Sept. 16, 1969 R. H. PRATT 3,466,836

METHOD OF PACKAGING FLAT ARTICLES

Filed May 3, 1966 3 Sheets-Sheet 1

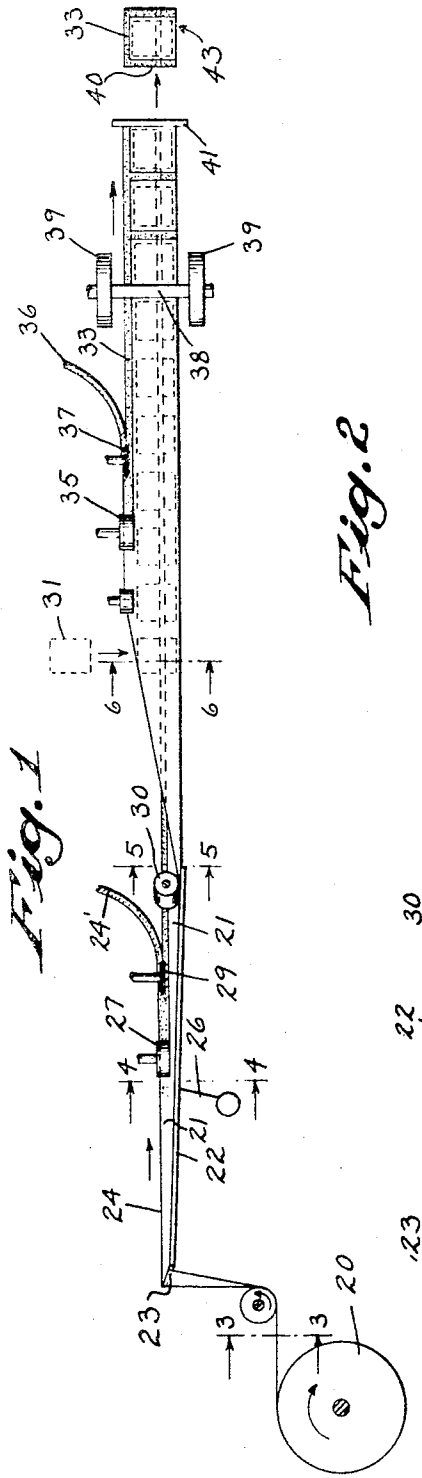


Fig. 1

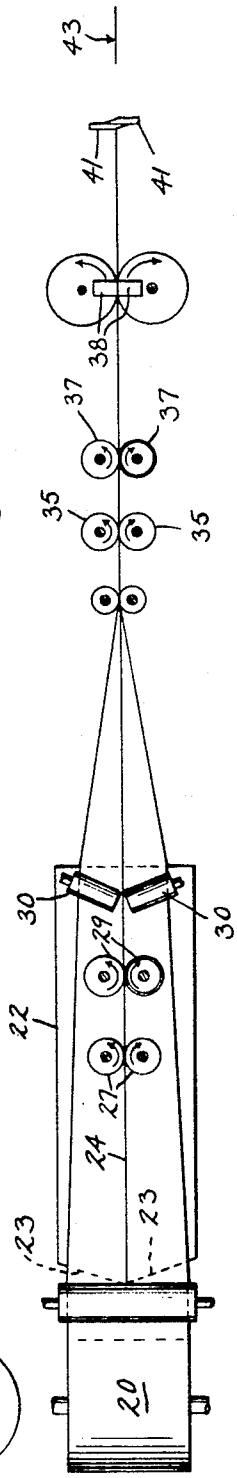


Fig. 2

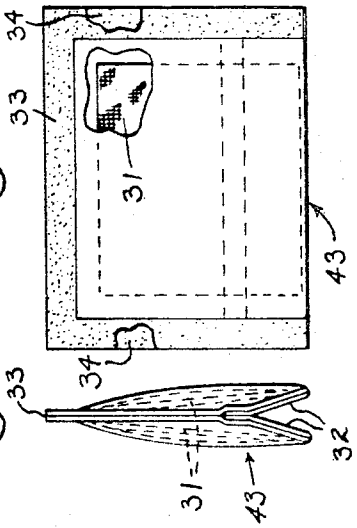


Fig. 8

Fig. 7



Fig. 5

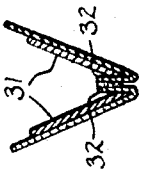


Fig. 6

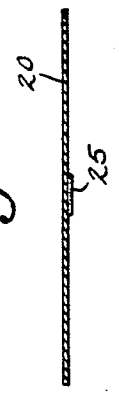


Fig. 3



Fig. 4

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Sept. 16, 1969 R. H. PRATT 3,466,836

