United States Patent

[11] 3,610,411

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White Plains, N.Y.

[54] **PACKAGING SYSTEM FOR INVENTORY MAINTENANCE**
28 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** ..... **206/65 R,** 53/30, 206/47, 206/80
[51] **Int. Cl.** **B65d 71/00.** B65d 75/34, B65d 85/62
[50] **Field of Search** ..... 206/46, 65, 52, 53, 78 B, 80 R, 45.34, 56 A, 47, DIG. 18; 220/4, 4 E, DIG. 25; 229/43; 281/20; 53/30

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ABSTRACT: A parts inventory maintenance system utilizing novel kit and parts packages. The kit package is a folded sheet which defines a plurality of sides of a multiple-sided tubular enclosure. At least one object is secured to the sheet by a plastic film. The remaining sides of the enclosure are at least in part defined by a closure which telescopes over edges of the sheet. The part package is composed of a piece of coated cardstock and a piece of film which skin packages a part to the card. The card has a perforated pressure-sensitive adhesive layer adhered to it.

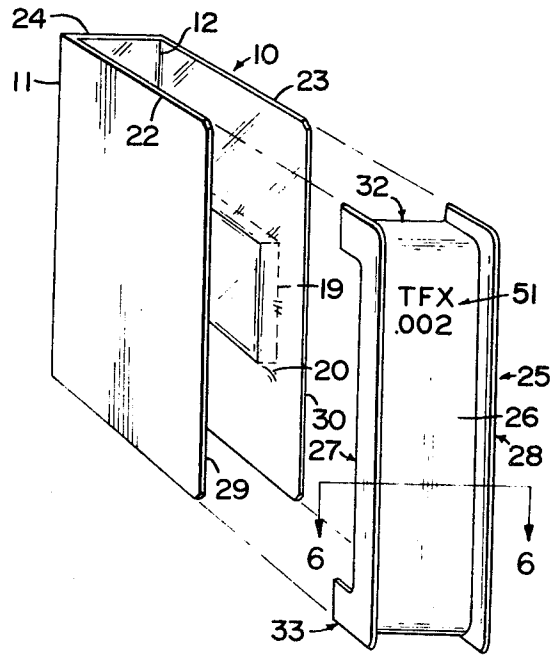

FIG. 1

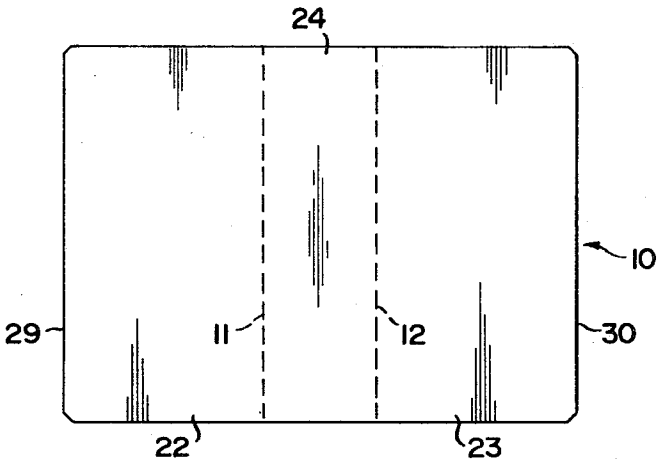

FIG. 2

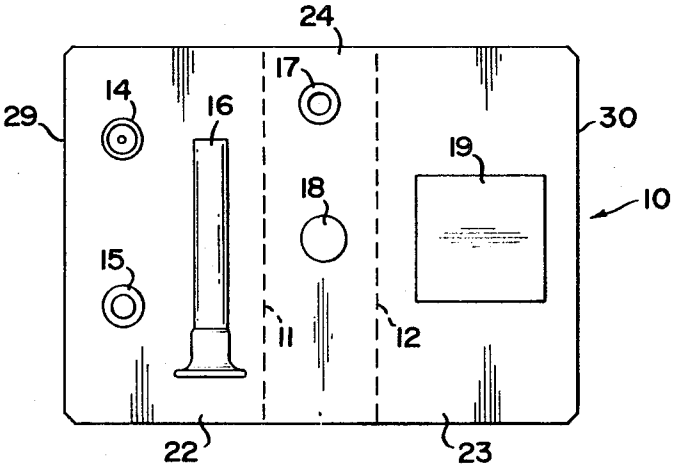

FIG. 3

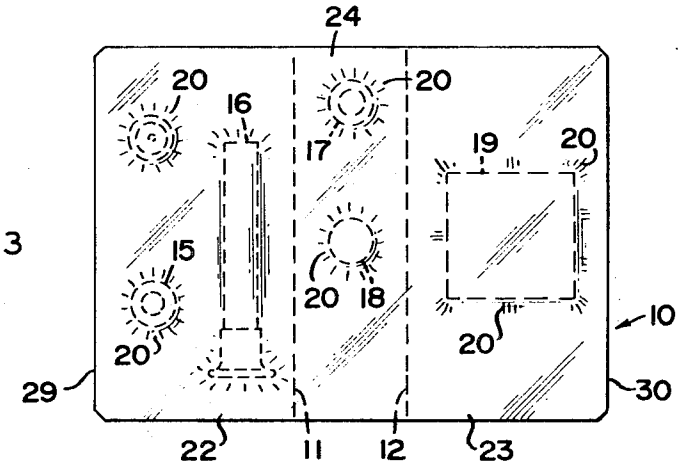

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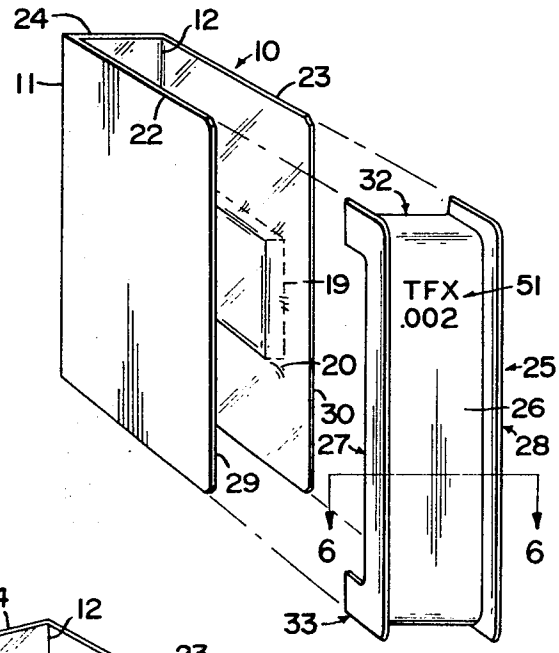
FIG. 4



