AIR TIGHT FOOD CONTAINER

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ABSTRACT

A two-piece container of self-supporting sheet-like plastic including a dish and cover therefor. The dish and surmounting cover are formed and dimensioned to establish in their assembled configuration a substantially air-tight frictional seal precluding invasion of atmosphere-carried contaminants into the container, thereby ensuring enhanced shelf life of comestibles packaged in the container.

19 Claims, 8 Drawing Figures
AIR TIGHT FOOD CONTAINER

BACKGROUND OF THE INVENTION

This invention relates generally to improvements in plastic containers of the single use throw-away type for food or other materials or products. The invention has particular utility as a container for products or materials which are advantageously kept substantially airtight, as for example sandwiches, hamburgers, pie servings and the like which are stored in and dispensed from vending machines, including refrigerated machines. Accordingly, for the sake of simplicity and clarity, the invention will be described with reference to this particular field of use.

The prior art is replete with plastic containers which have been used in the packaging of comestibles of the type stored in and distributed from vending machines. It will be appreciated that effectiveness and the economics of a successful vending machine operation depend upon packaging under such conditions as will ensure a reasonable shelf life for the products offered to the public. Utilizing the containers of the prior art, it has not been possible to achieve a shelf life for refrigerated type comestibles of more than about three days. At the end of this relatively short period it has been necessary to reclaim or recall those products which have not been vended and to discard them, a procedure which is not only inefficient but costly. The prior art packaging of comestibles for distribution through vending machines has utilized packages which are, for the most part, poorly sealed against atmospheric contamination. It is believed that this shortcoming of the containers is a primary cause of the very limited shelf life of the food products packaged.

While heat sealing of containers to establish a hermetically sealed package is an effective protective technique, the procedure is costly and time consuming and poses certain obvious problems in the opening of the package preparatory to consumption of the food item contained therein. Accordingly, it is the aim of the present invention to obviate the shortcomings of prior art packages and to provide a simple yet highly effective container which is hermetically sealable without the application of plastic-fusing heat, but relies solely on improved frictional engagement between the component parts.

It is a principal object of the invention to provide a self-supporting container of sheet-like plastic and which includes a dish and a surmounting cover, the two being so formed and dimensioned as to establish therebetween a hermetic seal upon closure of the container.

Another object of the invention is to provide an improved package for comestibles to ensure an enhanced shelf life of products stored for dispensing from a vending machine.

Yet another object of the invention is to provide an improved plastic container for the shipment and storage of comestibles, which container is readily closed and opened, manually, without any need to fracture the container or sever parts thereof.

Still another object of the invention is to provide a two-piece container for comestibles and including a relatively shallow opaque base or dish and a surmounting vaulted transparent cover, the latter frictionally engaging with the former to provide an essentially hermetic seal therebetween.

A further object of the invention is to provide, in a container of the type including a dish-like base and a surmounting cover, finger gripping tabs by means of which the cover may be easily and quickly removed from the base, merely by pulling the two components apart.

Still another object of the invention is to provide an inexpensive, single use, throw-away type container which may be readily manufactured by conventional vacuum forming and other thermal forming techniques.

Still another object of the invention is to provide a food container for vending machine use, which is easy to manufacture and which may be readily packed to provide a final package which has an attractive appearance and good sales appeal.

Other objects, features, and advantages of the invention will in part be obvious and will become evident upon a consideration of the following specification considered in conjunction with the drawing.

SUMMARY OF THE INVENTION

In accordance with the present invention, the aims and objects are accomplished by providing in a container for comestible products a two-piece structure of sheet plastic material including a dish-like base and a surmounting cover in which the dish and the cooperating cover are dimensioned and formed to establish, in their assembled configuration, a substantially air-tight frictional seal therebetween to preclude invasion of atmosphere-carried contaminants into the package. It is an important feature of the invention that the configuration adopted ensures enhanced shelf-life of comestibles packaged and stored in the container.

The container of the invention is characterized in that it provides an improved band or zone of sealing engagement between the cover and the cooperating dish, the seal established being essentially hermetic in nature. In a preferred embodiment of the invention the cover is sized, with respect to the dish portion, so that actual stretching of the plastic occurs when the cover is superimposed in sleeve engagement on the supporting base. It is believed that this "stretching" of the plastic establishes a tensioned gas-tight seal which accounts for the markedly improved shelf life of products packaged in the container of the invention. The shelf life of food packaged in the containers of the invention is 10 days or more as contrasted with the 3 day maximum heretofore achievable.

