ABSTRACT: A package comprising a container with an article therein, such container including a rigid backing member and an elastomeric thermoplastic netting member which is secured to the backing member and has means defining an elastic pocket therein for locking the article in position within the container. A method of packaging is provided for packaging the article in the container.
1. PACKAGE AND PACKAGING METHOD

BACKGROUND OF THE INVENTION

1. Field of the Invention
This invention is a package and, more particularly, is a package comprising a novel ventilated container having a single article packaged in it and includes a method of packaging the article in such container in a manner whereby such article is elastically locked in position within the container.

2. Description of the Prior Art
Ventilated or open-mesh bags are commonly used to package produce, such as onions and potatoes, and to package articles, such as small plastic toys and golf balls. Many of these bags are made from extruded thermoplastic netting. This type of bag has proven to be entirely satisfactory when packaging a plurality of articles but is deficient when packaging a single article, such as a prepackaged piece of frozen meat. A single article so packaged in an open-mesh netting bag does not stay centered within the bag and, thus, can shift from one position to another when the bag is handled. The packaged product or article can lose its sales appeal after being adversely oriented within the bag structure.

U.S. Pat. No. 3,123,279 to Day discloses a plastic open-mesh bag having a thermoplastic film joined to a thermoplastic netting member along three margins of the film by folding the film over the net and sealing the film through the net to itself. The patent mentions fruit, vegetables and produce, such as potatoes, as articles which may be packaged in the bag. U.S. Pat. No. 3,257,915 to Cartier et al. discloses a bag-forming machine for manufacturing the plastic bag of U.S. Pat. No. 3,123,279.

In known bags of the type disclosed in the Day U.S. Pat. No. 3,123,279, and in similarly constructed bags, there is no assurance that a single article positioned in such a bag will remain in a fixed preselected position within the bag during handling; hence, attractiveness of the package, if the article slips out of its preselected position, may be diminished.

SUMMARY OF THE INVENTION

The package of this invention provides a positive means for elastically locking an article in position in a container.

Briefly described, a ventilated container is provided for use in packaging a single article in a substantially fixed relationship with a rigid backing member of the container, which container further includes an elastomeric, thermoplastic netting member which is secured to the backing member along all sides of the backing member.

Open-mesh or ventilated bags or open-mesh or ventilated containers are generally used to package a plurality of articles loosely therewithin and various patents disclose bags or containers of this type. Articles packaged in these bags are free to move within such bags since they are not fixedly locked in position therewithin and this movement may damage the bag and, in single article packaging applications, the single article may be displaced from its desired location in the bag with the resultant loss of sales appeal in the package.

The container of this invention solves this single article packaging problem by providing an article locking elastic pocket within the open-mesh netting material of the package.

Further, unlike similar conventional packaging-type procedures or methods, the article being packaged within the container of this invention is not subjected to high ambient temperatures at any time during the packaging operation to shrink a film or other material around the article thereby to lock the article in position in the containers; instead, the article is finally locked therewithin by the novel method step of securing a fourth edge of the netting member to the backing member, which members comprise the major components of the novel container of the invention.

An especially useful application of the container of this invention is for packaging prewrapped frozen cuts of meat. The meat is initially wrapped in a transparent thermoplastic film, then frozen and subsequently placed within the container. The elastomeric properties of the netting member, as secured to the rigid backing member, immobilizes or locks the prewrapped meat package within a self-formed elastic pocket in the netting member. Such packages will withstand subfreezing temperatures and the dehydrating atmospheres associated with such refrigeration.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of the novel package of this invention showing a single article packaged in a ventilated container and at a preselected substantially fixed location therewithin.

FIG. 2 is a cross-sectional view of the package of FIG. 1 taken along line 2-2; and

FIG. 3 is a perspective view of the novel container of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, the novel package P of this invention, as shown in FIG. 1, comprises a container 10 having an article 20 packaged therein.

