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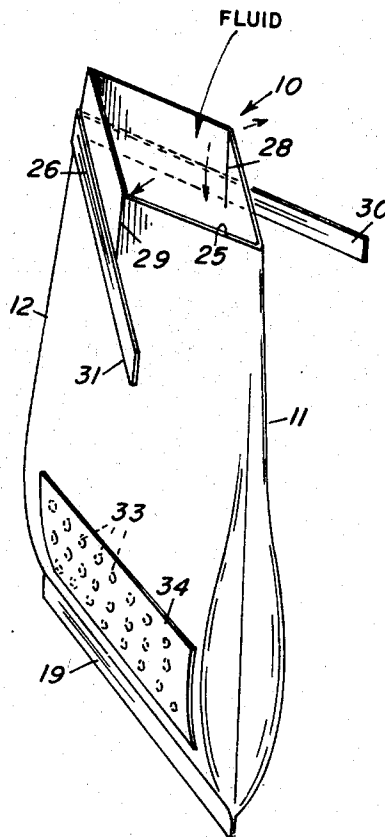
[54] **PILLOW-TYPE PACKAGE THAT IS
CONVERTIBLE TO A TETRAHEDRONAL
PACKAGE FOR MIXING, STORING AND
DISPENSING, WITH SPRAY-TYPE DISPENSING
MEANS**
6 Claims, 11 Drawing Figs.

