

Dec. 2, 1969

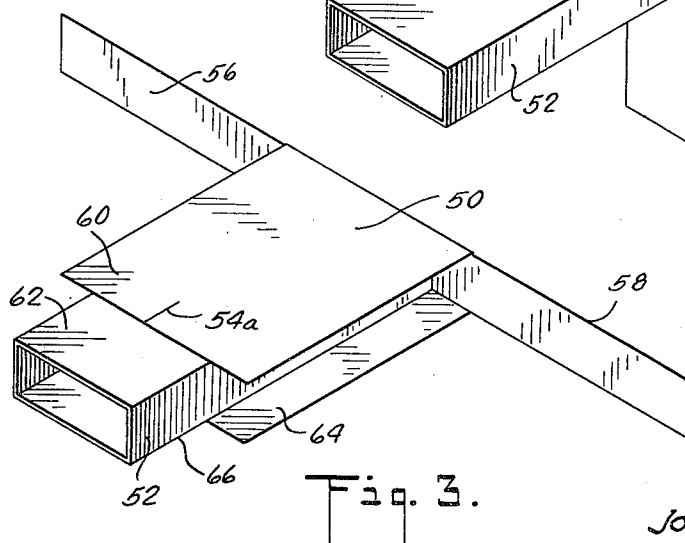
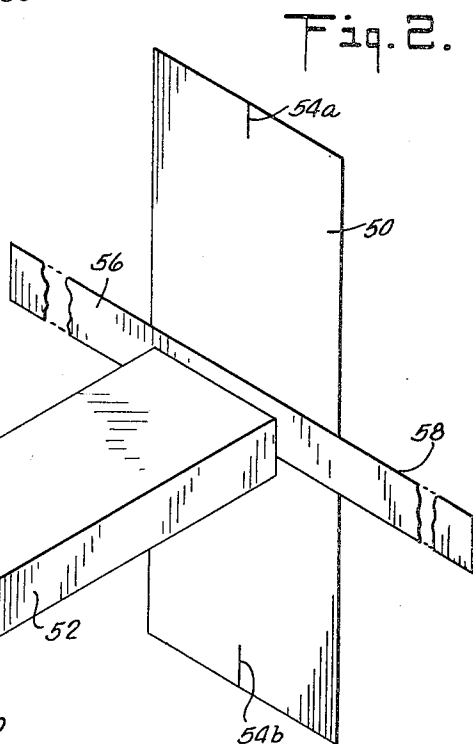
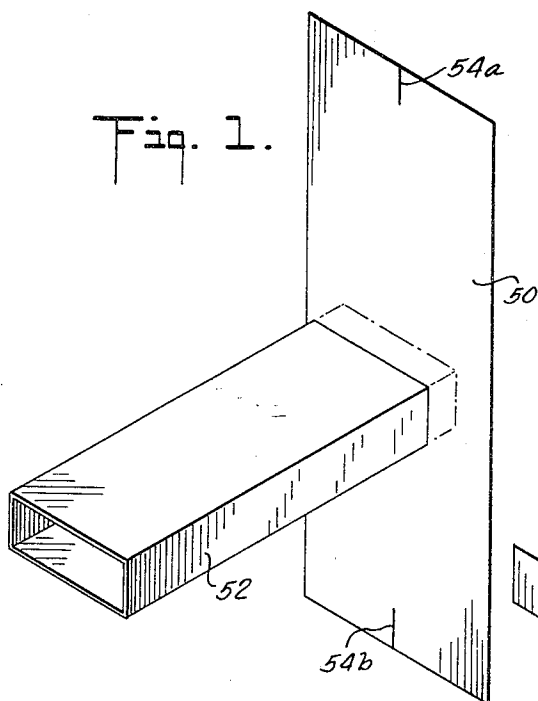
J. H. SHERRILL ETAL

3,481,098

PACKAGING METHOD

Original Filed Nov. 8, 1965

8 Sheets-Sheet 1



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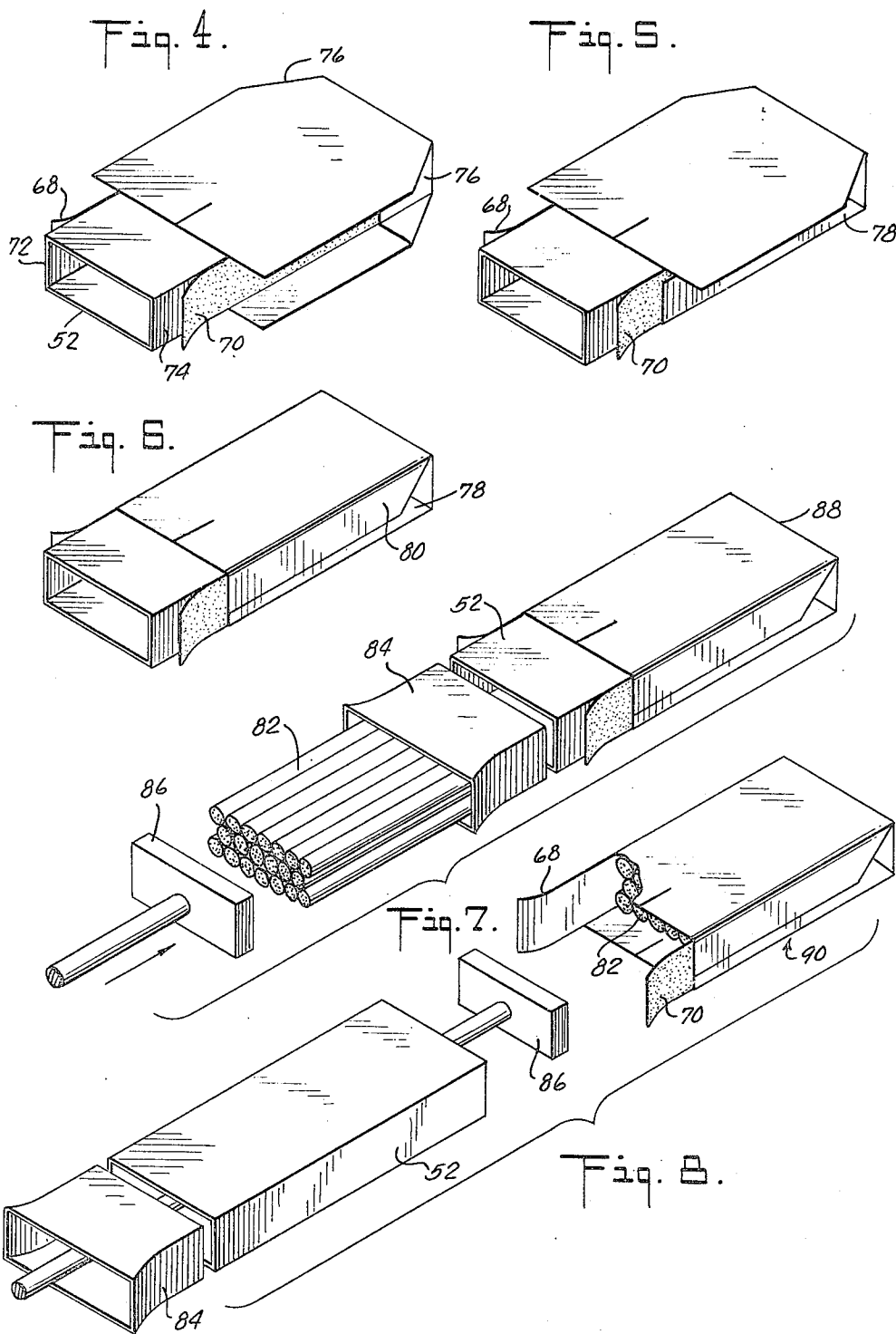
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Fig. 9.

