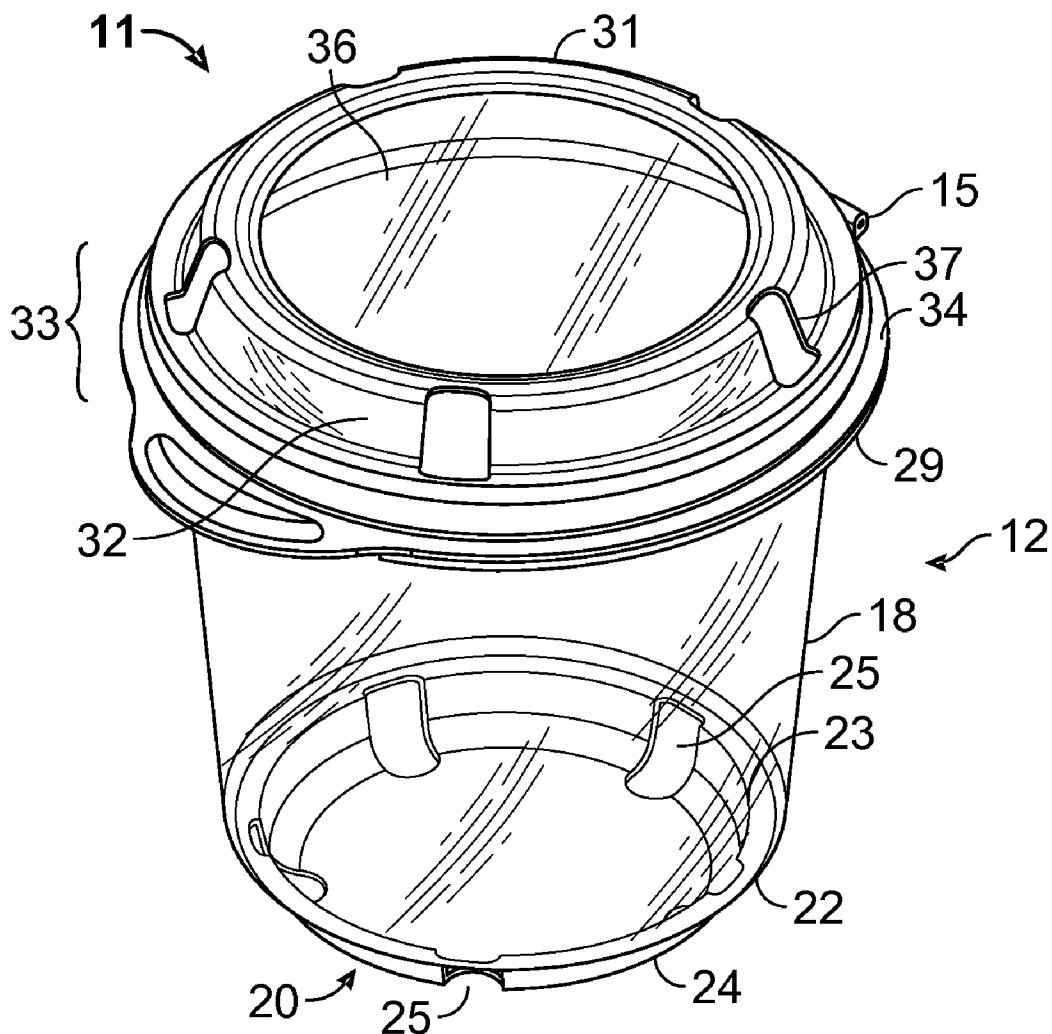
(57) **ABSTRACT**

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A packaging technology including a packaging cup and lid configured as a packaging container. In one approach the containers can have a frustro-conical shape having a lid with a securing rib and groove. The container can be arranged within a packaging sleeve apparatus suitable for shipping, secure storage, and easy cooling. Additionally, the packaging assembly can include a packaging tray configured to receive a plurality of containers arranged in a sleeve such that the sleeve is in registry with side vents of the tray.

Related U.S. Application Data

(60) Provisional application No. 61/496,505, filed on Jun. 13, 2011.