METHOD OF PACKAGING FLAT ARTICLES

Filed May 3, 1966 3 Sheets-Sheet 2

Fig. 9

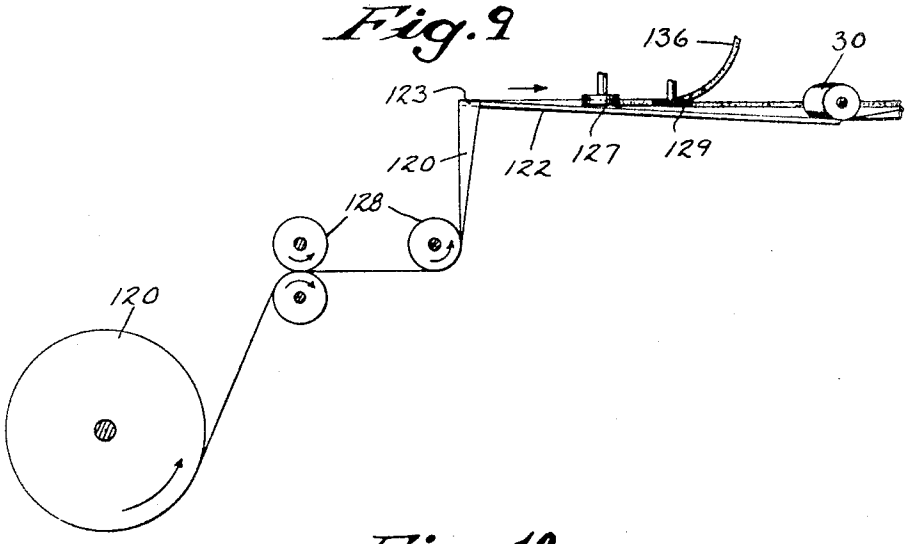


Fig. 10

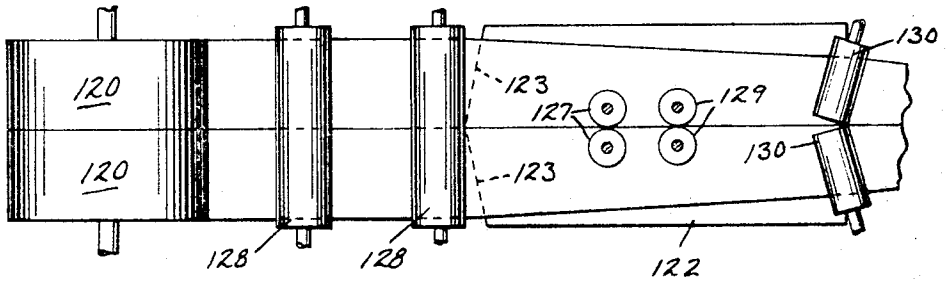
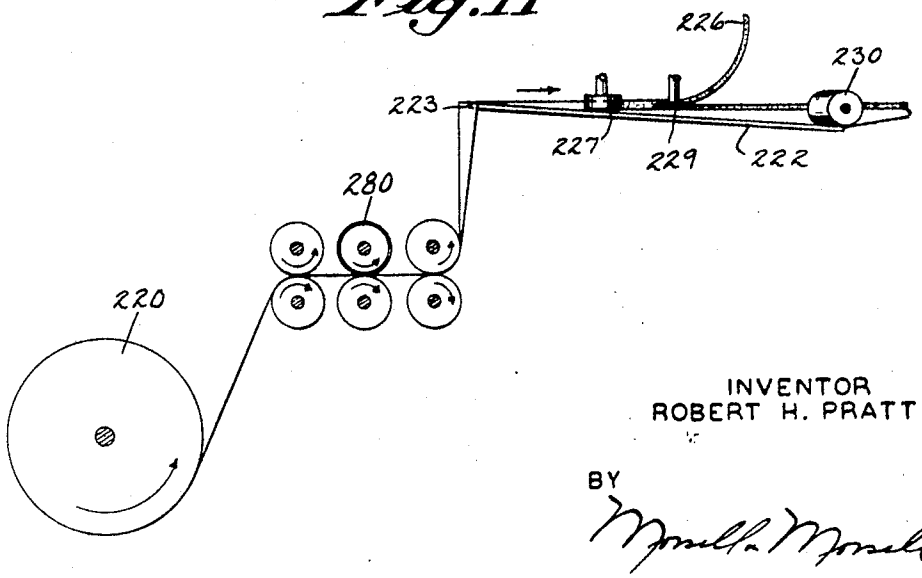


