

[54] **MULTI-COMPARTMENT MIXING PACKAGE**

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[51] Int. Cl. **B65d 79/00**

[58] Field of Search 206/47 A, 56 AA, 206/65 T, DIG. 32; 229/22, 51 WB

[56] **References Cited**

UNITED STATES PATENTS

3,156,352	11/1964	Hayhurst.....	206/47 A
2,771,724	11/1956	Hosier et al.	206/47 A X
3,367,489	2/1968	Schneider et al.	206/65 T

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[57] **ABSTRACT**

There is disclosed a multi-compartment package in the form of a tube having a breakable seal intermediate the ends thereof to provide at least two compartments therein, finger pulls secured to the opposed side walls of the tube in alignment with the breakable seal for pulling the side walls apart thereby breaking the seal, the package having a first greater dimension along the longitudinal axis of the breakable seal when the seal is unbroken and having a second smaller dimension in the direction of the longitudinal axis of the breakable seal after the finger pulls have been pulled apart to break the seal.

4 Claims, 13 Drawing Figures

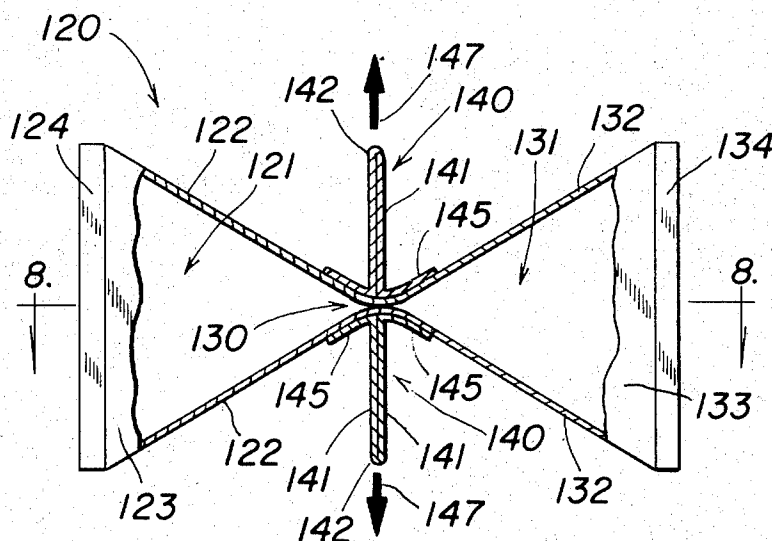


FIG. 1

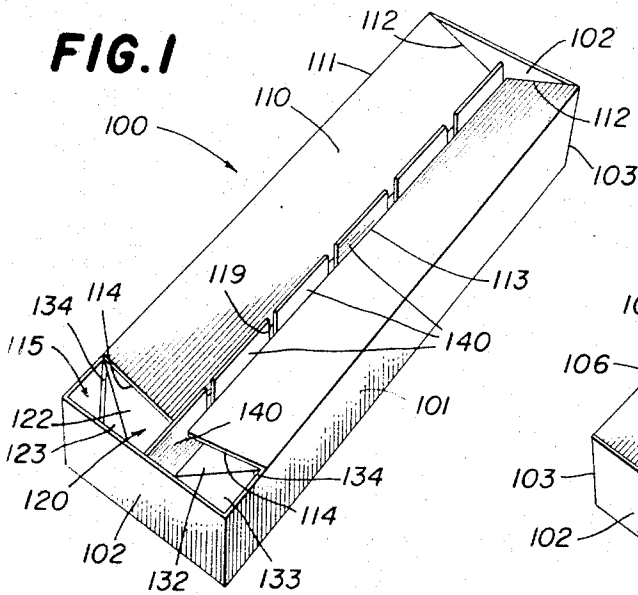


FIG. 2

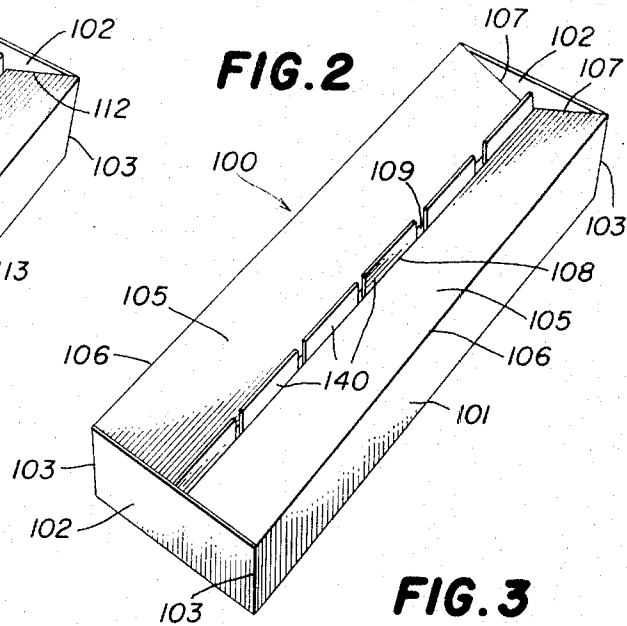


FIG. 4

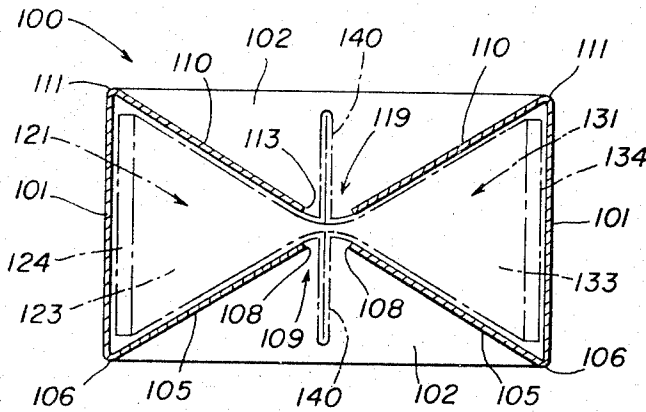


FIG. 3

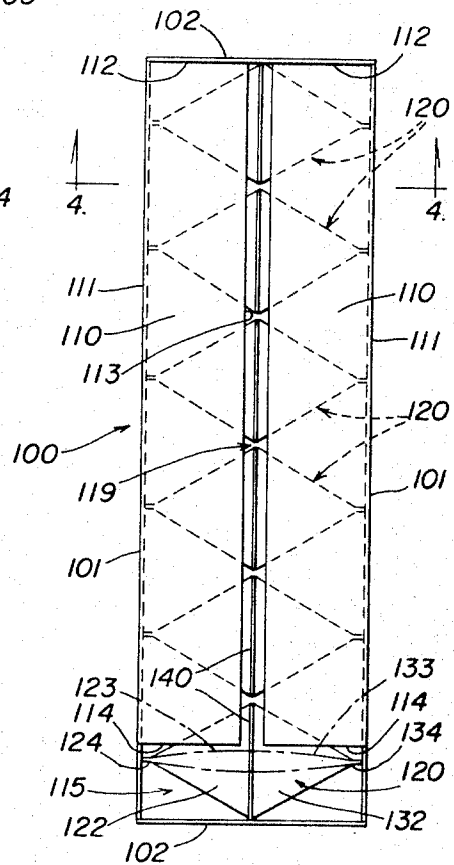
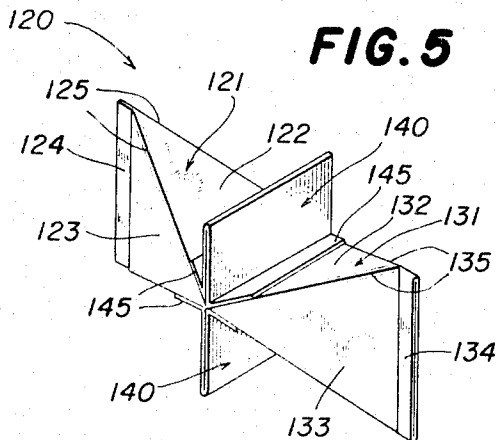