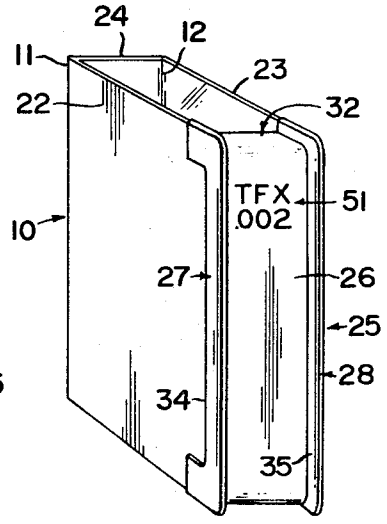


FIG. 5

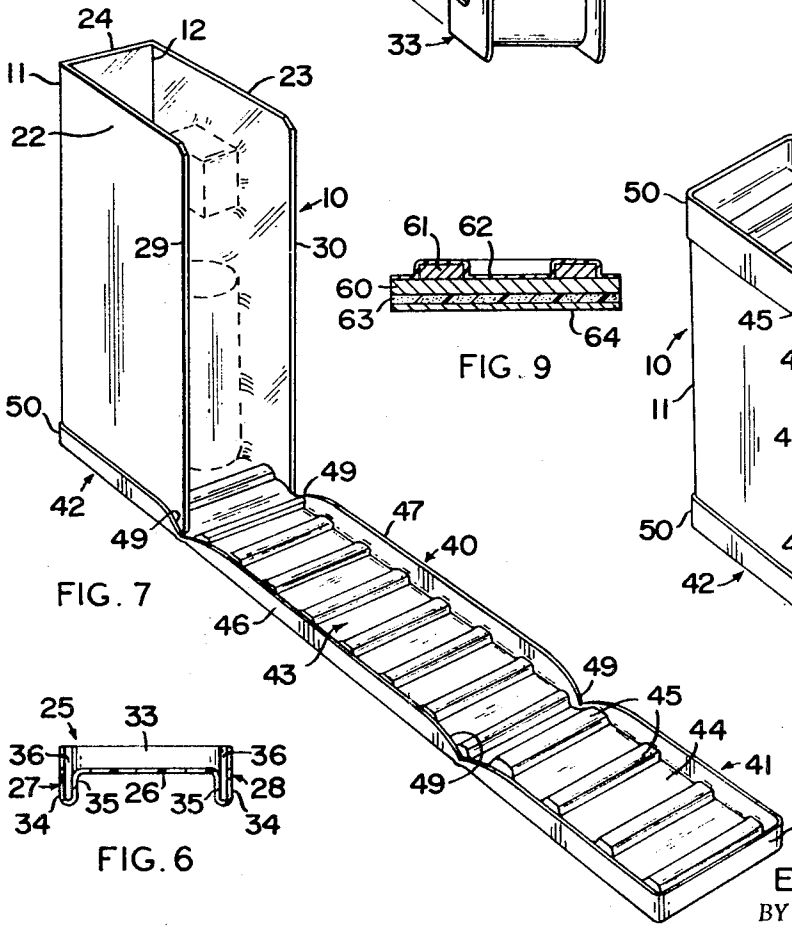


FIG. 7

FIG. 9

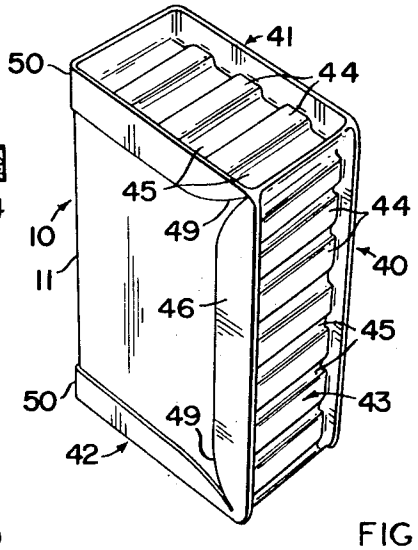


FIG. 8

FIG. 6

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PACKAGING SYSTEM FOR INVENTORY MAINTENANCE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an inventory maintenance system utilizing a novel package and more particularly to an inventory system utilizing skin packaging techniques to form the novel packages. The system is especially adapted for packaging repair kits and for maintaining a well-organized inventory of service kits and parts.

In many industries it is common for a manufacturer to supply customers with repair kits. These kits are made up of a collection of parts which, through experience, the manufacturer knows are typically required when a given mechanism is being serviced.

2. Prior Art

Many manufacturers now utilize skin packaging for packaging such kits. In the past, these skin-packaging kits have used a planar sheet of permeable card stock and a thermoformed thin sheet of plastic film adhered to one face of the sheet. Parts of the kit are interposed between the film and the sheet and maintained on the sheet by the film. For shipment, the known packages are placed in a shipping carton and, typically, a quantity of dunnage material is placed in the carton to immobilize the packages.

The kit as supplied to the customer presents some problems. Typically, the customer will store his inventory of kits in a manner that makes them readily identifiable. Storage of these sheets of card stock with odd-shaped parts projecting from them is usually relatively space consuming. If the parts are fragile, this may also contribute to the use of excessive volumes of space for adequate and safe storage. Security against pilferage is also a problem.

Proposals have been made for preforming carton blanks upon which objects were to be skin packaged. These blanks were then to be folded and secured together by tabs inserted in slots. Other proposals have used bands around such blanks to hold them together. Still others have proposed to skin package a product in place in an ordinary carton. All of these prior proposals are relatively inflexible as to sizes and require special labeling or the like to identify the contents.

SUMMARY OF THE INVENTION

With the present invention, the card stock is slit or scored so that it may be folded. In its preferred form, the card stock is folded such that three portions of it form three sides of a package. The products packaged are secured to one or more of the inner faces of the card stock portions by plastic film. After the products are secured to the stock, it is folded and a closure is attached. The closure overlaps the marginal edges of the cardstock to retain the card stock in its folded condition and complete a package which resembles a book.

