ABSTRACT: A device for positioning film bag liners in outer containers so as to prevent the collapse of the bag liner and retain its pouring spout in position for ready access through an accommodating opening in an outer container. A positioning sheet, preferably consisting of semirigid material, is secured to the liner at the base of the pouring spout and extends radially from the latter. By anchoring the extended portion or portions of the positioning sheet to the outer container, the pouring spout and the area of the liner immediately surrounding the same are maintained in position for ready access through an opening in the outer container, thus preventing displacement of the liner and its pouring spout and providing torque resistance for pouring spouts having screw-threaded or twist-off closures.
DEVICE FOR POSITIONING FILM BAG LINERS IN OUTER CONTAINERS

BACKGROUND OF THE INVENTION

Several types of plastic lined composite packages are currently in use, such as cartons, boxes or drums having thermoformed plastic liners or film bag type liners made to fit within the carton or outer container. The heavier thermoformed constructions are capable of maintaining their shape and position in the outer carton when standing empty and alone, while the thin film bag construction does not have this capability. The heavy thermoformed liner is sturdier and capable of withstanding more abuse in storage and shipment than the film bag liner. However, the film bag liner is substantially lower in cost, and current improvements in the quality of film bags suggests a wider use of this type of liner container in composite packages.

Presently available film bags, when used in cartons, boxes or other outer containers, present a number of distinct disadvantages to the user, namely:

1. The threaded opening, heat-sealed or otherwise fastened to the film liner, is not located in any specific position relative to the carton or outer container and is thus liable to be in any one of a number of locations prior to or after it is filled.

2. The threaded opening cannot be mechanically located relative to the outer carton for the purpose of automatic filling and for access to the closure.

3. When the screw cap is tightened, it is difficult to grasp the threaded opening to provide opposing torque. As a result, the bag twists, and it is not possible to tighten the cap.

4. When the user attempts to remove the cap, he experiences the same problem in reverse, i.e., he cannot loosen the cap because the film is too flexible to provide the required amount of torque.

5. If the threaded opening is located in the wall of the outer carton to overcome the above objections, then the opening is exposed to damage in shipment and storage due to:
   a. exposure at the exterior of the outer carton,
   b. severe stresses on the film in drop tests and other handling since the threaded opening cannot "give" relative to the carton. This applies to the film at the point of sealing to the threaded opening.

6. The threaded opening, as normally used on a filled film bag in a box, is exposed to the user after a perforated tab is removed from the outer carton or after a dust cover is removed from a precut hole. In conventional structures, the user finds the threaded opening in an unsightly relation to the body of the bag in view of the extreme flexibility of thin film which gives an impression of inferiority to the container as being "sleazy" or "flimsy."

7. When film bags are emptied, there is often a substantial amount of liquid which cannot be recovered because of the pocketing configuration of the wrinkles and folds.

It is the primary object of the present invention to overcome the above-noted disadvantages in conventional bag liners and to provide a film bag liner of the type having a pouring spout fixed thereto which can be used in an outer carton or other container and including means connected to the liner for initially locating and retaining its pouring spout in a position in the outer container for ready access in the filling and dispensing operations.

Another object is to provide a liner of this type equipped with a pouring spout having a removable closure and including support means, firmly attached to the pouring spout which can be anchored to an adjacent area or areas of an outer carton, so as to prevent collapse of the liner and position its pouring spout in line for access through the usual spout accommodating opening in the outer carton.

A further object is to provide a liner support means, such as above referred to, which, in addition to properly positioning the liner and pouring spout in the outer carton, acts as a torque resisting means for spouts having screw-threaded to twist-off closures.

With the above and other objects in view which will appear as the description proceeds, the invention consists in the novel features herein set forth, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

THE DRAWINGS

Referring to the drawings in which numerals of like character designate similar parts throughout the several views:

FIG. 1 is a perspective view of the bag-type liner per se, showing the preferred form of liner securing means;

FIG. 2 is a sectional view of the upper portion of a bag-type liner housed in an outer carton, showing the pouring spout and screw closure in retracted or shipping position;

FIG. 3 is a similar view showing the pouring spout with the closure removed and in projected or pouring position;

FIG. 4 is a plan view of the assembly shown in FIG. 3, but on a reduced scale;

FIG. 5 illustrates a modified form of the invention as adapted to a steel outer drum or the like;

FIG. 6 is a similar view of another modified embodiment of the invention as applied to a fiber outer container or drum;

FIG. 7 is a still further modification of the invention as applied to an outer carton having a corner opening for dispensing;

FIG. 8 illustrates one form of liner and pouring spout securing means embodying a snap ring;

and FIG. 9 is a view showing the position sheet and bag liner heat-sealed to the pouring spout.

