

Jan. 2, 1968

J. A. GABRIEL ET AL
BLANK ADAPTED TO BE FORMED INTO A MULTIPLE
LAYER PACKAGING ELEMENT

3,361,322

Filed May 2, 1966

2 Sheets-Sheet 1

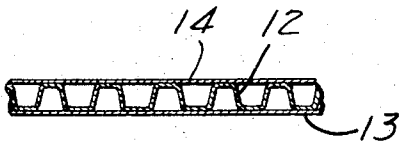
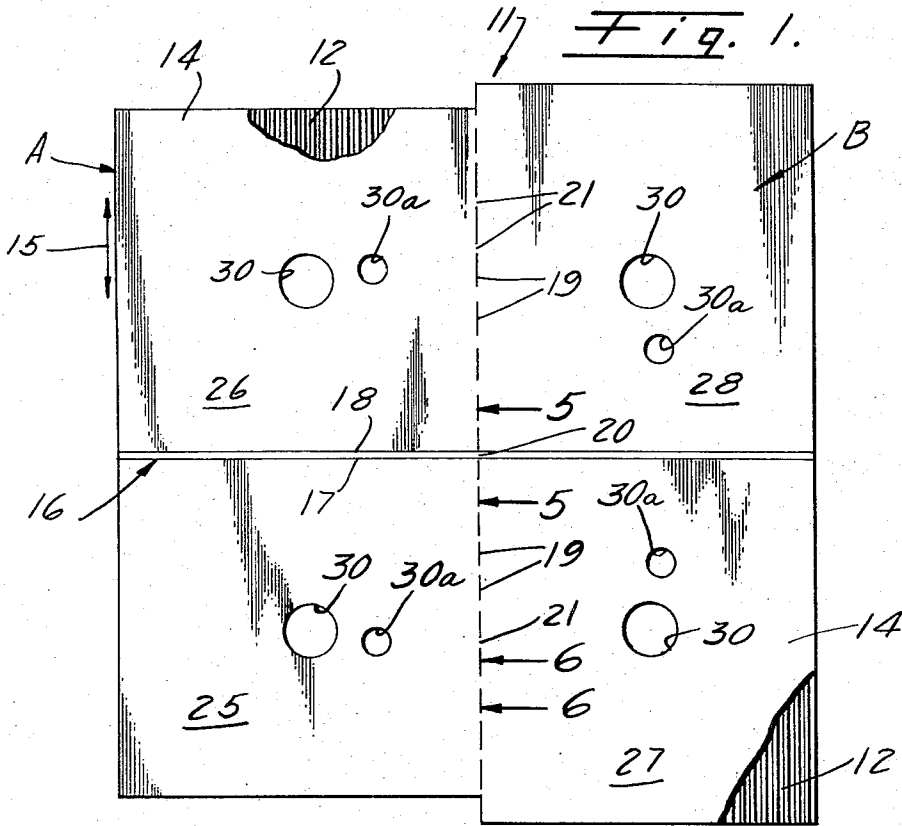


Fig. 2.

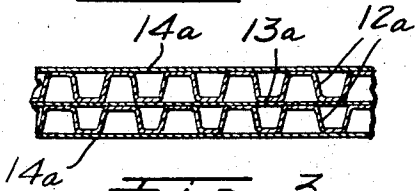


Fig. 3.

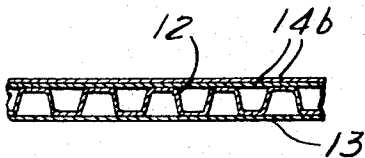


Fig. 4.

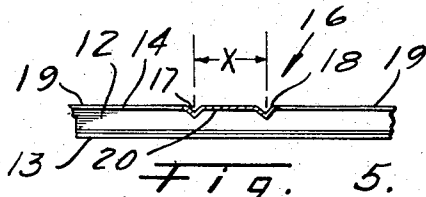


Fig. 5.