The closure is preferably thermoformed from plastic sheet material. Identifying indicia identifying the contents of the package can be molded into this thermoformed closure.

In one form, a closure is designed to cover both ends and a side of a completed six-sided package so that the closure and the cardstock together form a completely closed package. The closure can be stapled to the cardstock to secure it in place. The completed package may be shipped without being positioned in another shipping container. The need for shipment and for dunnage material and for a further carton or other container is completely eliminated. Thus, the packaging is simplified and the weight is materially reduced with a resulting saving in freight costs.

In another form of the invention, the closure telescopes over the card stock to close one side of the package and to only partially enclose the ends. Where a collection of repair kits are to be shipped, this closure is adequate since a number of these packages are placed in a carton of appropriate size for shipment.

The finished packages protect the enclosure products on all sides, while at the same time providing ready identification of the contents. The packages can be stored in an ordinary file cabinet or other enclosure for convenient organization and security against pilferage.

While by no means limited to the X-ray industry, this packaging system is ideally suited to it. When a hospital or aclinic purchases a given X-ray mechanism, it can simultaneously the service kits which experience has taught are normally required for proper maintenance of the particular mechanism. With computer control of the inventory of service parts, each customer may be supplied with a kit a short time before experience indicates it will be needed.

This package and system readily lends itself to modification from time to time and to replacement of parts used. If a given part has been used, a replacement part may be shipped to the customer in a suitable enclosure, including a pressure-sensitive backing. The customer than simply adheres the replacement part in the place in the package from which the part had previously been taken, restoring the kit to its original, complete condition. Similarly, if experience teaches after a period of time that another part of the mechanism has commenced to fail, an additional part can be readily added to the kit with the same pressure-sensitive system.

Accordingly, the object of this invention is to provide a novel and improved package and inventory system and a process of forming such package and system.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims taken in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of the card used with the package of this invention;

FIG. 2 is a plan view of the card of FIG. 1 with parts of a kit placed on it for skin packaging;

FIG. 3 shows the card of FIGS. 1 and 2 after the skin-packaging film has been added and adhered to the card;

FIG. 4 is an exploded view showing the card of FIG. 3 folded and one form of end closure in spaced relationship with it;

FIG. 5 shows the package assembly of FIG. 4 in its completed and assembled condition;

FIG. 6 is a sectional view of the closure of FIGS. 4 and 5 as seen from the planes indicated by the line 6—6 of FIG. 5;

FIG. 7 is a perspective e view of the package of FIG. 3 folded and another form of end closure partially attached;

FIG. 8 is a perspective view of the finished package of FIG. 7; and,

FIG. 9 is a sectional view of a part package.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, a sheet of cardstock is shown generally at 10. The card stock is the typical coated and perforated stock used in skin packaging. The cardstock is scored or perforated to provide lines of weakness 11, 12. When the package has been completed, the card stock is, as will be explained in greater detail presently, folded along these lines of weakness 11, 12.

In FIG. 2, products 14–19, inclusive have been positioned on the cardstock 10 for packaging. The products 14–19 are positioned such that ample skin packaging film will surround them and for good adherence of the film to the cardstock 10. The products 14–19 are also positioned such that the card stock can, subsequent to the skin packaging operation, be folded while the products are maintained in place.

In FIG. 3 a plastic film has been adhered to the cardstock 10 and covers each of the products 14–19 as well as the visible face or surface of the card stock 10. Lines identified by the numeral 20 indicate portions of the film which have been stretched over the product in the typical and known skin-packaging operation.

With skin-packaging operations, the film is first heat softened. The cardstock is positioned over a vacuum manifold and air is pumped from the manifold so as to establish a flow of air through the permeable cardstock and hence a pressure differential. The film, once heat softened, is brought into close juxtaposition with the card stock so that the established pressure differential forces the film down over the product, thermoforming the film around the product. The pressure differential also brings the film into contact with the cardstock so that the film adheres to the stock. In one version of skin-packaging, the natural adhesion of treated polyethylene film is utilized to bond the film to the cardstock. In another version, the heat which heat softens the plastic film radiates through the film and heat softens an adhesive which has been coated on the cardstock and perforated.