Referring first to FIG. 1 of the drawings, 10 generally represents the film-type bag liner with which the present invention is concerned, having a top wall 11 and sidewalls 12 which may be formed of polyethylene or other suitable plastic film and may be single or multiwalled. The liner is shown in flattened position, and, as best seen in FIGS. 1 and 2, a screw-threaded pouring spout 13 is attached by a base flange 14 to an opening in the top wall 11 of the liner, the spout having a screw threaded closure cap 15. There are a variety of different kinds of film bags made by heat-sealing a tube of film or by making special heat-sealed configurations which provide specially shaped liners to fit cartons, boxes or drums, and the pouring spout may be fixed to the wall of the liner in any of several ways, as will later appear.

The preferred form of liner positioning sheet is shown in FIG. 1 and comprises a main sheet 16 of a thermoformed semirigid plastic material having a depending apron 16a on one edge thereof, and it will be understood that in viewing FIG. 1, both the main positioning sheet 16 and apron 16a are simply overlying the adjacent walls of the liner and are not secured thereto, other than at the connection to the pouring spout. At a suitable point within its horizontal confines, the main positioning sheet 16 is provided with a relatively flexible web 17 of frustoconical form to facilitate its projection and retraction with the pouring spout 13 through an accommodating cutout opening in an outer carton, as will later be explained. The flange 14 of the pouring spout 13 is connected to a suitable opening in the web 17, as well as to the pouring spout discharge opening in the bag liner, so that the main sheet 16 of the positioning device is retained in fixed position with respect to the pouring spout as well as the bag liner.

The flange 14 of the pouring spout may be heat-sealed in the opening in the bag liner, or it may be secured by any other suitable means. For example, a snap ring arrangement, such as shown in FIG. 8, may be employed for securing the pouring spout and the openings of the liner top wall 11 and web 17 in the proper relative positions. Such a connecting means is described in detail in the Winstead U.S. Pat. No. 3,124,282, issued Mar. 10, 1964, and assigned to the assignee of the present invention.
3,599,840

The use of the preferred form of the invention is best seen in FIGS. 2 and 3 where the outer carton or container of more or less rigid material is generally represented by the numeral 19. The outer carton has the usual side walls 20 and 21 and foldable top flaps 22 and 23 (FIG. 4) and overlapping top flaps 24 and 25. When the bag liner 10 is inserted in the outer carton 19, the underlapping flaps 22 and 23 are folded over the top wall 11 of the liner, and as seen in the drawings, these flaps 22 and 23 are provided with cutout portions 26 to accommodate the projection and retraction of the web 17 and the pouring spout 13. The main sheet 16 of the positioner device is placed over the underlapping flaps 22 and 23 so that they rest between the top wall 11 of the liner and the overlapping flaps 24 and 25 when the latter are folded inwardly. Before folding these overlapping flaps, the angular extension 16a of the main sheet 16 is slipped past the outer edges of the underlapping flaps 22 and 23 to lie against the inner surface of the outer carton wall 21 and the side wall 12 of the liner, as seen in FIGS. 2 and 3. The overlapping flaps 24 and 25 are then folded inwardly over the flaps 22 and 23 and the intervening main sheet 16 of the positioner device.

The main positioning sheet 16 may be retained in fixed position between the coacting flaps 22, 23 and 24, 25 by any suitable means. For example, by simply sealing the overlapping flaps of the carton together with the sheet 16 therewith, the latter is held in place, or the sheet 16 may be additionally sealed at its surfaces between these flaps. Also, the sheet 16 may be stapled to the flaps. No securing means is required for the angular apron 16a, as this is held against the inner wall of the outer carton by the wall of the liner, and this apron additionally gives support against longitudinal or lateral movement of the sheet 16 with reference to the outer carton.

