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COMPARTMENTED PACKAGE AND DIVIDER THEREFOR

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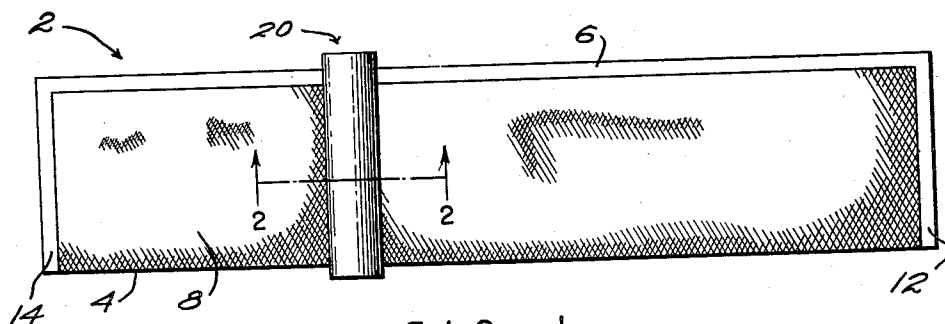


FIG. 1

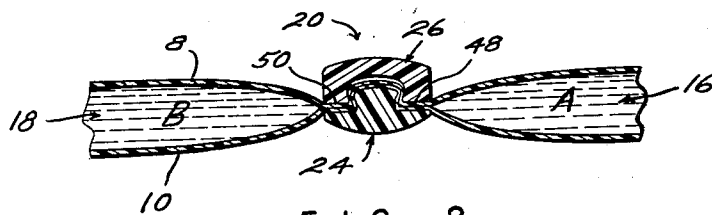


FIG. 2

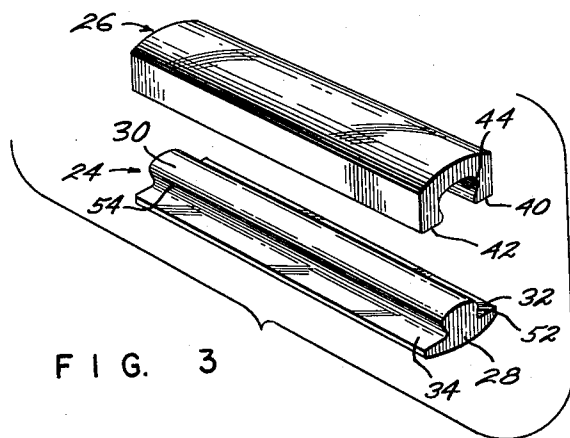


FIG. 3

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This invention relates to a disposable package suitable for containing and mixing a plurality of components and more particularly to a compartmented package comprising a sealed bag which is divided into two or more leak proof compartments by one or more removable divider assemblies.

Heretofore it has been considered desirable to produce an inexpensive multi-compartmented package for separately containing a plurality of components which can be readily converted into a single compartment bag within which the components can be mixed together without exposure to the air or to the hands of the user. This type of bag is especially useful for packaging chemicals which when mixed together will rapidly react to form a composition that must be used within minutes or else be useless. Thus, for example, one compartment may contain a fluid thermo-setting resin such as an epoxy resin and another compartment may contain a curing agent therefor such as an amine. When the two materials are mixed together, the resin will rapidly set up into a mass of hard, durable heat-resistant plastic. The mixture must be used before it becomes hard; otherwise it is worthless. Having the two ingredients in separate compartments of a single package is desirable since it facilitates selling them as a unit while at the same time keeping them separated so as to avoid premature setting up of the resin. Moreover, having them in separate compartments of a bag which is capable of serving as a mixing container without the components being exposed to the air or to the user's hands, is not only convenient and unmessy but also assures that the materials will be mixed in the proper proportions.

