

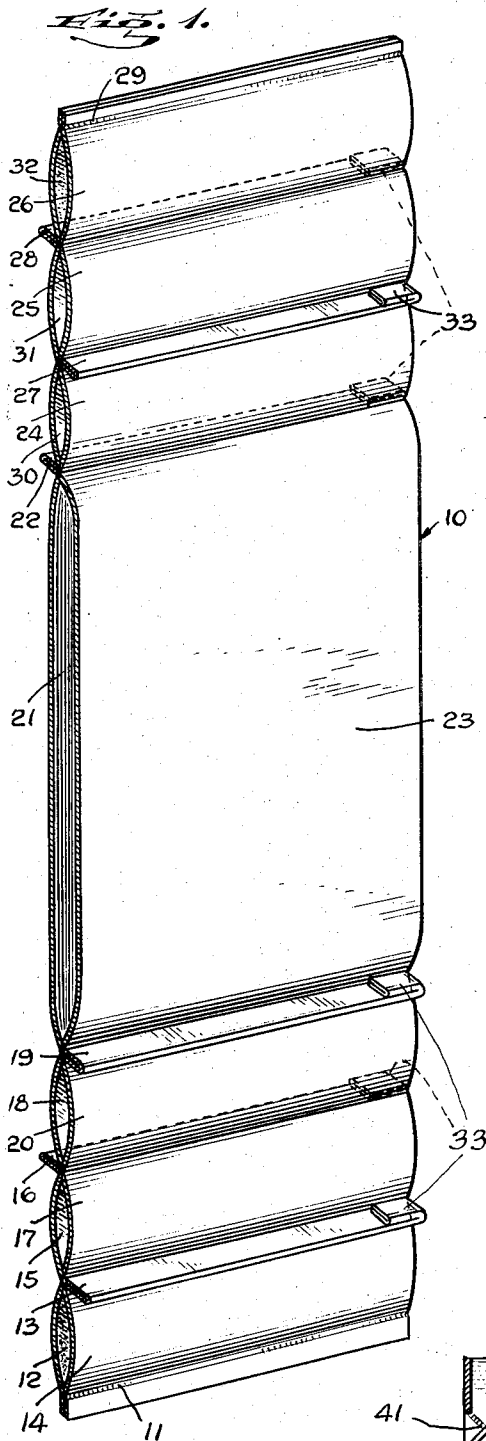
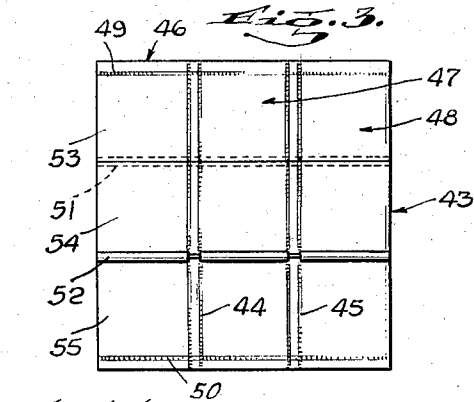
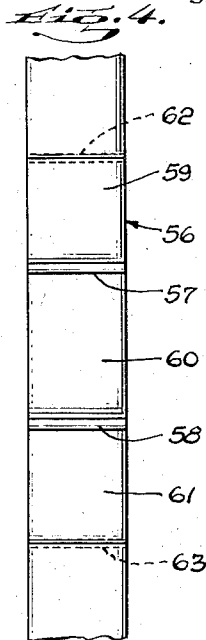
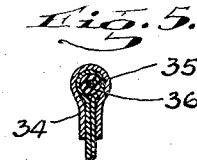
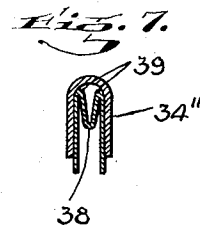
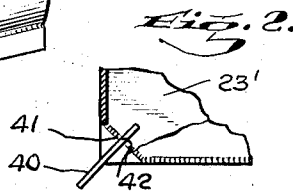
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2,874,830