In the embodiment of the invention illustrated in FIGS. 2 and 3, the outer carton 19 is of the general type illustrated and described in Winstead U.S. Pat. No. 3,042,271, issued July 3, 1962, wherein a removable portion 27 of the overlapping flap 25 can be torn out along weakened lines 28 to accommodate the projection of the pouring spout and web 17. Also, the positioning sheet 16 may be formed of the material disclosed in this same patent, namely, a semirigid thermoplastic material such as polyethylene, vinyls, acetates, and styrenes, as well as others. As distinguished from the wall thickness of 0.0004 inch, for example, of the bag liner this positioning sheet 16 should be of the order of 0.020 inch to provide the desired resistance to torque and displacement of the bag within the outer carton.

Actually, if the main sheet 16 is used without the angular apron, it could be formed of any semirigid material which is heat-sealed to the pouring spout area of the liner. The important point is that she anchor the pouring spout liner in such a manner that they remain in place relative to the dispensing opening in the outer container for ready access to the pouring spout both for filling and dispensing, and to provide torque resistance when applying or removing a screw-threaded or twist-off closure on the spout. In addition, the flexibility and shock absorbing quality of the frustoconical web 17 eliminates severe stresses on the film in drop tests and other handling. This web must be sufficiently flexible to be lifted up for pouring and depressed for storage and yet rigid enough to remain in either of these two positions as stable positions and to provide sufficient countertorque for tightening and loosening the screw cap. As seen in FIG. 3, when the web 17 is projected through the access opening of the outer carton that portion of the liner 11 which is connected to the flange 14 of the pouring spout 13 has been pulled into the frustoconical web 17. In other words, because the film is flexible, it is in conformity with the frustoconical web, thus forming a pour spout in the film bag wall to facilitate dispensing for completely emptying the product from the liner.

Other embodiments of the invention are illustrated in FIGS. 5—7. FIG. 5 showing use of the liner 10 in a steel drum 29. Here, the positioning sheet 30 is shown as a plastic disc, the periphery of which is attached over the rim 31 of the drum by a band or ring 32. In FIG. 6, the same type of disc 30 is applied to a fiber drum or box 33, and its bounding edges are stapled as at 34 to the outer container. In both instances, the disc is of thermoformed plastic provided with a retractable and projectable web 35 to accommodate the pouring spout 13 when a cover with an access opening (not shown) is placed over the top of the outer container. Even if no access opening is provided in the cover, the disc 30 would serve to prevent collapse of the liner so that the spout is readily accessible for filling and pouring.

With regard to FIG. 7, which shows an outer carton 19 provided with a corner tear-out opening 36, it will be noted that the pouring spout 13a may comprise an injected, molded, single piece device sealed to the corner of bag liner 10, including two semirigid wings or sheets 37 and 38. The extension 37 is sealed or otherwise fastened between the overlapping flaps 22 and 25 or the outer carton, and the extension 38 lies between the wall of the inner liner and the sidewall 21 of the outer carton. Here, the cutout opening 36 provides access to the pouring spout 13a which may be projected and retracted through the opening 36.

It will be apparent from the foregoing that the present invention overcomes the problems listed above in the use of conventional film bag liners in an outer carton:

1. The threaded opening of the pouring spout is located with reasonable accuracy relative to the carton so that is accessible through an opening in the outer carton.
2. The threaded opening or pouring spout can be lifted up to the top position to provide access for filling.
3. Lateral rigidity of the wall of the outer carton with the positioning sheet secured thereto is sufficient to provide counter torque for tightening the screw cap.
4. The same is true when removing the screw cap.
5. The present invention also provides a means whereby the opening or pouring spout can be depressed to a flush protective position for shipping and storage or lifted up to an elevated position to facilitate handling or use in a filling machine or pouring over the edge of a carton enclosing the film bag.
6. The user of the composite container of the present invention will not be aware of the presence of the thin film and so will not get the impression of flimsiness. His only view of the package will be identical to that of the more rigid, more expensive molded liner.
7. The projected position of the conical portion or web 17 of the apron causes the polyethylene film underneath the sheet 16 to form into a similar conical shape, which reduces the amount of liquid left in the liner after emptying the contents thereof.