The generally accepted approach has been to form one large flat bag of flexible material and to divide it into two compartments by means of a clamp-type divider, with one of the essential components stored in one compartment and the other of the essential components stored in the other compartment. Various types of clamp-type dividers have been devised. Some of them have been made of metal; others have been made of plastic. However, none of them has been satisfactory. For one thing, none of them (and particularly those made of plastic) has been capable of providing an effective seal between the two compartments, as a result of which some of the material in one compartment would leak into the other compartment to prematurely initiate the chemical reaction. Not only are such packages unsaleable but also they have created doubt as to the feasibility of marketing different reactive materials in a single plastic package. Another criticism of clamp-type dividers has been excessive cost, particularly in the case of metal dividers. Still another criticism is that they have prevented the bags from lying flat, thereby making it difficult to stack them neatly in boxes for shipment or for display. In certain other cases, the dividers have been difficult to apply and just as difficult to remove.

Accordingly, a primary object of the present invention is to provide a novel package divider which is free of the disadvantages and defects attendant to dividers heretofore available.

Another primary object of the present invention is to provide a flexible bag which is selectively and temporarily divided into a plurality of hermetically sealed compartments by means of a novel removable plastic bag divider.

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A more specific object of the present invention is to provide a divider or closure assembly for a flexible bag which comprises an elongate core member and an elongate clamp member between which the bag is clamped; the elongate core consisting of a relatively resilient plastic material and the clamp being constructed of a relatively stiff plastic material, the core and clamp having complementary mating sections which pinch together tightly the walls of the bag along different transversely extending areas of the bag.

Other objects and many of the attendant advantages of the present invention will become readily apparent from a study of the following detailed specification when considered together with the accompanying drawings wherein:

FIG. 1 is a plan view of a multi-compartment package embodying the present invention;

FIG. 2 is an enlarged cross sectional view taken along line 2—2 of FIG. 1; and

FIG. 3 is an enlarged exploded perspective view of the two elements which make up a divider assembly embodying the present invention.

Referring now to FIG. 1, there is illustrated a substantially flat bag 2 which is of any suitable rectangular shape and which is preferably formed from flexible sheet plastic material such as polyethylene or polymerized vinylidene chloride. However, other well known sheet plastic material may also be employed without departing from the principles of the present invention. Moreover, the bag may be formed from extruded tubing instead of from sheet material. Preferably, the bag material is transparent or translucent.

This type of bag may be formed from two different webs of sheet plastic material. Preferably however, it is formed by taking a single web of plastic material and folding it along its longitudinal center line which is represented by the edge 4 of the bag. On folding the web into two sections of equal width, its longitudinal edges will overlie one another. These edges are sealed together as indicated at 6. At this point, the web is in the shape of a flattened tube and comprises a front wall 8 and a rear wall 10 (FIG. 2). Thereafter, the bag 2 is formed by sealing the tube transversely as indicated at 12 and 14.

This type of bag is well known and is manufactured and filled at a relatively high rate on any one of several types of well known packaging machines.

In the practice of the present invention it is contemplated that the bag 2 will be filled with two different materials and that these materials will be retained in separate compartments 16 and 18 which are formed by subdividing the bag 2 by means of a divider assembly indicated generally at 20. The complete package of FIG. 1 may be made according to two different procedures. According to one procedure, after the first seal 12 has been made, the bag is filled with material in a predetermined quantity which is insufficient to fill more than a given amount of the bag, e.g., about half. Thereafter, the divider assembly 20 is applied to the bag so as to divide off the unfilled portion of the bag from the filled portion of the bag. Thereafter, the unfilled portion of the bag is filled with another material, after which the second seal 14 is made. At this point the bag is as illustrated in FIG. 1, comprising ingredient A in compartment 16 and ingredient B in compartment 18. The alternative procedure is to apply the divider assembly first, fill and seal at one end and then fill and seal at the other end.

FIGS. 2 and 3 illustrate in detail the divider assembly of the present invention. This novel divider assembly is adapted to hermetically seal off chamber 16 from chamber 18 while at the same time allowing the bag to lie flat. This facilitates stacking a plurality of the bags in a box or carton.

The novel divider assembly 20 comprises a core member 24 and a clamp member 26. The core member 24 may be formed of any suitable plastic material. However, it should be resilient in order to function as contemplated by the present invention. The clamp member 26 also is formed of plastic, but it must be relatively stiff in order to attain the proper result. Preferably, the difference in stiffness between the two elements is attained by manufacturing one member with less plasticizer than the other member. Alternatively, the two members may be made of different plastics, one of which is relatively rigid while the other is relatively flexible.