Fig. 11



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Sept. 16, 1969 R. H. PRATT 3,466,836

METHOD OF PACKAGING FLAT ARTICLES

Filed May 3, 1966 3 Sheets-Sheet 3

Fig. 12

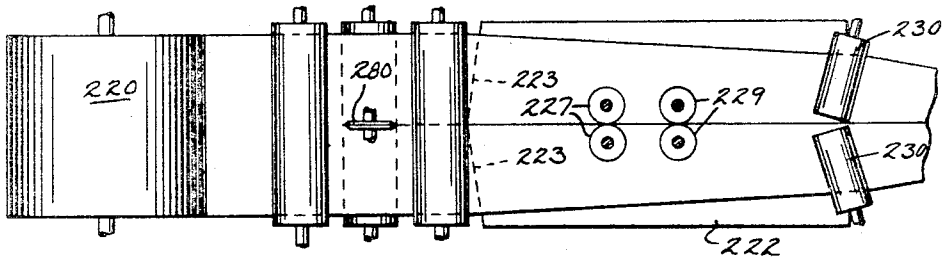


Fig. 13

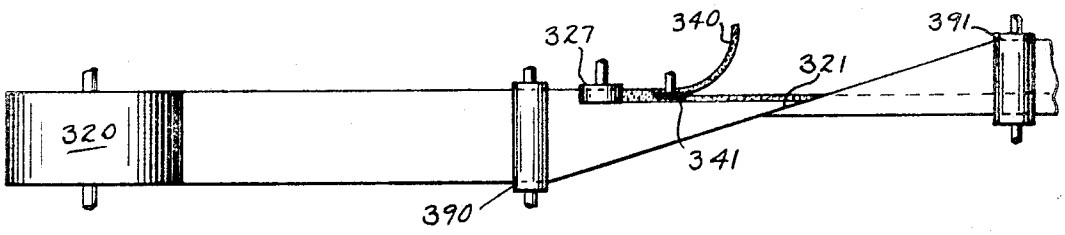
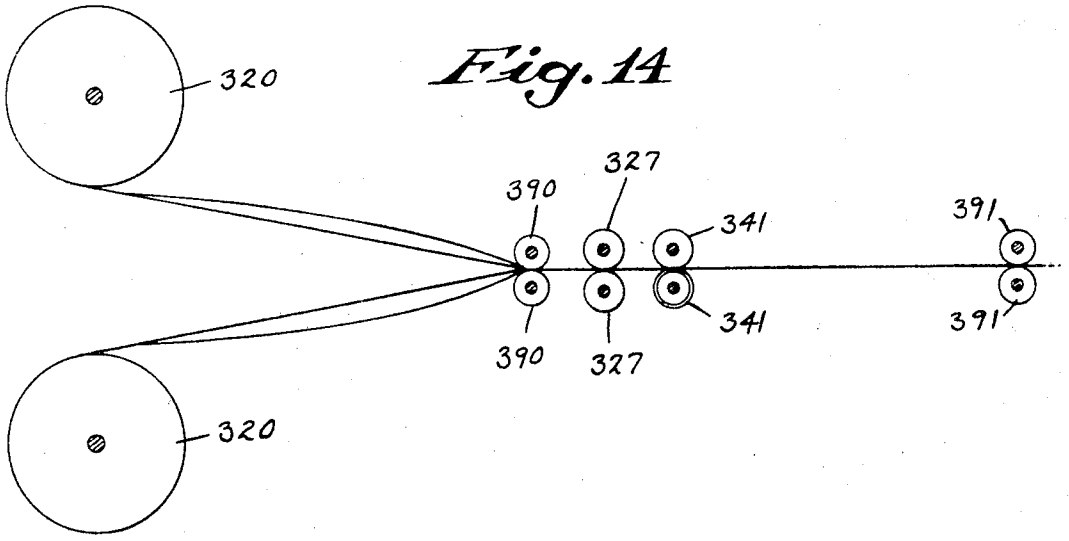