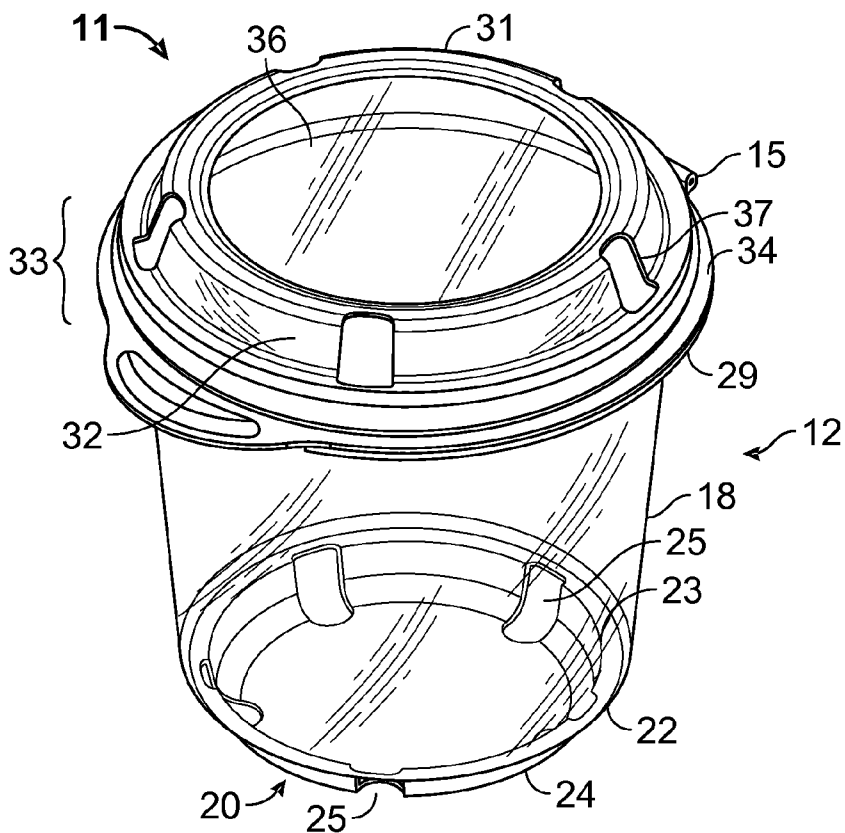


FIG. 1

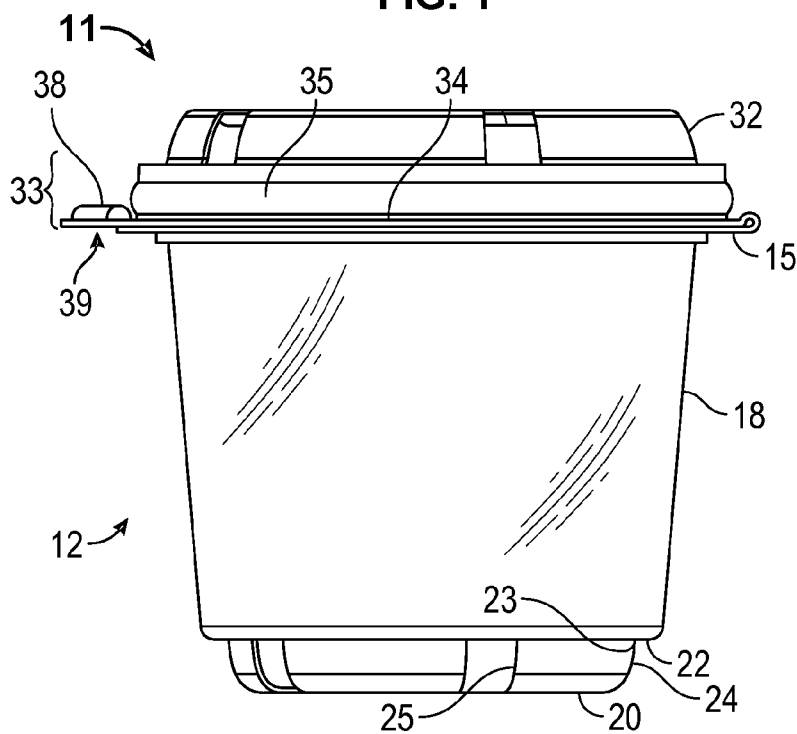


FIG. 2

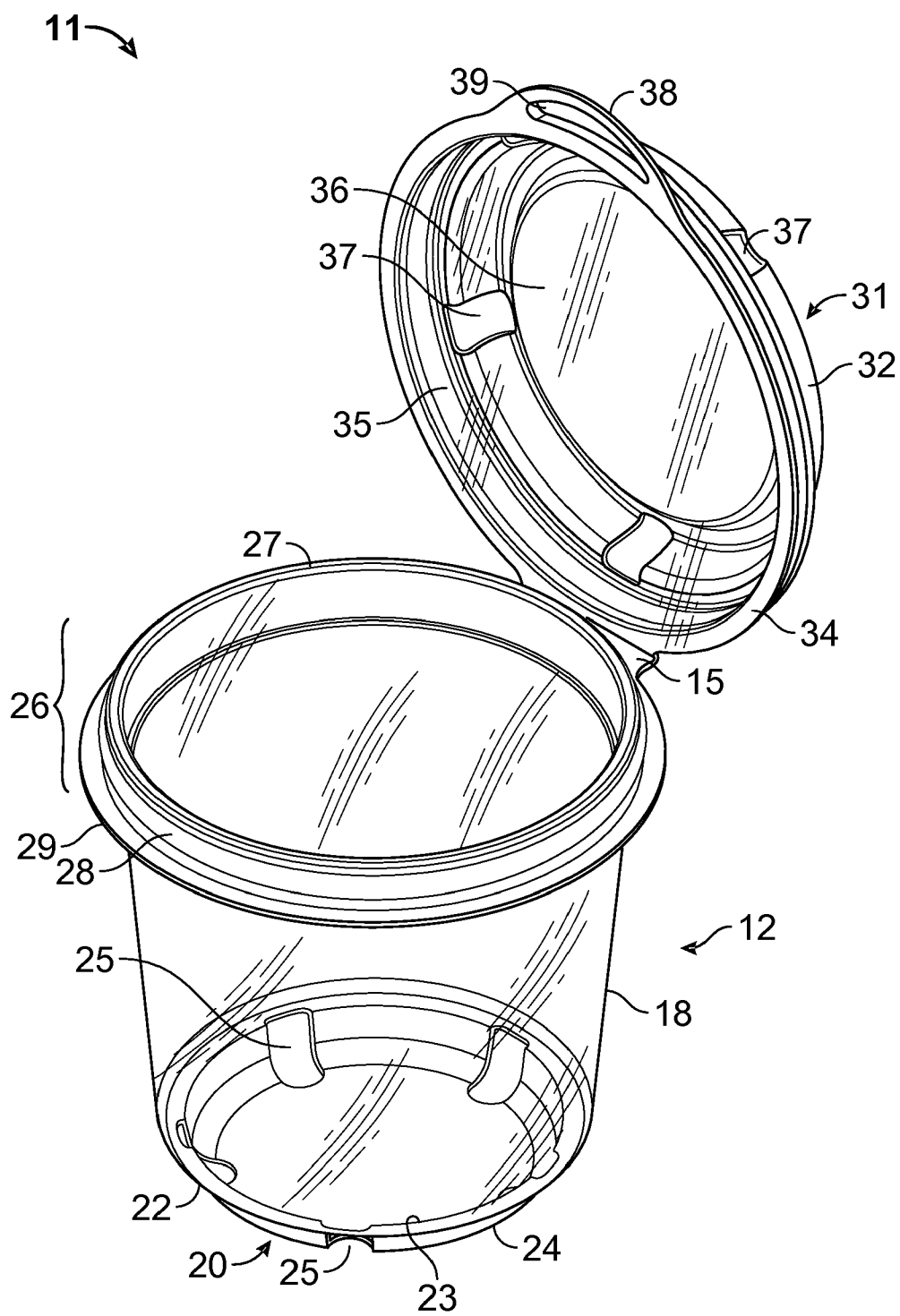


FIG. 3

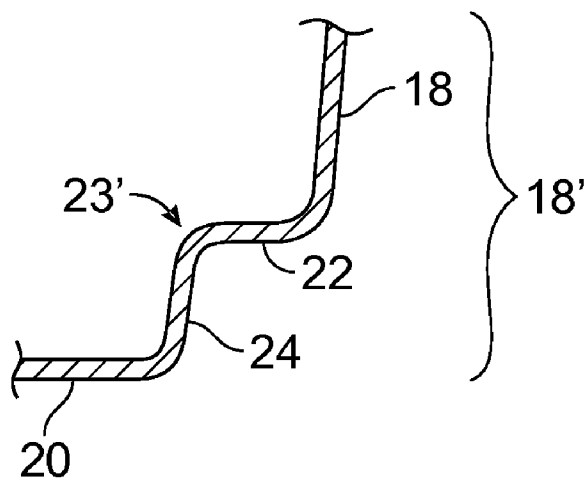


FIG. 4A

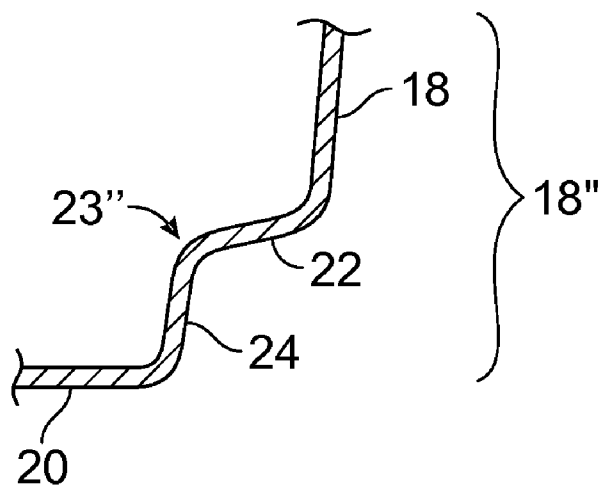


FIG. 4B

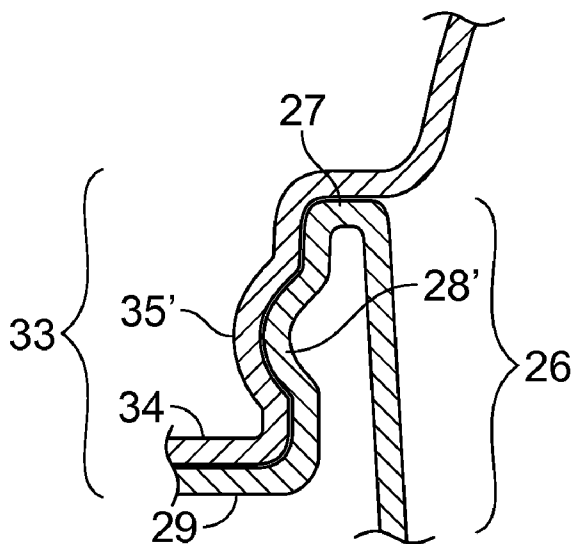


FIG. 4C

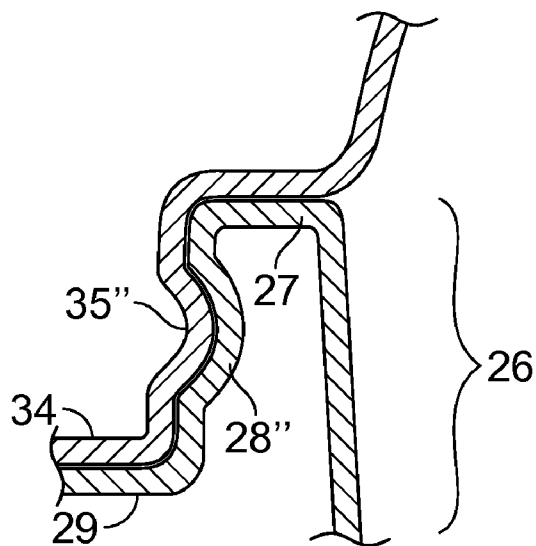


FIG. 4D

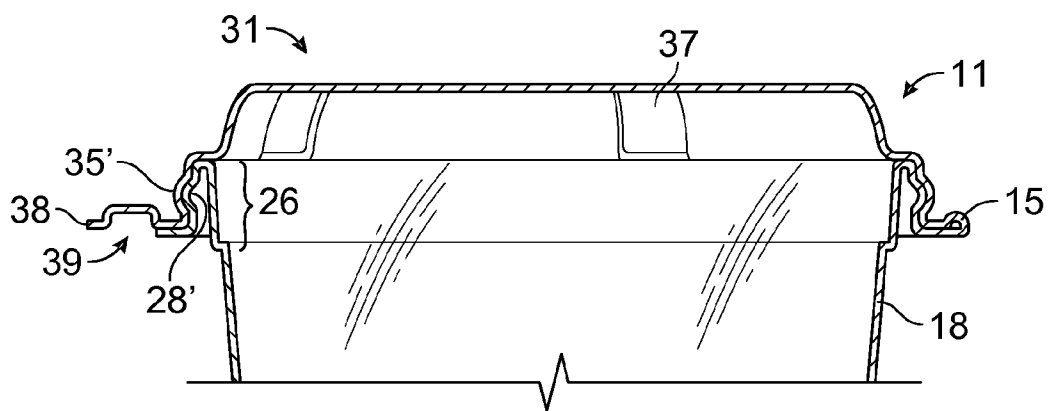


FIG. 4E

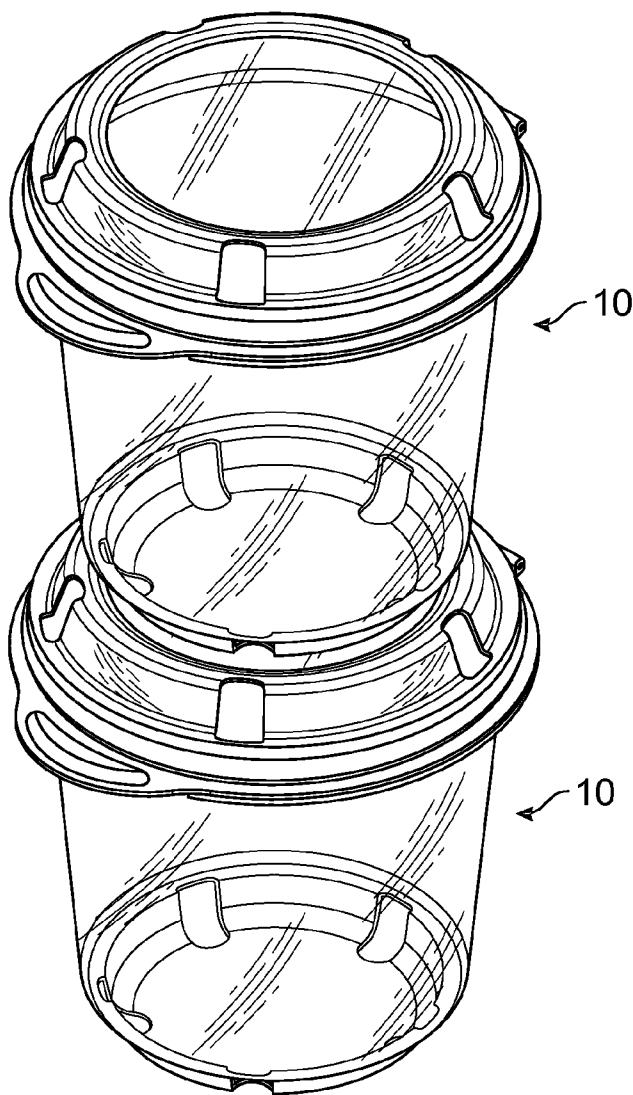


FIG. 5

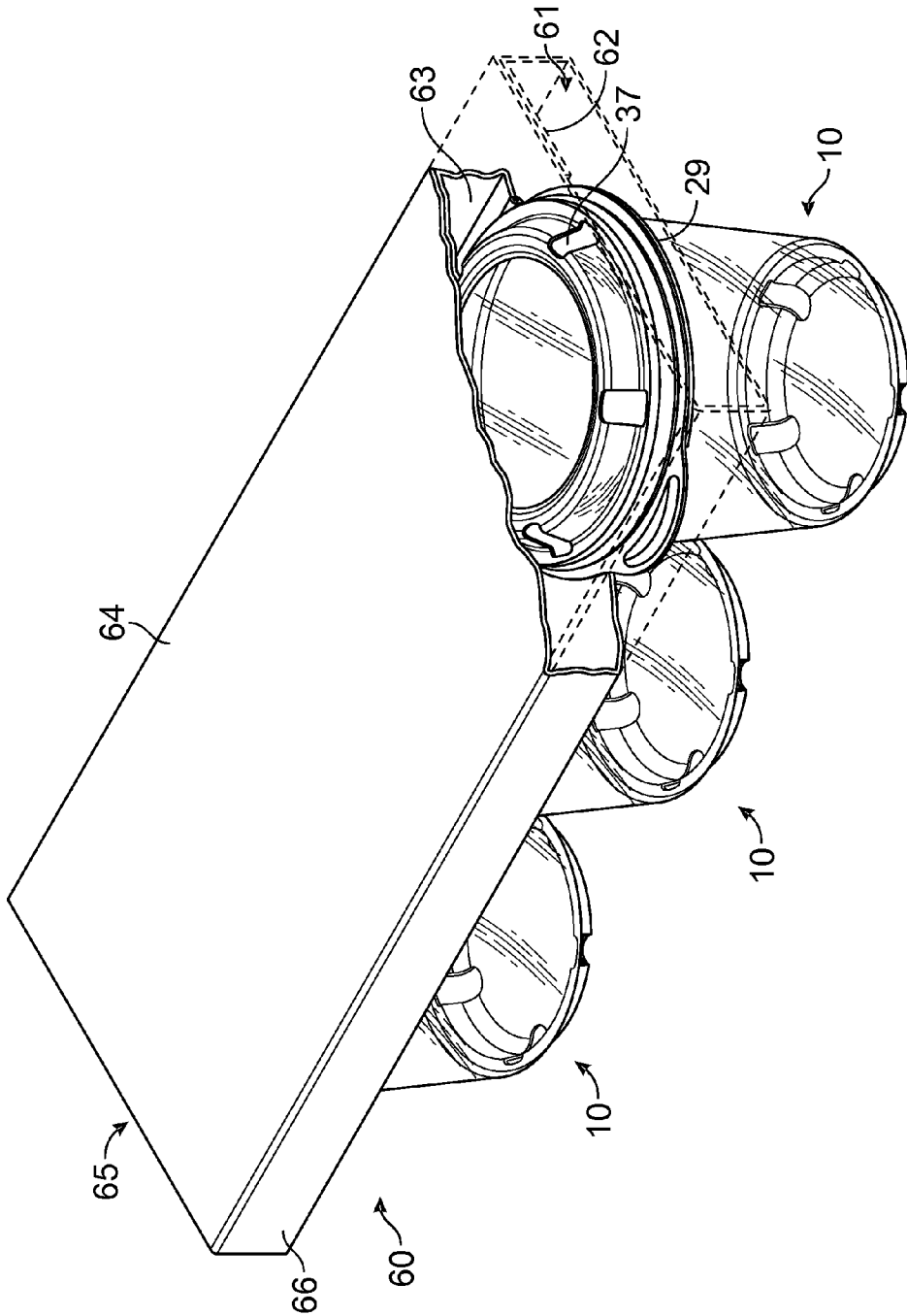


FIG. 6

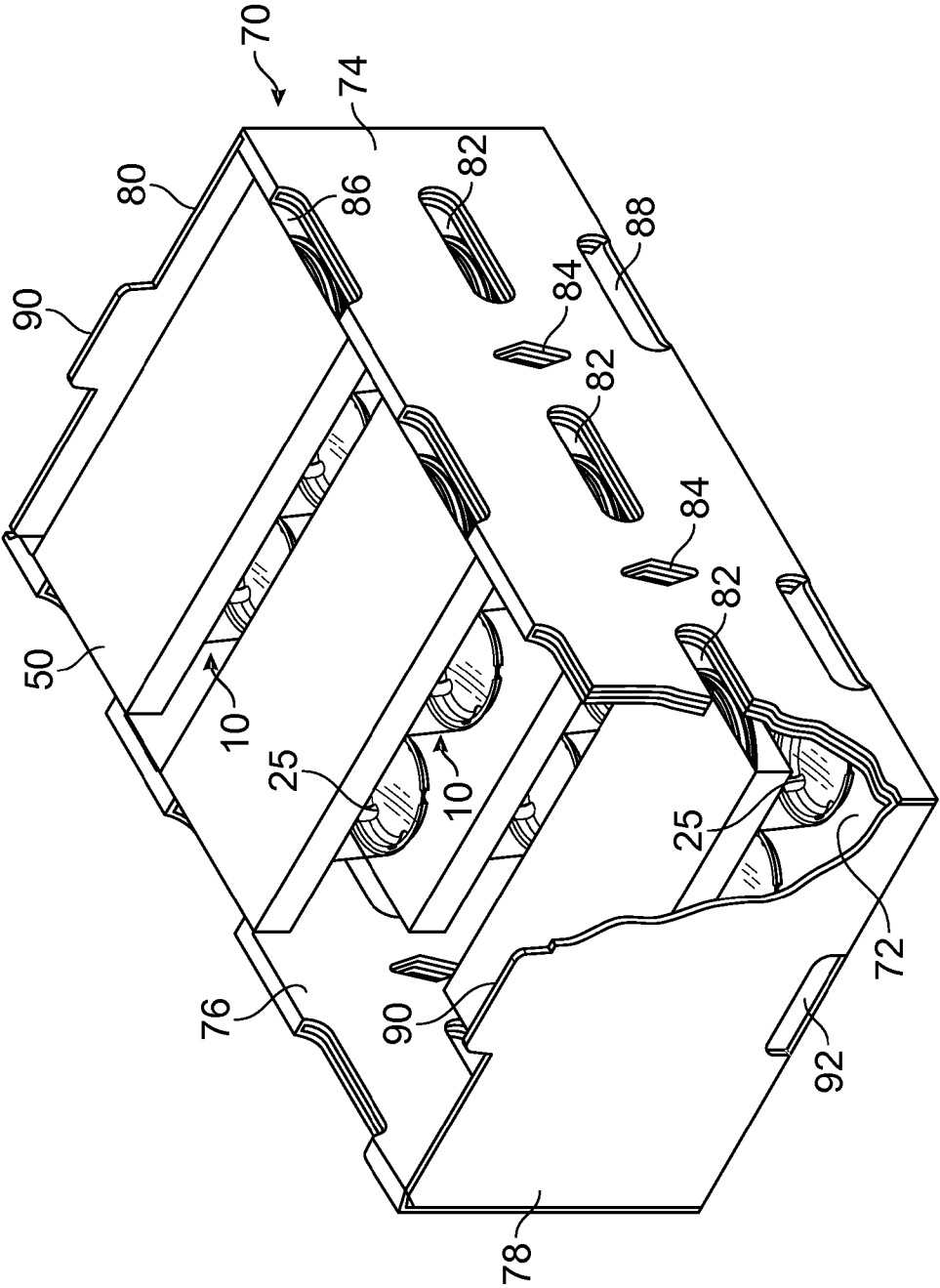


FIG. 7

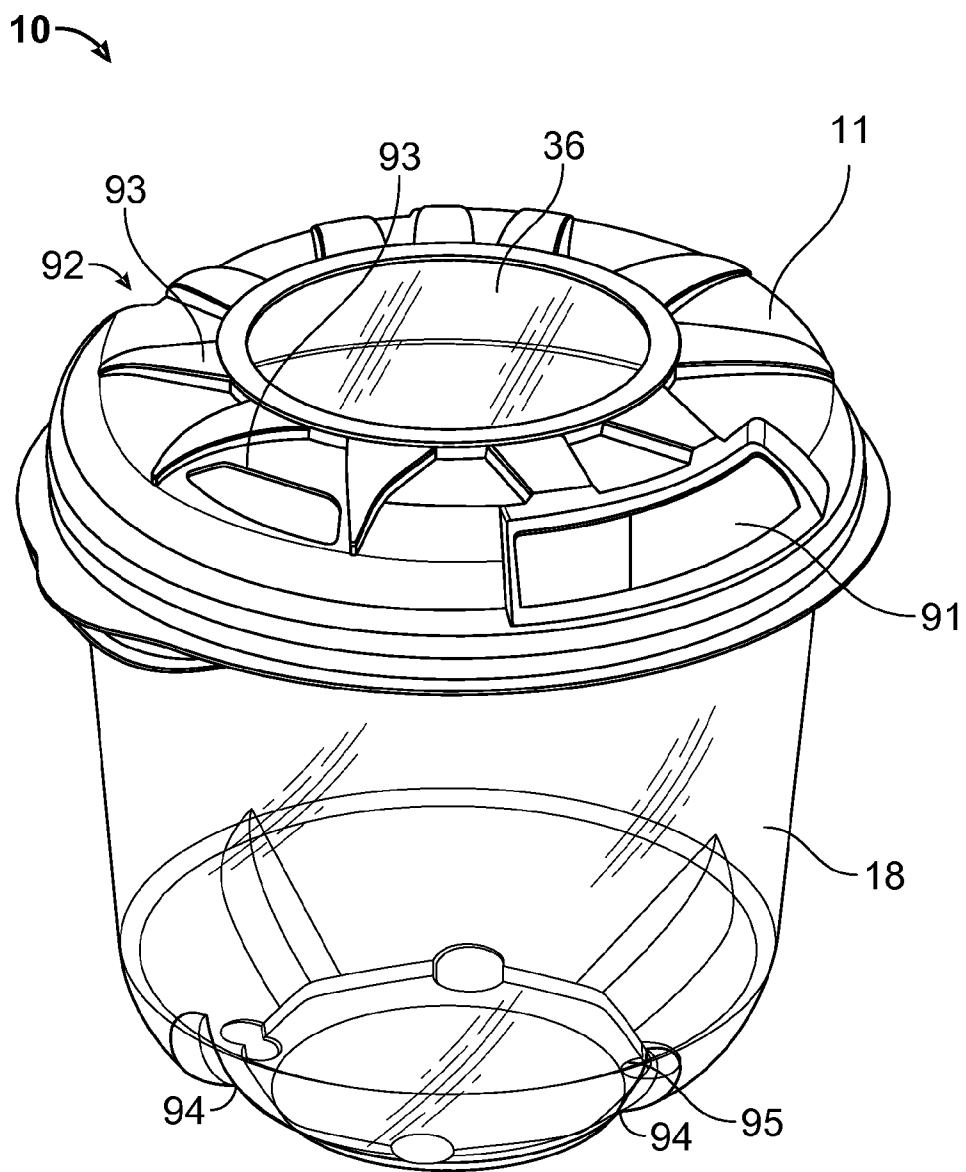


FIG. 8A

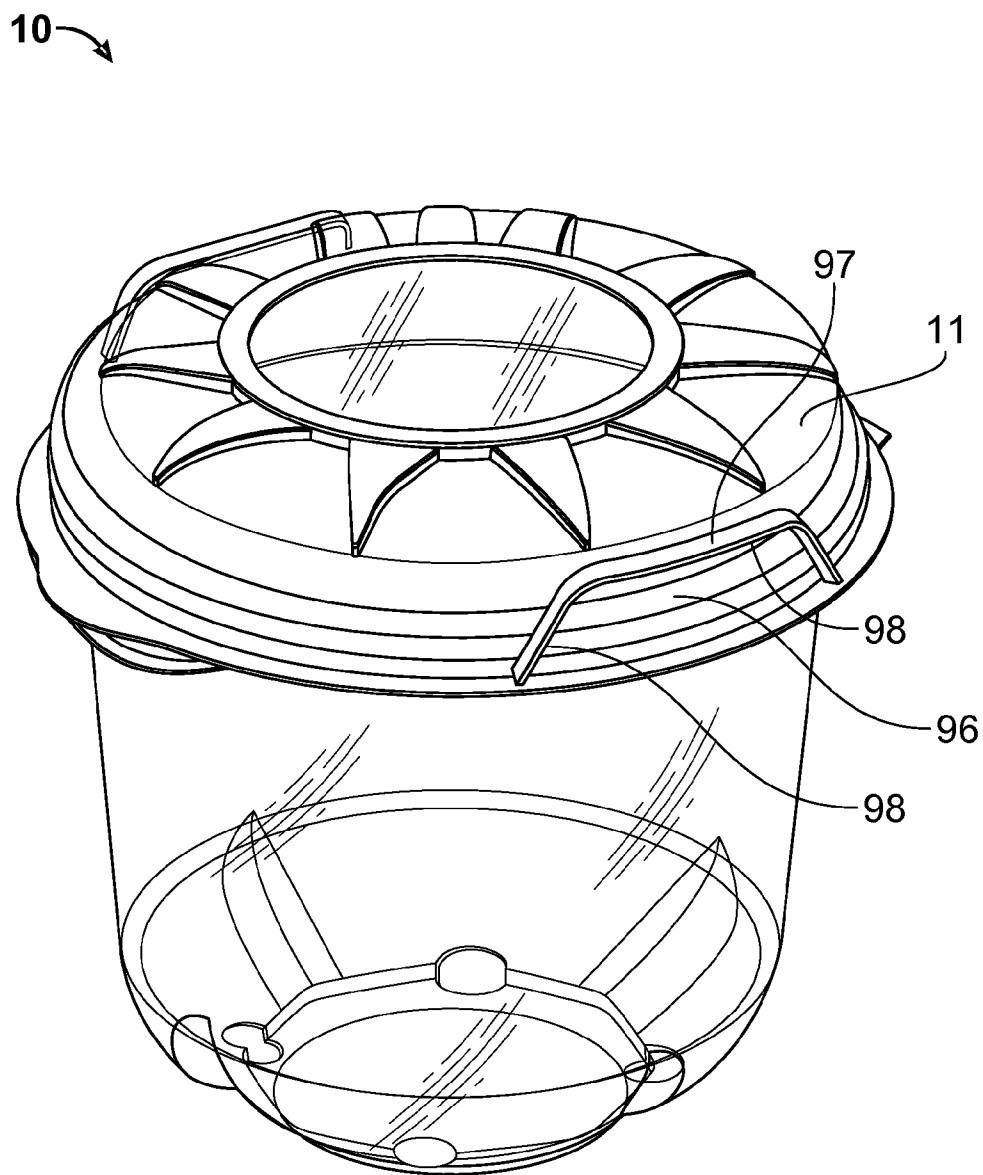


FIG. 8B

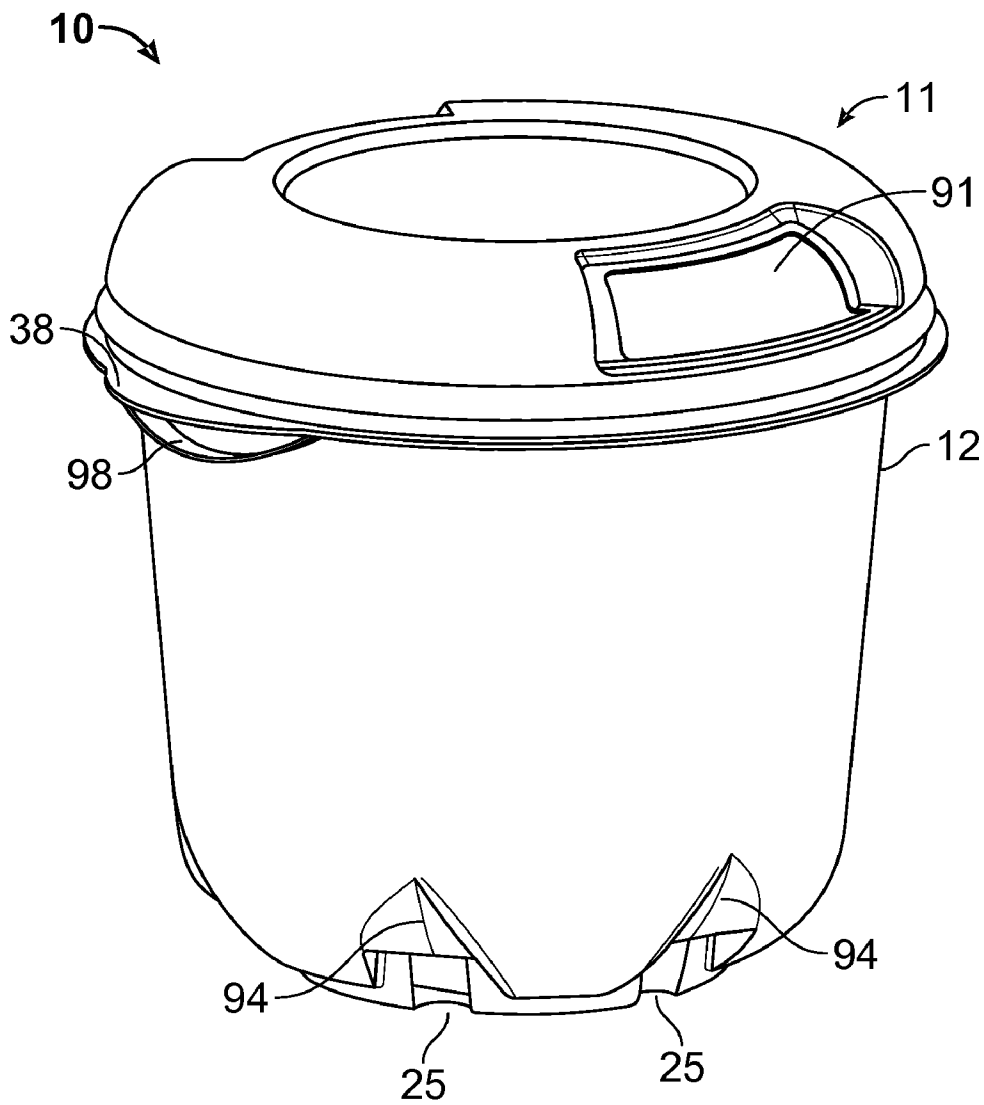


FIG. 8C

PRODUCE AND FRUIT PACKAGING CONTAINERS AND ASSEMBLIES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Patent Application No. 61/496,505, filed on Jun. 13, 2011, which is hereby incorporated by reference for all purposes.

TECHNICAL FIELD

[0002] The present invention relates to an improved method and apparatus used produce and fruit packaging. In particular, aspects of the invention describe novel packaging containers and configurations enabling the improved packing, storage, and shipping of produce and fruit. More particularly, the present invention has shipping management and customer access properties as well as a convenient range of sizes.

BACKGROUND OF THE INVENTION

[0003] In the field of produce and fruit packaging and shipping certain types of fruit containers are used. Such are generally large and attain a regular and generally box-like shape. Although these larger containers are generally well suited for the shipping and transmission of larger quantities of fruit, they are unsuited to smaller amounts of fruit. Additionally, existing containers demonstrate a certain degree of functional limitations when it is desired that such containers be used to provide single serving amounts. Additionally, some types of known containers are vulnerable to a certain amount of movement