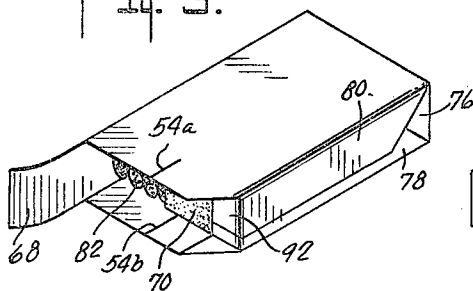


Fig. 10.

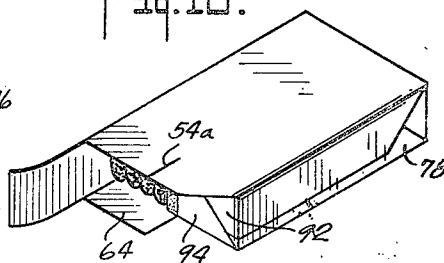


Fig. 11.

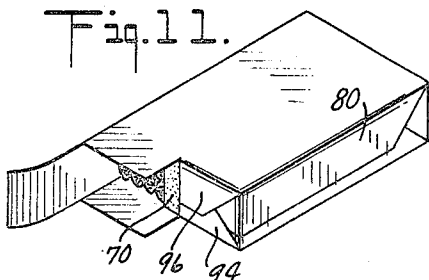


Fig. 12.

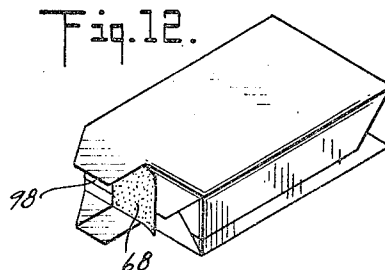


Fig. 13.

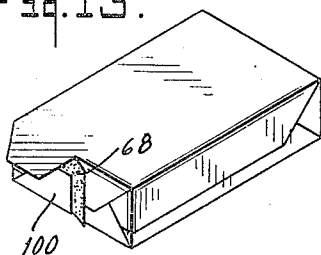


Fig. 14.

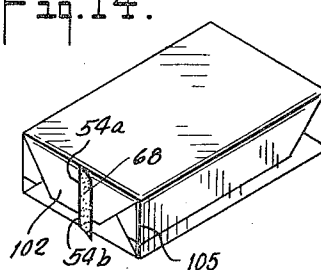


Fig. 15.

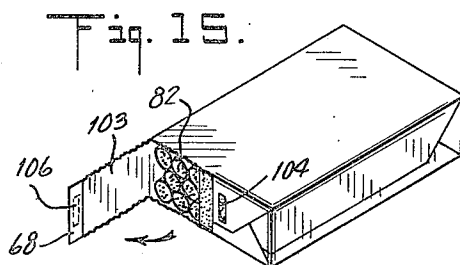
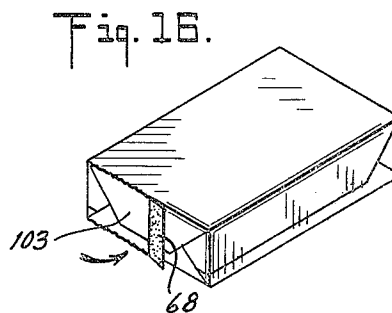


Fig. 16.



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Fig. 17.

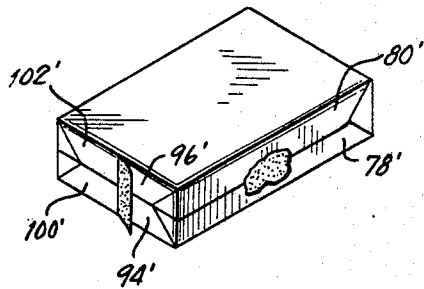


Fig. 19.

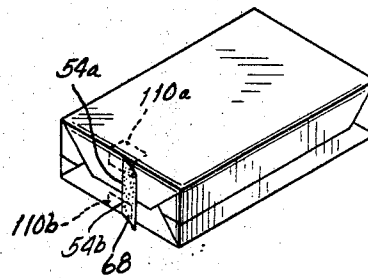


Fig. 20.

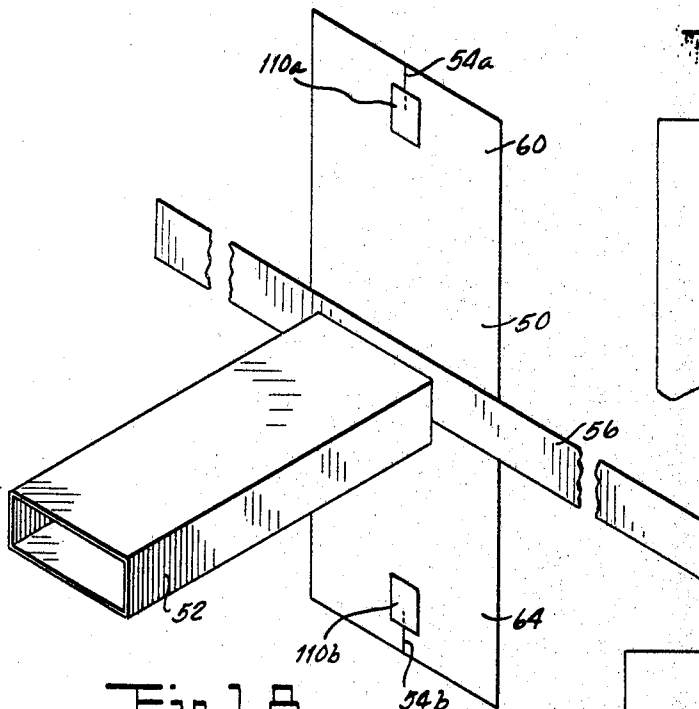
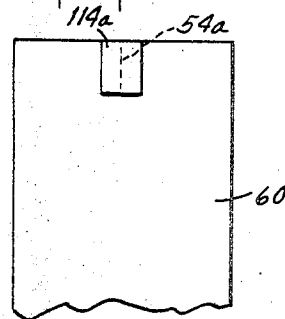
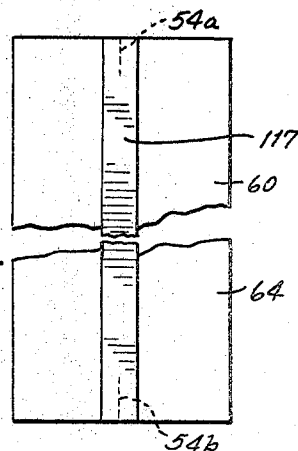


Fig. 18.

Fig. 21.