It should be additionally pointed that the positioning sheet, which is the only feature added to the standard commercial bag by the present invention does not add appreciably to the cost of production, since it can be made on high speed production equipment (vacuum forming or injection molding), and the material used can be low cost material since it does not come into contact with the liquid in the liner.

From the foregoing, it is believed that the invention may be readily understood by those skilled in the art without further description, it being borne in mind that numerous changes may be made in the details disclosed without departing from the spirit of the invention as set forth in the following claims.

I claim:

1. A device for maintaining a selected relative position in an outer container of a filmlike bag liner having a discharge opening and a pouring spout, said outer container having an access opening to receive said pouring spout, said device comprising a positioning sheet having an aperture to receive said liner pouring spout, means securing the area of said sheet bounded said aperture to said liner around the discharge opening in the latter and to said pouring spout, the area of said sheet immediately surrounding said pouring spout being at least semirigid and of greater thickness than the wall thickness
of said filmlike liner to provide torque resistance, yet of sufficiently flexible material to permit its projection and retraction with said pouring spout and that portion of the liner connected thereto through said outer container access opening, and means for anchoring at least portions of said sheet to said outer container, whereby said liner is prevented from collapsing in said outer container and said pouring spout is maintained in a position for ready access in filling and pouring.

2. A device as claimed in claim 1, wherein said positioning sheet is formed of semirigid plastic material.

3. A device as claimed in claim 1, wherein the area of said positioning sheet immediately surrounding said pouring spout is of frustoconical form to facilitate its projection and retraction with said pouring spout and that portion of said liner connected thereto through said access opening.

4. A device as claimed in claim 1, wherein said outer container is in the form of a carton having overlapping top flaps, said positioning sheet being anchored to said carton by insertion between said overlapping flaps and closing the latter.

5. A device as claimed in claim 4, wherein said positioning sheet is provided along one edge with a substantially angularly depending apron, said apron being insertable between the inner surface of the outer carton wall and the adjacent outer surface of the bag liner to provide additional resistance to movement of said positioning sheet.

6. A device as claimed in claim 1, wherein said outer container is in the form of a drum, the extremities of said positioning sheet being secured over the upper edges of the walls of said drum.

7. Apparatus as claimed in claim 1, wherein said pouring spout is provided with a radially extending base flange, said base flange being heat-sealed to the discharge opening of said liner and to the aperture in said positioning sheet.

8. A device as claimed in claim 1, wherein said positioning sheet is provided along one edge with a substantially angularly depending apron, said apron being insertable between the inner surface of the outer carton wall and the adjacent outer surface of the bag liner to provide additional resistance to movement of said positioning sheet.

9. The invention as claimed in claim 1, wherein said outer container is rectangular in shape and its access opening is in one corner thereof.

10. The invention as claimed in claim 1, wherein said filmlike liner and positioning sheet are of plastic material, the wall thickness of said liner being of the order of 0.004 feet and the thickness of said positioning sheet is of the order of 0.020 feet.

11. The invention as claimed in claim 3, wherein the frustoconical portion of said sheet has shape-retaining properties both when projected and retracted, the area of said liner secured to and surrounding said pouring spout being projectable and retractable with said spout in said frustoconical portion.

12. The combination with a substantially rigid outer container having an access opening and a filmlike bag liner for said container having an aperture fitted with a filling and pouring spout provided with a closure cap, of a positioning sheet formed of at least semirigid material, having an aperture to receive said pouring spout the material of said sheet immediately surrounding the aperture in said positioning sheet forming a web which extends radially from said last named aperture a predetermined distance in all directions and is secured around said filling and pouring spout, said web being sufficiently flexible to permit its projection and retraction with said pouring spout and the area of said liner secured thereto through the access opening in said outer container, but of sufficient rigidity to provide torque resistance when applying and removing said pouring spout closure cap, and means for anchoring at least a portion of said positioning sheet of said outer container.
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,599,840 Dated August 17, 1971

Inventor(s) Charles A. Speas

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 42, .0004 should be .004.

Column 6, lines 10 and 11, feet should be inch.

Signed and sealed this 7th day of March 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR. ROBERT GOTTSCALK
Attesting Officer Commissioner of Patents