Such container 10 includes a rigid backing member 11 and an elastomeric, thermoplastic, open-mesh netting member 12 secured to the backing member 11 by appropriate means along sides 13, 14 and 15 thereof. The four sides 16 of the netting member 12 and adjacent portions of the backing member 11 define an article receiving opening 17 therebetween and the article 20 is inserted through the opening 17 and into the container 10 and positioned between the backing member 11 and the netting member 12. Means, such as label member 18, is provided to close the open end 17 of the container 10 at the fourth side 16 of the netting member 12 after the article 20 is inserted in the container 10. The article 20 is retained or locked in position within the container 10 by an elastic pocket 19 of the elastomeric netting member 12 which envelops or receives the article 20 in a contour-forming configuration, as best seen in FIG. 2.

The material used to fabricate the elastomeric netting member 12 is preferably selected from elastomeric materials such as styrene-butadiene, ethylene vinyl acetate, low-orientation high density polyethylene, terpolymers of ethylene, propylene and a nonconjugated diene and polyurethane. The selection of the specific type of netting material is dependent upon the intended use, the cost, the size of the article being packaged and the weight of the article being packaged. It is preferred that the elastomeric material be extruded into an open-mesh netting structure by the method of U.S. Pat. No. 2,919,467 to Mercier. This method of extrusion of the netting insures strong joints in the mesh.

It is preferred that the backing member 11 be fabricated from coated fibrous cellulosic sheet material and be thick enough to provide sufficient rigidity to maintain a substantially flat surface in the finished package P of this invention irrespective of the pulling forces exerted on its sides by the netting member 12 of the finished package P. Solid bleached paperboard made from 100 percent virgin hardwood pulps and coated with a polyethylene resin or an ethylene/vinyl acetate copolymer resin to a 0.2 to 0.4 mil thickness has been found to be the most practical backing board to use. Such boards are readily sealable, inherently smooth and resistant to moisture and grease and possess the required strength.

The backing member 11 can be printed so as to describe the packaged product, show the price thereof or provide better advertising information. The backing member 11 may extend beyond one or more borders of the open-mesh netting member 12 to provide additional space for printed messages. Suitable holes or openings of other designs can be provided in the backing member 11 so that the packages P produced from the containers 10 can be displayed from a wall or rack projection.

The sides 13, 14 and 15 of the container 10 can be formed in many conventional ways, such as by direct heat-sealing of the netting member 12 to the coated backing member 11, ad-
hensive sealing of the netting member to the backing member, hot-melt adhesive bead sealing of the netting member to the backing member or stitching the netting member to the said backing member by use of a chainstitch, back-stitch, cross-stitch or knot-stitch. The preferred adhesives are polyvinyl acetate emulsions and hot-melt blends of petroleum wax and ethylene/vinyl acetate copolymers.

The container 10 may be loaded at its point of ultimate use by manual or semiautomatic means and is then closed by use of the header label 18 across the unsealed top side of the container. The containers 10 can be fabricated individually or can be produced in a continuous manner by receiving a web of elastomeric netting material to a continuous web of backing material in preselected linear patterns and severing the individual containers from the secured webs.

If desired, more than one article may be packaged in the container 10 of this invention by following the packaging method to be further described; however, it is to be understood that the invention primarily relates to single article packaging and that only a limited number of articles exceeding a single article may be so packaged.

The following examples illustrate the elastic recovery properties of the elastomeric netting member 12 used in the fabrication of the containers 10 of the invention which permits the container to be used for packaging applications of the type described:

EXAMPLE I

Containers 10, as best seen in FIG. 3, were fabricated using 60 pound bleached board as the backing member and 100 percent styrene-butadiene thermoplastic netting, having seven 30-md strands per inch, which was extruded from a 4-inch circular die by the process of U.S. Pat. No. 2,919,467 to Mercer. The netting member 12 was secured to the backing member 11 by use of a hot-melt adhesive comprising a blend of a petroleum wax and an ethylene/vinyl acetate copolymer.

Blocks of wood of varying heights were placed in the containers, held for one minute, and then removed from the containers. Machine-direction (MD) and transverse-direction (TD) stretch recovery was determined in each case using measurements taken from preset marks on the netting member. A group of typical averages of 5 readings each from this test is as follows:

<table>
<thead>
<tr>
<th>Height of block in inches</th>
<th>Stretch percent of MD &amp; TD</th>
<th>Recovery percent of MD &amp; TD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MD</td>
<td>TD</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>27</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>32</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>38</td>
<td>45</td>
</tr>
</tbody>
</table>

EXAMPLE II

The as-extruded open-mesh tubular netting used in example 1 was subjected to a series of load-deformation-recovery tests using precision loading equipment and deformation data based on preset marks on the netting.