FIG. 5



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FIG. 6

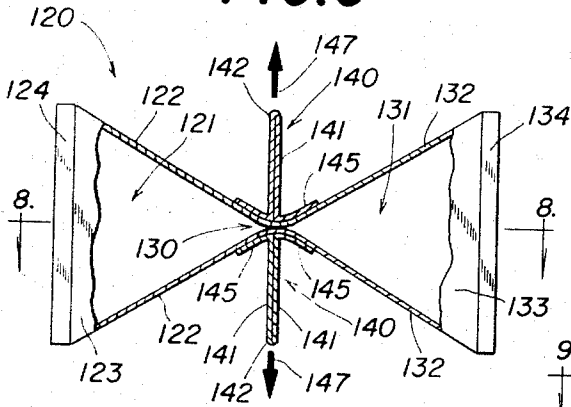


FIG. 7

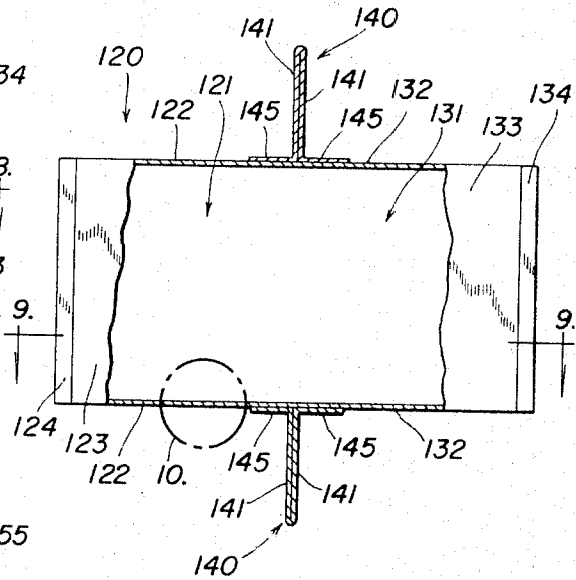


FIG. 11

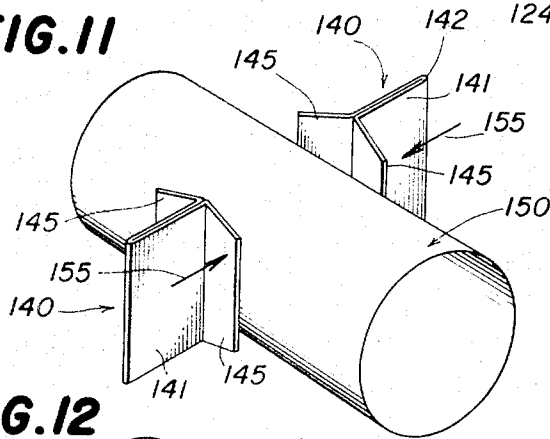


FIG. 8

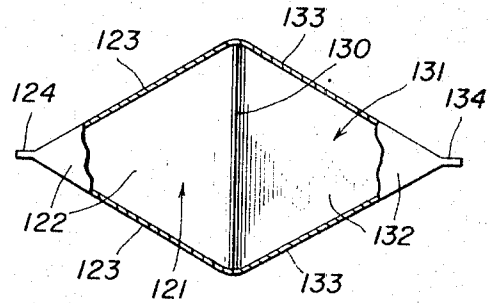


FIG. 12

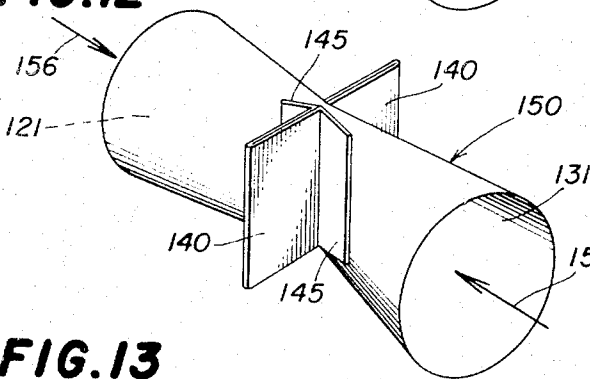


FIG. 9

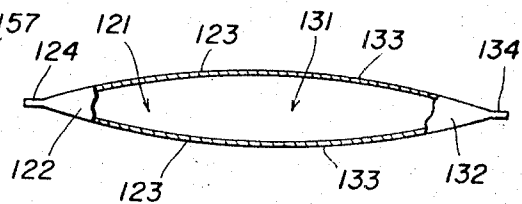


FIG. 13

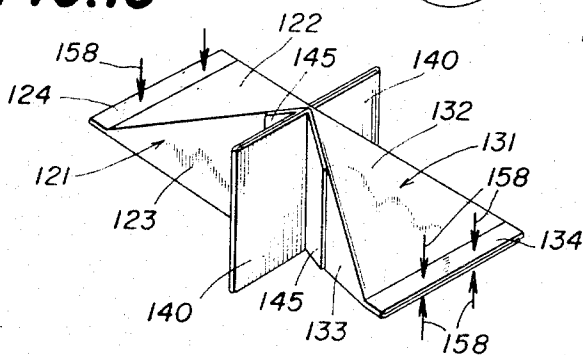
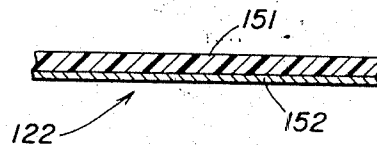


FIG. 10



MULTI-COMPARTMENT MIXING PACKAGE

The present invention is directed to packages of flexible material, and to dispensing cartons for such packages and to the method of making such packages, the packages having two compartments separated by a breakable seal and being changed from a first configuration retaining the packages in the carton to a second configuration permitting dispensing of the packages from the carton upon breaking of the seal.

It is an important object of the present invention to provide a multi-compartment package in the form of an elongated tube of flexible material having the opposed walls thereof intermediate the ends thereof disposed adjacent to one another with a heat-sealable resin coating therebetween heat-sealed to provide a breakable fluid-tight seal between the ends of the tube, the breakable seal being elongated in a direction transverse to the longitudinal axis of the tube and having a longitudinal axis extending transversely of the tube, the ends of the tube being sealed so as to provide fluid-tight compartments disposed between the breakable seal and the sealed ends of the tube, and two finger pulls respectively secured to the opposed side walls adjacent to the breakable seal, the package having a first greater dimension along the longitudinal axis of the breakable seal when the seal is unbroken to provide a first wider configuration for the package and having a second smaller dimension in the direction of the longitudinal axis of the seal after the finger pulls have been pulled apart to break the seal to provide a second narrower configuration for the package, pulling apart of the finger pulls simultaneously breaking the seal and changing the configuration of the package from the first wider configuration thereof to the second narrower configuration thereof.

Another object of the invention is to provide a dispensing carton for the improved multi-compartment package of the present invention, the carton having a pair of longitudinally extending side walls connected at the ends by end walls, two bottom wall members extending inwardly from the side walls but spaced to provide a pull-receiving slot therebetween, and two top wall members extending inwardly from the side walls but spaced to provide a pull-receiving slot therebetween, the carton receiving a plurality of the packages with one of the pulls extending through one of the slots and the other of the pulls extending through the other of the slots, pulling of the pulls away from each other changing the package from the wider configuration thereof to the narrower configuration thereof thereby to permit the package to be withdrawn from the carton through the dispensing slot.