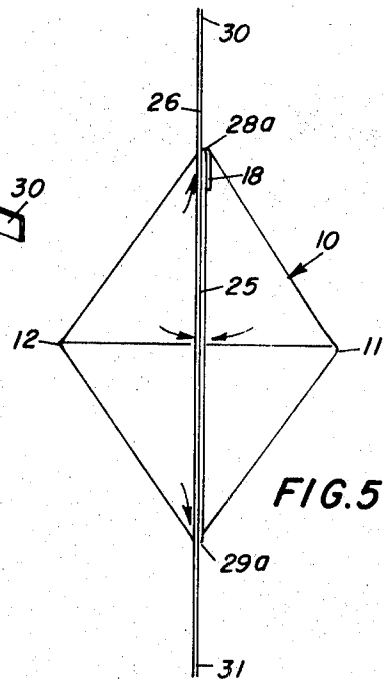
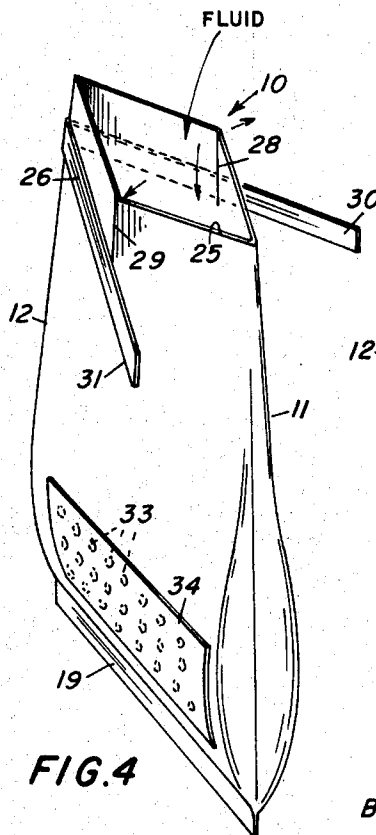
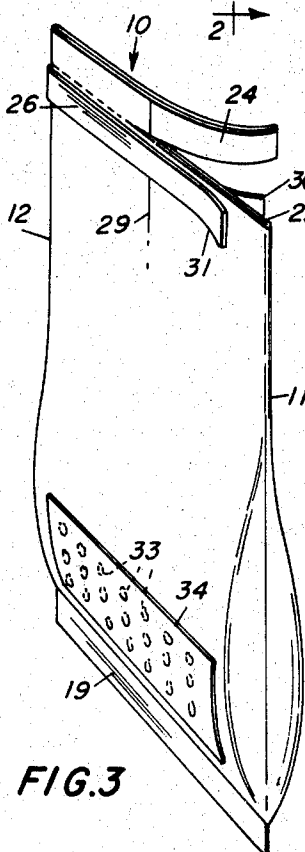
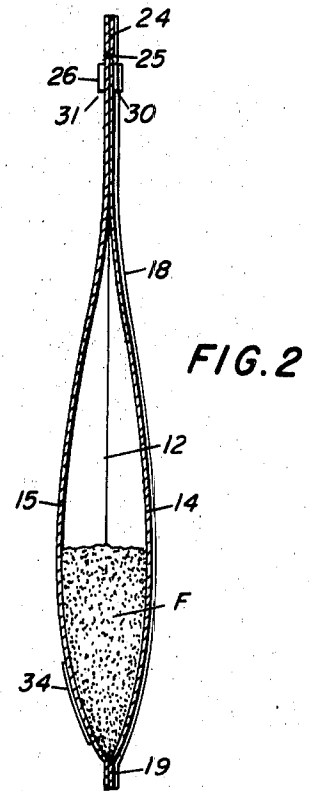
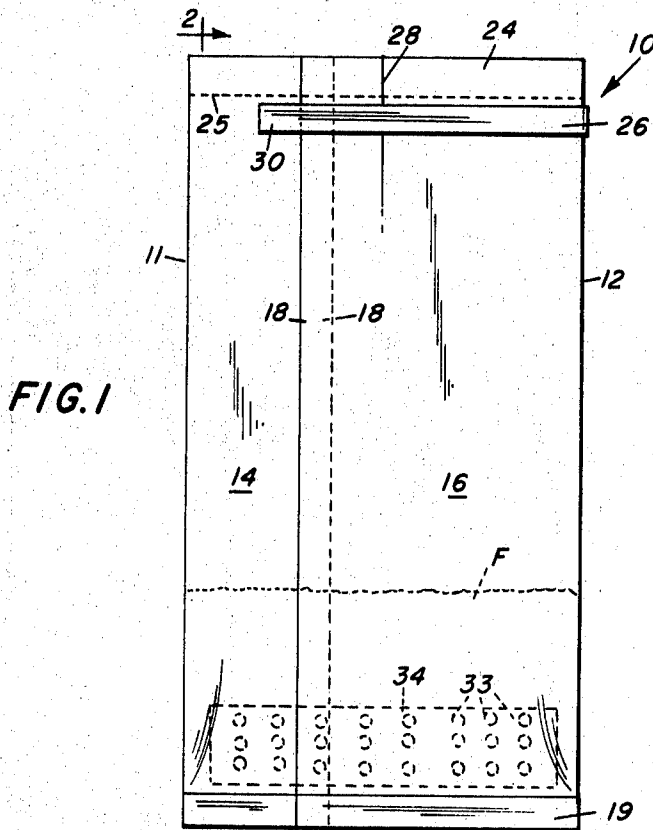
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107, 565, 541; 229/(Inquired), 65, 66