during shipping that can result in damaging to the delicate fruit and produce contents of the container. Additionally, when existing containers are displayed in stores or when moved through distribution channels they can be mishandled, dropped, or otherwise subject to breakage. In the ordinary course of use, a broken container can spill its contents throughout the immediate area. This spillage can dirty floors and also pose a slipping and tripping risk to people and machines near the spilled product. This poses particular risks to retailers when such containers are dropped and spilled throughout crowded customer environments. This is problematic for a number of reasons, not the least of which is the substantial litigation risks imposed upon a retailer when a spilled and the frequently resulting slippery surface cover consumer areas. It would be helpful to have resilient and yet low cost container and associated packaging systems to prevent such spillage.

[0004] Thus, while existing systems and methods work well for many applications, there is an increasing demand for improved fruit and produce packaging and containers. This disclosure addresses some of those needs.

SUMMARY OF THE INVENTION

[0005] In a first aspect, a packaging assembly comprises a plurality of packaging containers, each container comprising a cup having a cup sidewall, a bottom and a rim about a top opening. The cup top opening has a larger outer dimension than an outer dimension of the cup bottom. The container further comprises a lid, the lid having a top and a lid sidewall with the lid sidewall being configured to receive the rim of the cup and the lid sidewall including at least one vent opening therein. The packaging assembly further includes a carrier

