THERMALLY INSULATED CONTAINER

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ABSTRACT

A thermally insulative beverage container is provided. The container has an inner cup with a side wall and a bottom portion defining a bottom closure. The container further has an insulative layer circumferentially disposed around and adhered to the side wall of the inner cup. The insulative layer is fabricated from cork. A method for insulating a beverage container using a cork material is also provided.
THERMALLY INSULATED CONTAINER

REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation-in-part of, and claims priority to, a pending patent application Ser. No. 11/375,732. That parent application was filed on Mar. 15, 2006, and is entitled “Thermally Insulative Sleeve.” The parent application is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention generally relates to insulated containers. More particularly, the invention relates to a thermally insulated container that utilizes a cork-based, cellulosic material.

[0004] 2. Description of the Related Art

[0005] It is known to provide a thermally insulative sleeve around a container. The sleeve insulates a user’s hand from the hot or cold contents within the container. The sleeve also aids in maintaining the contents at a more constant temperature.

[0006] The sleeve is removable placed over the exterior diameter of a beverage container. The sleeve enables a consumer to grasp the beverage container even while the contents are at a high temperature. Such sleeves are most commonly used at coffee bars where paper-based containers are used to serve gourmet coffee, tea or cocoa beverages at hot temperatures.

[0007] U.S. Pat. No. 5,205,473 provides an example of a sleeve for a beverage container. The ‘473 patent issued to David W. Coffin, Sr. of Fayetteville, N.Y. in 1993. This patent is entitled “Recyclable Corrugated Beverage Container and Holder.” The ‘473 patent discloses a “recyclable, insulating beverage container holder” that utilizes a “corrugated tubular member.” The tubular member is fabricated from a cellulosic material, and offers a series of flutes for containing insulating air. A liner is adhesively adhered along the radially exterior surface of the sleeve to support the flutes and to aid the consumer in holding the beverage.

[0008] Column 2 of the ‘473 patent describes the materials of the sleeve.

[0009] The corrugation can be made of cellulosic materials, including craft paper, sulfite paper, or recycled paper. Ideally, the fluting and liners of this invention are adhered to one another with a recyclable, and preferably, a biodegradable adhesive, for example, R130 adhesive by Fasson, Inc., Grand Rapids, Mich.

[0010] A variety of other patents have issued which disclose the use of an insulating sleeve around a cup. Examples include U.S. Pat. No. 5,794,843 to Sanchez (1998), and U.S. Pat. No. 6,277,454 to Neale, et al. (2001).

[0011] One of the shortcomings of cup sleeves is that they must be assembled and/or placed onto the cup when the beverage is served. This requires extra labor and slows the speed of service. Also, cup sleeves do not necessarily fit in all vehicle cup holders, and may cover any graphics printed on the cup.

[0012] In some instances, insulating material is formed integral to the cup. Examples include U.S. Pat. No. 1,771,765 (paper); U.S. Pat. No. 2,266,828 (paper); and U.S. Pat. No. 3,908,528 (paper, plastics, foils and metals).

[0013] Many types of cups and containers are available for drinking hot or cold beverages. Such cups have different characteristics relating to biodegradability, recyclability, and microwavability. Such cups may also have characteristics related to surface print quality and rigidity. Most importantly, some containers are fabricated with a characteristic of being insulative. A common insulative material is expanded polystyrene. However, polystyrene or styrofoam cups are generally considered environmentally unfriendly because they are not biodegradable. Also, the relatively rough external surface is not conducive to high-resolution printing.

[0014] Standard single-wall paper containers are generally considered to be more environmentally friendly than polystyrene cups, as they are fabricated from a cellulosic material. However, paper cups have poor insulating qualities. As such, some coffee shops and delis resort to double cupping, which is the practice of serving a hot beverage in two stacked single-wall paper cups in order to provide some level of insulation. This is a more expensive and wasteful practice. A removable sleeve as discussed above may also be used.

[0015] As an alternative, multi-layered paper cups have been designed to provide thermal insulation and increased strength. U.S. Pat. No. 3,908,523 to Shikaya (1975), U.S. Pat. No. 5,205,473 to Coffin (1993), U.S. Pat. No. 5,547,124 to Mueller (1996), U.S. Pat. No. 5,685,480 to Choi (1997), U.S. Pat. No. 5,769,311 to Morita et al. (1998), U.S. Pat. No. 5,775,577 to Titus (1998), U.S. Pat. No. 6,039,682 to Doers et al. (2000) and U.S. Pat. No. 6,253,995 to Blok et al. (2001) all show multilayered cups, which include some form of an inner cup made from paper and an outer cover or wrapper to provide insulation. The wrapper may comprise a multi-ply sheet consisting of at least one base sheet, and at least one corrugated or embossed sheet adhered to the base sheet. The corrugated or embossed sheet is adhered to cover a significant portion of surface of the base sheet such as through a lamination process. This is a process whereby adhesive, such as hot melt or heated polyethylene, or a paste adhesive such as a starch based cold glue, is applied either to the surface of the embossed sheet and/or to the base sheet. The two sheets are then pressed together forming a multi-ply insulating sheet. The wrapper is then cut out (a process called blanking) of this multi-ply sheet and wrapped around and adhered to an inner cup.

[0016] Efforts have been made to manufacture an improved container fabricated from paper materials. U.S. Pat. No. 6,085,970 to Sadlier (2000) provides an inner cup and an outer layer made from a continuous blank, and made from the same paper material. The layers may be made from a polyethylene coated board for waterproofing.

[0017] A more desirable material for insulating a container is cork. The term “cork” generally refers to a material that represents the bark of a particular variety of cork oak, Quercus suber. This is a tree that belongs to the oak family. The cork oak tree is native to western Mediterranean countries including Portugal, Spain, Algeria, Morocco, France, Italy, and Tunisia. The tree is also found in certain South American countries, particularly Argentina. The cork oak tree is unique in that it has the ability to renew its bark indefinitely.