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ABSTRACT: A dispensing package, that is particularly useful for agricultural chemicals such as, for example, liquid or powdered pesticides, is initially constructed so as to retain a substantially flat and easily shippable, compact shape when a small quantity of a chemical or other substance is packed inside. The dispensing package is easily opened for adding water or other substances thereto, and is then readily resealed into a tetrahedronal shape, for use as a shaker and dispenser. A series of orifices is located in a panel of the package. These orifices are initially sealed by a removable strip of pressure-sensitive adhesive tape. The substance packed inside the package is easily dispensed therefrom by removing the tape from the orifices, then holding the package so that the substance can run out of the orifices.





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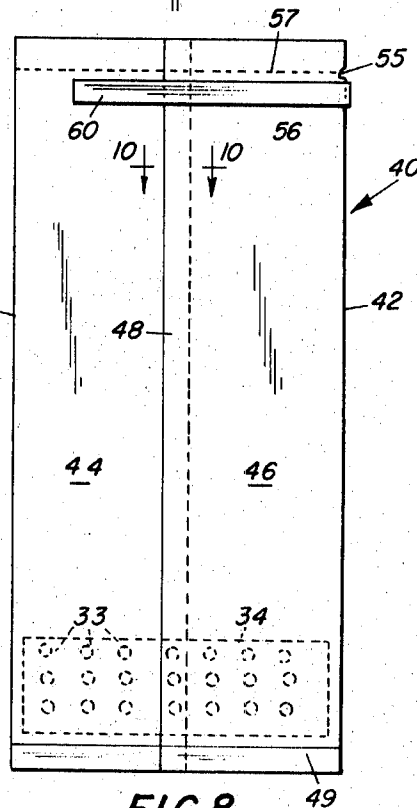
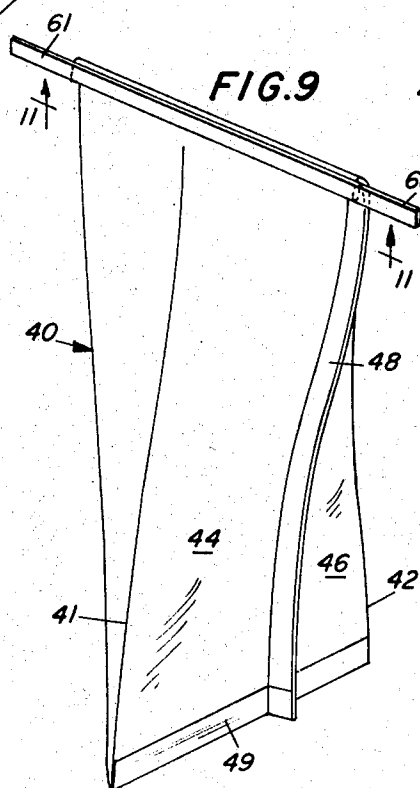
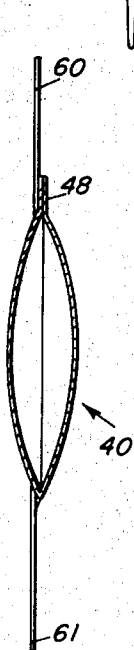
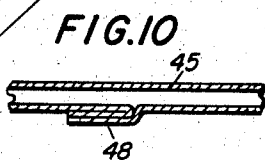
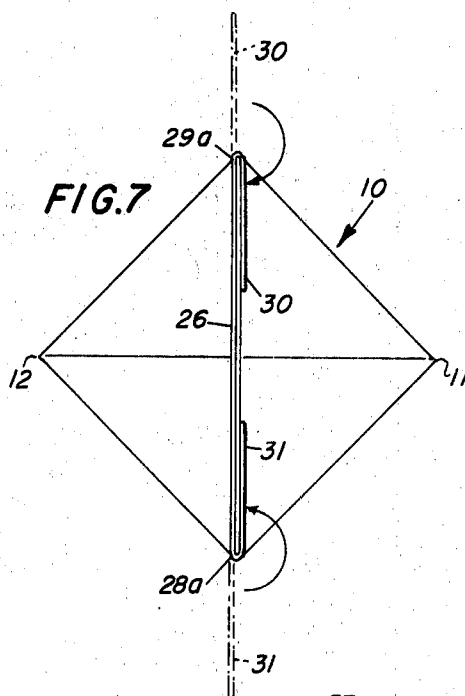
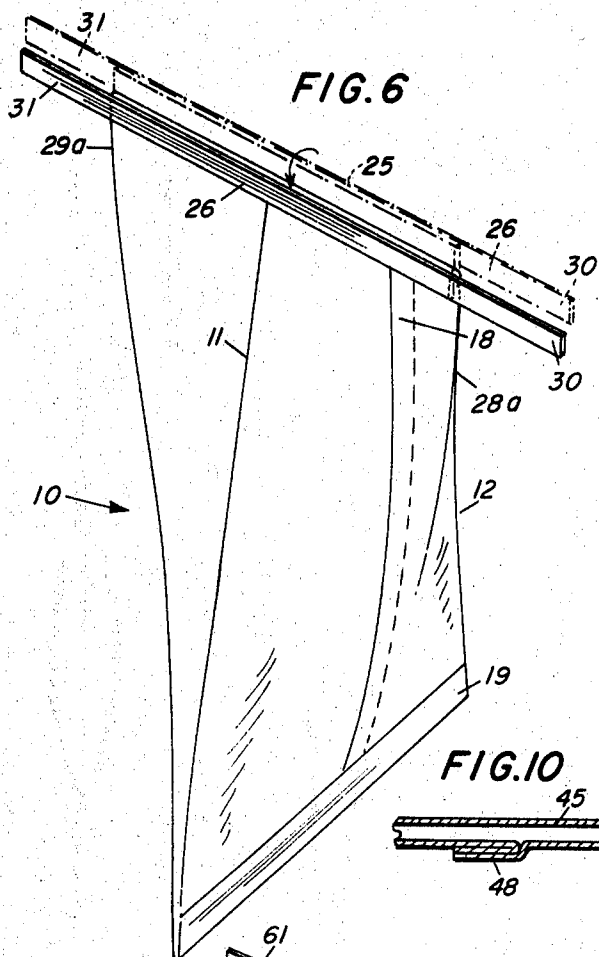