sleeve comprising a base having at least two container holes, with each of the at least two container holes being sized to receive the cup bottom but configured to not receive the outer dimension of the cup top opening, whereby a cup received in one of the at least two holes can be inserted into the hole without the cup top opening passing through the hole. Further, with the lid receiving the rim of the cup, at least one lid vent opening resides above the carrier sleeve base. The container sleeve further includes a top opposite the base spaced from the base a distance sufficient to receive the container lid therebetween. Moreover, containers having elongate lid vents are contemplated as are packaging assemblies suitable for enabling a cooling flow to pass through a first tray opening into a tray, through a first opening in a sleeve, then into the aligned elongate slots of the packaging containers, and then out of a second opening in the sleeve on an opposite side of the sleeve as the first opening and then out of the tray through another tray opening.

[0006] General aspects of the invention include, but are not limited to methods, systems, and apparatus for enabling improved fruit and produce packaging and containers.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The invention and the advantages thereof may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

[0008] FIG. 1 is a perspective view of a packaging container in accordance with the present invention;

[0009] FIG. 2 is a side elevation view of the packaging container of FIG. 1;

[0010] FIG. 3 is a perspective view of an opened packaging container such as shown in FIG. 1;

[0011] FIGS. 4(a) and 4(b) are cross-section views of a bottom portion of two cup embodiments;

[0012] FIGS. 4(c) and 4(d) are cross-section views of an upper portion of a cup and associate portion of a lid as characterized by two packaging container embodiments;

[0013] FIG. 4(e) is a partial cross-section of an upper portion of the packaging container of FIG. 1 showing the lid fully engaged with the cup;

[0014] FIG. 5 is a perspective view of two fruit containers of FIG. 1 stacked one upon the other;

[0015] FIG. 6 is a perspective view of three fruit containers of FIG. 1 being received within a carrier sleeve, with the carrier sleeve shown cut-away in part to reveal the fruit containers;