Fig. 14



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3,466,836

METHOD OF PACKAGING FLAT ARTICLES

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Int. Cl. B65b 9/08, 9/12, 51/30
U.S. Cl. 53—28 10 Claims

ABSTRACT OF THE DISCLOSURE

A method of packaging comprising continuously advancing web portions which are to form the opposite panels of a package, assembling adjacent parts of the advancing web portions to provide a relatively short upstanding inverted V between said panel portions, continuously sealing upper portions only of said inverted V to each other along a longitudinal path, thereafter continuously folding the advancing panel portions upwardly to provide a W formation, dropping merchandise in longitudinally spaced relationship onto said panel portions on each side of the inverted V, continuously sealing the upper longitudinal edges of the web portions, transversely connecting the web portions between items, and transversely cutting the packages.

This invention relates to improvements in method of packaging flat articles such as surgical sponges, which method is applicable to the packaging of any materials requiring a separation.

In my Patent No. 2,997,166 there is disclosed a package having its upper edge folded in the form of an inverted W, which package is very useful in the packaging of flat articles such as surgical supplies because each of the infolded portions of the package protects a portion of a sterile article such as a surgical sponge, which sponge portion is overlapped by said infolded package flap both during and after opening of the package. In addition the construction of my prior patent makes it possible for a nurse or other attendant to grip both of the sponges while the latter are protected between the infolded flap portion and coacting panel, each sponge being available for easy withdrawal by the surgeon for use independently of the other.

Patent No. 3,192,685 discloses a machine for continuously manufacturing and loading packages of the type shown in my Patent No. 2,997,166. In producing this type of package it has been found very desirable to utilize a pressure-sensitive adhesive such as latex for certain of the seals, which adhesive is pre-applied to the web. Such latex type adhesive is desirable for sealing the side edges of the package, and it is highly desirable to utilize a heat seal or glue to secure the infolded flaps to each other.

When manufacturing the style of package shown in FIGS. 9 or 10 of my Patent No. 2,997,166, wherein there are the extra outfolded flaps at **125** and **225**, the apparatus of Patent No. 3,192,685 is very practical and efficient because the latex strips can all be applied to the same side of the web in the pattern shown in FIG. 13 of said Patent No. 3,192,685. To try to manufacture a package of the type shown in FIG. 7 of my Patent No. 2,997,166 on apparatus such as shown in Patent No. 3,192,685, where the side edges are to be sealed by latex, has presented problems because, if the side edges of the package are to be thus connected, this would require the latex for sealing said side edges to be applied on one side of the web and the latex for securing the infolded flaps together to be applied to the other side of the web. Where latex strips are applied to two sides of a web they

will stick to each other in the roll wherever there is an overlap. In addition, any latex on an outer side of the blank is likely to be removed or loosened to an extent which may affect the seal. To try to heat seal the joint **19** of FIG. 7 of my package Patent No. 2,997,166 is not possible with either the method of production of said patent or with the method disclosed in apparatus Patent No. 3,192,685 as there is no access for such heat seal and it is difficult to apply liquid glue.