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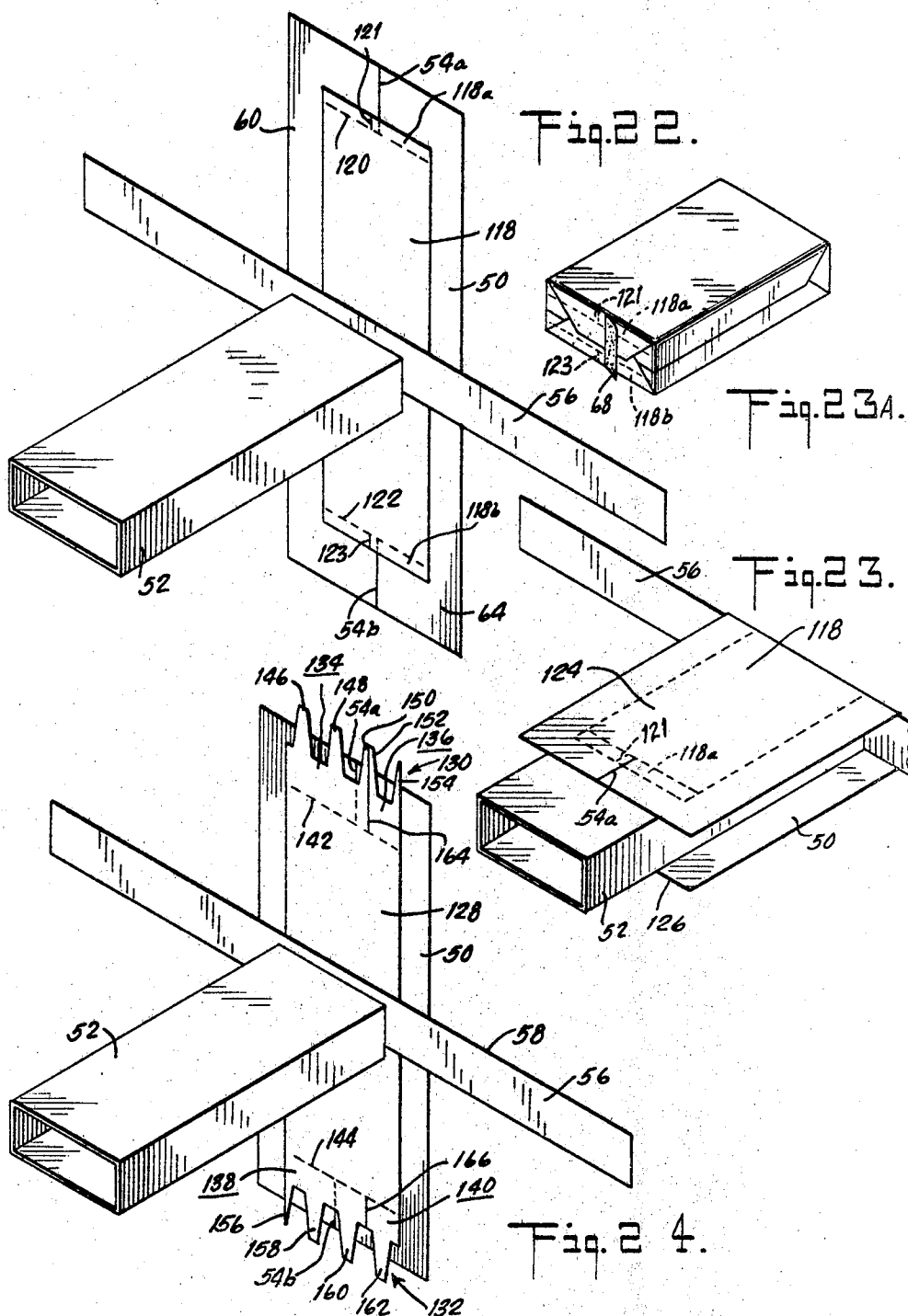
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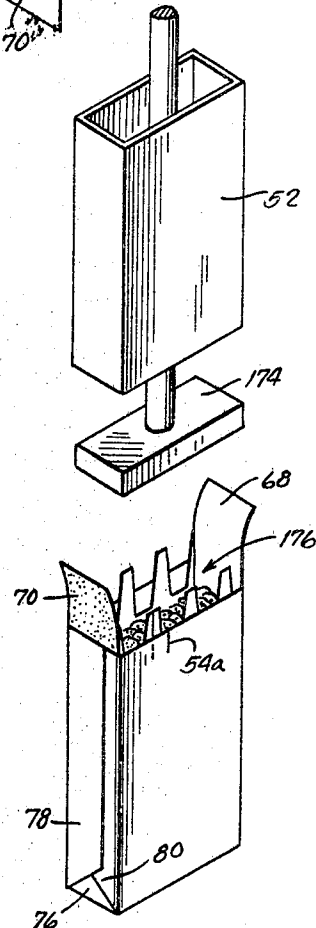
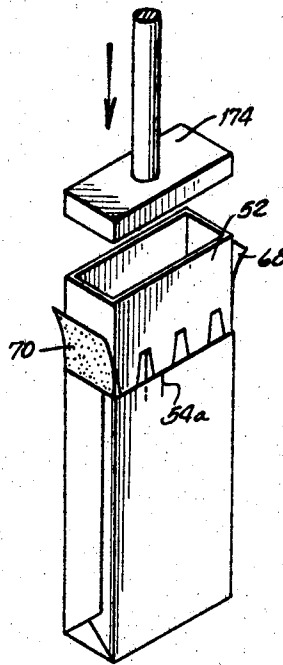
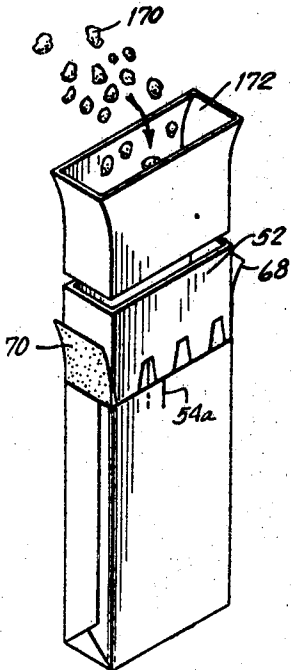
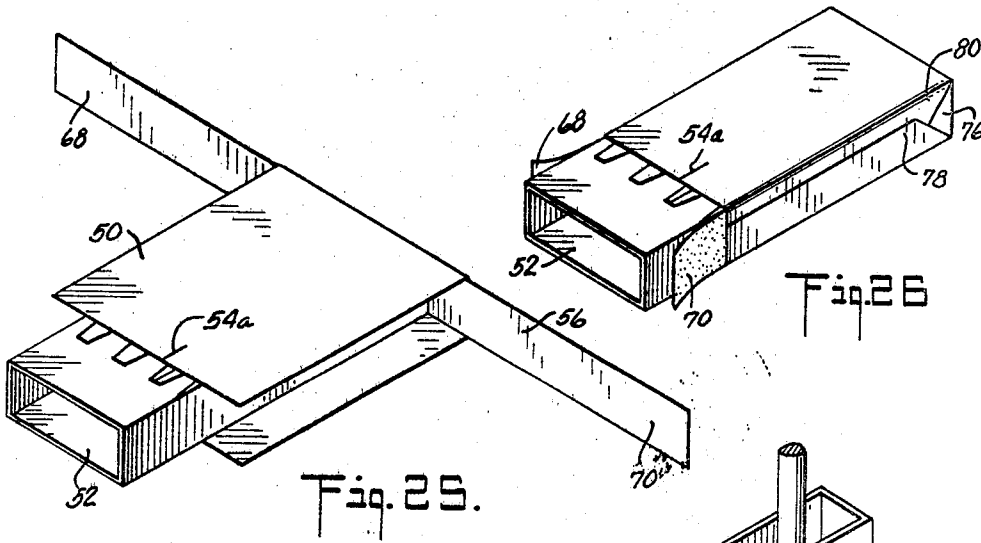
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Fig. 30.