[0016] FIG. 7 is a perspective view of a number of sleeves containing fruit containers received in a carton in accordance with the present invention; and

[0017] FIGS. 8(a)-8(c) are perspective views of various elongate slot packaging container embodiments.

[0018] In the drawings, like reference numerals are sometimes used to designate like structural elements. It should also be appreciated that the depictions in the figures are diagrammatic and not to scale.

DETAILED DESCRIPTION

[0019] Reference is made to particular embodiments of the invention. Examples of which are illustrated in the accompanying drawings. While the invention will be described in conjunction with particular embodiments, it will be understood that it is not intended to limit the invention to the described embodiments. To contrary, the disclosure is

intended to extend to cover alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

[0020] Unless otherwise indicated, all numbers expressing quantities of ingredients, dimensions reaction conditions and so forth used in the specification and claims are to be understood as being modified in all instances by the term “about”.

[0021] In this application and the claims, the use of the singular includes the plural unless specifically stated otherwise. In addition, use of “or” means both “and” and also, “or”, unless stated otherwise. Moreover, the use of the term “including”, as well as other forms, such as “includes” and “included”, is not limiting. Also, terms such as “element” or “component” encompass both elements and components comprising one unit and elements and components that comprise more than one unit unless specifically stated otherwise.

[0022] FIG. 1 depicts a produce or fruit container 10 shown in perspective view. In this embodiment the fruit container 10 comprises a cup 12 and a lid 11 joined by a flexible hinge 15. Another common embodiment contemplates a lid 11 secured to the cup 12 without a hinge.

