# United States Patent [19]

**Firth**

[11] **3,756,389**

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[54] **MULTIPLE COMPARTMENT PACKAGE WITH FRANGIBLE INTERNAL BARRIER MEANS**


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[52] **U.S. Cl.** ..... **206/47 A**

[51] **Int. Cl.** ..... **B65d 25/08,** B65d 81/32

[58] **Field of Search** ..... 206/47 A



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[57] **ABSTRACT**

A flexible package for storing multiple fluent materials in separate compartments and for ultimate mixing in the package, comprises:

a. an envelope and barrier means forming the compartments at opposite sides of the barrier means,

b. the barrier means comprising at least one frangible sheet extending within the envelope in position to be ruptured between the compartments in response to manual tension application thereto.


**7 Claims, 6 Drawing Figures**

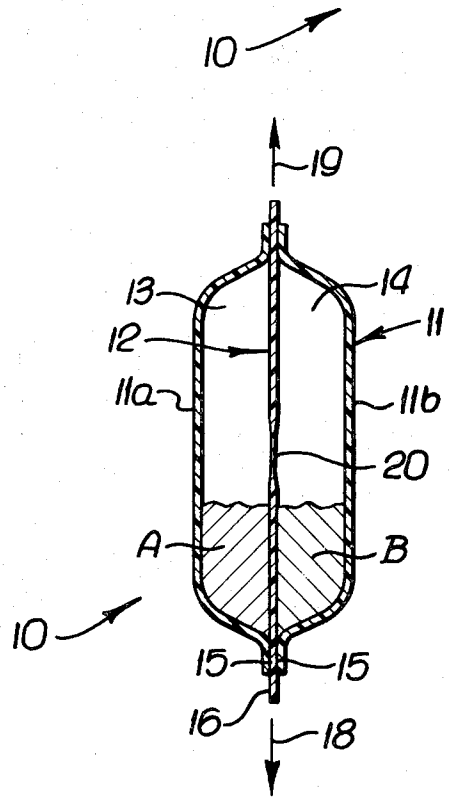


FIG. 1.

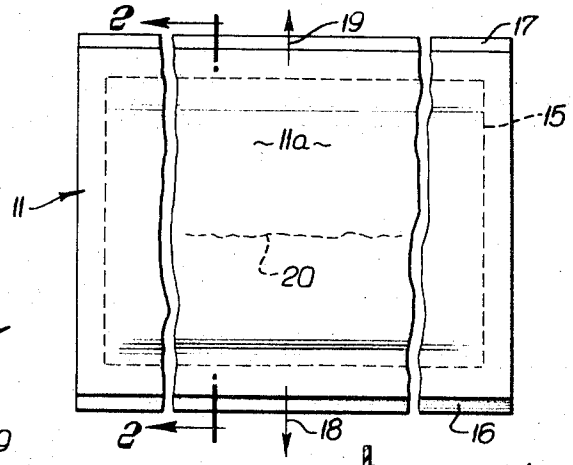



FIG. 2.

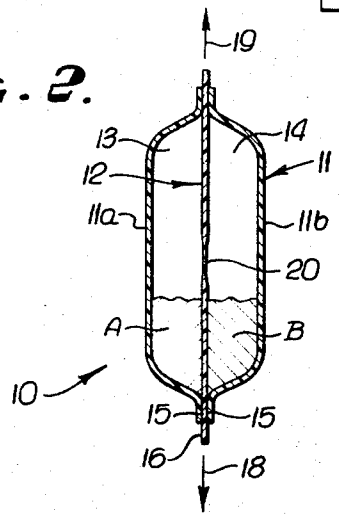



FIG. 3.

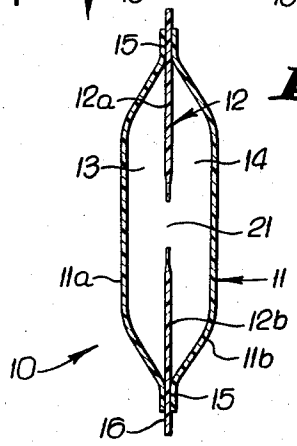



FIG. 5.