PACKAGING AND MIXING OR PROCESSING KIT

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PACKAGING AND MIXING OR PROCESSING KIT

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1 Claim. (Cl. 206—47)

This invention relates to a kit in the form of a flexible tubular member, having means spaced longitudinally thereof for dividing the same into a series of compartments, in which a series of different elements, or components, are adapted to be stored in the packaging of the kit and, then, converting the kit into a single compartment in the successive mixing of the elements or components, preparatory to producing a resulting end product or preparation.

More particularly, the invention deals with a kit of the character described, which may be produced in multiple, namely as a series of joined kits adapted to be separated one from the other in the individual use of a kit.

Still more particularly, the invention deals with a kit structure of the character described, wherein means is provided for removal of air from the compartments of the kit for preservation of the elements or components in the separate compartments, as well as to simplify characteristics of the kit for packaging and handling, preparatory to the use thereof in producing the desired end product.

Further, the invention deals with a novel method of producing end products from components of a packaging kit of the character described.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

Fig. 1 is a diagrammatic sectional and perspective view of one type of kit structure which I employ.

Fig. 2 is a diagrammatic sectional view of a corner portion of a compartment of a kit, illustrating the method of extracting air from the compartment, preparatory to sealing the same.

Fig. 3 is a face view, diagrammatically illustrating a multiple kit assemblage of three compartment kits.

Fig. 4 is a view, similar to Fig. 1, showing an elongated kit structure, with parts of the construction broken away.

Fig. 5 is a sectional detail view illustrating one method of sealing a tube intermediate compartments of a kit.

Fig. 6 is a view, similar to Fig. 5, showing a modification; and

Fig. 7 is a view, generally similar to Figs. 5 and 6, but showing the parts in open position, preparatory to closure in forming the desired coupling and seal.

A kit device of the type and kind under consideration is adapted for use in the initial storage of a plurality of elements or components, such for example, as two or more liquids, wherein one of the liquids may include particles in suspension, whereby these liquids may be first united and mixed and then in treating or processing the same with what might be termed a solid in the production of a desired predetermined end product for any particular use.

Kits of this type and kind will have numerous uses in

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the preparation of or production of end products in numerous arts, particularly where it is desirable to initially package the device with the various elements or components separated one from the other, so as to produce the resulting end product within the environment of the kit and then transfer the end product to the end use.

It is also possible, in some instances, that the elements or components might all be in a dry state and then after mixture, the end product of the kit could have a liquid of any type or kind added thereto in the final use of the end product.

In order to illustrate one adaptation and use of my invention, I will refer to the production of repair material which can be utilized to mend, fill or otherwise repair destruction or breakdowns in articles or products of various types and kinds, as well as to repair leaks in different types and kinds of apparatus or installations.

In providing a kit to produce repair materials of the kind under consideration, I employ an elongated tubular body 10, as shown diagrammatically in perspective and section and in Fig. 1 of the drawings. This tubular body can be composed of any suitable flexible material, preferably of a transparent or translucent character and to illustrate one of the many types and kinds of materials which can be employed a tube of polyethylene could be used. In producing a kit from a tube of this type and kind, a tube of predetermined diameter will be employed, depending entirely upon the size of the end product to be produced.

In forming the kit, one end 11 of the tube is heat sealed, after which a component 12 is placed in the tube at the end 11, the component, in this particular case, comprising a grained or powdered solid, such, for example, as powdered metal, preferably in suspension with a liquid such as a resin.

The amount of the component 12 will be measured in proportion to the other components used in the kit, after which, the tube is folded and sealed, as seen at 13 in such manner, as to remove air from the resulting compartment 14.