[0018] Cork material is organic and cellulosic. It has been estimated that one cubic centimeter of cork numbers 15 to 40 million hexagonal cells, with the thickness of the cellular membranes varying between 1 and 2.5 microns. Despite this
density, the cellular membranes of cork are very flexible, rendering the cork both compressible and elastic. Elasticity enables the cork material to rapidly recover to its original dimensions after any deformation. The tight chemical structure gives cork the property of repelling moisture. The cellular structure coupled with the elasticity of the material has made cork a common material used for stoppers in wine (or other liquid) bottles. More recently, cork bark has been used in the fabrication of floor tiling and insulation. (See, for example, U.S. Pat. No. 6,037,033 offering cork in an insulation panel.)

[0019] The value of cork is further increased by its low conductivity of heat, sound and vibration due to the gaseous elements sealed in small, impervious compartments. Cork is also fire resistant, recyclable, and renewable.

[0020] A need exists for a container that is fabricated at least in part from a material that is not only biodegradable, but which is renewable. Further, a need exists for a container that includes a material which provides effective thermal insulation qualities without the need for a corrugated or fluted layer. Still further, a need exists for a container that employs a cellulose material that includes quercus suber. Finally, there is a need for a light-weight, recyclable, environmentally friendly and aesthetically pleasing beverage container.

SUMMARY OF THE INVENTION

[0021] A thermally insulative sleeve for a beverage container is provided. The sleeve in one embodiment includes a substantially planar material fabricated from cork. The material has opposing ends, and is capable of being radially folded into a circumferential object. The sleeve also includes a connector for joining the opposing ends. The connector may be either reusable or may be substantially permanent.

[0022] In one aspect, the planar cork material is arcuate in shape such that when the material is folded over, a frusto-conical object is formed. In an alternate embodiment the planar cork material is rectangular in shape such that when the material is folded over, a cylindrical object is formed.

[0023] The cork may be a substantially pure sheet of cork. Sheets of cork tend to be flexible which enables them to be rolled and placed into a user’s carrying device or, alternatively, collapsed along a pair of folding lines. Alternatively still, the cork composition is an integral, circumferential object. Further still, the planar cork may define two separate sheets of granulated cork that are connected at opposing ends.

[0024] A method for insulating a beverage container is also provided. In one aspect, the method includes the steps of ordering a beverage at a restaurant; receiving the beverage in a frusto-conical container; and placing a thermally insulative sleeve around an outer diameter of the container, the insulative sleeve defining a frusto-conical member having an opening at an upper end and an opening at a lower end for receiving the beverage container. The sleeve, again, is fabricated from cork.

[0025] Also disclosed herein is a thermally insulated beverage container. In one aspect, the container comprises an inner cup having a side wall and a bottom portion defining a bottom closure attached to the bottom portion. The container further has an insulative layer circumferentially disposed around and adhered to the side wall of the inner cup. The insulative layer is fabricated from cork.

[0026] In one preferred embodiment, the inner cup is fabricated substantially of a paper-based material. The paper-based material may be coated with a water proofing substance. The water proofing substance may be, for example, a medium or high density polyethylene.

[0027] In another embodiment, the inner cup is fabricated from a polymeric material. The polymeric material may be, for example, polyethylene, polypropylene, or polystyrene.

[0028] The cork material of the insulative layer may be fabricated from an amalgamated cork material. Such material will preferably include a binder and, possibly, a plasticizer. Such an amalgamated cork material may, for example, comprise about 20 to 40 percent by weight material from quercus suber. Alternatively, the cork material of the insulative layer may be fabricated substantially from pure cork showing a natural grain. Alternatively, the cork of the insulative layer may be a mixture of cork and other cellular material.

[0029] In one embodiment, the container also includes an outer layer disposed around at least a portion of an outer surface of the insulative layer. The outer layer is fabricated from a paper-based material to facilitate printing. The outer layer may be of any dimension relative to either the side wall or the insulative layer. The side wall and the outer paper-based layer may be integral.

[0030] A method for forming a beverage container is also provided. In one aspect, the method includes a step of providing an inner cup fabricated from a paper-based material, with the inner cup having a side wall and a bottom portion defining a bottom closure. The method also includes adhering an insulative layer circumferentially around the side wall of the inner cup, the insulative layer being fabricated from cork. Preferably, the method also includes adhering an outer layer wrapped around at least a portion of an outer surface of the insulative layer, with the outer layer being fabricated from a paper-based material.

[0031] An alternate method for forming a beverage container is also provided. In one aspect, the method includes a step of cutting a side wall material and an integral outer layer from stock to form a blank, the side wall material and the outer layer being fabricated from a paper-based material. The method may also include adhering an insulative layer to either the side wall material or the outer layer, the insulative layer being fabricated from cork; folding the blank to create a form; and rolling the form and the adhered insulative layer to form the container, the container comprising a side wall and a bottom portion defining a bottom closure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] So that the manner in which the above recited features of the present invention can be better understood, certain drawings are appended hereto. It is to be noted, however, that the appended artwork illustrates only selected embodiments of the inventions and are therefore not to be considered limiting of scope, for the inventions may admit to other equally effective embodiments and applications.

[0033] FIG. 1 is a top view of a thermally insulative sleeve, in one embodiment. The material in this illustrative embodiment is fabricated from cork sheet. This embodiment presents a substantially planarized cork sheet material that is arcuate in shape such that when the material is folded over, a frusto-conical object may be formed.
FIG. 2 presents a perspective view of the thermally insulative sleeve of FIG. 1. The material has been folded over and a frusto-conical object has been formed.

FIG. 3 shows the thermally insulative sleeve of FIG. 1 folded around a beverage container. An optional lid is shown exploded away from the container.

FIG. 4 is a plain view of a thermally insulative sleeve, in an alternate embodiment. Here, the cork material is fabricated from granulated cork.

FIG. 5 shows a bottom view of the sleeve of FIG. 4. Here, the sleeve has been folded over.

FIG. 6 is a perspective view of the sleeve of FIG. 4 having been wrapped around a beverage container. Here, the beverage container is a cylindrical can.

FIG. 7 presents a thermally insulative sleeve, in yet another additional embodiment. Here, the sleeve is more elongated and has an open upper end but a closed lower end. Granulated cork is used for the material.

FIG. 8 is a perspective view of a sleeve in yet another additional embodiment. Here, the sleeve is formed by joining the ends of two planar cork sheets.