A further object of the invention is to provide an improved method of making a multi-compartment package comprising providing an elongated tube of flexible material including a heat-sealable synthetic organic plastic resin on at least certain portions of the inner surface thereof, providing two finger pulls of flexible material on opposed sides of the tube each having an attachment flange thereon and including a body of the heat-sealable resin, moving the attachment flanges toward each other to move the opposed walls of the tube into contact with a layer of the heat-sealable resin therebetween, applying heat and pressure to the assembly of the attachment flanges and the adjacent portions of the opposed walls of the tube to seal the attachment flanges to the outer surface of the opposed walls and to

form a breakable fluid-tight seal joining the opposed walls and disposed between the ends of the tube, moving the opposed walls at the ends of the tube toward one another to close the ends of the tube, and applying heat and pressure to the ends of the tube to produce a fluid-tight seal thereat to form two fluid-tight compartments disposed between the breakable seal and the sealed ends of the tube.

Further features of the invention pertain to the particular arrangement of the parts of the package and of the parts of the carton and of the particular arrangement of the steps of the method of making the package, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a plurality of the packages of the present invention disposed in the improved dispensing carton therefor of the present invention, the dispensing carton being viewed from the top;

FIG. 2 is a perspective view of the dispensing carton and packages of FIG. 1 viewed from the bottom thereof;

FIG. 3 is a plan view of the packages and carton of FIG. 1;

FIG. 4 is an enlarged view in vertical section along the line 4—4 of FIG. 3;

FIG. 5 is a perspective view of one of the improved packages of the present invention;

FIG. 6 is a side elevational view with certain portions broken away of the package of FIG. 5, the parts being in configuration to provide two compartments sealed one from the other;

FIG. 7 is similar to FIG. 6 but showing the parts after breaking of the seal between the two compartments;

FIG. 8 is a view in longitudinal section along the line 8—8 of FIG. 6;

FIG. 9 is a view in longitudinal section along the line 9—9 of FIG. 7;

FIG. 10 is a greatly enlarged view of a portion of the wall of the package within the dashed circle of FIG. 7; and

FIGS. 11 to 13 are diagrammatical views illustrating the method of making the package of FIG. 5 to 10.

Referring first to FIGS. 1 to 4, there are illustrated a plurality of multi-compartment packages 120 made in accordance with the present invention disposed in a dispensing carton 100 made in accordance with the present invention. The dispensing carton 100 includes a pair of longitudinally extending and spaced apart side walls 101 arranged generally parallel to each other and joined at the outer ends thereof by end walls 102, each of the side walls 101 and each of the walls 102 being rectangular in shape and all having essentially the same width. More specifically, the side walls 101 and the end walls 102 are joined at junctures 103 to provide a generally rectangular enclosure within which are disposed six of the packages 120. Referring to FIG. 2, it will be seen that there also are provided two bottom wall members 105 respectively joined to one of the longitudinal edges of the adjacent side wall 101 at junctures 106, the bottom wall members 105 having end edges 107 which abut against and are preferably secured to the adjacent end wall 102. From FIG. 4 it will be seen that

the bottom wall members 105 extend toward each other and upwardly from the junctures 106 as illustrated therein and terminate at longitudinal edges 108 spaced from each other to provide a pull-receiving slot 109 therebetween. The other longitudinally extending edges of the side walls 101 have thereon top wall members 110 secured thereto at junctures 111 and extending inwardly toward each other. One of the end edges 112 of each of the top wall members 110 is disposed adjacent to and is preferably secured to the adjacent end wall 102. The other end edges 114 of the top wall members 110 are spaced from the adjacent end wall 102 and define therewith a dispensing slot 115 through which the packages 120 are dispensed, all as will be explained more fully hereinafter. Referring to FIG. 4, it will be seen that the top wall members converge toward each other and downwardly toward the bottom wall members 105, the longitudinal edges 113 of the top wall members 110 being spaced apart to provide a pull-receiving slot 119 therebetween.