FIG. 11

FIG. 9

FIG. 8

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PILLOW-TYPE PACKAGE THAT IS CONVERTIBLE TO A TETRAHEDRONAL PACKAGE FOR MIXING, STORING AND DISPENSING, WITH SPRAY-TYPE DISPENSING MEANS

This invention relates to a dispensing package. More particularly, this invention relates to a combination container-dispenser in which a substance such as an agricultural chemical, for example, a pesticide, can be initially packaged, shipped, and stored, and from which, either with or without the addition of other powdered substances or liquid material thereto, the packaged substance may be readily dispensed.

There are currently many products on the market that are most economically shipped and stored in dry powder or granular form, but that are most conveniently used in solution or dispersion form. Examples of such products are the many agricultural chemicals that are applied in solution form, although often such chemicals are also applied as dusts. Chemicals of these kinds include, for example, pesticides such as insecticides, fungicides, and herbicides; soil conditioners and plant and animal nutrients either alone or in combination with the pesticides.

Insecticides and fungicides are often applied as dusts (powders) or as aqueous solutions, in mist or droplet form, to plant foliage, into the air infested by insects. Plant nutrients are often applied in aqueous solution form to the ground surrounding the plant or plants to be fed.

It is an object of this invention to provide a convenience container that will serve as an effective storage and shipping package and also an efficient mixing and dispensing apparatus for a product packed therein, and particularly for agricultural chemicals.

It is another object of this invention to provide a single package container-dispenser for a substance that is to be mixed with another substance such as a liquid material, for ultimate use, which container-dispenser is relatively flat in shape and therefore requires very little storage space, which container is further capable of being opened to receive and hold the other substance, and is easily reclosed, so that it can serve as a shaker-mixer for its contents.

Another object of the invention is to provide a flat, space-saving shipping and storage container for a substance that is to be mixed with a liquid for ultimate use, which container will also serve as a shaker for mixing the substance with the liquid, and which will further serve as a vessel from which the final mixture may be conveniently dispensed.

A further object of the invention is to provide a container for a dry or concentrated agricultural chemical product that is to be mixed with water or other chemicals prior to use, which container originally acts as a compact, flexible, easily stored package for the product; second, acts as a rigid receptacle for receiving the water or other chemical; serves as a shaker for mixing the product and the water or other chemical; and finally, functions as an easily handled vessel from which the final mixed product may be dispensed.

Other objects and advantages of this invention will be apparent hereinafter from the specification and the appended claims.

The drawings illustrate preferred embodiments of this invention that are capable of fulfilling the above objectives, wherein the package in its original sealed condition is in the form of a relatively flat, rectangular-shaped envelope or pouch which, after opening, is resealable in the shape of a tetrahedron. The resealed package, in distended form, can serve as a convenient shaker for mixing the original contents of the package with an added ingredient, or, if the contents are a powder that is to be applied as a dust, the package can be shaken to disperse the powder in the air in the package. The contents may then be dispensed directly from the package, by removing the seal from the orifices located in a wall of the package.