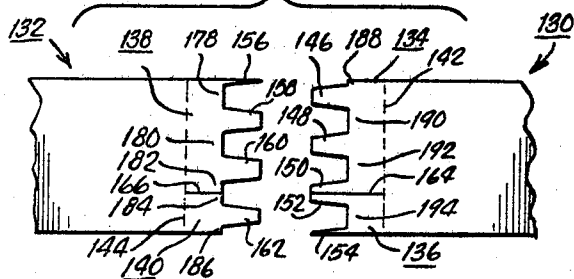


Fig. 31.

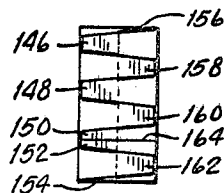


Fig. 33.

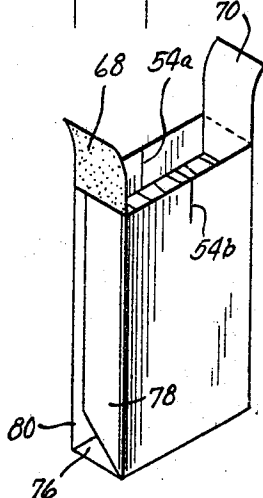


Fig. 34.

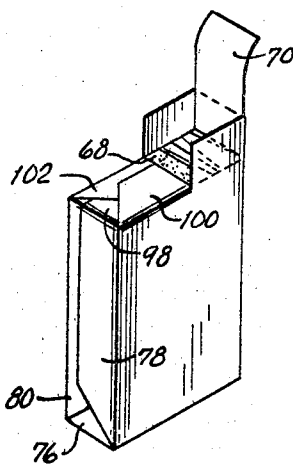


Fig. 32.

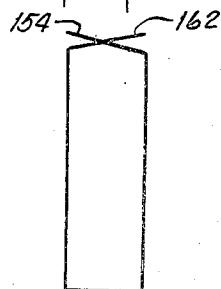


Fig. 36.

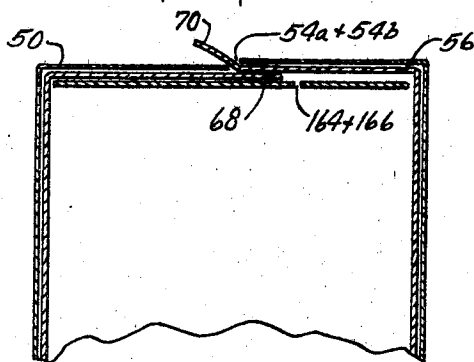
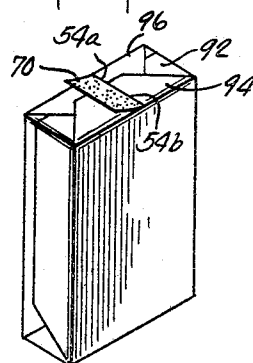


Fig. 35.



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Fig. 37.

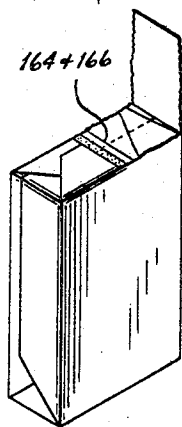


Fig. 38.

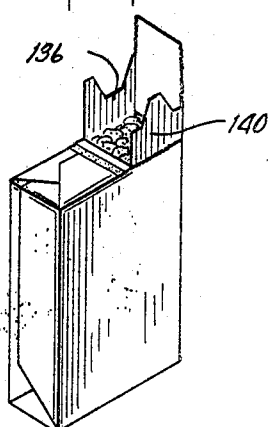


Fig. 39.

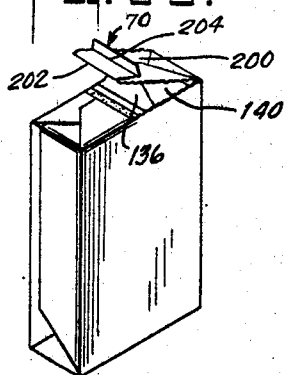


Fig. 40.

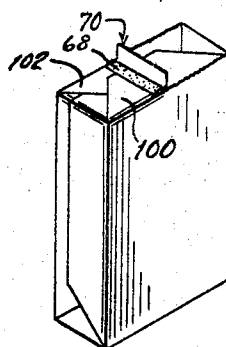
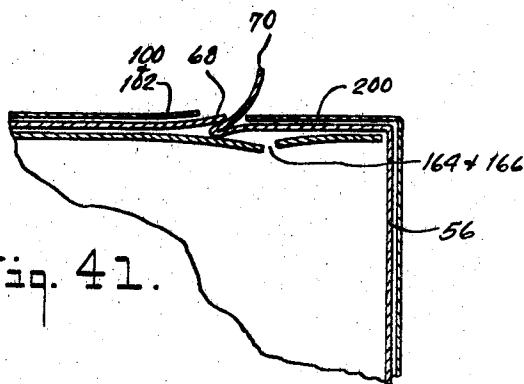


Fig. 41.



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PACKAGING METHOD

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Original application Nov. 8, 1965, Ser. No. 506,822, now Patent No. 3,378,187, dated Apr. 16, 1968. Divided and this application Oct. 19, 1967, Ser. No. 705,868
Int. Cl. B65b 19/24, 43/10, 61/18
U.S. Cl. 53—14

2 Claims

ABSTRACT OF THE DISCLOSURE

A method of packaging a product, in which a strip of bendable material is bent to a U-shape, portions of a wrapper are adhesively secured to the strip except at the ends thereof to provide an enclosure, the enclosure is filled with a product, the ends of the strip are bent to form an end face, portions of the wrapper are adhesively secured to adjacent ends of the strip to enclose the product, and one end of the strip is extended through a slit in the wrapper to provide an accessible pull for tearing the wrapper to render the product accessible. The wrapper may be adhesively secured to all portions of the strip enclosed by the wrapper to provide a sealed package.

This application is a division of our copending application Ser. No. 506,822, filed Nov. 8, 1965, for Package and Packaging Method now U.S. Patent No. 3,378,187.

This invention relates to a method of packaging a product. The invention is particularly directed to the packaging of a product through the use of a flexible wrapping material as a wrapper for enclosing the product and a strip of bendable material about a girth of the package.