FIG. 9 is a top view of the sleeve of FIG. 8.

FIG. 10 is a perspective view of a container of the present invention, in one embodiment. The container has an integral insulative cork layer.

FIG. 11 is a plan view of the insulative cork layer from the container of FIG. 10.

FIG. 12 is a plan view of an optional paper-based outer layer that may be placed over the insulative layer from the container of FIG. 10. The paper-based layer defines a suitable printing surface.

FIG. 13 is a plan view of an insulative cork layer and an outer paper-based layer. In this embodiment, the outer layer has a greater surface area than the insulative layer.

FIG. 14 shows the insulative cork layer and the outer paper-based layer of FIG. 13 being placed around an inner cup.

FIG. 15 provides a top view of the insulative cork layer and the outer paper-based layer of FIG. 13.

FIG. 16 is a plan view of a blank defining a cup side wall material and insulative material, ready to be folded into a form. The insulative layer is secured to a paper-based outer layer.

FIG. 17 is a plan view of the materials of FIG. 16 after folding.

FIG. 18 is a top view of the three-layer form of FIG. 17.

FIG. 19 is a cross-sectional view of a container fabricated from the form of FIG. 17.

DETAILED DESCRIPTION

DEFINITIONS

As used herein, the term “cork” refers to any cellulose material that includes at least 20 percent by weight material from quercus suber.

As used herein, the term “beverage container” refers to a container of any shape or size for holding consumable liquid contents. Non-limiting examples include a styrofoam, plastic, glass, cardboard, or paper-based cup.

The term “paper-based material” is intended to include any cellulose material derived from wood or grass pulp. Such materials include, but are not limited to, solid bleach sulfite paperboard, laminated paperboard, Kraft paper, brownstock, recycled paper, and cardboard. The paper-based material may optionally be coated with polyethylene or other polymeric material for water proofing.

The term “beverage” refers to any liquid that may be consumed by a mammal.

The term “carrying device” refers to a pocket, a purse, a brief case, a hand bag, a carrying case or any other carrying device.

Description of Specific Embodiments

FIG. 1 is a plan view of a thermally insulative sleeve 10, in one embodiment. The sleeve 10 is designed and configured to fit around the outer surface of a beverage container (not shown in FIG. 1). The sleeve 10 is fabricated from a substantially planarized material having opposing ends 12 and 14. The material also has an upper side 22 and a lower side 24.

It can be seen that the sleeve 10 has an outer surface 20. Disposed along the outer surface 20 is a wood grain pattern. This is a natural wood grain pattern arising from use of substantially pure cork as the material. Preferably, the material is pure cork stripped from the tree quercus suber. However, any cellulose material that includes at least 20 percent by weight material from quercus suber is contemplated herein.

Preferably, the sleeve 10 is fabricated from “refugo” bark, that is, a harvest of cork oak bark after the initial, or “virgin” bark is stripped. Refugo bark tends to have a smoother surface, and usually has fewer and more tightly closed pores. This gives the bark an appearance of wood grain. After the stripping process, the bark is usually allowed to dry. Once in the factory area, the cork may be boiled to make the cork more elastic for flattening and stamping. Larger blocks of cork may be cut into thin sheets having the desired thickness.

When planarized or cut cork is used, the material is capable of being radially folded into a circumferential object. The circumferential object is preferably a cylindrical body or a frusto-conical body. In order to acquire the circumferential shape, the planarized material is cut or stamped into an elongated body. The opposing ends 12, 14 of the sleeve 10 are then folded over each other and joined.

FIG. 2 shows the sleeve 10 having been folded into a frusto-conical shape. In order to acquire the frusto-conical shape, both the upper side 22 and the lower side 24 are preferably cut or stamped to have arcuate edges. To then retain the circumferential shape of the sleeve 10, a connector is provided. The connector is not visible in the rolled perspective view of FIG. 2; however, a connector is shown in FIG. 1 at 16. Connector 16 is seen at side 12. It is understood that a reciprocal connector (not shown) may be provided on the opposite surface of the sleeve 10 at side 14.

The representative connector 16 is preferably an adhesive. The adhesive may be a weak adhesive which provides a temporary and easily broken connection between the ends 12, 14. Alternatively, the adhesive may be a strong adhesive which provides a substantially permanent connection between the ends 12, 14. In either instance, the adhesive is preferably a biodegradable or natural adhesive made from a natural rubber latex or rosin. For example, according to the U.S. Agricultural Research Service, a strong and moisture-resistant wood adhesive may be fabricated from a combination of corn starch, polyvinyl alcohol, latex and citric acid.
Stuck on Starch, A New Wood Adhesive, Agricultural Research Magazine (April 2000), the article being incorporated herein by reference in its entirety. The natural adhesive is disposed onto a polyactic or other natural film placed along the opposing surface of the sleeve 10 at end 14.

[0063] U.S. Pat. No. 5,205,473 teaches the use of a biodegradable adhesive from Fasson, Inc. of Grand Rapids, Mich., referred to as “R130.” Fasson® R130 is a removable adhesive that exhibits moderate tackiness.

[0064] Another adhesive that may be employed is a non-toxic adhesive sold under the trademark NICNACTACK®. NicNacTac® Adhesive is available from a company from Los Angeles, Calif. that advertises through the worldwide web at www.nicnactac.com. The adhesive is the subject of U.S. Pat. No. 6,325,885 issued in 2001 to Harrison. According to the ’885 patent, the adhesive is a pressure sensitive adhesive based on a dimethylpolysiloxane gum for adhering porous and semi-porous substrates. The adhesive has thixotropic properties which permits the viscosity of the adhesive to break down when pressure from one substrate is exerted on another substrate. The teachings of the ’885 patent are incorporated herein in their entirety by reference to the extent not inconsistent with usages herein.

[0065] It is to be understood that the present invention is not limited by the type of connector 16 used. The connector 16 may be any type of adhesive. Alternatively, non-adhesive connectors may be used such as a hook-and-loop attachment. The connector 16 is used for joining the opposing ends 12, 14 to form the circumferential sleeve 10. However, biodegradable adhesives are preferred.