<table>
<thead>
<tr>
<th>Percent stretch in the MD</th>
<th>Percent recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>88</td>
</tr>
<tr>
<td>40</td>
<td>175</td>
</tr>
<tr>
<td>50</td>
<td>175</td>
</tr>
</tbody>
</table>

These data indicate that an article three inches in height can be packaged in the container of this invention so that the elastomeric netting member conforms with the configuration of the article being packaged in a skin-tight-type locking relationship.

In practicing the method of this invention, the article 20 to be packaged is inserted into the container 10 through the opening 17 and closed between the original netting member 12 and the rigid backing member 11. Preferably, the article 20 is centered between the edges of the netting member 12 for aesthetic considerations. In inserting the article into the container 10, the netting member 11 is stretched an amount sufficient to enable the article 20 to be inserted with ease, after which the stretching forces are released and the netting member 12 tends to return to its original dimensions. In so doing said netting member envelopes or receives the article 20 within the elastic pocket 19 defined by the netting member 12, as best seen in FIG. 2. The secured sides of the netting member and the solid flat backing member 11 prevent excessive distortion of the netting member 12 and the finished package. After the netting member 12 has enveloped the article 20, the fourth edge 16 of the netting member 12 is secured to the backing member 11 thereby providing securing forces completely enclosing or surrounding the article 20 thus locking the article 20 in position within the container 10 and providing a novel package P of great utility.

I claim:

1. A package comprising:
   a container and an article packaged in said container;
   said container including a substantially rigid backing member and an elastomeric netting member, said netting member being secured to said backing member along three sides thereof, the fourth side of said netting member and adjacent portions of said backing member defining an article receiving opening therebetween;
   said article being inserted in said container through said opening and positioned between said netting member and said backing member;
   said container having means to lock said article in position between said netting member and said backing member including means defining an elastic pocket in said netting member; and
   said container having means to close said opening including means to secure said netting member to said backing member along the fourth side thereof thus receiving said netting member to said backing member on all sides of said article whereby said elastic pocket in said netting members locks said article in a fixed, preselected position within said container.

2. The package of claim 1 wherein said netting member has at least a 90 percent recovery after being elongated up to 80 percent in its machine direction.

3. The package of claim 1 wherein said netting member is selected from the group consisting of styrene-butadiene, ethylene/vinyl acetate, low-orientation high density polyethylene, polyurethane and terpolymers of ethylene, propylene and a nonconjugated diene.

4. The package of claim 1 wherein said netting member is secured to said backing member by an adhesive selected from the group consisting of polyvinyl acetate emulsion and hot-melt blends of petroleum wax and ethylene/vinyl acetate copolymers.

5. The package of claim 1 wherein said netting member is secured to said backing member by sewing.

6. The package of claim 1 wherein said backing member has a coated surface and said netting member is secured to said coated surface of said backing member by heat bonding.

7. The package of claim 1 wherein a surface of said backing member is coated with a thermoplastic coating selected from the resin group consisting of polyethylene and ethylene/vinyl acetate copolymer.

8. The package of claim 1 wherein said backing member is substantially flat.

9. The package of claim 1 wherein said means to close said opening is a label adapted to overlie the fourth side of said netting member and to secure said netting member to said backing member along said fourth side thereof.

10. The package of claim 1 wherein a plurality of articles is packaged within said container.
11. A packaging method for packaging an article in a container, said container including a substantially rigid backing member and an elastomeric netting member, said netting member being secured to said backing member along three sides thereof, said fourth side of said netting member and adjacent portions of said backing member defining an article receiving opening therebetween, said method including the steps of:

inserting said article in said container through said opening and between said netting member and backing member by stretching said netting member an amount sufficient to

insert said article in said container;

releasing the stretching forces being applied to said netting member thereby permitting said netting member to relax and to return to substantially its initial dimensions before stretching, still leaving an elastic pocket to snugly receive said article; and

securing said fourth side of said netting member to said backing member thereby to lock said article in a fixed, preselected position within said container.