The core member 24 is essentially of T-shaped cross section. It comprises a base portion 28 having on one side a longitudinally extending rib 30 of C-shaped cross-sectional profile. The side of the base portion 28 on which is located a rib 30 is divided into two flat substantially co-planar surfaces 32 and 34 which are integral with but extend laterally of the surface 32 of the C-shaped rib 30.

The clamp member 26 has a flat underside which is divided into two flat substantially co-planar longitudinally extending surfaces 40 and 42 which are separated from each other by a longitudinally extending groove 44 which also is of C-shaped cross-sectional configuration. Groove 44 is sized and shaped to complement rib 30 of the core, with clearance being allowed between them to accommodate the thicknesses of the two walls 8 and 10 of the bag 2. The width of clamp member 26 is substantially the same as the width of the base portion 28 of the core member. Therefore, the surfaces 40 and 42 of the clamp member are in opposed facing relation with the co-planar surfaces 32 and 34 of the core member when the two members are in mating relation to each other.

FIG. 2 illustrates the relationship between the core and clamp members of FIG. 3 and the opposed sides 8 and 10 of the bag 2. The clamp member 26 is first positioned on one side of the bag, the bag being tipped so the commodity A will flow toward one end, in this case toward transverse seal 12. Thereafter core member 24 is applied on the other side of the bag. The clamp and core are snapped into mating relation with each other, causing the opposite sides of the bag to be sandwiched tightly between them. The two sides of the bag are pinched together to form a tight fluid seal which prevents commodity A from leaking out of the newly formed compartment 16. For clarity of illustration, a slight space is provided in FIG. 2 between the center portion of the clamp member and the adjacent sandwiched portion of the bag.

It is to be observed that the maximum width of rib 30 is substantially equal to or slightly greater than the minimum width of groove 44. Accordingly, in order for groove 44 to accommodate the two walls of the package in addition to rib 30, it is necessary for the core member 26 to contract slightly. A snap action results, the core member expanding again as the widest part of the rib passes the narrowest part of the groove. The difference between the maximum width of groove 44 and rib 30 should be less than four times the thickness of a wall of the bag. As a result, portions of the walls of the bag will be squeezed tightly on opposite sides of rib 30.

Since the surfaces 40 and 42 are substantially co-extensive with the surfaces 32 and 34, two discrete sections 48 and 50 of the bag 2 are effectively pinched together tightly between the core member and the clamp member on opposite sides of rib 30. Since the rib is of C-shaped construction, with its sides 52 and 54 diverging away from base portion 28, the walls of the bag, at the junctures of rib 28 with the surfaces 32 and 34, are bent back at an angle greater than 90° (please see FIG. 2). In all the walls of the bag are bent sharply four times within the limits determined by core and clamp members. In other words, commencing with the bag section

48 which is pinched between the surfaces 32 and 40, the walls of the bag are bent back through an angle greater than 90° up along side 52 of the rib 30, then they are bent sharply once more so as to follow the top curvature of rib 30, then they are bent back through another angle greater than 90° down along side 54 of rib 30, and then they are bent back again through another angle greater than 90° between surfaces 34 and 42. Because of this multi-bending of the walls of the bag, plus the fact that the walls of the bag are clamped together tightly along the sides 52 and 54 of the rib and between the flat surfaces of the two members, the two chambers 16 and 18 of the bag are effectively fully sealed off from each other so that no fluid can flow or otherwise migrate from one compartment to the other.

Furthermore, since the surfaces 32, 34, 40 and 42 are flat and may be considered to reside in substantially the same plane, the two sections of the bag can lie flat and substantially in the same plane. This permits the compartmented bag or package to be packed in boxes with little or no trouble. In this connection it is to be noted that the overall height of the divider unit (as seen in FIG. 2) is only negligibly greater than the maximum thickness of the package. This facilitates packing the bags in boxes in relatively flat layers.