[0023] Referring to FIGS. 1-3, the cup 12 comprises a cup sidewall 18 that has a larger outer diameter near its top than near its bottom thereby comprising a frusto-conical shape. The cup 12 can include a round bottom 20. Although depicted and described here as generally round, the lid and bottom can comprise ellipsoid shapes as well as polygons, and other conformations. The circular configuration shown here being but one example of a suitable configuration. The cup bottom and a lower portion of the cup sidewall can comprise a step 22 and a portion of the cup bottom that extends below the cup 12. The details of some aspects of the cup bottom are discussed elsewhere in this patent.

[0024] Embodiments of the containers can have cup openings or vents arranged in the cup. In this embodiment the cup vents 25 are formed in the cup sidewall 18 and the cup bottom 20 below the step 22. The patent contemplates vents 25 at numerous cup locations and is not limited to any of them. In one particular embodiment, it is contemplated that the vent openings 25 can also be made in the step 22. In the depicted embodiment, five evenly spaced cup vent openings 25 are arranged in a spaced apart configuration about the bottom portion of the cup. In the illustrated embodiment, the placement of the openings allows for ready drainage and the escape of substantially all of a fluid introduced into the container 10. In particular, the vent openings 25 enable drainage of water used for rinsing fruit within the container.

[0025] With particular reference to FIG. 3, a top lip portion 26 of the cup 12 is shown and described. The top lip portion 26 is formed at a top opening 30 of the cup 12. The top edge portion of the lip 26 comprises a rim 27. In the embodiment shown, the rim 27 is formed by a top portion of the cup sidewall 18. In this depiction, the lip 26 is folded over an upper portion of the exterior of the cup sidewall 18 with the folded over portion of the cup sidewall 18 being spaced from the unfolded portion of the cup sidewall 18 thus, in one embodiment, forming the lip 26. Accordingly, a circumferential lip 26 is formed in the folded over portion of the cup sidewall 18. At the bottom of the folded over portion of the cup sidewall 18 is a circumferential flange 29. Such a flange 29 can add rigidity to the cup 12 and also provide another supporting surface for a closed lid 11.

[0026] With further reference to FIGS. 1-3, 4(c), 4(d), & 4(e), the lid 11 depicted here is generally circular in configu-

ration. The lid 11 has a top 31 having a generally annular lid side wall 32 and having a lower portion of sidewall defining a lid lower wall 33 (See, FIGS. 1 & 2). As discussed above, the lower wall 33 of the lid can include an engagement feature 35 suited to nesting with a complementary feature of the cup lip.

[0027] Additionally, a lid annular flange 34 extends from lower portion 33 of the lid 12. The flange 34 can be sized to align with the annular flange 26 of the cup 12. Also, the lid 11 can include a finger grip 38 extends from the annular flange 35 opposite the hinge 15. The finger grip 38 can include an indentation 39 configured to facilitate grasping by human fingers. In an embodiment, the hinge portion 15 of the container is configured such that it is arranged on a tab that extends away from the cup 12, the lid lower sidewall 32, and the engagement features 28, 35. In some embodiments, the hinge is an extension of the ribs 29, 34. The hinge is simple folded over to achieve closure.

[0028] Also, the top of the lid 11 can include top recess 36. The lid recess 36 can be sized to receive a bottom 20 of a container as best illustrated in FIG. 5. In this way, the engagement of a top recess 36 of a first container with the bottom 20 of a stacked second container provides a degree of stability to lateral movement that aids in alignment and stacking. FIG. 4(c) shows one such embodiment configured such that the engagement feature 35 is arranged with a groove 35' arranged to engage the outward facing protrusion 28' of the cup 12.

[0029] In describing some container embodiments enabling a secure closure of lid with cup reference to FIGS. 4(c) and 4(d) is made. The depicted embodiments comprise engagement features proximal to the lip 26 of the cup. A lip engagement feature 28 is configured to engage with a complementary engagement feature 35 of the cup lid 12 to secure the lid 11 with the cup 12 in a closed configuration.

[0030] In one example embodiment, as shown in FIG. 4(c), the lip engagement feature 28 comprises an outward facing protrusion 28' arranged in a folded over portion of the cup and configured to engage a complementary groove 35' or other suitable complementary feature in the lid 11. In this embodiment, the outward facing protrusion 28' comprises an annular protrusion that circumscribes the entire outer circumference of the cup lip 26.

[0031] In another embodiment, the outward facing protrusion 28' can comprise a stacked plurality a number of annular protrusions arranged one above the other each circumscribing the outer circumference of the cup lip 26 one above the other. These protrusions are further configured to engage with a complementary number of annular grooves 35 of the lid.

[0032] In another embodiment, the engagement feature comprises a number of outward facing protrusions 28' arranged about an outer circumference of the cup lip 26 arranged to engage a complementary set of recesses 35' in the lid. In one implementation spaced apart protrusions 28' are spaced equidistant from each other as they are arranged radially about the outer circumference of the cup lip 26. These protrusions are further configured to engage with complementary depression(s) or groove(s) 35' of the lid to secure the cup 12 and lid 11 in closed configuration. It is also worth pointing out that embodiments of the invention can include circumferential ribs (29, 34) that can extend about the edge of the lid 11 and the cup 12 to enable added rigidity and/or increase ease of manufacturability and loading.

[0033] The view of FIG. 4(e) helps define a positional context for the lip 26 and the associated features thereof. An

outward facing protrusion **28'** is configured to engage a complementary groove **35'** or other indented feature in the lid **11**. In this embodiment, the outward facing protrusion **28'** comprises an annular protrusion that circumscribes the outer circumference of the cup lip **26**. Also shown in this view are the upper lid vents **37** and the top of the lid. As is the finger grip **38** and an associated depression **39** formed therein. Opposite the finger grip **38** is the hinge **15**.

[0034] Referring now to FIG. **4(d)**, another embodiment of the engagement feature **28** comprises an inward groove or indentation **28''** on the cup **12**. The groove **28''** is configured to engage a complementary protrusion **35''** or other protruding feature in the lid **11** to help secure a closed lid. The feature **28''** comprises a recess or groove with its opening facing outward with the depressed portion extending inward toward the center of the cup **12**. Here, the engagement feature **28''** comprises an annular groove that circumscribes the outer circumference of the cup lip **26**. In another embodiment, the outward facing indentation **28''** can comprise a number of annular indentations arranged, one above the other, each circumscribing the outer circumference of the cup lip **26**. These indentations **28''** engage with complementary annular inward annular protrusions **35''** of the lid. In another embodiment, the feature **28''** comprises a number of spaced apart indentations arranged about the outer circumference of the cup lip **26**. In one implementation, the spaced apart indentations are spaced equidistant from each other as they are arranged radially about the outer circumference of the cup lip **26**. These indentations are further configured to engage with complementary protrusions **35''** of the lid to secure the cup **12** and lid **11** in closed configuration. As with the embodiment described in FIG. **4(c)** above, some embodiments can include circumferential ribs (**29**, **34**) that can extend about the edge of the lid **11** and the cup **12** to enable added rigidity and/or increase ease of manufacturability and loading.

[0035] It should be noted that in alternative embodiments, the lid can be configured such that a portion of the lid extends inside the opening of the cup to engage an inner surface of the cup.

[0036] Additionally, in many embodiments, a plurality of circumferentially spaced lid vent holes **37** can be provided in the lid sidewall **32** to assist in ventilation of the contents of the container. In the illustrated embodiment, five evenly spaced vent holes **37** are provided. Further embodiments of this approach will be discussed elsewhere in this specification.

[0037] In use, a hinged lid can be readily fitted to the cup **12** by pivoting it down about the flexible hinge **15** and pressing on the lid **12** top which causes the engagement features (e.g., **28**, **35**) to secure the cup **12** and lid **11** in a closed configuration. A user may then quickly and easily open the lid **11** simply by grasping the finger grip **39** and lifting it upward.

[0038] Some embodiments of the container are configured such that the bottom portion of the cup can have specialized can include a step and a portion that extends downward below the step or contains a recess having an outer edge defined by the step.

[0039] FIGS. **4(a)** and **4(b)** can be used to illustrate a cup embodiment having a particular type of bottom configuration. In this embodiment the bottom of one container can be nested into the top of a container arranged below it. For example, a cup sidewall **18** can include a sidewall lower portion **18'** proximal to the cup bottom **20**. The sidewall lower portion **18'** can include an annular circumferential step **22** that extends around the circumference of the cup **12**. In one implementa-

tion, the cup sidewall **18** comprises an annular step **22** comprising a portion of the cup sidewall **18** near the cup bottom **20**. The step **22** defines a generally circular narrowed portion of the cup **12** that has a diameter that is less than a diameter of the lower portion **18'** of the sidewall immediately above the step **22**. As such, the step defines a lower cup rim **24** having a lesser diameter than the sidewall lower portion **18'** diameter immediately above the step **22**.