Referring now to FIGS. 5 to 10 of the drawings, the construction and operation of the package 120 will be described in detail. As illustrated, the package 120 includes a first compartment 121 and a second compartment 131 separated by a breakable seal 130, the outer walls of the package intermediate the ends thereof being provided with two opposed finger pulls 140. The first compartment 121 is formed by two opposed side walls 122 which are generally triangular in shape and two opposed end walls 123 which are also generally triangular in shape, the side walls 122 being joined to the end walls 123 along junctures 125. The outer ends of the walls 122 and 123 are flattened to provide a flattened end 124 which is sealed as will be described more fully hereinafter. The second compartment 131 is formed by two opposed side walls 132 which are generally triangular in shape and two opposed end walls 133 which are also generally triangular in shape, the side walls 132 being joined to the end walls 133 along junctures 135. The outer ends of the walls 132 and 133 are flattened to provide a flattened end 134 which is sealed as will be described more fully hereinafter.

Disposed between the two compartments 121 and 131 is the breakable fluid-tight seal 130 (see FIG. 6), the seal 130 extending the entire width of the base of the side walls 122 and 132 and being directed essentially transversely of the package 120 and having a longitudinal axis extending transversely of the package 120. As a result of the seal 130 cooperating with the sealed ends 124 and 134, the compartments 121 and 131 are sealed from each other in a fluid-tight manner and are completely enclosed for containing materials therein, which materials may be solids, liquids or gases. The seal 130, however, is breakable if the opposed side walls are pulled apart in the direction of the arrows 147 in FIG. 6, breakage of the seal 130 permitting the contents of the compartments 121 and 131 to mix, and also permitting the shape or configuration of FIGS. 5, 6 and 8 to the narrower configuration of FIGS. 7 and 10.

In order to facilitate the breaking of the seal 130 two finger pulls 140 have been provided on the opposite side walls of the package 120. As illustrated, each finger pull 140 comprises two layers 141 of sheet material disposed adjacent to each other and joined at the outer ends thereof at a juncture 142 and carrying on the inner ends thereof outwardly directed attachment flanges 145. Preferably at least the inner surfaces of the

layers 141 and the surfaces of the attachment flanges 145 disposed toward the side walls of the package 120 are formed of or carry thereon a heat-sealable synthetic organic plastic resin, whereby the attachment flanges 145 are firmly secured to the side walls 122 and 132 on the opposite sides of the package 120.

It will be seen that as illustrated, the finger pulls 140 have a longitudinal dimension essentially equal to that of the seal 130 and a transverse dimension in the direction of the longitudinal axis of the flattened ends 124 and 134 such that the outer end of each pull 140 is essentially in alignment with the adjacent outer ends of the flattened ends 124 and 134. The attachment flanges 145 extend laterally from the finger pulls 140 only a short distance, but extend longitudinal of the side walls 122 and 132 essentially the entire width thereof.

Simultaneous pulling of the finger pulls 140 in the directions of the arrows 147 not only breaks the seal 130 between the compartments 121 and 131, but also changes the configuration or shape of the package 120 from that illustrated in FIGS. 5, 6 and 8 to that illustrated in FIGS. 7 and 9. The first or wider configuration of FIGS. 6 and 8 is the configuration of the package 120 when the seal 130 is unbroken and intact, the width or transverse dimension of the package 120 in the center thereof being essentially that of the seal 130 since the combined lengths of the finger pulls 140 is of the order of magnitude as the length of the seal 130. After the parts are moved to the configuration of FIGS. 7 and 9, the transverse dimension of the package 120 is substantially less, the transverse dimension thereof being illustrated in FIG. 9 from which it will be seen that this configuration is much narrower than the original configuration illustrated in FIG. 8. In order to accommodate this change in the configuration of the package 120, it is also necessary that the pulls 140 be deformable and/or that the attachment flanges 145 be at least partially separable from the associated side walls 122 and 132 since the side walls 122 and 132 are essentially folded along the longitudinal mid-lines thereof and the junctures therebetween pulled apart one from the other as illustrated in FIG. 7.