In the practice of this invention it is preferred that the surfaces 32 and 34, and the complementary surfaces 40 and 42, have a width at least as great as approximately the minimum height of the sides 52 and 54 of the rib 30. Preferably, also the height of the rib should be at least as great as one half of its minimum width, the latter being measured at the level of surfaces 32 and 34. The foregoing preferred specifications assure adequate sealing area. In practice excellent sealing has been achieved where the overall widths of the core member and clamp member were in the order of 5/8 inch.

The advantage of making the two elements out of plastic is readily apparent to persons skilled in the art. These elements can be made in strip form at a relatively low cost, being made in a conventional plastic extruding machine. Moreover, this type of operation lends itself to the production of packages of different width, it being an easy matter to cut the extruded plastic strips into different lengths according to the size of the package being manufactured.

Application of the clamp and core members to the package is relatively easy and can be done rapidly with a simple press. Manual force is sufficient to readily separate the two members. Once the two members have been separated, the material A can be mixed with material B by squeezing the bag, preferably working from opposite corners of the bag in alternation until the two materials have been thoroughly mixed. After the components have been properly mixed, the bag is punctured or torn so as to release the mixture from the bag. Preferably, a small opening is made in one end or the other of the bag so as to facilitate dispensing the mixture from the bag by a squeezing action such as is done with an ordinary squeeze-type metal tube.

It is to be noted that the bag may be modified so as to contain more than two materials. In this case, an additional divider assembly would be used to further subdivide the bag. Similarly, it is anticipated that the divider assembly may also be used as a closure element for the bag, in which case the clamp and core members would be applied to one end of the bag. It is to be noted that the divider assembly may be used as a closure when the bag is initially manufactured, in which case one of the end seals 12 or 14 would be omitted, or it may be used as a closure element for a bag of the type illustrated in FIG. 1. In the latter case, the closure element would be used to retain unused material in the bag where the material is of a type which will still be useable at a later time.

In view of the foregoing description and the accom-

panying drawings, it will be seen that the several objects of the invention are achieved and that other advantageous results are attained.

Accordingly, since changes may be made in the illustrated construction without departing from the spirit of the invention, it is to be understood that the foregoing detailed description has been given primarily to facilitate understanding and that it should be interpreted as illustrative and not in a limiting sense since various modifications will be obvious to persons skilled in the art.

What is claimed is:

1. A package for mixing two components comprising: a substantially flat rectangular package having two walls which are joined together at their edges and a dividing element attached thereto which divides said bag into two compartments, said dividing element comprising an elongate core member and an elongate clamp member both formed of plastic, said core member comprising two substantially flat and co-planar surfaces separated from each other by an integrally formed rib of C-shaped cross-section profile, said clamp member having a relatively flat side which is divided into two substantially co-planar flat surfaces by a longitudinally extending groove of C-shaped cross-section, said groove sized to accommodate said rib with first and second portions of the walls of said package interposed therebetween, said members effectively pinching off said first and second wall portions, and the flat surfaces of said core member being in opposed parallel relation with the flat surfaces of said clamp member and cooperating therewith to pinch off third and fourth portions of said walls.

2. A package for mixing two commodities comprising: a substantially flat rectangular package having two walls which are joined together at their edges and a dividing element attached thereto which divides said bag into two compartments, each adapted to contain a selected commodity, said dividing element comprising an elongate core member and an elongate clamp member both formed of plastic, said core member comprising a pair of substantially flat surfaces separated from each other by an integrally formed rib, said clamp member having a relatively flat side which is divided into two substantially flat surfaces by a longitudinally extending groove, said groove sized to accommodate said rib with the walls of said package interposed tightly between said groove and rib, said walls bent four times between said core and clamp members with said members effectively pinching off selected portions of said walls at a plurality of spaced transversely extending areas, with the substantially flat surfaces of said core member and said clamp member being in opposed relation to each other and cooperating to urge the two compartment portions of said package into substantially coplanar relation with each other, said rib having a snap fit in said groove whereby said clamp and core members may be separated manually to permit mixing of the commodities in the two compartments.

References Cited in the file of this patent

UNITED STATES PATENTS

2,756,874	Erickson	July 31, 1956
2,874,830	Birmingham	Feb. 24, 1959
2,978,769	Harrah	Apr. 11, 1961