[0040] The annular step **22** and lower cup rim **24** can be sized and configured to nest into a recess formed in the lid of a container arranged below the lower cup rim such as depicted in FIG. **5**.

[0041] Additionally, annular steps **22** can be sized and configured to prevent fruit contained in the cup **12** from becoming wedged between the cup sidewall lower portion **18'** and the circular bottom **20** of the cup **12**. Additionally, with added reference to FIGS. **4(a)** and **4(b)**, the step **22** includes a step edge **23** arranged at the interface between the step **22** and the lower cup rim **24**. In one embodiment (that of FIG. **4(a)**), the step edge **23** forms a relatively sharp edge **23'** that can ease manufacturing. Additionally, another embodiment (that of FIG. **4(b)**) is configured such that the step edge **23''** has a more rounded configuration that is less likely to bruise, cut, or otherwise damage a produce or fruit products located inside the cup **12**.

[0042] In one particular embodiment of a container, the cup sidewall has a circular cross-section and the cup can be dimensioned to be received bottom first into a conventional cup holder. For example, an automobile cup holder sized to hold a standard 12 ounce soda can having a diameter of about 2½ inch. In another embodiment the cup sidewall may be embossed. The embossed sidewall may include indicia such as a trademark or other design features. In addition or alternatively, the embossed sidewall may provide an easily gripped or held surface. It should be understood that both larger and smaller sized containers are contemplated. Two ounce cups and 8 ounce cups are also specifically contemplated by this disclosure.

[0043] The container **10** is preferably integrally blow molded in a single operation from a suitable thermoplastic such as polyethylene terephthalate (PET). Other suitable materials may include polyethylene terephthalate glycol-modified (PETG) and recycled polyethylene terephthalate (RPET). For example, in one embodiment, the container **10** is formed of a PET material such as Copolyester 9921, available from Eastman Kodak. In addition to the above, alternative materials include, but are not limited to, various polymeric and monomeric plastics including, but not limited to, styrenes, polyethylenes (including HDPE and LPDE), polyesters, and polyurethanes; metals and foils thereof; waterproofed paper products may also be employed. Alternative manufacturing technologies include, but are not limited to, thermocasting; casting, including die-casting; thermosetting; extrusion; sintering; lamination; the use of built-up structures as well as many other processes well known to those of ordinary skill in the art.

[0044] FIG. **6** illustrates a carrier sleeve **60** receiving a number of fruit containers **10** as part of a packaging assembly. In this embodiment, the carrier sleeve **60** defines a plenum having open ends **61** and a plurality of containers arranged such that that top portions of the containers are arranged within the plenum.

[0045] The sleeve **60** includes a base **67** having three container holes, each of which is sized to receive the cup bottom

but of an inner diameter less than an outer diameter of a top portion of the cup. Thus, a cup received in one of the holes can be inserted into the hole without the cup passing entirely through the hole or opening the container lid. As mentioned above and illustrated in FIG. 6, the containers are arranged in the openings of the carrier base 67. The holes can be sized to catch the rim at the top of the cup 10 to prevent it from dropping through the base. Alternatively, they can be sized such that the bottom of the cup passes through the opening but the diameter of the opening is less than that of the container sidewall thus the catching the container on the sidewall preventing the container from passing through the sleeve.

[0046] The carrier sleeve 60 further includes a top 64 opposite the base. The top 64 spaced from the base a distance sufficient to receive the container lid 11 therebetween. The carrier sleeve 60 further includes sidewalls 66, 63 and open ends 61, 65. In the illustrated embodiment, the carrier sleeve 60 is formed from a relatively stiff sheet material, such as cardboard, which is folded in the manner illustrated in FIG. 6 and can include an overlap portion joined by an adhesive or any other suitable means. In this manner, the carrier sleeve 60 defines a plenum about the lid vents 37. For the sake of further clarity, in one embodiment, the open ends 61, 65 of the sleeve 60 can obtain an elongate shape. In one embodiment, the elongate open ends 61, 65 have a substantially horizontal major axis running substantially parallel to the wider portion of the open ends 61, 65. Moreover, the open ends 61, 65 also have a substantially vertical minor axis associated with the narrower portion of the open ends 61, 65. In general, the major axis is substantially parallel to the horizontal plane and the minor axis is substantially parallel to a vertical plane of the sleeve 60. Although the invention is not limited to such embodiments, this configuration can have advantages when container embodiments of a type such as described below with respect to FIGS. 8(a)-8(c). In such embodiments, a major axis of the elongate slot 91 of the container 10 can be substantially aligned with a major axis of the open ends 61, 65 of a carrier sleeve 60 when the containers 10 are arranged in the sleeve 60.

[0047] A tray 70 is shown in FIG. 7 receiving a number of carrier sleeves 60 containing fruit containers 10, which further comprises a packaging assembly. The tray 70 includes a bottom 72, front and back walls 74, 76 and sidewalls 78, 80. The front and back walls 74, 76 are spaced a distance sufficient to receive a carrier sleeve 60 containing fruit containers 10 with the open ends abutting the front and back walls 74, 76. Three lower elongate holes 82 with diamond shaped holes 84 therebetween are provided in the front and back walls 74, 76. The holes 82, 84 are configured to align with the open ends 61, 65 of a carrier sleeve 60 with the fruit containers 10 sitting on the carton bottom 72 to communicate outside air with the open ends of a carrier sleeve 60 received therebetween, as illustrated in FIG. 7. In the illustrated embodiment, the holes 82, 84 align in part with the open ends 61, 65 and with the top 64 of the carrier sleeves 60 intermediate the openings 82, 84 to allow for circulation of air from the holes 82, 84 over the carrier sleeve top 64. This will allow air to circulate into cup vent holes 25 of stacked carrier sleeves containing fruit containers. The tray 70 further includes a number of elongate upper carton openings 86 which are configured to align with the open ends 61, 65 of a carrier sleeve 60 containing fruit containers 10 stacked upon a lower carrier sleeve 60 containing fruit containers 10. These upper carton openings 86 there-

fore communicate outside air with the open ends 61, 65 of the stacked carrier sleeves 60 received between the carton sidewalls 78, 80.

[0048] The tray 70 preferably has a sufficient distance between the carton sidewalls 78, 80 to snugly receive a select number of side by side carrier sleeves containing fruit containers, for example, four carrier sleeves containing fruit containers. "Snuggly receive" means adjacent sleeves abut to prevent lateral shifting during shipping and handling. Regardless, the holes 82, 84 and 86 should be configured to provide communication of outside air with the open ends of the carrier sleeves as illustrated in FIG. 7 and as described above.

[0049] The tray 70 may further include bottom holes 88 to allow air to circulate to the cup vent openings 25. The tray 70 may further include locking tabs 90 configured to be received in the alignment holes 92 (one shown in FIG. 7) when cartons are stacked one upon another.

[0050] As should be apparent, the tray 70 is configured to provide front and back holes which communicate outside air with the open ends 61, 65 of the carrier sleeves 60 which in turn allows outside air to circulate into the lid vent holes 37. In addition, the front and back holes are configured to allow for circulation of air to the cup vent openings 25. This packaging assembly allows circulation of air to help dissipate moisture, thus extending the usable life of fruit received in the containers by helping prevent formation of molds and rapid decay of the contained fruit. The packing assembly further protects the fruit contained therein from bruising and crushing during transport.

[0051] This patent also describes other container embodiments that may have improved cooling properties when in storage or when cooled air is passed into the containers 10. In one such embodiment, depicted in FIG. 8(a), the lid 11 is further augmented by the presence of a large elongate cooling slot 91 matched by another complementary cooling slot 92 arranged on the other side of the lid 11 to enable a cooling air flow to pass through the upper portions of the contents. Additionally, the lid 11 can be embossed or otherwise marked with designs, decoration, trademarks, logos, or other desired indicia. Additionally, bottom 20 and/or the step portions can have a bottom aperture 95 enabling cooling and/or fluid drainage. In one approach the apertures 95 are generally circular and do not extend appreciably up the sidewall 18. Also, the lower portion of the cup sidewall 18 can include further indented features 94. In this case, the indented features 94 can define an improved and more manufacturable surface for the forming of the apertures 95. In one example, a region between a pair of such features 94 can be used to define a suitable surface for the formation of aperture 95 (or vents such as 25). For the sake of clarity, in one embodiment, the elongate cooling slot has a substantially horizontal major axis running substantially parallel to the wider portion of the elongate slot 91. The slot 91 has a substantially vertical minor axis associated with the narrower portion of the elongate slot 91. In general, the major axis is substantially parallel to the horizontal portion of the cup rim (e.g., a rim 27 similar to that FIG. 1). Other slot orientations can be employed, however, this is the preferred orientation.