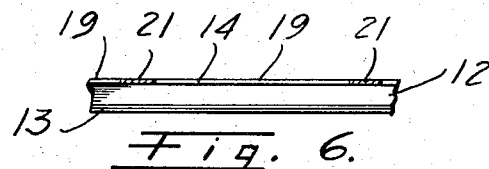


Fig. 6.

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2 Sheets-Sheet 2

Fig. 7.

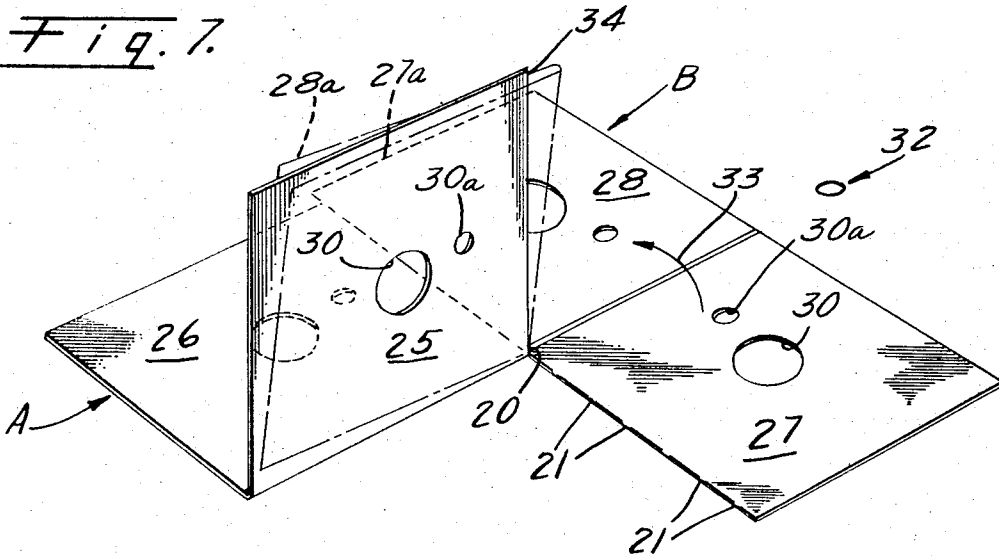


Fig. 8.

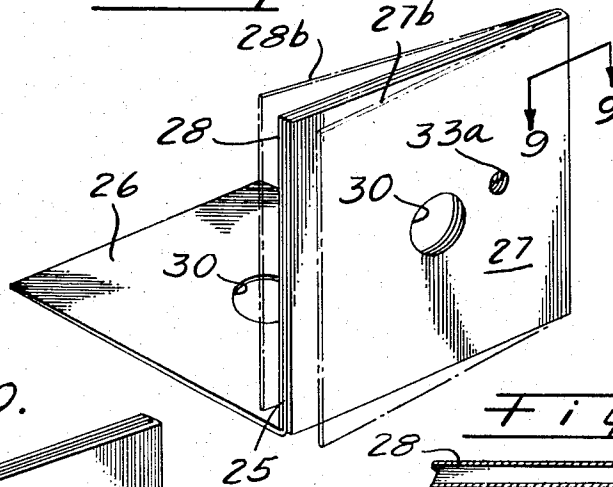


Fig. 10.

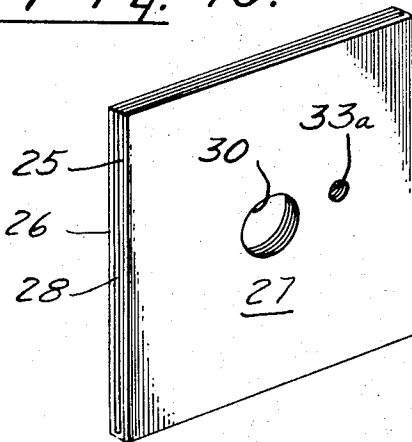
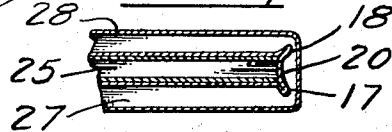


Fig. 9.