It is a general object of the present invention to provide a method of forming W-fold packages and of packaging merchandise therein which is more simple than the method of Patent No. 3,192,685, and which makes it practical to use a heat seal on one side such as for securing the infolded flaps to each other (see the connection **19** of FIG. 7 of Patent No. 2,997,166) whereby latex strips may be successfully used on the other side of the web for making the other seals.

A further object of the invention is to provide a method of forming W-fold packages and packaging merchandise therein in which infolded protecting flaps are formed at the bottom of the package as the web is being continuously advanced, so that the flat sponges or other product can be expeditiously dropped into proper position between the flaps and panels by automatic machinery or by hand, with gravity aiding in the feed process. With the method of Patent No. 3,192,685, the package is formed in a reverse position, with the infolded flaps on top so that the product must be laid in position at an earlier stage and the flaps then folded down over the product. This sometimes produces problems, and does not insure an accurate insertion of the product in proper flap-protected position.

With the above and other objects in view, the invention consists of the improved method of packaging and all of its steps, as set forth in the claims, and all equivalents thereof.

In the accompanying drawings illustrating several embodiments of the method:

FIG. 1 is a diagrammatic view, generally in side elevation, showing the improved method;

FIG. 2 is a top view of the apparatus illustrated in FIG. 1;

FIG. 3 is a sectional view taken on line **3—3** of FIG. 1;

FIG. 4 is a sectional view taken on line **4—4** of FIG. 1;

FIG. 5 is a sectional view taken on line **5—5** of FIG. 1;

FIG. 6 is a sectional view taken on line **6—6** of FIG. 1;

FIG. 7 is an edge view of the finished package;

FIG. 8 is a plan view of the finished product;

FIG. 9 is a fragmentary side elevational view like the left hand portion of FIG. 1 showing a modification wherein the process of FIG. 1 may be carried out with two separate rolls instead of from a single roll of stock;

FIG. 10 is a plan view of the apparatus illustrated in FIG. 9;

FIG. 1 is a fragmentary side elevational view like FIG. 10 showing how the process may be carried out with a single roll of stock which, however, is slit after it comes off of the supply roll and before it reaches the former;

FIG. 12 is a plan view of the apparatus shown in FIG. 11;

FIG. 13 is a side elevational view of another modification showing how the process may be carried out using two vertically-disposed supply rolls; and

FIG. 14 is a top plan view of the apparatus shown in FIG. 13.

Referring more particularly first to FIGS. 1 and 2, the package here illustrated is preferably formed of a thin,

non-transparent packaging paper such as white sulphite. While other materials may be used, such as glassine, polyethylene, or the like, the improved method has its greatest utility when using the first-mentioned type of paper. While the package to be formed is suitable for various types of merchandise, it is particularly useful in connection with gauze pads, surgical dressings, surgical sponges, rubber gloves, and the like.

In carrying out the improved method of FIG. 1 a supply roll of the material **20** is suitably supported on a horizontal axis for unrolling. The first step of the process is to form the web with an upstanding, central inverted V-fold portion **21**. This may be accomplished in several ways but it is prefered to use a forming plate **22** having a V-shaped receiving end **23** over which the paper is drawn to start the fold line **24** which is to form the apex of the fold. The upfolded material is then suitably sealed together. The present method makes it practical to use a heat seal. This may be accomplished by having a web precoated on its underside with a heat-sealable material **25** (FIG. 3). Where the web is a non-transparent packaging paper such as white sulphite this heat seal coating would normally be a polyethylene coating material or other material which is responsive to heat to bring about a seal.

As an alternative, glue or other liquid or settable adhesive may be applied within the fold **21** before it is finally squeezed together. This may be accomplished by having a glue gun **26** extending into the fold to discharge glue therein as shown in FIG. 1. Where there is the heat seal coating **25**, the heat sealing step may be accomplished in any desired manner such as by pressure and heat-sealing wheels **27** which engage the upstanding V-fold portion **21**, as shown in FIGS. 1 and 2. Where glue is applied instead of a heat seal coating, the wheels **27** may serve only as pressure rolls.