Another component 15 is then placed in the tube 10, the latter being in the form of a liquid catalyst; the tube is then sealed, as indicated at 16, similar to the seal 13, but preferably at the opposed side of the tube, thus forming the resulting compartment 17. Then another component, in the form of a resin 18, is placed in the tube, the tube again sealed, as at 19, to form a compartment 20. Then a component 21, in the form of a series of layers or plies of glass fabric, is arranged in the bag and the size of the fabric component 21 will govern the size of the resulting end product to be produced. The bag is then sealed beyond the component 21, as at 22, which results in forming the component 23. In certain types of kits, the seal, as at 22, could be the end seal of the tube 10. However, in Fig. 1, I have shown a more complete kit, wherein compartments 24, 25 and 26 are formed by seals 27, 28 and a final end heat seal 29. In the compartments 24, 25 and 26 are arranged components 30, 31 and 32, respectively, the component 32, in the present instance, being in the form of a resin, the component 31 being in the form of a curing agent; whereas, the component 30 is in the form of an accelerator.

The various seals of the bag 10, as, for example at 13, 16, 19, 22, 27 and 28 can be formed by simply folding the tube 10 transversely and, then, applying U-shaped metal or plastic clips to the folded portion and, in the structure as shown in Fig. 1 of the drawing, the ends of these clips can be folded, as indicated at 33.

In Figs. 5 to 7, inclusive, I have illustrated other methods of forming the seals in question. For example, in Fig. 5 of the drawing, the U-shaped clip strip 34 is applied to the fold of the bag, after a rubber rod 35, pref-

erably with a wire or other reinforcing core 36, has been arranged in the fold. With this type of construction, upon opening the seal, the rods 35, 36 can be utilized in movement over the bag in the mixing or blending of the various components and in spreading the components over the fabric, such as the fabric 21 in the production of the final end product.

In Fig. 6 of the drawing, 34' represents a U-shaped clip, generally similar to the clip 34, but arranged in the fold of the bag is a cord or strand 37, preferably of flexible, compressible material.

In Fig. 7 of the drawing, 34'' represents a sealing clip, the same being shown in its open position, preparatory to effecting the seal but here, instead of a single fold in the tube, the tube is first folded, as at 38 and, then, folded back on itself, as at 39, preparatory to applying the sealing clip 34''.

From the foregoing, it will be apparent that it is important to provide a positive seal at the various sealing junctures which divide the tube into the separate compartments while, at the same time, providing a seal which can be easily removed in the mixing of the various components, preparatory to producing the resulting end product.

As stated, it is particularly desirable to provide means for removing air from the compartment 23, in which the solid component, such, for example as the fabric 21, is arranged. Accordingly, I have diagrammatically illustrated in Fig. 2 of the drawing, a corner portion of a compartment 23', generally similar to the compartment 23 and, for the purpose of removing air, a fine tubular needle 40, such, for example, as a hypodermic needle is positioned in the compartment 23' with the tube of the kit sealed around the needle, as diagrammatically illustrated at 41.

The vacuum pump, not shown, then draws air from the compartment 23' and, in this operation, the needle 40 is withdrawn from the compartment 23' and a final heat seal is effected at the point 42, thus maintaining the compartment 23' in a flat and substantially airless state. This procedure not only simplifies the packaging of the resulting kit, but also facilitates mixing and spreading of the various components onto the fabric 21 in the production of the end product.

In using the kit, as diagrammatically illustrated in Fig. 1 of the drawing, the kit is extended and laid upon a suitable flat support; after which, the clip 13 is first removed and the component 12 is then thoroughly mixed with the component 15, it being understood that the removal of the clip 13 then forms one compartment of the combined compartments 14 and 17. Then the clip 16 is removed and the combination of components 12 and 15 are then thoroughly mixed with the component 18 in the resulting single compartment which will be formed by the addition of the compartment 20.