[0066] An optional additional feature may be provided to the sleeve 10. That pertains to the use of a liner along an inner surface of the sleeve 10 opposite the outer surface 20. FIG. 2 shows a liner 26 as the inner surface of the sleeve 10. The liner 26 is preferably a light-weight piece of woven fabric. However, non-woven materials, leathers, or synthetic leather materials may also be used. The liner 26 provides an even more aesthetic aspect to the sleeve 10 while reinforcing the cork material.

[0067] Another optional feature relates to the placement of a paper-based material around the outer diameter of the cork sleeve 10. A paper or cardboard material (not shown) may be a liner that circumferentially encompasses the cork-based sleeve 10. Alternatively, the paper or cardboard material could be a smaller piece of material that is applied to the exterior of the cork based sleeve 10. The paper or cardboard material is advantageous as it more readily permits the printing of the owner's name or any other information, such as the trademark of a sponsor or restaurant owner, or advertising material. The paper or cardboard material is preferably applied to the exterior of the cork sleeve 10 by a pressure-sensitive adhesive.

[0068] As noted, the sleeve 10 is designed to serve as a thermal insulation device for a beverage container. An example of a beverage container is a paper cup for holding hot coffee, hot tea or other hot beverages. Another example of a beverage container is a plastic cup for holding iced beverages such as iced coffee drinks, smoothies, milk shakes and other cold beverages.

[0069] FIG. 3 shows the thermally insulative sleeve 10 of FIG. 1 folded around an illustrative beverage container 30. The beverage container 30 may be a paper or plastic cup, or other type of cup. It may also be a glass container. Typically, the beverage container 30 is a paper container served by a restaurant or coffee bar or smoothie shop. The container 30 has an upper end 34 and a base 32.

[0070] When the container 30 holds a hot beverage, the upper end 34 of the container 30 will frequently be served with a lid. An illustrative lid is shown in FIG. 3 at 37. The lid 37 is shown exploded away from the container 30. The lid 37 is configured to snap onto the upper end 34 of the container 30. The lid 37 includes a spout 39 through which the hot beverage may be poured and consumed.

[0071] The container 30 of FIG. 3 has an outer surface 36. The outer surface 36 has radially received the illustrative sleeve 10. In the arrangement of FIG. 3, the sleeve 10 immediately engages the outer surface 36 of the container 30. However, the sleeve 10 may alternately engage the outer surface of a cardboard sleeve (not shown) provided by the restaurant or coffee bar.

[0072] When the user has consumed the beverage in the container 30, the user will typically dispense the container 30 and any cardboard sleeve provided by the server. However, the insulating cork sleeve 10 is preferably reusable. Thus, the user may take the malleable and foldable sleeve 10 from his or her purse or carrying bag, and place it over the container 30, or over the provided cardboard sleeve and container 30.

[0073] U.S. Pat. No. 5,205,473 discussed above provides an example of a sleeve for a beverage container. This sleeve (or others like it) is commonly used in such restaurants as Atlanta Bread Company® and Starbucks®. However, this sleeve is not fabricated from cork and does not offer the thermally insulative benefits available from cork. Thus, the present sleeve may be used in lieu of or in addition to the cardboard sleeves currently in popular use.

[0074] A definition of “cork” was provided above, to wit, any cellulosic material that includes at least 20 percent by weight material from quercus suber. The sleeve 10 shown and discussed in connection with FIGS. 1-3 is fabricated from a substantially pure cork material. However, other types of cork may be used. For instance, granulated cork fabricated from cork particles may be employed. Such a material is known for use as handle grips, gaskets, and floor or ceiling tiles. Such a material is also used for bulletin boards, and is known as cork board. Such cork material may include at least 40 percent by weight material from quercus suber. Alternatively, the cork may include at least 60 percent by weight material from quercus suber. In one aspect, the cork material includes 60 to 85 percent by weight material from quercus suber. Still further, the cork material may include at least 80 percent by weight material from quercus suber.

[0075] In one aspect, a flexible cork composition is fabricated by filling a polyvinyl chloride resin material with cork granules. The thermosetting resin holds the granules together in a flexible, amalgamated structure. However, the cork granules may become dry and brittle as the product ages, so that the resulting product is only slightly flexible without resulting in breakage of the cork granules even though the vinyl binder material itself is flexible.

[0076] In order to maintain the flexibility of the composition as the product ages, a plasticizer is preferably used. In one aspect, cork granules are mixed with gelatin, glue and glycerin as a plasticizer for the cork, plus water. However, this composition, after formation, may also dry out due to slow loss of the glycerin from the cork, resulting in shrinkage of the composition.
It is desirable to employ a cork composition wherein the plasticizer in the cork is retained within the cork granules and does not migrate into the binder or matrix of the composition. Thus, in another aspect, the cork granules are plasticized with a liquid organic polyol, and bonded to each other in a flexible plastic binder material. According to U.S. Pat. No. 4,347,272, the loss of glycerin or other polyol-type plasticizer proceeds at a slower rate. Thin sheets of a flexible composition may then be produced which retain their flexibility for a long period of time due to inhibition of the loss of the glycerin or other polyol plasticizer from the cork granules.

In one embodiment, the formulation comprises 20 to 50 parts by weight of finely divided cork particles plasticized with 3 to 25 parts by weight of the liquid polyol. The plastic binder material then makes up 25 to 75 parts by weight. Preferably, the cork material represents 40 percent by weight, the liquid polyol represents 15 percent by weight, and the plastic binder material represents 45 percent by weight of the sleeve.

In one embodiment, the cork-based material is fabricated from a combination of granulated cork and other biodegradable cellulosic materials. The cellulosic materials may be, for example, paper, cardboard, or paperboard. Granulated cork may be laid onto a paper or cardboard substrate and bound with an adhesive. Alternatively, granulated cork may be laid into cellulosic fibers, such as through an airlaid process.

Cellulosic fibrous materials suitable for combining with the cork in the sleeves include both softwood fibers and hardwood fibers. Exemplary, though not exclusive, types of softwood pulps are derived from slash pine, jack pine, radiata pine, loblolly pine, white spruce, lodgepole pine, redwood, and Douglas fir. Hardwood fibers may be obtained from oaks, genus *Quercus*, maples, genus *Acer*, poplars, genus *Populus*, or other known pulped species.


