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W. F. KURFIRST

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PREVENTING DEFORMATION OF VACUUM FORMED CONTAINERS

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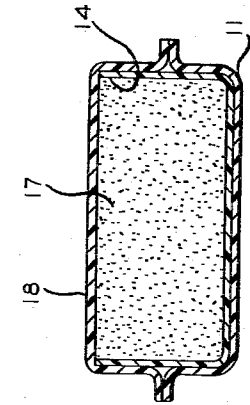


FIG. 4

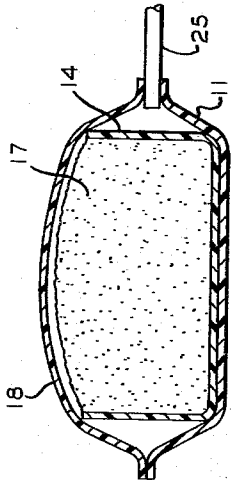


FIG. 3

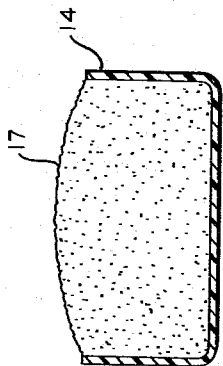


FIG. 2

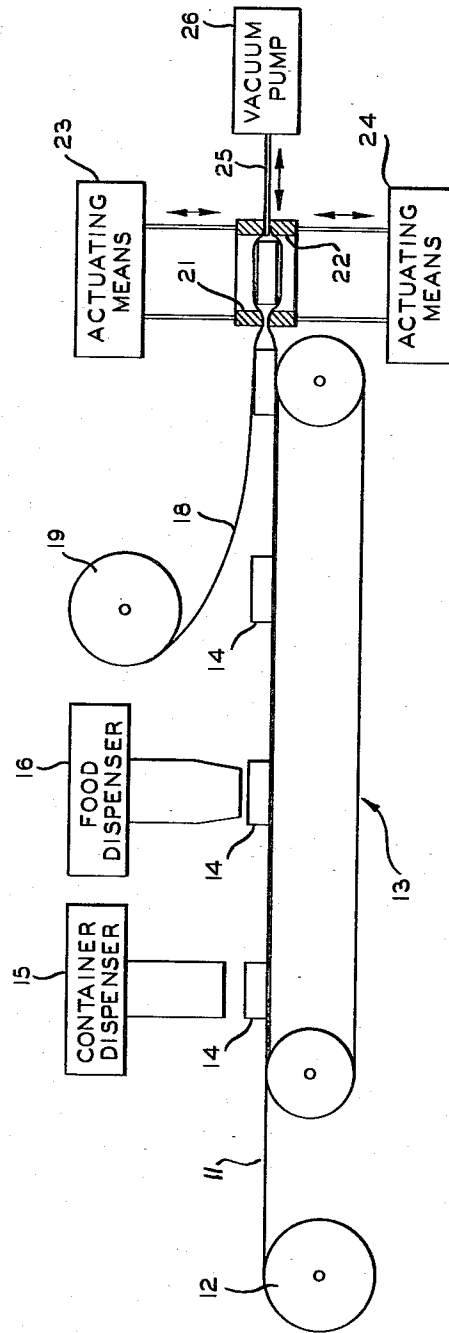


FIG. 1

INVENTOR  
W. F. KURFIRST

BY

*Young & Dugg*

ATTORNEYS

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**PREVENTING DEFORMATION OF VACUUM FORMED CONTAINERS**

William F. Kurfurst, Deerfield, Ill., assignor to Phillips Petroleum Company, a corporation of Delaware  
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 5 Claims. (Cl. 53-22)

**ABSTRACT OF THE DISCLOSURE**

A semirigid formed container is overfilled with the material to be packaged to an extent sufficient for the outward pressure of the material in the final package to substantially balance the inward pressure of the atmosphere on the final package.

*Background of the invention*

This invention relates to a method for filling and vacuum packing formed containers to prevent deformation of the container.

Heretofore when products such as food were placed in semirigid formed containers covered by pliant film and vacuum packed, the containers were deformed by the force of atmospheric pressure. Such packages were unsightly and hence undesirable from the standpoint of customer appeal. Strengthening the formed container by increasing the wall thickness is economically undesirable and the formation of internal support ribs decreases the volume of the container as well as increasing the amount of material required to form the container.

*Summary of the invention*

Accordingly, it is a object of this invention to provide a method for vacuum packing formed containers without incurring deformation of the formed container. It is an object of the invention to provide a vacuum packed formed container which is pleasing in appearance. It is an object of the invention to minimize or entirely prevent deformation of a vacuum packed formed container due to atmospheric pressure. Other aspects, objects and advantages of the invention will be apparent from a study of the disclosure, the drawings and the appended claims.

I have found that these objectives can be obtained and the disadvantages of the prior art avoided by overfilling the container prior to the vacuum packing operation. The atmospheric pressure is then balanced by the outward pressure of the product itself, thus eliminating a differential pressure across the formed container in its undeformed state. The product supports the container and enables it to retain the desired shape. The degree of overfilling will depend upon the thickness and type of material of the container, the type of product being packed, and the degree of vacuum utilized, and is selected to provide the balance between the inward pressure of the atmosphere and the outward pressure of the container contents. In general, the degree of overfilling will be in the range of 5 to 100 percent of the internal height of the container, and most generally in the range of 10 to 25 percent. The overfilled container can be enclosed in a pliant bag capable of sustaining a vacuum and then subjected to the desired vacuum with the bag being sealed to retain the vacuum. In another embodiment a pliant film can be utilized to seal the opening of the container and retain the vacuum.