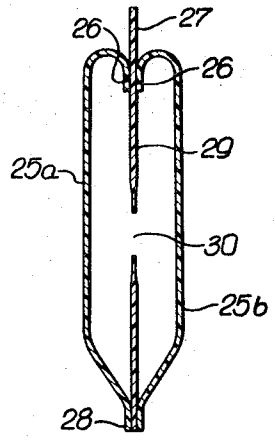



FIG. 4.

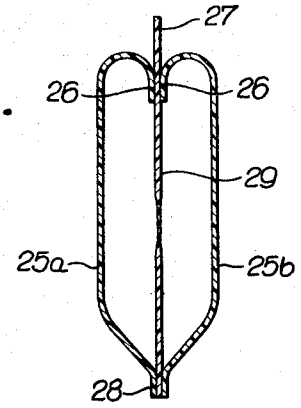
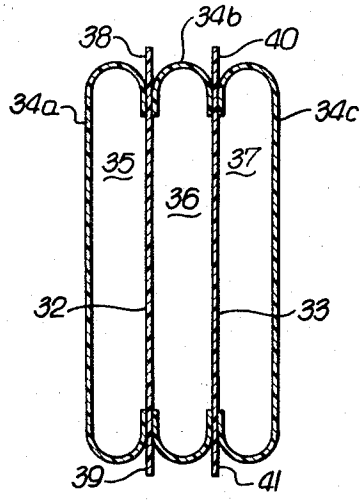



FIG. 6.

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# MULTIPLE COMPARTMENT PACKAGE WITH FRANGIBLE INTERNAL BARRIER MEANS

## BACKGROUND OF THE INVENTION

This invention relates generally to multiple component packaging, and more particularly concerns a flexible package capable of being controllably internally ruptured to enable mixing of the multiple components, as desired.

Prior package of the above type have in general lacked the unusually advantageous features of construction, mode of operation and results which characterize the present invention. For example, prior packages have suffered from excessive complexity of construction and manufacture as well as difficulty of use.

## SUMMARY OF THE INVENTION

It is a major object of the invention to provide a multiple component, internally rupturable package overcoming the above difficulties and objections. Basically, the new package comprises an envelope and barrier means forming compartments at opposite sides of the barrier means, the latter comprising at least one frangible sheet extending within the envelope in position to be ruptured between the compartments in response to manual tension application, or shear force applied manually through the flexible envelope. As will appear, the barrier may be peripherally sealed to the envelope, for example by bonding or heat sealing a plastic envelope to the barrier sheet; the barrier may consist of metallic foil (which may or may not be previously treated to enhance adhesion, for example by radiation means or by a sealable coating) or other suitable material; and the envelope may consist of plastic material, as for example polyethylene, butyl or other suitable flexible film or combination thereof.

Further, the barrier may comprise multiple frangible sheets extending between envelope sections to form separate compartments, such barriers being selectively rupturable; and peripheral portions of the barrier alone, or together with the envelope, may form pull tabs to be manually grasped for oppositely directed pulling to create the rupture producing tension as described. Also, the barrier may be locally weakened between the compartments to rupture at predetermined locations, and the envelope may consist of sections with inturned ends attached to the barrier, as will be seen.

These and other objects and advantages of the invention, as well as the details of illustrative embodiment, will be more fully understood from the following description and drawings, in which:

## DRAWING DESCRIPTION

FIG. 1 is a fragmentary front elevation, showing a package incorporating the invention;

FIG. 2 is a section taken on line 2—2 of FIG. 1;

FIG. 3 is a view like FIG. 2, but showing the package subsequent to rupture of the internal barrier;

FIGS. 4 and 5 are views like FIGS. 2 and 3 respectively, but showing a modified package construction; and

FIG. 6 is a view like FIG. 2, but showing a still further modified package.