In a preferred embodiment of the invention the sealing between the cover and the dish is established not only along an upstanding annular band or zone, but in a second area defined by horizontal flange of the cover which abuts and bears upon a cooperating horizontal ledge integrally formed with the dish of the container. Thus, in the specific embodiment described above, there are two distinct and independent yet cooperating sealing areas, each contributing to the overall effectiveness of the container in precluding the admission of ambient atmosphere and its contained contaminants.

While the internal diameter or cross sectional dimension of the cover of the container of the invention is essentially equal to but not greater than the corresponding cross sectional dimension of the base, in a preferred embodiment of the invention the cover is actually slightly smaller so that some stretching of the plastic actually occurs in positioning the cover in place on the supporting base or dish. This structural configuration
establishes a tensioned engagement between the cooperating parts so that a live or resilient seal is produced precluding atmospheric contamination of the contents of the package.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more specifically and more fully described in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of one form of the container of the invention with the cover in place on the supporting dish;

FIG. 2 is a front elevational view of the container of FIG. 1,

FIGS. 3 and 4 are cross sectional views taken respectively on the lines 3–3 and 4–4 of FIG. 2;

FIG. 5 is a perspective view of a second embodiment of the container of the invention, the container being in a closed position;

FIG. 6 is a top plan view of the container of FIG. 5; and

FIGS. 7 and 8 are cross sectional views taken respectively on the lines 7–7 and 8–8 of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, and particularly to FIGS. 1, 2, 3 and 4, there is shown, for the purpose of illustrative disclosure, a preferred embodiment of one form of the container of the invention. The embodiment of the invention illustrated includes a container 20 consisting of a base or dish 24 and a cover 28. As seen in FIGS. 3 and 4, the cover is sleeved over and supported on the dish, the peripheral configurations of the base and of the cover being the same and the dimensional relationship being such as to establish a hermetic seal therebetwixt.

The dish 24 includes a floor 30 and an upstanding wall 34 continuous with the floor 30 and integrally formed therewith. At its upper extremity the wall 34 of the dish 24 is reversely curved upon itself to define a circumambient ridge 40. As an integral continuation of the dish there is formed a skirt-like wall 44 which depends downwardly from the ridge so that the wall 44 is spaced radially outwardly from the product retention wall 34. The skirt-like wall 44 serves as a principal container sealing wall, as is more fully described and explained herebelow.

The container sealing wall 44 terminates at its lower extremity at a position intermediate the ridge 40 and the floor 30 to form an integrally connected outwardly extending peripheral ledge 48 projecting from the wall 44 in a generally horizontal plane. It will be recognized that in the preferred embodiment of the invention shown in FIGS. 3 and 4, the skirt-like wall 44 is flared upwardly and outwardly to a slight degree. This particular structural arrangement is important in establishing the improved sealing effectuated in accordance with the present invention, as is more fully explained hereinafter.

The cover 28 of the container 20 is upwardly vaulted or domed and includes a top wall 52 integrally formed with a depending side wall 54 and joined to the latter through an annular interconnecting web 60, the particular configuration imparting structural stability to the relatively thin plastic material. A series of perimetrically spaced generally parallel external ribs 64 which are formed in and extend vertically in the side wall 54 of the cover 28 impart additional physical strength to the structure.

A lower marginal extremity of the side wall 54 defines a smooth-surfaced upstanding substantial vertical endless band 70 which cooperates with the sealing wall 44 of the dish 24 to establish a hermetically tight seal. In the preferred embodiment of the container shown in FIGS. 1 through 4, the band 70 is offset radially outwardly from the principal wall 52 of the cover through an annular shoulder 74 extending perimetrically about the cover 28. In the particular form of the invention shown, the shoulder 74 of the cover bears upon the ridge 40 of the dish 24 therebelow.

The sealing band 70 of the cover 28 terminates at its lower extremity in a flange 78 integrally formed with the band 70 and extending horizontally outwardly from and substantially normally to the band around the entire perimeter of the cover 28. The flange 78 seats flatly on and in-air-tight sealing engagement against the ledge 48 of the dish 24 when the cover is in place on the ledge to close the container.

It is an important feature of the invention that the sealing band 70 and the flange 78 of the cover 28 and the cooperating sealing wall 44 and ledge 48 of the dish are of substantial heights and widths to provide a maximum of contact area between cooperating and engaging parts so as further to ensure an effective air-tight seal.