The packages 120 are specifically arranged and designed for dispensing from the carton 100 illustrated in FIGS. 1 through 4. More specifically, the height of the side walls 101 and the end walls 102 is slightly greater than the length of the flattened ends 124 and 134 and the combined heights of the finger pulls 140, see FIG. 4. The compartment 121 is disposed between one of the bottom wall members 105 and one of the top wall members 110, while the compartment 131 is disposed between the other of the bottom wall members 105 and the other of the top wall members 110. One of the finger pulls 140 extends downwardly through the pull slot 109, while the other finger pull 140 extends upwardly through the other pull slot 119, whereby the major portion of the finger pulls 140 are disposed in position to be grasped by a user, but the outer ends thereof are spaced below the outer edges of the side walls 101 and the end walls 102 so as to be protected thereby.

So long as the package 120 is in its sealed configuration having the greater transverse dimension as illustrated in FIGS. 6 and 8, the package 120 is too large to pass through the dispensing slot 115, whereby the packages are retained in the dispensing carton 100. When it is desired to use one of the packages 120, the package 120 can be removed from the carton 100 by

the user grasping the finger pulls 140 and pulling the same away from each other as illustrated by the arrows 147 in FIG. 6. This action changes the configuration of the package 120 from that of FIGS. 6 and 8 to that of FIGS. 7 and 9, i.e., from a wider configuration to a narrower configuration, the narrower configuration of the package 120 permitting withdrawal thereof through the dispensing slot 115, whereby to remove the package 120 from the carton 100. Simultaneously with the change in configuration of the package 120, the breakable seal 130 is broken whereby to join the compartments 121 and 131 and thus to permit mixing of the contents thereof.

In one preferred use of the package 120, the first compartment 121 contains a quantity of potassium iodide while the second compartment 131 contains water. So long as the seal 130 is unbroken, the contents of the compartments 121 and 131 will remain separated and there will be no interaction thereof. Immediately upon breaking of the seal 130, the potassium iodide and the water will mix and there will result an endothermic reaction which will cool the contents of the package 120, the package 120 and anything in contact with the package 120; one use for such a package 120 is as a coolant for a beverage to which it is desired that no water be added, whereby to have cooling of the beverage without dilution thereof by melting ice or the like.

The package 120 can also be utilized to store ingredients which when mixed will produce an exothermic reaction, reference being made to U. S. Letters Patent No. 2,040,406 granted May 12, 1936 to Raymond E. Reed; when applying the teaching of that patent to the package 120, oxalic acid, barium chloride, cupric carbonate and iron filings in the ratio 10:21:25:600 by weight would be disposed in compartment 121 while water would be disposed in compartment 131. So long as the seal 130 remained unbroken, there would be no reaction and no heating; upon breakage of the seal 130, the contents of the compartments 121 and 131 would mix and there would result a highly exothermic reaction which would heat the contents of the package, the package 120 and anything in contact therewith.

In general, the package 120 can be used with a wide variety of materials wherein it is desired to package two or more materials or ingredients which are to be kept separate until the user wishes to intermix the same. Milk powder could be placed in one compartment and distilled water in the other, whereby upon breaking of the seal 130 there would result potable milk that can be removed by cutting one end of the package 120. Other beverages or liquid food materials can be similarly packaged, such as powdered soup stock, powdered cocoa, dehydrated foods, and the like in one compartment, and water in the other. Yet another application would be in storing the ingredients of a self-curing resin such as an epoxy resin wherein one ingredient must be held out of contact with the other until immediately prior to use of the adhesive resin to be produced by the mixture thereof.

The dispensing carton 100 may be made of cardboard, synthetic organic plastic resin, or other suitable and satisfactory material, the only requirement being that the material have sufficient rigidity to retain the shape of the carton 100.