After the products have been skin packaged as depicted in FIG. 3, the cardstock **10** is folded along its lines of weakness **11, 12**. This folding brings end portions **22, 23** into face-to-face relationship. They are maintained in spaced relation by the central portion **24**. The product **19**, and any other products, are on inwardly oriented surfaces of the cardstock.

An end closure **25** is provided to complete a multiple-sided tubular enclosure. The end closure is preferably a thermoformed plastic member. The end closure **25** has a central section which includes bridging portion **26**. The bridging portion has longitudinal and transverse dimensions substantially identical to the longitudinal and transverse dimensions of the cardstock central portion **24**. The closure has side portion **27, 28** which respectively telescope over edge parts **29, 30** of the cardstock end portions **22, 23**.

The closure **25** has top and bottom sections **32, 33** which bridge portions of top and bottom openings defined by the card stock. These end sections **32, 33** are, in cross section, identical to the cross section of the central section **26**, as seen in FIG. **6**. As shown in FIG. **6**, the side portions **27, 28** have flange and connecting parts **34, 35**. These parts define spaced channels **36** which receive the card stock edge portions **29, 30**, respectively.

In FIG. **5**, the completed package utilizing the closure **25** is shown. As an examination of FIG. **5** will show, the completed package is partially open at the top and the bottom. This package is adequately closed for use in packaging kits which are to be shipped as groups, or individually, in a separate container. The closure **25** may be secured in place by a suitable adhesive or by staples extending through the side portions **27, 28** and the cardstock adjacent the edges **29, 30**, respectively. Alternately, the frictional engagement of the closure **25** and the cardstock is adequate to maintain the unit in an assembled condition for most purposes facilitating the opening of the kit to remove a part and then subsequently reclosing and storing of the kit with any remaining parts.

In FIGS. **7** and **8** an end closure **40** is shown. The end closure **40** completely closes the package to provide a suitable shipping container. The end closure **40** includes top and bottom end sections **41, 42** and a central section **43**. The top, bottom and central portions completely close the top, bottom and side of a carton so that the closure forms three sides and the cardstock **3** of a completed six-sided carton.

The closure **40** is molded flat with, for strengthening purposes, transversely extending lands and grooves **44, 45**. The closure **40** has side portions **46, 47** which correspond to the side portions **27, 28**, respectively, defining channels to receive edge portions of the cardstock **10**. The side portions **46, 47** are notched at four locations bearing the numeral **49** to delineate the junctures of the end sections **41, 42** with the central section **43** and facilitate folding of the closure **40**.

The closure **40** also has end portions **50**, one of which is visible in FIG. **7**, which overlie the central portion **24** of the cardstock **10**. End portions **50** define channels which telescope over the top and bottom edges of the central portion **24**. As suggested at **51** in FIGS. **4** and **5**, the closure may include identifying indicia which identifies the kit and the contents of it. The closure **40** affords flexibility in package sizes. It is molded as one long piece. The length of the piece can be selectively determined through the use of insets in the mold. The lengths of the central and end portions is determined by the location of the notches **49**.

FIG. **9** is a somewhat schematic sectional view of a package for a replacement part. The thicknesses of the film, cardstock, and other components have been exaggerated for clarity of illustration. The replacement part package includes a substrate of cardstock **60**. A product **61** is mounted on one face of the cardstock **60**. The product shown in FIG. **9** is a washer. The washer is skin packaged to the face of the stock **60** by a piece of plastic film **62**.

The back of the stock **60** has a layer of pressure-sensitive adhesive **63** has the usual protective covering **64** which is removed when a replacement part **61** is to be adhered in place in one of the kits. In order to permit airflow through the cardstock **60**, the adhesive **63** and the protective covering **64**, the covering **64** and the adhesive are perforated prior to the skin-packaging operation. This permits the pressure differential to be established so that the film **62** will be forced down over the product to become thermoformed around the product and adhered to the card stock **60**.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. A skin package comprising:

a. a sheet folded along each of a plurality of lines of weakness;

b. the folded sheet defining a plurality of sides in a multiple-sided tubular enclosure and having inwardly oriented surfaces;

c. a sheet of plastic film adhered to selected portions of one of said surfaces;

d. an object interposed between the film and said one surface and maintained in position relative to said sheet by the coaction of the sheet and the film;

e. said sheet having marginal portions spaced from one another; and,

f. closure means overlapping said marginal portions and at least partially closing said multiple-sided tubular enclosure and maintaining the sheet in a folded condition and thereby completing the package and frictionally engaging at least parts of said marginal portions whereby the closure may be maintained in place by friction alone.