Referring further to important structural features which contribute to effective sealing between the cover 28 and the base or dish 24 of the container of the invention, it will be seen in FIGS. 3 and 4 that the sealing band 70 of the cover 28 is contoured to flare upwardly and outwardly so that in placing the cover 28 on the dish 24 it is necessary to stretch the cover or expand it somewhat radially at its open end in forcing the band 70 of the cover over the outer edge or extremity of the ridge 40 of the dish 24. In the closed position of the container shown, the band 70 bears resiliently against the sealing wall 44 and tends to force the latter to conform in resilient and tensioned cooperation and engagement. It will be appreciated that when the container base is separated from or apart from the cover, the sealing wall or skirt 44 of the dish 24 extends essentially normally to the floor 30 of the dish, the perceptible deformation evident in FIGS. 3 and 4 being the result of the tensioned constrictive engagement of the band 70 of the cover against dish wall 44. In the structure described there is thus provided not only an effective tensioned air-tight frictional seal but also a mechanical interlock between the dish 24 and the sleeved encircling cover 28. In effect, the sealing wall 44 of the dish 24 is biased radially outwardly and the superimposition of the sealing band 70 of the cover over the sealing wall 44 of the dish is effective to overcome the bias and establish a tensioned sealing engagement.

As seen most clearly in FIG. 1, for ease of separating the cover 28 from the dish or base 24 of the container, there are provided a pair of finger grip tabs 80 and 82, integrally formed respectively as lateral extensions of the flange 78 of the cover 28 and the ledge 48 of the dish 24. The tabs are preferably offset with respect to one another to facilitate gripping.

A second preferred embodiment of the container of the invention, as illustrated in FIGS. 5 through 8, differs from first embodiment primarily in the configura-
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A container comprising, in combination, a dish-like base, and a cover for support on and sleeved over said base in hermetically sealing frictional securement therewith.

A floor, wall means including an inner principal product-retention wall extending generally upwardly from said floor and integrally formed therewith to provide a unitary one-piece structure, said wall means being reversely curved upon itself at an upper extremity thereof to define a circumambient ridge, a skirt-like auxiliary wall constituting a container sealing wall depending downwardly from said ridge and spaced radially outwardly from said product retention wall and extending therearound, said container sealing wall terminating on a circumferential line along a locus intermediate the vertical expanse of said product-retention wall in an integrally formed peripheral ledge continuous with said container sealing wall and projecting outwardly therefrom in a generally horizontal plane; said cover constituting an upwardly vaulted closure element of thin, self-supporting plastic material, said cover being dimensioned for attachment to said base in contiguous frictional engagement therewith, said cover including a top wall, a side wall integrally formed with said top wall and depending downwardly therefrom around the periphery thereof, a lower marginal portion of said side wall constituting a smooth-surfaced upstanding substantially vertical endless band for frictional securement to said container sealing wall of said base in overlying contiguous abutment thereagainst and encircling the periphery thereof to define an air-tight seal between said cover and said dish, and a flange integral with and extending horizontally outwardly from and substantially normally to said band around the entire perimeter of said cover, said flange of said cover sealing flatly on said ledge of said base when said cover is in place on said base to close said container, and finger-grip tabs integrally formed with and extending laterally outwardly from each said ledge of said base and said flange of said cover, said tabs being circumferentially offset from one another to facilitate the grasping thereof to pull said base and said cover apart.

The structure as set forth in claim 1 wherein said band at the lower marginal portion of the side wall of said cover is offset outwardly with respect to the side wall projecting upwardly therefrom to provide shoulder means extending perimetricaly about said cover.

3. The structure as set forth in claim 1 wherein said flange of said cover and said ledge of said base are in substantially air-tight abutment to establish a second zone of sealing contact between said cover and said base.

4. The structure as set forth in claim 1 wherein said side wall of said cover is deformed to provide perimetricaly spaced generally parallel external rib means extending upwardly from said band toward said top wall to stiffen said side wall and to strengthen said package.

5. The structure as set forth in claim 1 wherein said container sealing wall of said base and said band of said cover of said package are sleeved in radially stressed
engagement to provide a tensioned seal between said base and said cover.

6. The structure as set forth in claim 1 and further comprising gutter means extending peripherally around said floor of said dish and defining a floor-encircling moat integrally formed with and separating said floor from said wall means; whereby said floor is disposed in a horizontal plane displaced upwardly from a lower limit of said wall means.

7. The structure as set forth in claim 1 wherein the transverse inside dimensions of said cover are no more than outside dimensions of said base at corresponding overlapping peripheral positions thereof, whereby upon forced placement of said cover onto said base to close said container tensioned contact is established between said band of said cover and said sealing wall of said base to enhance the seal therebetween.