Packages have been formed in the past from a flexible wrapping material and a strip of bendable material about a girth of the package. The flexible wrapping material is wrapped about the strip and encloses the product to be packaged. In the present invention, flexible wrapping material encloses and is adhesively secured to a strip of bendable material about a girth of the package so as to form a package for a product. The wrapper is slit in a portion thereof adjacent to an end of the package. One end of the strip is passed through the slit in the wrapper so that it extends outside the package. When it is desired to open the package, the strip end extending outside the package is pulled, tearing the wrapper and exposing the end of the package so that the contents of the package may be removed. This arrangement for opening the package is advantageous since the strip end extending through the slit is an opening device which is readily apparent to the user, requiring few, if any, written instructions on the package. The strip also provides for sealing of the package.

When the outside strip end is pulled, tearing the wrapper and exposing the contents of the package, a flap is created which may be either torn away or use to reclose the package. A small amount of permanently tacky adhesive material may be secured to the outside of the wrapper or to the underside of the strip that forms this flap to aid in securing the flap to the package when the flap is used for reclosing.

The strip of bendable material may be made of stiff material in the event that the product to be packaged does not have dimensional stability, i.e., it lacks inherent rigidity to give the package a desired shape. In this instance, the stiff material forming the strip about the girth of the package provides the desired shape for the package.

On the other hand, when the product to be packaged has dimensional stability, the strip of bendable material may be of flexible material of the same or greater flexi-

bility as that of the wrapping material. In the packaging of cigarettes in a wrapper of flexible material, it is desirable to have the package crushable so that as the cigarettes are removed from the package the package may be crushed to a smaller thickness. A flexible strip permits the package to be crushed easily.

The strip of bendable material, about the girth of the package is used for effective sealing of the package at the tucks and folds in the marginal portions of the outer wrapper. In particular, the strip may include a coating of adhesive material which is activated upon the application of heat. The tucks and folds of the outer wrapper may then be secured to the strip for complete sealing of the package. In this fashion, for sealing there need be no reliance upon the adhesive of one fold of the outer wrapper to another or to a tuck.

Hence the strip extending through the slit in the wrapper provides the advantages of easy opening and sealing and, if desired, dimensional stabilization of a package. Conventional packages, on the other hand, are typically unable to provide these advantages. For example, the well known "fin seal" package provides a good seal of a packaged product but is hard to open and does not provide a convenient rectangular shape unless the product packaged has dimensional stability and is rectangular.

When a strip of bendable, stiff material is employed to form the girth of the package, the rigidity of the package is provided by the strip. Hence the remainder of the package may be formed from flexible wrapping material without further reinforcement. If desired, however, one or two panels of stiff sheet material may be secured to the flexible wrapper to provide rigidity to the front and rear faces of the package. A plurality of side-by-side pairs of opposing flaps formed from this reinforcing sheet material may be employed at the end of the package through which the product is removed. Each flap includes a projection thereon which is adapted to overlap a nonprojecting portion of an opposing flap. The flaps thus close the end of the package and form a reinforcing truss structure which provides rigidity to the package end to aid in sealing the flexible wrapping material at the end of the package. This structure is particularly useful, but not essential, for packaging a loose product which lacks dimensional stability at the end of the package. Further, however, since the truss structure is composed of a plurality of side-by-side pairs of opposing flaps, only one pair of opposing flaps need be opened to provide access to the product contained in the package without requiring the other opposing flaps to be opened. In this fashion the entire end of the package need not be opened but only a portion thereof. This truss structure is useful with the strip about the girth of the package as described above. The truss structure, when combined with the strip, provides a useful package which is rigid and which is easily opened. Additionally, when the strip extends about the girth of the package and is adhesively secured to the wrapper, effective sealing as described above is also achieved.

Accordingly, an object of the present invention is to provide an improved method of packaging a product.

A further object of the present invention is to provide a method of packaging a product incorporating a strip of bendable material and a flexible wrapping material, including a slit in the wrapping material through which an end of the strip pass to aid in opening the package that is formed.

These and other objects of the invention will be more fully appreciated by reference to the following detailed description of representative embodiments of the invention. In the figures of drawing:

FIG. 1 is a perspective view of a wrapper positioned adjacent to a forming mandrel as an initial step in completing a package in accordance with the invention.

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FIG. 2 is a perspective view of the wrapper and mandrel of FIG. 1, including a strip of bendable material, and illustrates another step in forming the package.

FIG. 3 is a perspective view of the wrapper, strip and mandrel of FIG. 2, with the wrapper folded against the broad sides of the mandrel to form front and rear faces of the package and with the mandrel pushed against the strip so as to secure the strip to the wrapper to form a closed end of the package.

FIG. 4 is a perspective view of the wrapper, strip and mandrel of FIG. 3, with the strip folded against the narrow sides of the mandrel and with side tucks taken in the wrapper.

FIG. 5 is a perspective view of the wrapper, strip and mandrel of FIG. 4, with a first side fold taken in the wrapper over each side tuck.

FIG. 6 is a perspective view of the wrapper, strip and mandrel of FIG. 5, with a second side fold taken in the wrapper over each first side fold and each side tuck so as to form a partially completed package.

FIG. 7 is a perspective view showing the mandrel and partially completed package of FIG. 6 being filled with a product to be packaged, e.g., cigarettes.

FIG. 8 is a perspective view showing the separation of the mandrel from the partially completed package of FIG. 7 containing the product therein.

FIG. 9 is a perspective view of the partially completed package of FIG. 8 containing the product therein, with a first end tuck taken in the wrapper following the folding of an end of the strip against the product in the package.

FIG. 10 is a perspective view of the partially completed package of FIG. 9, with a first end fold taken over the first end tuck.

FIG. 11 is a perspective view of the partially completed package of FIG. 10, with a second end fold taken over the first end fold.

FIG. 12 is a perspective view of the partially completed package of FIG. 11, with a second end tuck taken in the wrapper following the folding of the other end of the strip against the product in the package.

FIG. 13 is a perspective view of the partially completed package of FIG. 12, showing a third end fold taken over the second end tuck.

FIG. 14 is a perspective view of a package completed in accordance with the invention following the final end fold of the wrapper over the previous end fold shown in FIG. 13.

FIG. 15 is a perspective view of the package of FIG. 14, showing a portion of the end of the package torn, and further illustrating adhesive used for reclosing the package.

FIG. 16 is a perspective view of the package of FIG. 15, with the torn portion of the package in a reclosed position.

FIG. 17 is a perspective view of an alternative form of package similar to that shown in FIG. 14, with adjacent side and end folds of the wrapper abutting each other and not overlapping as in FIG. 14.

FIG. 18 is a perspective view of a wrapper, strip and mandrel for forming another package in accordance with the invention, showing tabs for sealing slits in the wrapper.

FIG. 19 is a perspective view of a completed package formed from the strip, wrapper and tabs of FIG. 18.

FIG. 20 is a fragmentary view of a wrapper with a slit therein covered by a tab slightly different from each of the tabs shown in FIG. 18.

FIG. 21 is a fragmentary view of a slitted wrapper and a sealing strip serving the same function as the sealing tabs shown in FIGS. 18 and 20.