2. The package of claim **1** wherein said closure means is a thermoformed plastic member closing one side and partially closing the ends of said tubular enclosure and wherein said sheet is air-permeable cardstock defining three sides of the package.

3. The package of claim **1** wherein said sheet is air-permeable cardstock.

4. The package of claim **1** wherein said sheet is cardstock defining three sides of a six-sided package and wherein the closure means is a molded plastic member closing the remaining three sides of a six-sided package.

5. The package of claim **1** wherein said closure means is a molded plastic member including transversely extending stiffening lands and grooves.

6. The package of claim **1** wherein said closure means is a molded plastic member having a central portion and side portions defining channels in which marginal edges of the permeable sheet are disposed.

7. The package of claim **1** wherein said closure means is a molded plastic member having top, bottom, and central sections, a marginal portion surrounding the sections and including a notched flange wherein the notches delineate lines of juncture between the top and bottom sections and the central section respectively, and facilitating folding of the top and bottom sections relative to the central section.

8. The package of claim 1 wherein there are objects interposed between the film and each of said inwardly oriented surfaces.

9. The package of claim 1 wherein there are objects interposed between the film and a plurality of said inwardly oriented surfaces.

10. The package of claim 1 wherein said closure is a molded plastic member with identifying indicia molded therein.

11. The package of claim 1 wherein said closure means is a molded plastic member having top, bottom, and central sections and wherein each of the plastic member sections includes a transversely extending portion, flange parts, and connecting parts connecting the transversely extending portion to the flange parts and wherein said flanges and connecting parts together define a pair of spaced cardstock-receiving channels.

12. The package of claim 1 wherein said closure means is a thermoformed plastic member closing one side and partially closing the ends of said tubular enclosure.

13. The package of claim 1 wherein the closure means is a molded plastic member closing the remaining three sides of a six-sided package.

14. A package comprising:

a. a sheet of cardstock having a pair of parallel lines of weakness, the stock being folded along said lines;

b. the cardstock having inner and outer surfaces with portions of the inner surface oriented toward one another

c. a sheet of plastic film adhered to at least one of the inner surface portions;

d. an object interposed between the film and the cardstock and maintained in position relative to the stock by coaction of the film and the stock;

e. said folded stock forming three sidewalls of a six-sided package; and,

f. a molded plastic member telescoped over marginal edge portions of the cardstock and forming the fourth sidewall and at least portions of end walls of the package and frictionally engaging at least parts of said marginal portions whereby the closure may be maintained in place by friction alone.

15. The package of claim 14 wherein said molded plastic member completely closes both ends and one side of the package thereby to complete a six-sided package.

16. A package comprising:

a. a sheet of cardstock having parallel lines of weakness dividing the card stock into side and central portions with the side portions being of equal area;

b. a sheet of plastic film adhered to an inner face of at least one of said portions;

c. a product interposed between the film and the cardstock and maintained in position relative to the cardstock by the coaction of the film and of the cardstock;

d. said cardstock being folded along said lines of weakness with said end portions being in spaced parallel relationship whereby the end portions and the central portion define three sides of a tubular enclosure, the film and object being within such enclosure;

e. a plastic end closure including a bridging portion extending from one of said card stock side portions to the other thereby bridging the space therebetween and defining a fourth side of the tubular enclosure;

f. said end closure including side portions telescoped over edge parts of said central portion; and,

g. said closure also including top and bottom sections including a central portion bridging the space between other marginal edges of said end portions to at least partially close top and bottom openings defined by said card stock and bridging portion, said end sections also including side portions overlying other edge parts of said card stock end portions.

17. The device of claim 16 wherein said closure closes said end openings and where the closure includes end parts overlying edges of said cardstock central portion.