As the next step in the method it is desirable with most materials to trim off the folded edge as at **24'**, FIG. 1, leaving the cut-off portions sealed together therebelow as in FIG. 5. With some materials such trimming is not essential as the flaps can be readily separated along the fold line **24**. The trimming can be accomplished by slitter wheels **29** or in any other suitable manner. The two sides of the web are then held down on opposite sides of the upstanding fold portion **21** by former rolls **30**, which are angled as illustrated in FIG. 2 to engage on opposite sides of the upstanding fold portion **21**.

The sides of the web, after the web emerges from the former plate as in FIG. 5, which sides are to form opposite panels of the package, are then folded up to complete the W as shown in FIG. 6, and while the panels are in approximately the position of FIG. 6, in the case of surgical sponges or other flat articles they may be dropped in position as shown at **31** (FIG. 6), with the lower edges of the articles naturally gravitating to a position within the fold between its side panel portion and the adjacent upfolded flap **32**.

In the preferred embodiment of the method, where a non-transparent paper such as white sulphite is employed, it is preferred that the opposite side edges of the upper side of the web emerging from the supply roll have pre-applied, longitudinal strips of latex or other pressure-sensitive adhesive in the locations indicated at **33** in FIG. 1, and that there be longitudinally-spaced transverse strips of pressure-sensitive adhesive at locations such as indicated at **34** in FIG. 8. Where pre-applied latex is not present on the supply roll, glue or the like may be applied to the strip portions **33** on the top side of the web at a suitable stage in the process or a heat seal may be employed. In either case the transverse seals **34** may be sealed by heat sealing (when latex is not used) and in this case must have a heat seal coating.

In any event, in carrying out the method, the juxtaposed upper edges of the package are subjected to sealing pressure, preferably between pressure wheels **35**. If this upper edge seal is to be a heat seal, then the wheels **35** must be heated to perform a heat sealing operation.

A desirable, but not essential, additional step in the method is to trim the sealed upper edge as at **36**. This may be accomplished in any suitable manner, such as by use of slitter wheels **37**. If the cross seals are latex as at **34** these are pressed together between rotatably supported pressure bars **38** suitably driven by wheels **39**. If, on the other hand, the cross seals are to be accomplished by heat sealing, the pre-applied heat seal coating is subjected to both heat and pressure by the bars **38**, the latter having suitable heating elements therein. Thereafter the completed packages are cut off as at **40**, which may be accomplished by knives **41** driven by wheels, the finished package **43** dropping off as shown at the right in FIG. 1.

It is thus apparent that with this improved method the cross seals and top edge seals may be effected by the pressure sealing of latex strips or by heat sealing, and the sealing of the infolded flaps **32** may be accomplished either with glue or with a heat seal as desired, or latex may be used if it is not being applied to the reverse side of the web. It is preferred, however, to use the heat seal or glue at **25**, as in FIG. 1, to permit use of latex strips on the opposite side of the web. It is also apparent that because of the improved method the insertion of the products by gravity, as indicated in FIG. 6, may be accomplished very easily either by hand or by automatic insertion machinery with assurance that the articles will be properly inserted between the folds of the package.

In the form of the invention illustrated in FIGS. 9 and 10 the method of procedure is the same except that there are two separate supply rolls **120** which are placed end-to-end and which feed separate web portions alongside one another. While these two supply rolls may carry the same kind of material, the method makes it practical to use two different materials in forming the package. For example, one of the supply rolls may be polyethylene film or glassine, and the other supply roll may be non-transparent paper such as white sulphite. Also, regardless of whether the same types of stock are used on the two supply rolls, only one need be printed. The two webs are suitably guided through and beneath rollers **128** to a former, which former is the same as has been illustrated and described in connection with FIGS. 1 and 2. Here the procedure is the same as heretofore described in connection with FIGS. 1 and 2 except that the slitting wheels **129** merely do a trimming job as the upper edges of the upfolded flaps are already separate from each other. From this point on, the method is the same as heretofore described in connection with FIG. 1.

In the form of the invention of FIGS. 11 and 12 the method is also the same except that here the method starts with a single supply roll **220** as in FIG. 1, but the roll is slit into two webs prior to forming, which slitting may be performed by a slitting wheel **280**. From this point on, the method is the same as has heretofore been described in connection with the form of the invention of FIG. 9.