[0052] With returning reference to the embodiment shown in FIG. 6, when the containers having elongate cooling slots are used, the elongate cooling slots 91 are aligned with the open ends 61, 65 of the carrier sleeve 60. Thus an air flow through the sleeve 60 passes in through a first open end 61 and

then through the aligned elongate cooling slots **91** of the containers **10** and then out by the second open end of the sleeve **60**.

[0053] In another embodiment such as shown in FIG. **8(b)**, the lid **11** comprises another large elongate cooling slot **96** (which can be paired with another elongate slot **96** arranged on the opposite side of the lid **11** to facilitate a cooling air flow through the container). Additionally, in this embodiment, the lid **11** includes a cooling slot flange **97** arranged proximal to the slot **96**. And advantage of this configuration is that the bottom surfaces **98** of the flange **97** comprise the lower edge of the lid **11** in the regions of the lid **11** defined by the slot **96**. Accordingly, punching out of an elongate slot is not required, thereby simplifying manufacturing.

[0054] FIG. **8(c)** depicts another embodiment of the container **10** showing some additional features. In the depicted embodiment, the container cup **12** includes a bulge **98** proximal to a finger grip **38**. Such a bulge **98** can further support the grip **38** during opening and closing. Also, the cup **12** can include further indented features **94** that are arranged in closely spaced pairs about the bottom of the cup **12** to provide strength in regions having cup openings or vents **25**. In particular, the vents **25** can be formed at the bottom areas of the cup **12** between the indented features **94**. As with earlier embodiments, elongate slots **91** can be arranged in the container **11**.

[0055] Moreover, these lid mounted slots can be used to enhance the cooling attributes in entire packaging systems. For example, referring to previously discussed FIG. **7** wherein the tray **70** is with a number of carrier sleeves **60** containing fruit containers **10** arranged inside the tray **70**. The sleeves **60** are arranged such that the open ends **61**, **65** of the sleeve are aligned with lower elongate holes **82** and with the cutouts **86** such that a cooling airflow can pass into the sleeves through **82**, **86**. Accordingly, the holes and cutouts **82**, **86** are configured to align with the open ends **61**, **65** of a carrier sleeve **60** with the fruit containers **10** stacked one another in the tray **70**. Additionally, the elongate slots **91** of the containers **10** shown in FIG. **8(a)** and **8(b)** (as well as other suitably configured containers) are arranged in registry with the sleeve ends **61**, **65** so that air flowing through the ends **61**, **65** passes through the elongate slots **91** of the containers **10**. Thus, using the elongate openings, cooling air can pass into the tray **70** through the holes and cutouts **82**, **86**, through the sleeve ends **61**, **65**, through the elongate slots **91** of the container lids, and out through the through the holes and cutouts **82**, **86** at the opposite end of the tray. Additionally, in some embodiments, air flow can pass through the intermediate holes **82**, **84** enabling further cooling flow within the tray **70**.

[0056] Various embodiments of the disclosure could also include permutations of the various elements recited in the claims as if each dependent claim was a multiple dependent claim incorporating the limitations of each of the preceding dependent claims as well as the independent claims. Such permutations are expressly within the scope of this disclosure.

[0057] The foregoing description, for purposes of explanation, used specific nomenclature to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that the specific details are not required in order to practice the invention. Thus, the foregoing descriptions of specific embodiments of the present invention are presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to

the precise forms disclosed. It will be apparent to one of ordinary skill in the art that many modifications and variations are possible in view of the above teachings.

[0058] The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the following claims and their equivalents.

What is claimed is:

1. A packaging container comprising:

a cup, the cup comprising a cup sidewall, a bottom, and a rim about an annular top opening;

a lid joined to the cup by a flexible hinge, the lid having lid side wall, the lid sidewall being configured to receive the rim wherein the lid further comprises a finger grip extending from and edge of the cup sidewall; and

a first engagement feature configured to nest with a second complementary engagement feature between the cup sidewall proximate the rim and the lid sidewall near a distal edge of the lid while the lid is in a closed configuration.

2. A packaging container as recited in claim **1** wherein the lid includes an elongate ventilation slot arranged on the lid.

3. A packaging container as recited in claim **2** wherein the elongate slot includes a major axis and a minor axis, a longer dimension of the slot extends coextensively with the major axis with a short dimension of the slot extending coextensively along the minor axis, the slot arranged such that the major axis is generally parallel with an upper surface of the cup rim.

4. A packaging container as recited in claim **1** wherein the cup is sized such that it can be arranged snugly in an automobile cup holder.

5. A packaging container as recited in claim **1** wherein the first engagement feature comprises an annular groove that extends around an inner surface of the lid sidewall and the second complementary engagement feature comprises an annular protrusion that extends around the rim arranged such that when the lid is closed the annular protrusion is nested with the annular groove to assist in maintaining the lid in a closed configuration.

6. A packaging container as recited in claim **1** wherein the first engagement feature comprises an annular protrusion that extends around an inner surface of the lid sidewall and the second complementary engagement feature comprises an annular protrusion that extends around the rim arranged such that when the lid is closed the annular protrusion is nested with the annular groove to assist in maintaining the lid in a closed configuration.

7. A packaging container as recited in claim **1** wherein the cup has a bottom and wherein the bottom has formed therein at least one ventilation aperture suitable for enabling at least one of fluid drainage out the bottom or ventilation of the contents of the container.

8. A packaging container as recited in claim **7** wherein indentations are formed in the cup arranged such that a ventilation aperture is arranged between a pair of said indentations.

9. A packaging container as recited in claim **1** wherein the cup has a protruding bottom that extends downward from a lower portion of the cup such that a step is formed between the cup sidewall and the protruding bottom.

10. A packaging container as recited in claim 1 wherein the cup has a protruding bottom that extends downward from a lower portion of the cup such that a step is formed between the cup sidewall and the protruding bottom.

11. A packaging container as recited in claim 10 wherein an edge of the step has a rounded contour suitable for reducing damage to produce items contained within the container.

12. A packaging assembly comprising:

a plurality of packaging containers, each container comprising,

a cup, the cup comprising a cup sidewall, a bottom and a rim about a top opening of the cup, an upper portion of the cup having a larger outer dimension than an outer dimension of the cup bottom, the container further comprising,

a lid, the lid having a top and a sidewall, the lid sidewall being configured to receive the rim of the cup and the lid sidewall including at least one at least one vent opening therein; and

a carrier sleeve, the carrier sleeve comprising a base having at least two container holes, each of the at least two container holes configured to receive the cup bottom but not the outer dimension of the cup top opening, whereby a cup received in one of the at least two holes can be inserted into the hole without the cup top opening passing through the hole and with the lid receiving the rim of the cup the at least one lid vent opening resides above the carrier sleeve base, the carrier sleeve further comprising a top opposite the base spaced from the base a distance sufficient to receive the container lid therebetween.

13. A packaging assembly comprising,

a carrier sleeve having a base, a top and two sidewalls arranged between the top and base to form a plenum with a space defined by the base, the top and the two sidewalls, the sleeve having a pair of open ends arranged at opposite sides of the sleeve, the base comprising at least two container holes arranged between the two open ends; and

a plurality of packaging containers arranged in the container holes of the sleeve.

14. A packaging assembly as recited in claim 13, wherein, the plurality of packaging containers are configured such that each container comprises,

a cup, the cup comprising a cup sidewall, a bottom and a rim about a top opening of the cup, the container further comprising,

a lid, the lid having a top and a sidewall, the lid sidewall being configured to receive the rim of the cup and the lid sidewall including at least one at least one vent opening therein;

the cups are arranged in the container holes of the carrier sleeve; and

wherein the at least two container holes of the base are configured to receive the cup bottom such that a cup received in a corresponding hole enables the cup to be inserted into the hole without the lid passing through the hole and with the lid receiving the rim of the cup such that said at least one lid vent opening resides above the carrier sleeve base.

15. The packaging assembly recited in claim 14, wherein, the cup of the packaging containers are configured such that an upper portion of the cup has a larger outer dimension than an outer dimension of the cup bottom;

and

the container holes of the carrier sleeve are configured to receive the cup bottom but not the larger outer dimension of the upper portion of the cup such that when the cup is received into the hole, the lid does not pass through the hole.

16. The packaging assembly recited in claim 15, wherein the lid of the cup is arranged within the plenum of the carrier sleeve.

17. The packaging assembly recited in claim 16, further comprising a packaging tray, the tray comprising a bottom and first, second, third, and fourth sidewalls with

the first and third sidewalls arranged on opposite sides from one another,

the first and third sides having elongate slots formed therein, the sleeve arranged in the tray such that the open ends of the sleeve are substantially aligned with the elongate slots of the tray enabling an airflow to pass through the plenum of the sleeve.

18. The packaging assembly recited in claim 17, wherein at least two sleeves are arranged side by side in the tray, the first and third sides having supplementary holes formed therein, said holes arranged to enable another air flow through the tray outside the plenums and between sleeves.

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