The package 120 may be made of any of the suitable heat-sealable resins which are available as flexible ther-

moplastic polymeric films. The preferred material of construction is a laminate of a thin metal foil such as aluminum, to which is laminated a layer of a heat-sealable thermoplastic resin, the preferred resin being polypropylene resin. As illustrated in FIG. 10, the polypropylene resin layer 151 is laminated to an aluminum foil layer 152 to provide a composite material for the package 120, the foil 152 being disposed exteriorly of the package 120 with the heat-sealable polypropylene layer 151 being disposed inwardly in the package 120. The finger pulls 140 are also preferably formed of the same material with the polypropylene layer 151 in the layers 141 being disposed toward each other and with the polypropylene layer 151 of the attachment flanges 145 being disposed against the aluminum layer 152 of the side walls 122 and 132.

Referring now to FIGS. 11 to 13 of the drawings, there is illustrated the preferred method of forming the package 120 from a tube 150 having an exterior metal foil layer and an interiorly disposed heat-sealable resin layer. There are provided the finger pulls 140 which may be conveniently formed by folding the laminate material upon itself with the polypropylene resin layers disposed toward each other, after which application of heat and pressure in the usual manner will seal together the two layers 141 of the finger pull 140. The attachment flanges 145 are then positioned with the heat-sealable resin surfaces thereof, disposed against the tube 150 on opposed side walls thereof and essentially centered intermediate the ends thereof. The finger pulls 140 are then pushed toward each other in the directions of the arrows 155 so as to press the attachment flanges 145 against the outer surfaces of the tube 150 and also to deform the tube 150 at the center thereof to move the opposed walls into contact, i.e., to place the heat-sealable resin layers thereon in contact with each other. Application of heat and pressure will simultaneously produce the breakable seal 130 and also seal the attachment flanges 145 to the tube 150.

The first compartment 121 is then filled as diagrammatically illustrated by the arrow 156 in FIG. 12, and the second compartment 131 is also filled as diagrammatically illustrated by the arrow 157 in FIG. 12. The outer ends of the tube 150 are then closed by moving the opposed sides thereof toward each other and applying heat and pressure to the contacting sides to seal the heat-sealable resin layers thereon, all as diagrammatically illustrated by the arrows 158 in FIG. 13. The sealing of the ends 124 and 134 also automatically shapes the package 120 as illustrated to produce the sealed configuration of the package 120 illustrated in FIGS. 5, 6 and 8 of the drawings.

While there has been described what are at present considered to be the preferred embodiments of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A multi-compartment package comprising an elongated tube of flexible material including a heat-sealable synthetic organic plastic resin on at least certain portions of the inner surface thereof, said tube having the opposed walls thereof intermediate the ends thereof disposed adjacent to one another with the resin coating thereon heat-sealed to provide a breakable fluid-tight seal between the ends of said tube, said

breakable seal being elongated in a direction transverse to the longitudinal axis of said tube, the ends of said tube having the opposed side walls thereof disposed adjacent to one another with the resin coating thereon heat-sealed to provide fluid-tight compartments disposed between said breakable seal and the sealed ends of said tube, and two finger pulls each consisting of a length of flexible material folded back upon itself with attachment flanges extending outwardly away from each other, said finger pulls respectively being secured to the opposed side walls adjacent to said breakable seal for grasping by a user to pull the same away from each other thereby breaking said breakable seal to interconnect the two compartments in said package, said package having a first greater dimension along the longitudinal axis of said breakable seal when said breakable seal is unbroken to provide a first wider configura-

tion for said package and having a second smaller dimension in the direction of the longitudinal axis of said breakable seal after said finger pulls have been pulled apart to break said breakable seal to provide a second narrower configuration for said package.

2. The multi-compartment package set forth in claim 1, wherein said flexible material is an aluminum metal foil.

3. The multi-compartment package set forth in claim 1, wherein said resin is a polypropylene resin.

4. The multi-compartment package set forth in claim 1, wherein said sealed ends are elongated in a direction transverse to the longitudinal axis of said tube and lying in a common plane that is disposed normal to the longitudinal axis of said breakable seal.

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