In the drawings:

FIG. 1 is a front elevation of a package, that is constructed in accordance with one preferred embodiment of the invention, in its sealed, unopened condition, and having a powdered substance disposed within the package;

FIG. 2 is a section taken along line 2-2 of FIG. 1, looking in the direction of the arrows;

FIG. 3 is a perspective view of the package, showing one end of the envelope partially removed;

FIG. 4 is another perspective view of the same package, after complete removal of the end of the envelope, showing the upper end of the envelope opened out, as it would be, for example, to receive a liquid that is to be mixed with the substance in the package;

FIG. 5 is a top plan view of the envelope after the open upper end has been closed at an angle of 90° to its original position when unopened;

FIG. 6 is a perspective view of the package after the closure flap at the upper end of the envelope has been folded over once, with the position of the flap prior to folding over being shown in dotted lines;

FIG. 7 is a top plan view thereof;

FIG. 8 is a front elevation of a package that is constructed in accordance with another preferred embodiment of the invention, showing the package in its sealed, unopened condition;

FIG. 9 is a perspective view of the package shown in FIG. 8, after the closure flap at the upper end of the package has been folded over once, prior to reclosing the package in tetrahedronal shape;

FIG. 10 is a fragmentary section taken on the line 10-10 of FIG. 8, looking in the direction of the arrows; and

FIG. 11 is a section taken on the line 11-11 of FIG. 9, looking in the direction of the arrows. A package or container-dispenser that is made in accordance with the invention is constructed to lie relatively flat in its original, closed condition, like a pouch or envelope, and is preferably made of semiflexible material which is substantially impervious to liquids. Such characteristics provide for economic shipping of a product packed therein without fear of chemical degradation of the product due to moisture spoilage. The container is provided with easily operated means for opening it, whereby the container can be opened and, if desired, another ingredient, such as water, can be introduced. It is further provided with means for reclosing, or resealing, the opening in such a manner that the container-dispenser assumes a distended shape, whereby the volume of the container is much increased as compared to its original volume. The enlarged volume of the container facilitates mixing, and its distended shape provides sufficient rigidity to permit shaking. The container-dispenser is also provided with dispensing means, in the form of a pattern of orifices. By selecting the size of these orifices, their number, and their locations the maximum rate for dispensing from the package may be effectively controlled.

The term "semiflexible" is used to refer to a quality of the wall of the container, that is, of the material from which the container is made, that permits it to be yielding so that it does not break or shatter, upon normal handling; that permits folding along crease lines conveniently and without undue effort; and that has sufficient rigidity, nevertheless, in its tetrahedronal shape particularly, to permit its use for the intended purpose of shaking materials to mix them. Many conventional and well-known packaging materials can be used having this characteristic, such as, for example, films of synthetic plastic materials; metallic foils; and moistureproof laminates, of two or more plies, of plastic films with paper, paper board, metallic foils, and other plastic films.

In order to form the container, after initially opening it, with the desired distended shape, volume, and rigidity for the subsequent operations, it is desirable that it be easily reclosable at an angle to the line along which it was originally opened. The degree of this angle will depend upon the original shape of the container and the amount of distention and volume ultimately desired. Generally, a 90° angle will afford the maximum volume, but smaller angles can also be employed.

In a preferred embodiment of the invention, the container is constructed in the form of a generally rectangular envelope that is provided with opening means across one of its ends, and is further provided with means for reclosing the opening at that same end, at an angle of approximately 90° to the opening line, so that the resealed container is tetrahedral in shape.

Referring now in detail to the drawings by numerals of reference, and particularly to FIGS. 1 to 7, the numeral 10 denotes generally a sealed package or container that is made in accordance with one preferred embodiment of the invention. This package 10 is formed from a single sheet of a semiflexible, moisture-impervious packaging material such as, for example, paper stock that is coated with metal foil on one surface and a plastic film on the other, such as is in use for many packaging purposes. This single sheet of packaging material has been folded over upon itself along opposed, lengthwise extending parallel crease or fold lines 11 and 12 respectively. The somewhat tubular structure formed by the folding operation includes a narrow front panel 14, a single, wide back panel 15, and a second front panel 16 that is lapped over one marginal edge of the narrow front panel 14 along a lengthwise seam 18, along which the two front panels 14 and 16 respectively are bonded together in moisture proof fashion, by adhesive, heat-sealing, or some other suitable bonding technique for accomplishing the desired purpose.

The package is sealed along its lower end, relative to FIG. 1, along a transverse seam 19. The package is further sealed across its upper end by a second transverse seam 24. A transverse guide line 25, such as, for example, a score line, is formed across the entire upper end of the package 10, just below the lower edge of the seam 24.