FIG. 22 is a perspective view of a mandrel, strip and wrapper, including an inner sheet for forming another package in accordance with the invention.

FIG. 23 is a perspective view of the mandrel, strip, wrapper and sheet of FIG. 22, with the wrapper and sheet folded against the broad sides of the mandrel to form

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front and rear faces of the package and with the mandrel positioned against the strip to urge the strip and wrapper together to form a closed end of the package.

FIG. 23A is a perspective view of a completed package formed from the strip, wrapper and sheet of FIG. 23.

FIG. 24 is a perspective view of a mandrel, strip, wrapper and reinforcing sheet of bendable, stiff material formed at the ends thereof with flaps having projections thereon to provide a truss structure for an end of the package.

FIG. 25 is a perspective view of the mandrel, strip, wrapper and reinforcing sheet material of FIG. 24, with the wrapper and sheet folded against the broad sides of the mandrel to form front and rear faces of the package and with the mandrel positioned against the strip to urge the strip and the wrapper together to form a closed end of the package.

FIG. 26 is a perspective view of the mandrel, strip, wrapper and reinforcing sheet material of FIG. 25, with side tucks and folds taken to form a partially completed package ready for the introduction of a product therein.

FIG. 27 is a perspective view of the mandrel and partially completed package of FIG. 26 being filled with a product.

FIG. 28 is a perspective view of the mandrel and partially completed package of FIG. 27 filled with the product and in position for the separation of the mandrel from the partially completed package containing the product therein.

FIG. 29 is a perspective view showing the separation of the mandrel from the partially completed package of FIG. 28 containing the product therein.

FIG. 30 is a view showing the ends of the reinforcing sheet material of the partially completed package of FIG. 29, and illustrates the formation of the truss structure formed by the ends of this sheet.

FIG. 31 is a view of a truss structure formed by the ends of the reinforcing sheet material shown in FIG. 30.

FIG. 32 is a side view of the truss structure of FIG. 31.

FIG. 33 is a perspective view of the partially completed package of FIG. 29 filled with the product therein and with the truss structure closed. In FIG. 33 the package is shown rotated 180° from the package orientation in FIG. 29.

FIG. 34 is a perspective view of the partially completed package of FIG. 33, with a first end tuck and two end folds taken in the package.

FIG. 35 is a perspective view of the package of FIG. 34, showing a package completed in accordance with the invention following the completion of the final end tuck and end folds in the wrapper.

FIG. 36 is a simplified sectional view of an end of the package of FIG. 35, showing the relative positions of the strip, wrapper and truss structure.

FIG. 37 is a perspective view of the package of FIG. 35, with a portion of an end of the package torn open.

FIG. 38 is a perspective view of the package of FIG. 37, with a portion of the truss structure open to render the contents of the package accessible.

FIG. 39 is a perspective view of an alternative form of package completed in accordance with the invention, showing the opened flap at the top end of the package formed with a reclosure tab.

FIG. 40 is a perspective view of the package of FIG. 39 with the flap in the reclosed position.

FIG. 41 is a simplified sectional view of a portion of the top of the package of FIG. 40, showing the details of the reclosure.

Referring now to FIG. 1, a sheet 50 of flexible wrapping material, which may comprise a laminated wrapper of foil and paper, for example, is positioned adjacent to a hollow mandrel 52 open at both of its ends. The mandrel is used as a guide in the formation of the package and also serves as a receptacle for a product to be packaged, as will be explained in more detail later. The wrapper 50 is slit at

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both of its ends, as designated **54a** and **54b**. The wrapper **50** is long enough and wide enough to form the completed package, i.e., to extend from top to bottom and from side to side with the necessary overlaps for the conventional tucks and folds at the sides and at an end of the package.

Referring to FIG. 2, a strip **56** of bendable material, such as cardboard or heavy paper, is positioned between the sheet **50** of flexible wrapping material and an end of the mandrel **52**. The width of strip **56** is the same as the width of the completed package, and the strip is typically slightly longer than the girth of the package, i.e., the periphery of the package about the two ends and the two narrow sides. The strip **56** advantageously includes a pressure-thermal sealing coating, e.g., polyethylene or wax, on outside surface **58** thereof.

Referring to FIG. 3, the mandrel **52** is shown moved into contact with the strip **56** so that the midportion of the strip bears against the mid-portion of the wrapper **50**. At this time the mid-portions of the strip and the wrapper may be adhesively secured to each other, e.g., by applying heat to these portions of the strip and the wrapper to activate the sealing coating on the surface **58** of the strip. The two ends of the wrapper **50** are bent or folded into contact with the mandrel as shown in FIG. 3. In particular, end **60** of the wrapper is folded so as to lie against face **62** of the mandrel, while end **64** is folded so as to lie against face **66** of the mandrel.

Referring now to FIG. 4, ends **68** and **70** of the strip **56** are bent or folded respectively against sides **72** and **74** of the mandrel as shown. Side tucks **76** are then taken in the wrapper. Following this a first side fold **78** is completed in each side face of the package, as shown in FIG. 5. Next, a second side fold **80** (FIG. 6) is completed in each side face of the package over the first side fold **78** previously completed. Those portions of the side folds **78** and **80** and the side tucks **76** bearing against the outside surface **58** of the strip **56** are adhesively secured thereto, typically by the application of heat. Where portions of the wrapper overlap each other, e.g., the portion of the side face **80** overlapping the side fold **78**, these overlapping portions may be secured to each other by a suitable adhesive material applied to these portions of the wrapper.

The partially completed package and mandrel as shown in FIG. 6 are now ready for the application of a product thereto. Although in the following description cigarettes are shown as the product to be packaged, this of course is only representative.

Referring to FIG. 7, cigarettes **82** are applied to the package through a funnel **84**. The cigarettes may be pushed through the funnel by a pusher mechanism **86** and pass through the funnel into the mandrel **52**. The pusher **86** typically operates to push the cigarettes **82** entirely through the mandrel **52** so that the lower ends of the group of cigarettes strike lower end **88** of the package. The pusher **86** continues to push the cigarettes against the end of the package so as to cause the package containing the cigarettes therein to be ejected from the mandrel **52** as shown in FIG. 8. The partially completed package of FIG. 8, ejected from the mandrel **52** and containing cigarettes **82**, is ready to be completed as shown in FIGS. 9 through 14.

In FIG. 9, end **70** of the strip **56** is folded against the cigarettes **82**, and a first end tuck **92** is completed in the open end of the package. Next, as shown in FIG. 10, a first end fold **94** is completed over the end tuck **92**. The first end fold **94** is formed from a portion of the end **64** of the wrapper which is possible because of the slit **54b** in this end of the wrapper (see FIG. 9). Referring to FIG. 11, a second end fold **96** is completed over the first end fold **94**. It will be noted from FIG. 11 that typically a small portion of the end **70** of the strip **56** extends along the end of the package beyond the end folds **94** and **96**.

Referring to FIG. 12, the end **68** of the strip **56** is next

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folded against the ends of the cigarettes **82**, and a second end tuck **98** is completed in this end of the package. The end **68** of the strip **56** typically overlaps the other end **70** of the strip. As shown in FIG. 13, a third end fold **100** is completed in this end of the package. As shown in FIG. 14, a fourth and final end fold **102** is completed to complete the package.