In the form of the invention of FIGS. 13 and 14 there are two separated supply rolls **320**, mounted on vertical axes, from which the webs are fed to merging relationship between vertical rolls **390**. Just as in the form of the invention of FIGS. 9 and 10, here one supply roll may carry one kind of material and the other one a different type. Also, one may be printed and the other plain. Thereafter the upper edge of the two vertically-disposed strips may be glued together by the action of pressure rolls **327**, glue having been previously applied in advance of the rolls **390** or, if the inner faces of the merging webs have been precoated with a heat seal coating material, then they may be heat sealed together by the use of heat and pressure from the sealing wheels **327**. Thereafter, the connected meeting edges may be trimmed as at **340** by slitters **341** and the sides of the web are then folded upwardly between the rollers **391** to produce

the W-fold formation with the upstanding folded portion **321**. From this point on, the method can be the same as in the form of the invention of FIG. 1.

It is apparent from the above that with all of the methods heretofore described the same result shown in FIG. 6 is produced, whereby the pads can be inserted manually or automatically into position with the aid of gravity, and wherein the packages may be then closed and sealed to produce the final package of FIG. 8.

The package of FIG. 8 is adapted to be used in the same manner as the package shown in my Patent No. 2,997,166, i.e. the thumbs are inserted within the bottom of the inverted V and the two halves of the package are pulled apart to break the seal **25**, whether it be a heat seal, latex or glue. If the upper edge of the inverted V has been trimmed off as at **24**, or if the upper edges of the protecting flap portions **32** are already separate as in the form of the invention of FIGS. 9 and 10 and 13 and 14, continued pulling apart will readily open the side seals **34**. Thus the party opening the package can hold one surgical pad between one flap and the adjacent panel, and the other surgical pad between the other flap and the adjacent panel. The flaps completely protect the surgical pads from contamination. Thereafter the surgical pads may be either shaken out or removed by a forceps one at a time as required. While it is preferred, in the final package, that the material at the apex of the inverted V be unconnected, such as results from the trimming off of the piece **24'**, nevertheless with certain materials the package is fully usable even if no trimming is done, it being merely necessary when breaking the seal **32** to also tear apart the flaps at their apex **24**, certain materials being sufficiently weakened by the fold line **24** to facilitate such tearing.

All forms of the method present the following options:

(1) A heat seal pattern on one side of the web with a glue pattern on the opposite side.
(2) A pressure-sensitive latex pattern on one side of the web with glue on the opposite side.
(3) A heat seal pattern on both sides.
(4) A heat seal pattern on one side of the web and a pressure-sensitive latex pattern on the opposite side.

In the claims the term "sealing" or "sealingly connecting" is intended to cover any type of connection, such as heat seal, pressure-sensitive latex, or glue.

In addition to the above the use of two separate rolls, as in the form of the invention of FIGS. 9 and 10 and 13 and 14, makes it practical with these methods to use two kinds of material in forming the package. For example, one roll may be polyethylene film and the other roll may be paper such as white sulphite. This is an advantage in certain packages where transparency on one side may be desirable. The use of two separate rolls in these modifications also makes it possible to economically apply all printed matter to one of the webs only, it being unnecessary to have any printing on the web forming the back panel of the package. In the claims the expression "web portions" contemplates either connected web portions as in FIG. 1 or separate web portions as in FIGS. 9 and 10 or 13 and 14.

In the form of the invention of FIGS. 9 and 10 all parts which correspond to similar parts in FIG. 1 are designated by the same numerals preceded by the digit **1**; in the form of the invention of FIGS. 11 and 12 all parts which correspond to similar parts in FIG. 1 are designated by the same numerals preceded by the digit **2**; and in the form of the invention of FIGS. 13 and 14 all parts which correspond to similar parts in FIG. 1 are designated by the same numerals preceded by the digit 3.

While in the illustrated embodiment the invention has been described and illustrated to show its applicability to the packaging of surgical sponges, it is obvious that the method is applicable to the formation of W-fold packages for a variety of uses wherein the upfolded flap portions **32** may act as separators in the package and, depending upon the merchandise being packaged, the flaps **32** may vary in the amount which they project upwardly within the package.