A strap 26, preferably formed from a metallic ribbon, is bonded to the outer surface of the package in such fashion that it extends, somewhat in a U-shape, around both the front and back surfaces of the package, just beneath the guide line 25. The package 10 is formed in its front face with a preformed, lengthwise extending guide or crease line 28 and in its rear face, opposite the crease line 28, with a second, similar, preformed guide or crease line 29. The two opposite ends of the strap 26, that project beyond the two crease lines 28 and 29 respectively, are free, that is, are not bonded to the surface of the package, and provide tabs 30 and 31 respectively.

A quantity of water-soluble fertilizer F is shown, in FIGS. 1 and 2, disposed within the package.

In order to effectively dispense a product from the container-dispenser, the panels of the container are provided with orifice means 33. These orifice means may be located in any convenient area of the panels 14, 15, and/or 16, although one preferred location is shown in the drawings, in which the orifices 33 are disposed in a regular pattern and are located on the wide back panel 15 closely adjacent the transverse seam 19.

The pattern for the orifices, that is illustrated in the drawings, is effective for dispensing both powder and liquid products. The size and number of the orifices may, of course, be selected to meet the particular dispensing needs of a particular product.

The orifices 33 are sealed for shipment and storage of the package by a pressure-sensitive adhesive tape 34. Preferably, the adhesive tape 34 is a pressure-sensitive, moistureproof tape which may be reused after it is once removed.

In one preferred mode of using a package in accordance with the present invention a substance 32 is placed within the package before both of the end seams 19 and 24 respectively are sealed. Thereafter, the package is sealed to enclose the substance 32 therein. This substance may be, for example, a powdered, concentrated, turf fungicide, such as cadmium succinate, that is useful in wetted form to prevent and control dollar spot, copper spot, and pink patch in lawns. As shown in FIG. 2, at this point the package is what is sometimes called in the trade a conventional pillow or envelope type of package. Such a package is safely and easily stored as well as economically shipped.

To use the package as a mixer and dispenser in accordance with the present invention, the entire upper seam 24 is removed by tearing the package open along the guide line 25, as shown in FIG. 3. After the upper seam 24 has been completely removed, the opposite side fold lines 11 and 12 of the package are pressed toward each other near the upper end of the package, which causes the upper end of the package to open, to the position shown in FIG. 4. When the preformed front and back crease lines 28 and 29 serve their purpose properly, the front and back panels of the package fold along these crease lines as the fold lines 11 and 12 are pressed toward each other. A sufficient amount of water and any other desired material such as a turf nutrient solution, can then be poured into the open package.

To use the container as a shaker, for mixing the fungicide 32 with the water and other added materials, the opposite fold lines 11 and 12 of the package are then brought together at the upper end of the package, as shown in FIG. 5, thus forming the package into a generally tetrahedral shape, with the crease lines 28a and 29a (FIGS. 5 and 6) extending further along the package from the original, preformed crease lines 28 and 29.

This manipulation of the package causes the strap 26 to straighten out. This strap 26, and the adjacent portion of the upper end of the package, while being held together, are then folded over once, at least, as shown in FIG. 6, and preferably are folded over two or more times, to reclose the package with a fluidtight seal. The end tabs 30 and 31 are then turned inwardly, as shown in FIG. 7, to hold the package securely in its new generally tetrahedral shape, and to maintain the package in sealed condition. The user then can shake the package in order to mix the contents and make them uniform.

Once the fungicide has been thoroughly mixed with the added liquid, the mixture is ready for application to a lawn. For dispensing, the package is inverted, so that orifices 33 are disposed on the uppermost surface of the package. The adhesive tape 34 is then removed, and the package is reinverted, whereupon the fungicidal mixture flows out through the orifices 33 onto the lawn. By adjusting the position or inclination of the package, the rate of application of fungicide may be controlled. By squeezing the package to increase the hydrostatic pressure therein, the rate of application can be increased. The flow can be stopped simply by turning the package so that the orifices are uppermost again.

Should any fungicidal solution remain in the package, the adhesive tape 34 may be replaced over the orifices 33 to seal them again. The package is then storable for future use. To guard against leakage, the package should be rested in a storing position with the orifices uppermost.