8. The structure as set forth in claim 1 wherein inside dimensions of said cover as measured thereacross at a line defined by an intersection with said band of a horizontal plane passing therethrough is less than the outside dimensions of said container sealing wall as measured at corresponding positions, whereby stretching of said cover at said band occurs when said cover is placed in position on said dish to establish between said cover and said dish a tensioned overlapping engagement.

9. The structure as set forth in claim 8 wherein, prior to stretching, said cover, as measured transversely thereacross at said band, has an overall outer dimension about 0.015 inch less than the transverse dimension of said dish as measured at corresponding opposed perimetric positions.

10. The structure as set forth in claim 1 wherein said band of said cover flares upwardly and outwardly from its lower extremity and wherein the cross sectional dimension of said band at its free end is less than a maximum horizontal dimension of said base as measured at said ridge, whereby application of force is necessary in positioning said cover in place upon said ridge and onto said base.

11. A container for the shipment and storage of combustible products to retain said products sealed from the ambient atmosphere thereby to preclude contamination from organisms and other deleterious agents present in the atmosphere and to provide extended shelf life for products contained and held in said package,

said container comprising, in combination, a dish-like base, and a cover for support on and sleeved over said base in hermetically sealing frictional securerethwith, said base constituting a molded dish of thin, self-supporting material and including a floor, wall means including an inner principal product-retention wall extending generally upwardly of said floor and integrally formed therewith to provide a unitary one-piece structure, said wall means being reversely curved upon itself at an upper extremity thereof to define a circumambient ridge, a skirt-like auxiliary wall constituting a container sealing wall depending downwardly from said ridge and spaced radially outwardly from said product retention wall and extending therearound, said container sealing wall terminating on a circumferential line along a locus intermediate the vertical expanse of said product-retention wall in an integrally formed peripheral ledge continuous with said container sealing wall and projecting outwardly therefrom in a generally horizontal plane; said cover constituting an upwardly vaulted closure element of thin, self-supporting plastic material, said cover being dimensioned for attachment to said base in contiguous frictional engagement therewith, said cover including a top wall, a side wall integrally formed with said top wall and depending downwardly therefrom around the periphery thereof, a lower marginal portion of said side wall constituting a smooth-surfaced upsiding substantially vertical endless band for frictional securement to said container sealing wall of said base in overlaying contiguous abutment thereagainst and encircling the periphery thereof to define an air-tight seal between said cover and said dish, and a flange integral with and extending horizontally outwardly from and substantially normal to said band around the entire perimeter of said cover, said flange of said cover sealing flatly on said ledge of said base when said cover is in place on said base to close said container, and said band of said cover being flared upwardly and outwardly from its lower extremity and the cross sectional dimension of said band at its free end being less than a maximum horizontal dimension of said base as measured at said ridge, whereby application of force is necessary in positioning said cover in place over said ridge and onto said base.

12. The structure as set forth in claim 11 wherein said band at the lower marginal portion of the side wall of said cover is offset outwardly with respect to the side wall projecting upwardly therefrom to provide shoulder means extending perimetrically about said cover.

13. The structure as set forth in claim 12 wherein said shoulder means of said cover bears upon said ridge of said dish.

14. The structure as set forth in claim 13 wherein said ridge of said dish constitutes a radius blend formed upon reversely curving said wall means of said base upon itself, and wherein said shoulder means of said cover is in substantial abutment with a cooperating upper peripheral edge of said ridge.

15. The structure as set forth in claim 11 wherein said flange of said cover and said ledge of said base are in substantially air-tight abutment to establish a second zone of sealing contact between said cover and said base.

16. The structure as set forth in claim 11 and further comprising finger-grip tabs integrally formed with and extending laterally outwardly from each said ledge of said base and said flange of said cover, said tabs being circumferentially offset from one another to facilitate the grasping thereof to pull said base and said cover apart.

17. The structure as set forth in claim 11 wherein said side wall of said cover is deformed to provide perimetrically spaced generally parallel external rib means extending upwardly from said band toward said top wall to stiffen said side wall and to strengthen said package.
18. The structure as set forth in claim 11 wherein said container sealing wall of said base and said band of said cover of said package are sleeved in radially stressed engagement to provide a tensioned seal between said base and said cover.

19. The structure as set forth in claim 11 and further comprising gutter means extending peripherally around said floor of said dish and defining a floor-encircling moat integrally formed with and separating said floor from said wall means; whereby said floor is disposed in a horizontal plane displaced upwardly from a lower limit of said wall means.

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