18. An end closure for a package comprising:

a. a central bridging portion;

b. a marginal flange part surrounding the central bridging portion;

c. connecting parts connecting the bridging portion to the flange part;

d. said flange and connecting parts defining sheet receiving channels therebetween;

e. said channels surrounding the bridge portion; and,

f. said flange parts including a plurality of notches defining a line of connection between sections of said closure whereby the closure may be folded along each such line to provide a multisided enclosure for a tubular package.

19. The process of maintaining a parts inventor for service of a given apparatus comprising the steps of:

a. determining the service parts requirements of the apparatus;

b. collecting a group of parts composed of parts selected according to said determined requirements

c. skin packaging the group of parts as a service kit;

d. utilizing selected ones of said group for service; and,

e. repairing the kit by securing prepackaged, skin-packaged parts to the kit package thereby increasing the content of the used kit to include a group of parts selected according to predetermined requirements

20. The process of claim 19 wherein the requirements are redetermined prior to use of the kit and prepackaged parts are added to the kit package according to such predetermined requirements.

21. The process of claim 19 wherein the requirements are redetermined prior to the step of repairing the kit and wherein the predetermined requirements are the redetermined requirements and the prepackaged parts are selected according to said redetermined requirements.

22. The process of claim 19 wherein the packaging of the group comprises:

a. positioning the parts of the group in spaced relationship on a sheet;

b. adhering a piece of film to the sheet to skin package the products to the sheet;

c. folding the sheet for form a plurality of sides of a plurality of sides of a multisided tubular enclosure; and,

d. connecting a closure to the sheet to complete a package.

23. The process of skin-packaging a product to a sheet having a pressure-sensitive adhesive and covering on one surface comprising the steps of:

a. perforating the adhesive and covering to make them air permeable;

b. positioning the sheet over a vacuum manifold with the one surface orientated toward the manifold;

c. positioning the product on the other surface;

d. heat softening a piece of plastic film; and,

e. establishing a pressure differential to force the film over the product and adhere the film to said other surface thereby skin-packaging the product.

24. A process of skin packaging a product to a sheet comprising the steps of:

a. forming a perforate pressure-sensitive adhesive layer on one surface of the sheet;

b. positioning the sheet on a skin package forming support with the one surface oriented toward the support;

c. positioning a product to be packaged on the obverse surface of the sheet;

d. positioning a piece of deformable plastic film above the product and bringing the film down over the product and the other surface; and,

e. establishing a pressure differential to force the film over the product and adhere the film to said other surface, thereby skin packaging the product to the sheet.

25. The process of claim 24 wherein the adhesive is applied as a layer over said one surface and thereafter perforated to provide gas permeability.

26. A skin package comprising:

a. a permeable sheet having product-receiving and adhesive surfaces;

b. a permeable quantity of pressure-sensitive adhesive adhered to the adhesive surface;
c. a permeable protective covering layer adhered to the adhesive such that the adhesive is between the protective covering layer and said adhesive surface;
d. a sheet of plastic film adhered to said product-receiving surface; and,
e. a product interposed between a sheet of film and said product-receiving surface.

27. The package of claim **26** wherein the adhesive is a layer and the covering and adhesive layers are perforated to provide air permeability.

28. A kit comprising:

a. a sheet of material forming a substrate for the kit;
b. a plastic film adhered to one surface of the sheet;
c. at least one product interposed between the film and the sheet; and,
d. at least one other product secured to the sheet in a separate package, said separate package comprising:
i. a substrate;
ii. an adhesive adhering the substrate to the sheet;
iii. a portion of plastic film adhered to the substrate on a surface opposite said adhesive; and,
iv. said other product being interposed between said portion of plastic film and said substrate.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,610,411 Dated October 5, 1971

Inventor(s) Eugene W. Coleman

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 8, delete "aclinic" substitute - - a clinic - -

Column 2, line 48, before "view" delete "e"

Column 3, line 28, before "27" delete "portion" substitute - - portions - -

Claim 10, line 1, after "closure" insert - - means - -

Claim 19, line 1, delete "inventor" substitute - - inventory -

Claim 20, line 3, "predetermined" should be - - redetermined -

Signed and sealed this 25th day of April 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334