In the modified form of the invention that is illustrated in FIGS. 8 and 9, the numeral 40 denotes generally the container. The construction of this container is similar to that of the package illustrated in FIGS. 1 through 7 and previously described. That is, the package 40 is formed from a single sheet of a semiflexible packaging material such as, for example, a plastic film or a laminate of a plastic film and a metal foil. Many kinds of packaging films, foils, and laminates are suitable.

This sheet of packaging material is folded over upon itself along opposed, lengthwise extending parallel fold lines 41 and 42 respectively. The somewhat tubular structure formed by the folding operation includes a left front panel 44 (relative to FIG. 8), a single, wide back panel 45, and a second, right front panel 46. The ends of the sheet from which this tubular structure is formed are secured together to form a seam 48 of the face-to-face type. The confronting marginal areas of the material that are joined together at the seam 48 may be bonded together by an adhesive or, preferably, by heat-sealing, although any suitable bonding technique can be employed to accomplish the desired purpose. The face-to-face type of seam, that is employed in this embodiment of the invention, is in contrast to the face-to-back type of seam that was employed in the package construction illustrated in FIGS. 1 through 7 and previously described.

Referring again particularly to FIGS. 8 and 9, the package is sealed at its bottom end, relative to FIG. 9, along a transverse end seam 49. The package is further sealed at its upper end by a second transverse seam 54. A preformed, punched-out bight or notch 55 is formed in the package body adjacent or overlapping the lower edge of the seam 54, to facilitate tearing to separate that seam from the package body, when opening the package. If desired, a guide line 57, such as a dotted line printed on the package or, possibly a line of weakness such as a score line, can be provided, extending along the upper end of the package from the notch 55.

A strap 56 is secured to the outer surface of the package in such fashion that it extends, as in the previous embodiment of the invention, around both the front and back surfaces of the package, just beneath the lower edge of the end seam 54. The two opposite ends of the strap 56 that project beyond the center line of the package, are free, that is, are not bonded to the surface of the package, and provide tabs 60 and 61 respectively.

This package may be used in the same manner as the package embodiment of the invention previously described. However, it has the advantage that the seam 48 facilitates opening of the package to its distended form during use, and in addition, facilitates resealing the package prior to mixing or shaking.

This novel package is adaptable for many different uses. For example, it provides a convenient package for storing, shipping, mixing, and dispensing agricultural products generally, particularly for domestic garden and insecticidal use.

One advantageous use for the package is in the sale of fertilizer. When a florist sells a potted plant, it is usually in healthy, luxuriant condition. Thereafter, its condition is apt to deteriorate unless the plant is furnished with nutrients. The present invention provides a convenient way for the florist to furnish small packets of fertilizer to the potted plant purchaser, in unit dosage amounts, so that the dangers of overfeeding are minimized. If each packet contains just enough fertilizer for a single feeding, it is merely necessary for the florist to instruct the purchaser of the time periods that should elapse between feeding. The purchaser then can store the packets until needed. Then, as each is needed, it is opened, the fertilizer is dissolved in added water, and the package provides a convenient mixer and applicator. After use, the package can be thrown away, or it can be used for the same or other purposes. Larger size packages of soluble fertilizers can be used for garden plots.

When a large size package is manufactured for a use where it is likely to be used for storage of a solution or dispersion between uses, it may be desirable to locate the orifice pattern close to the tab-held closure end. Then, when the package is rested on its side for storage, both the tab-held end and the orifices (preferably covered by tape) are uppermost and are not acting as seals for the package. This reduces the hazard of leakage.

The packages of this invention, furthermore, are not limited to use as dispensers for liquids only. Rather, these packages may also be used, as well, for dispensing solids, particularly gaseous suspensions of solids. For example, the packages of this invention are particularly useful as dusting dispensers. Very often, the foliage of a plant or the body of an animal is to be treated by dusting with a powdered pesticide. By packing the required powdered pesticide in the package, the purchaser, at the time of use, forms the package into a tetrahedron. The enclosed air is then used as a dispersing medium for the pesticide powder. The package is shaken, and then, after removing the tape from the orifices, the package is squeezed to direct streams of the dust, suspended in air, onto the desired area for application. This is a particularly convenient way, for example, to dust rose bushes and to dust pets or the bedding of pets for fleas and other parasites.