## DETAILED DESCRIPTION

In FIGS. 1 and 2, a flexible package 10 includes an envelope 11 and barrier means, such a sheet 12, forming separate compartments 13 and 14 at opposite sides of the barrier means or membrane. The envelope may comprise like sections 11*a* and 11*b* at opposite sides of the barrier, each section peripherally bonded thereto, as for example by heat sealing, or adhesive attachment at 15. The membrane 12 may consist; for example, of metallic foil (say, aluminum, etc), or of a polymer (polyester film, Mylar, etc) to which a sealable coating such as polyethylene or adhesive has been applied; and the envelope may consist of polyethylene or other plastic sheet material, transparent or translucent.

In accordance with the invention, the barrier membrane is frangible and positioned to be ruptured between the compartments in response to application of manually exerted tension or transverse shear. For example, tension may be applied to the tabs 16 and 17 in the direction of arrows 18 and 19 to produce the rupture at tear location 20; and, for this purpose, the membrane may be thinned or weakened at that location prior to assembly of the package. FIG. 3 shows the package configuration after rupture of the membrane, with communication established between the two compartments 13 and 14 via the gap 21 between the membrane sections 12*a* and 12*b*. Accordingly, previously separated fluent or flowable materials in the compartments may then be thoroughly mixed with the package remaining closed, as by manual kneading of the envelope. Such materials are indicated at A and B in FIG. 2. Merely as illustrative, the materials may consist of resin components (liquid or powder) which polymerize only after mixing; foodstuffs which may be mixed in the package just prior to serving after heating of the package in hot water (meat and sauce, vegetables and sauce, etc); and any other substances which are to be subjected to controlled mixing, say after heating or without temperature change.

The rupture may alternatively be produced by grasping the package with two hands so as to grip the membrane through the envelope material, and exerting tension on the membrane. After thorough mixing, the package may be cut to discharge the contents.

FIG. 4 shows another form of the package in which envelope sections 25*a* and 25*b* are reversely turned at one end of the membrane for attachment thereto, as by bonding, heat sealing, etc. at 26. Upon manual pulling of tabs 27 and 28 in opposite directions, the barrier membrane 29 ruptures as at 30 in FIG. 5.

FIG. 6 illustrates a multiple compartmented package with frangible barrier membranes 32 and 33 cooperating with envelope sections 34*a*, 34*b* and 34*c* to form three compartments 35–37. The barrier may be selectively ruptured, as by pulling on tabs 38 and 39, and tabs 40 and 41, to thereby selectively mix the contents of the compartments 35 and 36, or the contents of compartments 36 and 37, or the contents of all three compartments.

In each of FIGS. 4 and 6, the package may be opened after such mixing in situ, to discharge the contents.

I claim:

1. A flexible package for storing multiple fluent materials in separate compartments and for ultimate mixing in the package, comprising

a. an envelope and a barrier sheet forming the compartments at opposite sides of the barrier sheet,

b. the barrier sheet having a locally thinned section extending within the envelope in position to be rup-

tured at said section thinning between the compartments in response to manual tension application thereof,

c. the barrier sheet defining externally accessible pull tabs in general alignment with said thinned section and at opposite ends of the barrier sheet, the local thinning extending transversely in the barrier sheet, and

d. the envelope comprising plastic sheet sections confined at opposite sides of the barrier sheet and peripherally bonded thereto.

**2.** The package of claim **1** wherein the barrier consists of metallic foil.

**3.** The package of claim **1** wherein the barrier includes a sealable coating on the sheet.

**4.** The package of claim **1** wherein the barrier sheet consists of a sealable polymer film.

**5.** The package of claim **1** including said fluent materials in said compartments and consisting of resin components which polymerize after mixing.

**6.** The package of claim **1** wherein the barrier sheet comprises multiple parallel sheets extending between multiple envelope sections to form therewith multiple compartments.

**7.** The package of claim **1** wherein the edge portions of the envelope sections are turned inwardly for attachment to the barrier means.

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