The next step in the procedure can be one of two methods. First, to apply the mixed components 12, 15 and 18 to the fabric component 21 or before this procedure component 32 can first be mixed with component 31 by removing clip 28 and the combination of 32 and 31 then mixed with 30 by removal of the clip 33, after which, the clip 19 can be removed and components 12, 15 and 18, in their resulting mixture, spread over the entire area of the fabric 21, whereupon, the mixture of components 32, 31 and 30 can be spread over the fabric 21, thus producing the desired end product which would be in the form of a repair patch, which is applied to the article to be repaired in the following manner.

The tube 10 is cut transversely substantially along the line of the position of the clips 19 and 22 and then along the side edges of the tube, after which, one of the side surfaces of the tube is stripped from the end product, but the other side surface is retained on the end product to facilitate applying the end product to the article to be repaired by hand without having the hand

coming directly in contact with the product and pressure is applied to the end product to firmly secure the same to the article. The various components provide, on the end product, an adhesive material, which will readily adhere to the article. In this connection, it will be understood that the particular components used will be suitable to establish the adhesion with the article to be repaired and this would vary in many instances. The bulk of the component 12, such for example as the powdered metal, is simply used to form a body fill to close the interstices of the braid of the fabric, such as the glass fiber and would result in forming a homogeneous mass, which, in many instances, can constitute a fill in metallic or other articles.

In some instances, the question of temperature is a factor, that is to say, temperature of the atmosphere or of the article as and when the repair is to be made, thus, in some instances, it would be necessary to apply heat. In such cases, it would be desirable to cover the end product patch when arranged upon the article with a sheet of metal foil or the like and then apply steam or other heating medium to provide the desired temperature in effecting a setting of the adhesive properties or the characteristics of the patch.

In some instances, the section defined by the compartment 23 in the final use of the end product can be cut into different sizes and/or shapes. In other words, this section may be sufficiently large to produce several end products for patching, repair or the like.

It will also be apparent that kits of the type and kind under consideration can be made of simple or even more elaborate characteristics. However, a simple form of a kit is such as diagrammatically seen in Fig. 3 of the drawing. However, in this figure, a multiple kit unit is disclosed formed from one large diameter tube 43 which is heat sealed, as at 44 and 45, to form three separable kit units 46, 47 and 48, each unit being of the same construction. Therefore, the brief description of one unit, for example, the unit 46, will suffice for all units. The unit 46 has heat sealed ends 49 and 50 which, together with two clips 51 and 52, and which can be similar to the clips previously described, divide the unit 46 into three compartments 53, 54 and 55. One of the compartments, for example, the compartment 53, will contain the solid component, such for example, as the glass fabric 21; whereas, the compartment 54 would contain a component, similar to the component 18, and the compartment 55 would contain a component similar to the component 15. In other words, in this simple form of kit, when the clip 52 is removed; components of compartments 54 and 55 are then thoroughly mixed, after which, the clip 51 is removed and these components are spread over and thoroughly mingled with the component, such, for example, as the glass fabric in the compartment 53. In other words, with this simple construction, the bulk component, such, for example, as the component 12, is dispensed with and, in fact, in many of the uses, components, such as 12, are unnecessary.

In Fig. 4 of the drawing, I have indicated what might be termed an elongated type of kit structure, which could be generally similar to the simple kit 46, or further modified by the addition of other compartments containing additional components, as diagrammatically shown in Fig. 1. The long tube 56 of Fig. 4 can be of indefinite length and separated at intervals to form or remove a kit assemblage. In this figure, 57 and 58 represent clips which divide the tube 56 into three compartments 59, 60 and 61, which may be the same as compartments 53, 54 and 55. Thus, at position 62 and 63, the tube 56 could either be heat sealed or have additional clips applied thereto in either partitioning the one kit from adjacent kits, or to add additional compartments to the three compartment kit, which has been described.

In all instances, a tubular body is fashioned to form a kit which will comprise two or more compartments,

the compartments being divided by removable clip means, which enables the kit to be transferred into a single compartment in the final preparation of the end product to be produced.