In one process, a nonwoven material is formed as a continuous airlaid web. The airlaid web is typically prepared by disintegrating or delignizing a cellulosic pulp sheet or sheets, typically by hammermill, to provide individualized fibers. Rather than a pulp sheet of virgin fiber, the hammermills or other disintegrators can be fed with recycled airlaid edge trimmings and off-specification transitional material produced during grade changes and other airlaid production waste. The individualized fibers from whichever source, virgin or recycle, are then air conveyed to forming heads on an airlaid web-forming machine. The fibers are mixed with granulated cork as part of the airlaid process and deposited on the continuously moving forming wire. Where defined layers are desired, separate forming heads or dispensers may be used for each type of fiber or for cork.

Cork compositions may be manufactured according to different thicknesses and qualities. Those of ordinary skill in the art will understand that the quality and size of the granules, the type and quantity of the binder, and the compression of the mix (density) determines the quality of the cork composition. Various methods exist for manufacturing composition cork using different resins. Phenolic and synthetic resins can be used depending on the use of the final product. The mixture of cork and binder is poured into a mold, compressed and subsequently heated in an oven. The cork composition is usually developed in sheets, and then cut or stamped.

FIG. 4 is a plan view of a thermally insulative sleeve 40, in an alternate embodiment. In this embodiment the material that makes up the sleeve 40 is fabricated from granulated cork. The sleeve 40 has an upper end 42 and a lower end 44. The sleeve 40 also has opposing ends 46, 48. As with sleeve 10, sleeve 40 is intended to form a circumferential object to be disposed around a beverage container. However, sleeve 40 of FIG. 4 has different characteristics than sleeve 10 of FIG. 1.

First, as noted, sleeve 40 is fabricated from a granulated cork material rather than a natural cork. The result is that sleeve 40 may not have the flexibility and elasticity of sleeve 10 depending upon the cork composition. This may render sleeve 40 less practical for folding up and carrying in a purse or hand bag. At the same time, sleeve 40 may be collapsed and carried in a user’s pocket. Alternatively, sleeve 40 may be collapsed and staked for shipping to and usage by a restaurant or coffee bar.

In order to effectuate collapsing and stacking of sleeve 40, perforated weakening lines are formed in the sleeve 40. Preferably, two separate lines 41, 43 are provided. These lines 41, 43 allow ends 46, 48, respectively, to be folded under a central body portion 45 the sleeve 40 and then joined together by an adhesive (or other connector) 47.

FIG. 5 shows a bottom view of the sleeve 40 of FIG. 4. Here, the sleeve has been folded over so that ends 46, 48 are under the central body 45 of the sleeve 40. The ends 46, 48 are then joined together by connector 47.

It is also noted that the upper 42 and lower 44 ends of the sleeve 40 are substantially straight, rather than being arcuate. This enables the circumferential object formed by the connection of ends 46, 48 to be cylindrical (or, optionally, square) rather than frusto-conical. This is desirable when the beverage container is itself cylindrical rather than frusto-conical. However, it is understood that the upper 42 and lower 44 edges may also be arcuate to provide a conical shape when folded over.

FIG. 6 is a perspective view of the sleeve 40 of FIG. 4 having been wrapped around a cylindrical beverage container 60. Here, the beverage container 60 is a can. The can 60 most commonly will hold a cold liquid such as a carbonated beverage. The can 60 has a lower end 62, an upper end 67 and a radial outer surface 66. A spout 69 is provided in the upper end so that liquid may be consumed therethrough.

It is noted that the sleeve 40 has both an open upper end 42 and an open lower end 44. In this way the outer surface 66 of the container 60 is circumferentially received by the sleeve 40. Preferably, the sleeve 40 is dimensioned to provide a friction fit around the outer surface 66 of the can.
60. However, in an alternate embodiment the connector 47 for the sleeve 40 is releasable, permitting the user to tightly wrap the sleeve 40 around the container 60.

[0091] FIG. 7 presents a thermally insulative sleeve 70, in yet another embodiment. Here, the sleeve 70 has an upper end 72 and a lower end 74. The upper end forms an opening 76 through which a container such as container 60 may be received. The sleeve 70 also has a cylindrical outer surface 75 and inner surface 78. Unlike sleeve 40 of FIGS. 4-6, sleeve 70 has a lower end 74 that is closed. In this way, the container 60 is received in such a manner that the base 62 of the container 60 is encompassed. This provides still further insulation in order to maintain the liquid therein in a cold state.

[0092] The encompassing sleeve 70 may be fabricated from any cork material. The cork material may be either a planar cork such as that shown in FIG. 1, or a granulated cork such as that shown in FIG. 4. The sleeve 70 is again releasable. Where the sleeve material is granulated cork, the sleeve 70 could be fabricated as a single, integral, radial unit without need of joining ends.

[0093] The sleeves 10, 40 may serve as an alternative to the well-known cardboard insulating sleeves used by both Starbucks® and Atlanta Bread Company®. This cork sleeve has the advantages of being light-weight, recyclable and reusable. Further, branding could be printed on the outer surface of the sleeve, either directly on or onto paper or cardboard material adhered to the outer surface 20 of the sleeve 10.

[0094] FIG. 8 is a perspective view of a sleeve 80 in yet another embodiment. Here, the sleeve 80 is formed by joining two planar sheets 82, 84. This embodiment is shown with the planar sheets being fabricated from granulated cork. However, a solid sheet of cork or a cork mixed with other cellulosic material may optionally be employed. In the illustrative arrangement of FIG. 8, the two planar sheets 82, 84 are connected by flexible end connectors 86, such as transparent strips of adhesive. The connectors 86 may be on the outer surfaces of the planar sheets planar sheets 82, 84; however, it is preferred that the connectors 86 be in the form of adhesive strips disposed along the inner surfaces of the planar sheets 82, 84 as shown in FIG. 8.

[0095] The planar sheets 82, 84 have flexible properties and are capable of being separated so as to form a three-dimensional, frusto-conical object 80. When opened, the sleeve 80 defines an internal chamber region 84 between the planar sheets 82, 84. The chamber region 84 is dimensioned to receive a beverage container such as container 30 of FIG. 3.