Those portions of the end tucks and folds against the outside surface of the strip ends **68** and **70** are adhesively secured thereto, typically by the application of heat to activate the adhesive material on the strip. The overlapping portions of the end tucks and end folds of the wrapper may be adhesively secured to each other by the application of a suitable adhesive material on these portions of the wrapper.

It should be noted that the side and end tucks and folds of the package may be formed by suitable guides and folders (not shown) which are conventional and well known in the art. Conventional folder bars (not shown) may be heated to activate the adhesive material on the outer surface of the strip **56** as well as any adhesive material positioned on the overlapping portions of the tucks and folds of the wrapper. It should be further noted that the sequence of operations shown in FIGS. 1-14 is to some extent arbitrary and that the sequence of some steps may be varied.

It will be noted from FIG. 14 that overlapping end **68** of the strip **56** passes through the slits **54a** and **54b** in the wrapper. There is thus provided an accessible pull for the purpose of opening the package. This pull is an opening device which is readily apparent to the user, and requires few, if any instructions regarding the opening of the package. As shown in FIG. 15 the strip end **68** is pulled away from the end of the package to tear open the package end and to form a flap **103** which renders the cigarettes **82** accessible for use. An adhesive material **104** may be added to the package in position to be engaged by flap **103** to serve to maintain the flap **103** of the package in a closed position as shown in FIG. 16. Alternatively, the adhesive material may be positioned at the end of the flap **103**, as at **106** in FIG. 15, to permit the flap to be maintained in the closed position. Adhesive material is preferred as shown at **104**, however, to avoid a sticky opening flap. In the event that the product contained in the package is to be emptied completely from the package as soon as the package is opened then the package normally would not be made reclosable, and the opening tab **103** could be torn completely off the end of the package.

The wrapping sequence illustrated in FIGS. 1-14 involves end folding of the wrapper **50** about the forming block or mandrel **52**. With this sequence, the tucks and folds are in the sides of the package and in one end. The other end of the package includes no tucks or folds. It is obvious that the blank **50** could be modified so as to be adapted for side folding about the forming block **52**, e.g., in a fashion similar to that shown in FIGS. 2 and 3 of Sherrill Patent No. 3,135,459 which issued on June 2, 1964 and which is assigned to R. J. Reynolds Tobacco Company. With such side folding of the blank about the forming block, there are no folds or tucks on the sides of the package; tucks and folds are included on both ends of the package. Such side folding of a blank about an arbor is achieved by conventional apparatus well known in the art.

As described above in connection with FIGS. 1-16, the strip **56** is adhesively secured to the wrapper about the entire periphery of the strip. Such sealing, particularly the sealing to the strip of the marginal portions of the wrapper that are tucked and folded, provides an effective seal in the package and does not rely on seals between overlapping tucks and folds to seal the contents of the package. If the contents of the package are such that they need not be sealed from the atmosphere, then the

strip 56 need not be adhesively secured at all portions thereof to the wrapper.

In the case of the packaging of cigarettes, in particular involving a flexible wrapping material as the outer wrapper of the package, it is desirable that the strip 56 be of flexible material so that as the cigarettes are removed by the user from the package, the package may be crushed so as to reduce the thickness of the package. On the other hand, in the case of some products which have relatively little or no dimensional stability—that is, they lack the necessary inherent rigidity to provide a shape to the package—the strip 56 should be of bendable, stiff material so as to define the shape of the package and to provide rigidity to the package.

FIG. 17 shows a package in which the side and end folds abut each other and do not overlap as in FIG. 14. In particular, side folds 78' and 80' abut each other, as do end folds 94', 96' and 100', 102'. In this fashion no additional adhesive material is needed on the wrapper as in the case of side and end folds which overlap. If desired, the side and end folds need not abut exactly, e.g., a gap may be left between adjacent folds. Adhesive material on the overlapping portions may be dispensed with if there is but a slight amount of overlap in the side and end folds.

FIG. 18 illustrates a pair of sealing tabs 110a and 110b that are respectively used to seal the slits 54a and 54b. Each tab may extend only over a portion of the respective slit and is adhesively secured to the wrapper 50 adjacent to the associated slit. FIG. 19 shows a completed package with the tabs in place. As will be noted, the end 68 of the strip 56 passing through the slits 54a and 54b passes over the sealing tabs 110a and 110b.

FIG. 20 shows an alternative form of the sealing tab. Only the upper end 60 of the wrapper is shown containing the slit 54a. In this case the sealing tab, designated 114a, may extend over the entire portion of the slit 54a. The tab is advantageously secured to the wrapper end 60 by adhesive material.

FIG. 21 shows still another form of sealing arrangement used to seal the slits 54a and 54b. In this case a single strip 117 is employed extending the full length of the wrapper from the slit 54a in the end 60 to the slit 54b in the end 64 of the wrapper. The sealing strip 117 is secured to the wrapper at locations adjacent to the slits 54a and 54b.

FIG. 22 shows a sheet 118 in the package. The sheet 118 may be of stiff material, e.g. cardboard, in the event that rigidity to the front and rear faces 124 and 126 of the package is required by the product to be packaged or by customer preference. The sheet 118 also may be of a flexible material of roughly the same degree of flexibility as that of the outer wrapper 50. In such a case the sheet 118 may serve as a resilient cushion for cushioning the product within the package and preventing rippling in the outer wrapper. Such a cushion is disclosed in Sherrill Patent No. 3,135,459 referred to above.

The sheet 118 may be a single sheet of bendable material, or it may be two separate sheets. For convenience in manufacture, however, a single sheet normally would be employed. The sheet 118 is advantageously positioned so that end portions 118a and 118b extend partially over the end of the package. Hence the sheet is normally scored, as at 120 and 122, and is slit as at 121 and 123 respectively adjacent to the slit 54a and 54b in the outer wrapper 50. FIG. 23 shows the next step in the formation of the package incorporating the sheet 118. The outer wrapper 50 and the sheet are folded against the arbor 52 as shown, and the package is thereafter completed as described above in connection with FIGS. 4-14 to form the completed package shown in FIG. 23A. The end 68 of the strip 56 is passed through the slits 121 and 123 and lies between the sheet 118 and the outer wrapper 50 until it passes through the slits 54a and 54b to extend outside the wrapper as shown in FIG. 23A. Thereafter the pack-

age is opened as described above in connection with FIGS. 15 and 16.

It should be noted that the package shown in FIG. 23A is particularly suited for the use of a flexible material constituting the sheet 118. If a rigid material is employed to provide rigidity to the broad faces of the package, then normally the ends 118a and 118b of the sheet would not extend over onto the end face of the package. It should be noted further that when a flexible material is employed for the sheet, the sheet serves to seal the ends of the slits 54a and 54b as described above in connection with FIGS. 18-21. In this case, the sheet 118 need not be slit, as at 121 and 123, and the strip 56 may lie entirely between the sheet and the outer wrapper.