The foregoing illustration of one adaptation and use of the invention is given simply to portray one of the possible uses of kits of the kind under consideration and preparation of an end product, such as the repair patch is used, particularly in that patches of this type and kind have been produced in accordance with other methods, which methods have been extremely objectionable from the standpoint of inaccuracy in measuring and mixing of the proportionate amounts of the various components and in applying the same to the fabric, as well as the final end product to the article to be patched or repaired. These other known methods have been objectionable from the standpoint of the toxic properties of some of the components which have been used. In this connection, it will be apparent that, with my improved method, the mixtures and treatment are all performed within the sealed tube, which eliminates this highly objectionable feature. Furthermore, it is quite apparent that a more complete and thorough spreading of the mixed liquid, as well as the bulk, when included, is made possible within the sealed tube environment. Kits of the type and kind under consideration can be utilized in constructing any desired number of compartments in a kit, each compartment containing a different component or element and these components or elements successively fixed or blended to produce finally in the one resulting large compartment of the tube a particular end product which can be in the form of simply a homogeneous mass or incorporated with a solid of any type or kind, depending entirely upon the end product to be produced.

In referring to a homogeneous mass or mixture, this might be utilized as an end product for the production of a final resulting product. Here reference is primarily made to various mixes that might be utilized in the preparation of various types and kinds of food products.

The foregoing is briefly outlined simply to give a fair idea of the many uses to which a kit of the type and kind under consideration can be put into practical commercial use while, at the same time, providing a kit which facilitates packaging, transportation, as well as handling thereof.

The tube of the kit may be said to comprise a container which is divided into the separate compartments by the use of the clips and/or heat seals of the material of the container. In this connection, it is preferred that flexible plastic materials, which can be readily heat sealed, is desirable to simplify and economize on the cost of production of the resulting kit or kit units.

By way of description, it may be said that my improved method consists in providing a substantially air-free sealed flexible walled chamber, which is temporarily divided by suitable sealing means into a plurality of adjacent compartments, in which are stored the different components in the normal packaging of the kit. Then, upon the use of the kit, the temporary seals are opened, the components intermingled in step by step fashion, until such time as a resulting end product is produced, which comprises an intermingling or assemblage of the several components, which end product is then disposed in the single substan-

tially air-free sealed chamber, and the seal of this chamber is broken in removal of the end product for any predetermined end use. In carrying out this method, the steps of intermingling or combining the end products can be expedited by agitation, reciprocation or other movement of the kit, so as to effect a more perfect mixing, blending or association of the components in efficiently producing the resulting end product.

In some methods of carrying my invention into effect, it would be desirable to produce a container which would include the single chamber with temporary seals dividing the chamber into independent compartments and the product, thus formed, distributed to the ultimate user. The user would then inject or otherwise place in the compartments the various components, sealing each compartment in a manner to render the same substantially air-free; whereupon, the package thus assembled can be shipped or distributed to the consumer who will then proceed with the combining or intermingling of the various components in producing the end product which is desired.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

A kit for packaging a plurality of different components, said kit comprising a flexible walled single compartment container of uniform diameter, said container having, alternately spaced on opposed sides longitudinally thereof, oppositely directed transverse folds dividing the container into a plurality of longitudinally spaced substantially flat compartments, means comprising removable clips arranged on and directly engaging and sealing said folds of the container, said clips extending the width of the container, a central compartment of the kit being materially larger than other compartments disposed at ends of said central compartment, each compartment containing a different component, means whereby successive removal of the clips will open the folds for communication between adjacent compartments in mixing components of said compartments and upon removal of all of the clips to open all of the folds in converting the container into a single compartment in which all of the components are mixed, said central compartment containing glass fabric, the components of the other end compartments comprising a resin, a liquid catalyst, and a powdered solid in suspension with a resin.

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