[0096] The sleeve 80 has an upper end 87 and a lower end 89. FIG. 9 is a top view of the sleeve 80 of FIG. 8. In this view, the upper end 87 is seen. It is also seen that the two planar sheets 82, 84 are placed in immediate contact with one another, allowing the sleeve 80 to be efficiently stacked for packaging and later use. By having two separate sheets 82, 84 of cork-based material joined by end connectors 86, a truly flat and stackable sleeve 80 is provided.

[0097] A method for insulating a beverage container is also disclosed herein. In one aspect, the method includes the steps of ordering a beverage at a restaurant, and then receiving the beverage in a container. The container may be any container, including containers 30 or 60. A thermally insulative sleeve such as any of sleeves 10, 40, 70, 80 is placed around the outer diameter of the container. Thus, the sleeve is fabricated from cork.

[0098] In one embodiment, the container is a frustoconical cup, and the sleeve defines a frusto-conical member having an opening at an upper end and an opening at a lower end for receiving the cup. Optionally, the step of receiving the beverage in a frusto-conical container comprises receiving the container with a recyclable cardboard sleeve already disposed around the container. The step of placing a thermally insulative sleeve around the outer diameter of the container then comprises placing the sleeve fabricated from cork around the sleeve fabricated from cardboard.

[0099] Alternatively, the step of receiving the beverage in a frusto-conical container comprises receiving the container with a recyclable cardboard sleeve already disposed around the container, and the method further comprises the step of removing the cardboard sleeve before placing the sleeve fabricated from cork around the container.

[0100] A container having an integral insulative cork sleeve is also provided herein. FIG. 10 provides a perspective view of a container 1000 of the present invention, in one embodiment. The container 1000 is configured and arranged to hold a beverage, such as a heated beverage or a chilled beverage.

[0101] The container 1000 first comprises an inner cup 1010. The inner cup 1010 has an upper open end 1012, and a lower closed end 1014. The inner cup 1010 further defines a side wall 1016 for containing the hot or cold beverage.

[0102] The inner cup 1010 may be fabricated from any material suitable for containing a hot or cold beverage. Preferably, the material for the inner cup 1010 is paper-based, such as a solid bleech sulfite paperboard. Preferably, the paper-based material is treated or coated on at least one side with polyethylene or any other suitable water proofing substance.

[0103] The process of making a single-walled paper cup such as the inner cup 1010 is known in the art. Such a paper cup typically has a vertical side seam (not shown) that runs from the bottom 1014 to the top 1012 of the cup 1010. Different material combinations and thicknesses can be used to achieve certain properties for the inner cup 1010. For example, if an insulated container 1000 with a long shelf life is required, the inner cup 1010 can be coated with a layer of foil on the inside. Foil provides a great moisture and oxygen barrier to preserve the contents of the liquid within. Alternatively, different thermoplastic barrier materials can be coated onto the paper, such as high density polyethylene which provides a moisture barrier. If more sidewall strength is required, the side wall 1016 can be made thicker. If the container 1000 is to be microwaved, a waterproof material with a high melting point, such as medium to high density polyethylene, can be applied.

[0104] If made from plastic, the inner cup 1010 may not have a side seam, and can be formed from any of a number of materials, or combination of materials, such as polyethylene, polypropylene, polystyrene, and/or high density polyethylene. Processes for making single-wall plastic cups from a thermoforming or injection molding process are known. Different material combinations and thicknesses can be used to achieve certain properties. For example, if an insulated cup with a long shelf life is required, the plastic cup can be made from a combination of high density polyethylene and ethylene vinyl alcohol polymer. The high density polyethylene provides a moisture barrier which increases with the
thickness of the material, while the ethylene vinyl alcohol polymer provides an oxygen barrier.

[0105] Returning to FIG. 10, the container 1000 also includes an integral insulative layer 1020. The insulative layer 1020 of the present invention is fabricated from cork. In the view of FIG. 10, the insulative layer 1020 is shown disposed around the side wall 1016 of the inner cup 1010. Preferably, the insulative cork layer 1020 extends across a substantial portion of the length of the side wall 1016. However, any length sufficient to permit a consumer to grasp the container 1000 while his or her hand is substantially insulated from the side wall 1016 is contemplated.

[0106] FIG. 11 provides a plan view of the insulative layer 1020. Preferably, the insulative layer 1020 is cut from a stamping process. In the embodiment shown in FIG. 11, the insulative layer 1020 has an arcuate shape. This permits the sleeve 1020 to encompass and closely fit the side wall 1016 of a frusto-conical cup 1010 as discussed above. However, the present invention accommodates any other profile of the insulative cork layer 1020, such as cylindrical.

[0107] To prepare the insulative layer 1020, a base sheet of cork material (not shown) is provided. The base sheet may be either pressed, natural cork, or a composite cork-based material held by a binder as described above. In one aspect, the base sheet is 0.20 mm to 0.50 mm thick. The base sheet may be cut or blanked from a larger starting sheet or roll (not shown). If the insulative layer 1020 is to bear a trademark and/or other printing, the base sheet should preferably be printed prior to being cut.

[0108] The insulative layer 1020 has left 1022L and right 1022R edges. The insulative layer 1020 further has top 1024T and bottom 1024B edges. In practice, the insulative layer 1020 is disposed around the side wall 1016 of the cup 1010 to provide insulation to the consumer of a beverage. Preferably, the insulative layer 1020 is dimensioned so that the left 1022L and the right 1022R edges meet to form a seam 1026 around the container 1000. However, it is contemplated that the left 1022L and the right 1022R edges may overlap to form the seam 1026 around the cup 1010.

[0109] In order to attach the insulative layer 1020 to the inner cup 1010, an adhesive may be used. The adhesive (not shown) may define one or more beads of a cold glue paste adhesive that is applied to either the inner surface of the insulative layer 1020 or to the side wall 1016 of the cup 1010. Alternatively, the adhesive may be a thin layer of polyethylene (or similar heat sealing material). Alternatively, a pressure sensitive adhesive may be used. In the instance of a heat activated or pressure sensitive adhesive, the adhesive is preferably pre-applied to the inside cut edges 1022L, 1022R of the insulative layer 1020. The adhesive is then heat- or pressure-activated immediately prior to wrapping the insulative layer 1020 around the side wall 1016, and then pressing the edges 1022L, 1022B against the side wall 1016 to simultaneously glue the edges 1022L, 1022R to the inner cup 1010 and to form the seam 1026.