FIG. 24 shows another form of package assembly incorporating a sheet 128 of stiff material typically adhesively secured to the wrapper 50. Normally a single sheet of bendable material is employed. However, two separate sheets could be employed at each end of the wrapper 50. As shown in FIG. 24, the ends of the sheet 128 include end panels 130 and 132. Each end panel is formed from a plurality of side-by-side flaps; in this particular embodiment two flaps: flaps 134 and 136 of the panel 130 and flaps 138 and 140 of panel 132. The sheet 128 is scored as at 142 and 144 so that the flaps 134 and 136 may bend or pivot about the score line 142 and the flap 138 and 140 may pivot about the score line 144. Each of the flaps 134, 136, 138 and 140 includes at least one projection thereon. In particular, the flap 134 includes projections 146, 148 and 150; the flap 136 includes projections 152 and 154. Similarly, the flap 138 includes projections 156, 158 and 160, while the flap 140 includes a single projection 162.

The flaps 134 and 136 forming the panel 130 are positioned adjacent to each other; in practice they are formed by slitting the sheet material 128 as at 164. Similarly, the adjacent flaps 138 and 140 of the opposing panel 132 are formed from slit 166 in the sheet material. The slits 164 and 166 in the sheet 128 are positioned respectively adjacent to the slits 54a and 54b in the wrapper 50.

As will be explained below, the end panels 130 and 132 of the stiff sheet material 128 are for the purpose of providing a reinforcing truss structure in the package which is helpful in forming the end tucks and folds of the package, particularly in the case of a loose product, such as soap flakes. Additionally, by forming each panel from a plurality of side-by-side flaps, it is possible for an end of the package to be opened only partially, without requiring the entire truss structure to be opened to make the contents of the package accessible.

The package is formed as in FIGS. 1 through 6, namely, the strip 56 advantageously includes an adhesive material on the outside surface 58 thereof to which the wrapper is secured in completing the package. The mandrel 52 is moved against the strip 56 as shown in FIG. 25 and the closed end of the package is formed by folding the wrapper 50 and the sheet 128 against the mandrel. Next, the ends 68 and 70 of the strip 56 are folded against the sides of the mandrel 52, as shown in FIG. 26, and side tuck 76 and side folds 78 and 80 are completed in each side of the package.

The partially completed package shown in FIG. 26 is ready to receive a product. Referring to FIG. 27, a product such as powdered soap flakes 170 is inserted in the package through a funnel 172. The product fills the mandrel 52. Next, as shown in FIG. 28, a pusher 174 may be employed to tamp the product and disengage the package from the mandrel. FIG. 29 shows the pusher 174 moved entirely through the mandrel 52 to eject package 90, containing the product, from the mandrel. If the product is not sufficiently rigid to withstand a force sufficient to eject the package, it may be necessary to pull the package and its contents from the mandrel, as by means of a vacuum or gripping device (not shown), both of which are well known in the packaging art.

The package as shown in FIG. 29, filled with the product, is next closed at its open end 176. The closure of this open end will be best understood with reference to FIG. 30 which shows opposing panels 130 and 132 of the truss structure separated for the purpose of showing how the truss is completed. First, it will be noted that each of the projections on a particular flap is positioned opposite a corresponding nonprojecting portion of the opposing flap. In particular, the projections 146 and 148 of the flap 134 are positioned opposite nonprojecting portions 178 and 180 of the opposing flap 138. The projections 150 and 152 respectively of the flaps 134 and 136, which are adjacent to each other and which are separated by the slit 164, are positioned opposite nonprojecting portions 182 and 184 of the flaps 138 and 140 (separated by the slit 166). Finally, the projection 154 of the flap 136 is positioned opposite nonprojecting portion 186 of the opposing flap 140. In like fashion, the projections 156, 158 and 160 of the flap 138 and projection 162 of the flap 140 are positioned respectively opposite nonprojecting portions 188, 190 and 192 of the flap 134 and nonprojecting portion 194 of the flap 136. The truss structure is formed by the projections of the flaps overlying the corresponding nonprojecting portions of the opposing flaps, as shown in FIG. 31. For example, projection 158 of flap 138 overlies nonprojection portion 190 of flap 134. FIG. 32 is a view taken from the side of the package of FIG. 31 showing the interlocking engagement of the flaps forming the truss structure.

FIG. 33 shows the package of FIG. 29 with the truss structure closed prior to completion of the end tucks and folds. In FIG. 33, the partially completed package is shown rotated 180° about a longitudinal axis passing through the package from top to bottom, with respect to the package shown in FIG. 29. In FIG. 34 the end 68 of the strip 56 has been folded against the truss structure, and end tuck 98 and end folds 102 and 100 have been completed. FIG. 35 shows the completed package following the end tuck 92 and the end folds 94 and 96. The overlapping end 70 of the strip passes through the slits 54a and 54b in the wrapper to facilitate in opening the package as described previously.

FIG. 36 is a sectional view of the completed package of FIG. 35 showing the relationship of the slits 54a and 54b in the outer wrapper 50 with respect to the slits 164 and 166 in the sheet 128, the ends of which sheet form the truss structure described above. This relationship is important, inasmuch as it is necessary that the slits 54a and 54b in the wrapper 50 be positioned at least over or slightly more to the center of the package than the slits 164 and 166 in the sheet 128. This relationship of the slits in the outer wrapper and the sheet 128 is required so that when the outer wrapper is torn away to open the package as shown in FIG. 37, the slits 164 and 166 will be exposed so that the flaps 136 and 140 may be pivoted about the score lines 142 and 144 to raise the flaps to an open position as shown in FIG. 38 to empty the contents of the package.

FIGS. 39 through 41 show how the flap 200, formed by the tearing of the outer wrapper at the top of the package, may be folded so as to permit the reclosing of the package. In particular, the overlapping strip end 70 is scored as at 202 and 204 so that the strip end may be folded back upon itself as shown in FIG. 39 to provide a closing tab. When it is desired to close the package, the free end of the flap 200 is inserted under end 68 of the strip 56 (FIG. 41) beneath the folds 100 and 102 to close the top of the package. The strip end may be folded so as to lie back upon itself when the package is made. In this case the reclosure tab is already formed and need not be formed by the user after the package has been initially opened.

It should be noted that the reclosure structure of the package shown in FIGS. 39 through 41, although described specifically with reference to the package shown in FIGS. 24 through 38, is suitable for the packages shown in FIGS. 1 through 23.

From the description of the invention above it will be noted that the invention involves a method of packaging a product. The invention is defined by the following claims.

What is claimed is:

1. A method of packaging a product, comprising the steps of:
 - (a) forming a strip of bendable material substantially to a U shape,
 - (b) adhesively securing portions of a wrapper to said strip except at the ends of said strip so as to form an enclosure for containing a product open adjacent to the ends of said strip,
 - (c) filling the wrapper with the product to be packaged,
 - (d) bending the ends of the strip so as to form an end face, and
 - (e) adhesively securing portions of the wrapper to adjacent ends of said strip so as to completely enclose said product, one end of said strip extending through a slit in the wrapper so as to provide an accessible pull for tearing open the wrapper to render the product therein accessible.
2. A method of packaging a product as defined in claim 1, wherein the wrapper is adhesively secured to all portions of said strip enclosed by said wrapper to provide a sealed package.

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