The packages of this invention also find particularly good utility as storage, shipping, mixing, and dispensing means in

fields other than agricultural chemicals. For example, the package may also be used for makeup powder or body deodorant, for application in dust form. As a further example, the package may also be used as a baster in the culinary arts. That is to say, solid or liquid ingredients may be packed in the package, for use, generally after dilution with water or oil, to baste meat being cooked. In one embodiment, the packaged ingredients might comprise a concentrate for a barbecue sauce. Use of the package of the present invention eliminates the need for mixing bowls, basting brushes, and the like.

The widely divergent areas as disclosed above in which the packages of this invention may be used, will render obvious to the skilled artisan many other areas of use where the effect is to provide a package which will store, ship, mix, and/or dispense a product in accordance with the teachings of this invention. Such other uses are therefore within the scope and considered a part of this invention.

While this invention has been described in a connection with specific embodiments thereof, it will be understood that it is capable of further modifications, and this application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practicing the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth, and as fall within the scope of the invention and the limits of the appended claims.

I claim:

1. A convertible dispensing package comprising:
 - a pillow-type package comprising a generally tubular body that is formed from a semiflexible packaging material, and that is generally flat form, with its opposite sides being parallel, lengthwise extending fold lines; first and second transverse seams closing the opposite ends of the package body respectively; said body being formed to permit easy separation of the first of said seams from the package body, for opening the package at that end; strap means secured about the body adjacent said first seam for securely reclosing the opening with the package body in distended, generally tetrahedral shape, to provide enclosed space therein; and said body also being formed with sealable orifice means, other than said opening, for dispensing material from the distended package.
2. A convertible dispensing package for a substance that is to be mixed with a liquid material for ultimate use, and that is adapted for use for the operation of mixing said substance and the liquid material, comprising:
 - a pillow-type package comprising an elongate, substantially flat, generally rectangular pouch that is formed from semiflexible, substantially liquid-impervious packaging stock, said pouch being sealed by at least one seam, and being formed to remain unsubstantially flat or pillow form with a small quantity of the substance disposed therein; said pouch also being formed to permit easy separation of said seam from the package, to form an opening at one end of the pouch for easy addition of a liquid material to the pouch; means integral with the pouch for easily resealing said opening, with the pouch in distended, generally tetrahedral shape, to permit mixing of the substance and the liquid; and said pouch being provided with sealable orifice means other than said opening, for dispensing said mixture.
3. A dispensing package in accordance with claim 2 wherein said orifice means comprise a plurality of holes located in a dispensing pattern in said pouch, remote from said opening, sealed by removable adhesive tape.
4. A package in accordance with claim 2 wherein said first-named seam is disposed at one end of the pouch, and wherein the pouch is formed at a second, opposite end thereof, with a second seam that is generally parallel to said first-named

seam, and including means for resealing the opening, that is formed upon separation of said first seam from the package, along a line that is generally at right angles to the original seam, thereby to reseal the pouch in the distended, generally tetrahedral shape.

5. A container for a substance that is to be mixed with a liquid for ultimate use, which container is further adapted to be used for the operation of mixing said substance with said liquid and of further being used for storing and for dispensing the mixture:

said material being constructed of a semiflexible material;
said container being generally rectangular in shape and relatively flat;

means for opening the container in the form of a relatively straight guide line that extends across one end of the container;

a semirigid tab positioned adjacent said one end of said container, a portion of said tab being affixed firmly to said container, and at least one end of said tab being unaffixed

to said container, said container and said tab being so constructed that after the container has been opened at the end closest to the tab, liquid can be introduced into said container;

reclosing means such that the container can be closed at an angle to said opening line, by bringing the edges of the open end together in such a manner as to cause the container to assume the general shape of a tetrahedron, and said container being resealable by folding over the open end at least once and holding the fold in place by means of the unaffixed portion of the tab; and

a plurality of sealable orifices located in a dispensing pattern near the end of said container remote from said tab, said orifices being capable of dispensing said mixture.

6. A container in accordance with claim 5 wherein the reclosing means is such that the container can be reclosed at an angle of approximately 90° to the opening line.

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