[0110] It may be desirable for the purchaser of the container 1000, such as a retail coffee shop, to have source indicating material printed onto an outer surface of the container 1000. The purchaser or manufacturer may print a logo or advertising material directly onto the outer surface of the insulative cork layer 1020. However, the cork material used in fabricating the cork sleeve 1020 may not be conducive to conventional print processes. Accordingly, an optional paper-based sleeve 1030 may additionally be applied around the container 1000.

[0111] FIG. 10 shows a paper-based sleeve 1030 disposed centrally around the insulative layer 1020. However, the paper-based sleeve 1030 may be placed anywhere along the outer surface of the insulative layer 1020. The paper-based sleeve 1030 may be of any dimension. In the embodiment of FIG. 10, the paper-based sleeve 1030 is shorter than the insulative layer 1020. This allows a portion of the insulative layer 1020 to be left visible around the side wall 1016 of the cup 1010. This is both for aesthetic and marketing purposes. However, this is a designer's choice, and the present inventions are not limited to any dimension of the optional paper-based sleeve 1030.

[0112] FIG. 12 provides an end view of the paper based sleeve 1030 for the container 1000 of FIG. 10, in one embodiment. The paper-based sleeve 1030 has left 1032L and right 1032R edges. The paper-based sleeve 1030 further has top 1034T and bottom 1034B edges. In practice, the paper-based sleeve 1030 is wrapped around the insulative layer 1020 of the container 1000 to provide a printing surface to be viewed by the consumer of a beverage. Preferably, the paper-based sleeve 1030 is dimensioned so that the left 1032L and the right 1032R edges overlap to form a seam 1036 around the insulative layer 1020. However, it is contemplated that the left 1032L and the right 1032R edges may meet to form the seam 1036. Further, the left 1032L and the right 1032R edges may not meet such that only a portion of the circumference of the insulative layer 1020 is traversed.

[0113] The paper-based sleeve 1030 may be fabricated from any of a number of paper products. Examples include brownstock, Kraft paper, laminated paperboard, and solid bleach sulfite paperboard. The paper may be coated with polyethylene or other polymeric material for water proofing.

[0114] It is noted that the paper-based sleeve may actually define an outer layer that is larger than the area of the insulative layer. FIG. 13 shows one embodiment whereby the insulative layer 1020 is secured to a central area of, or centered on, a similarly shaped paper-based sleeve 1030'. The insulative layer 1020 of the present invention is fabricated from cork. The insulative layer 1020 is cut from a stamping process and prepared for sealing to the paper-based sleeve 1030' as discussed above.

[0115] The insulative layer 1020 has left 1022L and right 1022R edges. The insulative layer 1020 further has top 1024T and bottom 1024B edges. The paper-based sleeve 1030' has left 1032L and right 1032R edges. The paper-based sleeve 1030' further has top 1034T and bottom 1034B edges. Both the insulative layer 1020 and the paper-based sleeve 1030' have an arcuate shape. The left 1022L and right 1022R edges of the insulative layer 1020 are horizontally centered between the left 1032L and right 1032R edges of the paper-based sleeve 1030'. Similarly, the top 1024T and bottom 1024B edges of the insulative layer 1020 are vertically centered between the top 1034T and bottom 1034B edges of the paper-based sleeve 1030'.

[0116] In the illustrated embodiment, the insulative layer 1020 is secured to both the paper-based sleeve 1030' and inner cup 1010. Thus, in practice, the insulative layer 1020 and paper-based sleeve 1030' are wrapped around and secured to the side wall 1016 of the cup 1010 as illustrated in FIG. 14 to protect the consumer from possibly harmful temperatures. In an alternative embodiment, the insulative
layer 1020 is secured to the paper-based sleeve 1030' to form a separate assembly that a consumer slides over the side wall 1016 of a frusto-conical cup 1010.

[0117] FIG. 14 demonstrates the insulative layer 1020 and the outer paper-based layer 1030 of FIG. 13 being placed around a frusto-conical cup 1010. In the illustrated embodiment, the paper-based sleeve 1030 and insulative layer 1020 are wrapped around and sealed to the side wall 1016 of a cup 1010. This may be accomplished by placing the cup 1010 on a mandrel (not shown) and wrapping the insulative layer 1020 and outer paper-based layer 1030 assembly around the cup. The paper-based sleeve 1030 and insulative layer 1020 assembly is centrally dimensioned on the side wall 1016 of the cup 1010 so as to substantially wrap and insulate the cup 1010. However, the paper-based sleeve 1030 and insulative layer 1020 may be placed anywhere along the side wall 1016 of the cup 1010. Further, the paper-based sleeve 1030 may be of any dimension depending upon aesthetic and marketing purposes. This is a designer’s choice, and the claimed methods are not limited to the dimensions of the illustrated paper-based sleeve 1030 of FIGS. 13 and 14.

[0118] FIG. 15 provides a top view of the insulative layer 1020 and the paper-based sleeve 1030 of FIG. 13. In order to attach the insulative layer 1020 to the paper-based sleeve 1030, one or more beads of a cold glue paste adhesive (not shown) may be applied to either the inner surface of the insulative layer 1020 or to an inner face of the paper-based sleeve 1030. Alternatively, the adhesive may be a thin layer of polyethylene (or similar heat sealing material). Alternatively, a pressure sensitive adhesive may be used.

[0119] In another embodiment, a cork-based insulative layer may be placed along a side wall of a container during the container-manufacturing process. FIG. 16 provides a plan view of cup material that defines a blank 1600. In this view, the blank 1600 first comprises a side wall 1616. It can be seen that the side wall material 1616 has not yet been rolled or otherwise formed into a side wall for a cup. However, arrows are shown indicating a direction for folding, in one arrangement. In this embodiment, the side wall material 1616 is cut from one, continuous layer of paper. The sidewall material 1616 is arcuate in shape in anticipation of forming a frusto-conical container.