*Brief description of the drawing*

In the drawings FIGURE 1 is a schematic representation of an apparatus for carrying out the method of the invention; FIGURE 2 is a cross-sectional view of an overfilled formed container; FIGURE 3 is a cross-sectional

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view of the overfilled container enclosed by a pliant film ready for vacuum packing; and FIGURE 4 is a cross-sectional view of a vacuum packed formed container in accordance with the invention.

*Description of the preferred embodiment*

Referring now to the drawing and to FIGURE 1 in particular, film 11 is unrolled from supply roller 12 and passed over conveyor 13. Individual semirigid formed containers 14 are periodically deposited on film 11 by container dispenser 15. As each formed container 14 passes under food dispenser 16 food 17 is ejected by dispenser 16 into the container 14 in an amount sufficient to provide the desired degree of overfill as illustrated in FIGURE 2.

A second sheet of film 18 from supply roll 19 is deposited on the overfilled container 14. Opposing sealing members or rings 21 and 22 in the shape of the seal to be made are activated by actuating means 23 and 24, respectively, to move films 11 and 18 into sealing contact in an area around an individual overfilled container 14. The trailing edge of one of members 21 and 22 can be provided with a cutting edge to sever the sealed container from the remaining film sheets 11 and 18. A vacuum connection conduit 25 is inserted between films 11 and 18. As illustrated in U.S. Patent 2,888,792, issued June 2, 1959, one of sealing members 21 and 22 can contain a baised member which accommodates conduit 25 and completes the seal upon the withdrawal of conduit 25. FIGURE 3 illustrates the formed container 14 enclosed by films 11 and 18 which are sealed together except in the area of conduit 25. Vacuum pump 26 provides the desired vacuum within the package formed by films 11 and 18. The vacuum packed sealed container is illustrated in FIGURE 4. The outward pressure of the package contents balances the inward pressure of the atmosphere, preventing the deformation of container 14 and maintaining a pleasing appearance. While the method of the invention has been described in terms of the apparatus system of FIGURE 1, any suitable equipment can be utilized. It is also within the contemplation of the invention to use only one film which is sealed directly to the upper edge of container 14. Container 14 can be of any suitable shape and can be provided with a flange 45 around the upper edge thereof to facilitate sealing of the film to the container.

Formed container 14 is a semirigid container and can be made from any suitable material, examples of which include aluminum, tin, paper and thermoplastic. Thermoformed polyethylene containers are particularly suitable. Pliant films 11 and 18 can be made of any suitable material, examples of which include polyethylene, polypropylene, polyvinyl chloride, vinylidene chloride copolymers, laminates of two or more thermoplastic films, and laminates of thermoplastic films with metal foil or paper. The method of the invention can be applied to the packaging of many products, examples of which include meats, cheese and spreads.

The following example is presented in further illustration of the invention and should not be construed in undue limitation thereof.

**EXAMPLE**

A thermoformed container of polyethylene having a wall thickness of 18 mils, and internal dimensions of 3/4 inch in height, 4 1/4 inches in width, and 4 1/4 inches in length was overfilled with cheese to the extent of 3/8 inch or 25 percent of the internal height of the container. The container was enclosed in a bag of 50 gauge Saran polyvinylidene chloride coated Mylar polyethylene terephthalate overcoated with 1 mil polyethylene. A vacuum of approximately 25 mm. of mercury was drawn on the

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bag and the bag was sealed. The formed container in the resulting package retained its original shape and was not deformed.

The procedure was repeated except that the formed container was filled even with its upper edge. The container in the resulting package was significantly deformed.

Reasonable variation and modification are possible within the scope of the foregoing disclosure, the drawings and the appended claims to the invention.

I claim:

1. A method of vacuum packing a semirigid formed container without incurring deformation of the formed container, the walls of said container being sufficiently flexible that deformation thereof normally would occur if the container were employed in vacuum packing, which method comprises overfilling said formed container with the material to be packaged, the volume of material so employed being greater than the volume of said formed container by an amount such that the outward pressure of said material in the final package substantially balances the inward pressure of the atmosphere, covering the thus overfilled formed container with a pliable film to form a package, subjecting the interior of said package to the desired vacuum conditions, and sealing said package.

2. A method in accordance with claim 1 wherein the formed container is overfilled to a height in the range of 5 to 100 percent of the internal height of said formed container.

3. A method in accordance with claim 2 wherein said container is a thermoformed container of a thermoplastic material and said pliable film is formed of a thermoplastic material.

4. A method of vacuum packaging a semirigid formed container without incurring deformation of the formed container, the walls of said container being sufficiently

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flexible that deformation thereof normally would occur if the container were employed in vacuum packaging, which method comprises overfilling said formed container with the material to be packaged, the volume of material so employed being greater than the volume of said container and the height of the material overfilling the container being in the range of 10 to 25 percent above the internal height of said formed container, forming a bag of pliable film surrounding the thus overfilled formed container, effecting the desired degree of vacuum in said bag, and sealing said bag.

5. A method of vacuum packaging a semirigid formed container without incurring deformation of the formed container, the walls of said container being sufficiently flexible that deformation thereof normally would occur if the container were employed in vacuum packaging, which method comprises overfilling said formed container with the material to be packaged, the volume of material so employed being greater than the volume of said container and the height of the material overfilling the container being in the range of 10 to 25 percent greater than the internal height of said formed container, covering the thus overfilled formed container with a pliable film to form a package, effecting the desired degree of vacuum in the interior of said package and sealing said package.

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TRAVIS S. McGEHEE, *Primary Examiner.*