Various other changes, adaptations, and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What I claim is:

1. A method of packaging comprising continuously advancing web portions which are to form the opposite panels of the package, continuously folding adjacent parts of said advancing web portions a short distance upwardly to provide an upstanding inverted V between said panel portions which is of substantially less height than the corresponding dimensions of said panel portions so that the opposite side of the inverted V provide separating flaps in the package being formed, with lower fold lines between said flaps and panel portions, continuously sealing upper portions only of said separating flaps to each other along a longitudinal path before folding said panel portions upwardly, thereafter continuously folding the advancing panel portions of the web upwardly to provide a W formation in conjunction with said inverted V, dropping merchandise which is of greater height than said inverted V in longitudinally-spaced relationship onto said panel portions with merchandise received in each lower edge fold and separated by said separating flaps, continuously sealingly connecting the upper longitudinal edges of the panel portions, transversely sealingly connecting the web along longitudinally-spaced paths located between merchandise, and transversely cutting off packages intermediate the width of said transverse seal paths.

2. A method of packaging as set forth in claim **1** in which the web portions are initially advanced in integral form.

3. A method of packaging as set forth in claim **1** in which the web portions are initially advanced in integral form and which includes the step of continuously trimming off the top of the inverted V after the latter has been folded upwardly and before the panel portions have been folded upwardly.

4. A method of packaging as set forth in claim **1** which includes the step of trimming off the top of the inverted V after the latter has been folded upwardly and before the panel portions have been folded upwardly.

5. A method of packaging comprising continuously advancing web portions which are to form the opposite panels of the package in separate condition alongside one another in the same plane, continuously folding adjacent parts of said advancing web portions to provide an upstanding inverted V between said panel portions so that the opposite sides of the inverted V may provide separating flaps in the package being formed, with lower fold lines between said flaps and panel portions, continuously sealing upper portions only of said separating flaps to each other along a longitudinal path, continuously folding the advancing panel portions of the web upwardly to provide a W formation in conjunction with said inverted V, dropping merchandise in longitudinally-spaced relationship onto said panel portions with merchandise received in each lower edge fold and separated by said protecting flaps, continuously sealingly connecting the upper longitudinal edges of the panel portions, transversely sealingly connecting the web along longitudinally-spaced paths located between merchandise, and transversely cutting off packages intermediate the width of said transverse seal paths.

6. A method of packaging comprising initially advancing web portions which are to form the opposite panels of the package in separate condition alongside one another in vertical planes, continuously sealing upper portions only of said web portions to each other along a longitudinal path to provide separating flaps, thereafter

continuously folding the advancing panel portions of the web upwardly on fold lines spaced below said sealing path to provide a W formation in conjunction with said separating flaps, dropping merchandise in longitudinally-spaced relationship onto said panel portions with the merchandise received in each of said fold lines and separated by said separating flaps, continuously sealingly connecting the upper longitudinal edges of the web portions, transversely sealingly connecting the web portions along longitudinally-spaced paths located between merchandise, and transversely cutting off packages intermediate the width of said transversely sealed paths.

7. A method of packaging as set forth in claim **1** in which the seals for the opposite panels are performed by pre-applying a pressure-sensitive adhesive to one side of the web only and by pre-applying another type of sealing material to the other side of the web at a location for sealing the separating flaps.

8. A method of packaging as set forth in claim **1** in which the upper portions of the separating flap portions of the inverted V are continuously heat sealed together on a line extending longitudinally thereof before said panels are folded upwardly.

9. A method of packaging as set forth in claim **1** in which the upper portions of the separating flap portions

of the inverted V are continuously longitudinally heat sealed together before the panels are folded upwardly and in which the upper longitudinal edges and transverse seals of the panel portions are thereafter continuously pressure sealed.

10. A method of packaging as set forth in claim **1** in which the continuous sealing of the upper portions only of the separating flaps of the inverted V to each other along a longitudinal path is performed by applying glue to said portions longitudinally thereof and within the inverted V after formation of the latter and before the panels are folded upwardly.

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53—180