[0120] Connected to the side wall material 1616 is a paper-based outer layer 1630. Preferably, the outer layer 1630 is fabricated from the same material as the side wall material 1616, and is cut from the same blank stock. In this way, the side wall material 1616 and the insulative layer material 1630 are integral.

[0121] A cork-based insulative layer 1620 is again provided. The insulative layer 1620 is adhesively attached to either the side wall material 1616 or the outer layer 1630. In the arrangement of FIG. 16, the insulative layer 1620 is adhesively connected to the side wall material 1616. The insulative layer 1620 is attached to the paper-based outer layer 1630 by an adhesive, such as a hot-melt adhesive.

[0122] In operation, the paper-based outer layer 1630 with attached insulative layer 1620 is folded over the side wall 1616 material to form a substantially flat, three-layered form 1650. The form 1650 is shown in FIG. 17 and FIG. 18. A fold is seen at fold 1640 in FIGS. 16 and 17, with an arrow extending from fold 1640 in FIG. 16 to demonstrate the direction of folding for the paper-based outer layer 1630. FIG. 17 is a plan view of the materials of FIG. 16 after folding so as to create the form 1650. An arrow extending from the right side 1616R of side wall material 1616 demonstrates the direction of wrapping for the blank 1600 in order to form cup 1650.

[0123] In one aspect, the paper-based outer sleeve 1630 and the side wall material 1616 are glued, bonded or otherwise adhered to one another to secure the assembly into the folded form 1650. The adhesive used to attach the paper-based layer 1630 and the side wall material 1616 is preferably a cold-glue or paste adhesive, because minimal thickness is desired. The adhesive can be polyethylene. Other types of adhesives can be used such as a hot-melt adhesive, or a pre-applied layer of thermoplastic material such as polyethylene. In the latter example, the thermoplastic material is heat activated. This operation may be performed by a machine called a folder-gluer, which is used to make folding cartons and boxes. A forming machine such as the machine sold under the trademark Pick n’ Place® by MG&I Machine Corp of Maple Grove, Minn. (not shown) may also be used.

[0124] FIG. 18 provides a top view of the three-layered form 1650 of FIG. 17. The three-layered form 1650 is wrapped and manipulated to create a three-layered, insulated container. A tapered mandrel (not shown) is used to form an insulated beverage container.

[0125] FIG. 19 provides a cross-sectional view of a container 1690 fabricated from the form 1650 of FIGS. 17 and 18. During wrapping, the folded edge 1640 is inside and a marginal portion of the side wall material 1616 overlaps a marginal portion of the paper-based layer 1630 adjacent the folded edge 1640. As illustrated in FIG. 18, the paper-based layer 1630 is longer than the side wall material 1616 so that a left 1632L edge overlaps both the side wall edge 1616R and a marginal portion of the paper-based sleeve 1630 adjacent the folded edge 1640. These overlapping layers are heat sealed together through the application of heat and pressure to form a side seam. The heat fuses and joins the previously applied layer of polyethylene or other heat sealable and waterproof coating.

[0126] Additional details concerning the use of a mandrel to form a paper container are disclosed in U.S. Pat. No. 6,422,456, the entirety of which is incorporated herein by reference.

[0127] It should again be understood that the disclosed embodiments are merely exemplary of the inventions, which may be embodied in various forms. Therefore, the details disclosed herein are not to be interpreted as limiting, but merely as the basis for the claims and as a basis for teaching one skilled in the art how to make and/or use the invention.

1 claim:
1. A thermally insulated beverage container, comprising:
   an inner cup having a side wall and a bottom portion defining a bottom closure; and
   an insulative layer circumferentially disposed around and adhered to the side wall of the inner cup, the insulative layer being fabricated from a material that is not significantly lighter than cork.
2. The container of claim 1, wherein the inner cup is fabricated substantially of a paper-based material.
3. The container of claim 2, wherein the inner cup is fabricated substantially of a polymeric material.
4. The container of claim 3, wherein the insulative layer is comprised of a thermoplastic material.
5. The container of claim 4, wherein the insulative layer is comprised of a thermoplastic material that is not significantly lighter than cork.
6. The container of claim 5, wherein the insulative layer is comprised of a thermoplastic material that is not significantly lighter than cork.
7. The container of claim 3, wherein the insulative layer is fabricated from an amalgamated cork material.

8. The container of claim 3, wherein the insulative layer is a substantially pure cork showing a natural grain.

9. The container of claim 3, wherein the cork of the insulative layer is a mixture of cork and other cellulosic material.

10. The container of claim 3, wherein the cork of the insulative layer comprises about 20 to 40 percent by weight material from quercus suber.

11. The container of claim 3, wherein the container is frusto-conical.

12. The container of claim 3, wherein the insulative layer is attached to the side wall by an adhesive.

13. The container of claim 12, wherein the adhesive is a biodegradable adhesive made from a natural rubber latex or rosin.

14. The container of claim 12, wherein the adhesive is a pressure-sensitive adhesive, a heat activated adhesive, or both.

15. The container of claim 12, wherein the adhesive is a hot melt adhesive, a heated polyethylene, or a cold glue paste adhesive.

16. The container of claim 3, further comprising an outer layer wrapped around at least a portion of an outer surface of the insulative layer, the outer layer being fabricated from a paper-based material.

17. The container of claim 1, wherein the side wall and the outer paper-based layer are integral.

18. A method for forming a beverage container, comprising the steps of:
providing an inner cup fabricated from a paper-based material, comprising a side wall and a bottom portion defining a bottom closure; and
adhering an insulative layer circumferentially around the side wall of the inner cup, the insulative layer being fabricated from cork.

19. The method of claim 18, further comprising:
adhering an outer layer wrapped around at least a portion of an outer surface of the insulative layer, the outer layer being fabricated from a paper-based material.

20. The method of claim 19, wherein the paper-based material of the inner cup is coated with a water proofing substance.

21. A method for forming a beverage container, comprising the steps of:
cutting a side wall material and an integral outer layer from stock to form a blank, the side wall material and the outer layer being fabricated from a paper-based material;
adhering an insulative layer to either the side wall material or the outer layer, the insulative layer being fabricated from cork;
folding the blank to create a form; and
rolling the form and the adhered insulative layer to form the container, the container comprising a side wall and a bottom portion defining a bottom closure.

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