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**BLANK ADAPTED TO BE FORMED INTO A
MULTIPLE LAYER PACKAGING ELEMENT**

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ABSTRACT OF THE DISCLOSURE

A blank of corrugated sheet material in which the corrugations are unidirectional, the blank having panels foldable to provide a pad support of multiple layers bonded by a surface applied glue into flat surface engagement with the corrugations of adjacent layers extending in right-angled relation, said blank being generally rectangular and composed of four integrally formed rectangular panels connected by hinge means formed by spaced scoring lines on one surface of the blank extending transversely between opposite edges thereof and separating the blank into two sections each of which contains two panels. Perforated tear lines formed by spaced cuts separated by narrow tearable neck portions respectively join the two panels of each section, each of these tear lines extending outwardly from the adjacently positioned scoring line so that when the panels of the sections are separated at their connecting tear lines the material between the scoring lines at the inner ends of the tear lines provides a pivotal connection between the panels for holding and orienting them during the folding operation.

Our invention relates generally to the art of packaging wherein relatively stiff sheet-like material, such as corrugated board and the like, is used as cushioning and retaining elements for supporting packaged products within a shipping container so that the products will be protected from damage resulting from shifting or jarring during shipping.

It is an object of our invention to provide a unique corrugated board blank and a method of folding the same into a four panel or four layer packaging element in which all of the layers will lie flat against each other and be glued together into a single unit.

It is a further object of our invention to provide a blank and method as above identified in which the alternate panels or layers have corrugations running at right angles to each other. In other words, panels 1 and 3 will have the corrugations running in one direction and panels 2 and 4 will have the corrugations running at right angles thereto.

It is a further object of our invention to form the blank with double scoring so that when folded each panel will lie flat against adjacent panels in order that there will be full contact and full gluing of one panel to the other.

It is a still further object of our invention to provide a multilayer packaging element in which all of the layers consist of a single flat element having no folds in it and having maximum strength.

It is another object of our invention to provide a blank and method of folding in which the glue may be applied

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to one side of the blank which is thereafter folded so that all of the elements may be glued together without any further gluing operation.

Other objects and advantages of our invention will be pointed out during the course of the following description.

In the drawings we have illustrated our invention as applied to a blank which, when folded, comprises a packaging element for a water heater. It should be understood that the blank of our invention may be made in various sizes or shapes and may be useful in packaging numerous types of products for shipping.

Referring to the drawings:

FIG. 1 is a plan view of a corrugated board blank having a configuration and design which incorporates the features and advantages of our invention;

FIG. 2 is an enlarged fragmentary sectional view showing the construction of the corrugated board which may be used;

FIG. 3 is an enlarged fragmentary sectional view showing an alternative form of corrugated board which may be used;

FIG. 4 is an enlarged sectional view showing a still further form of corrugated board which may be used;

FIG. 5 is a sectional view taken along the line 5-5 of FIG. 1 showing the double scoring arrangement of our invention;

FIG. 6 is a fragmentary sectional view taken along line 6-6 of FIG. 1 showing the necks or attaching elements whereby the two double panels of our invention are releasably held together until the folding process is to be performed;

FIG. 7 is a perspective view showing the first step in the folding process;

FIG. 8 is a perspective view showing the second step in the folding process;

FIG. 9 is a fragmentary sectional view taken along line 9-9 of FIG. 8 showing the manner in which the double scoring permits panel members to be folded around another panel member with the surfaces in full contact; and

FIG. 10 is a perspective view showing the blank completely folded into a multilayer packaging element of our invention.

Referring more specifically to the drawings, there is shown in FIG. 1 a blank 11 which is formed according to our invention of a single layer corrugated board consisting of a central corrugated element 12 and flat facing sheets 13 and 14, as shown in FIG. 2. If desired, the corrugated board may be of a double layer construction, as shown in FIG. 3, having two corrugated elements 12a-12a, a central sheet 13a and outer facing sheets 14a-14a. A third form, as shown in FIG. 4, consists of a corrugated board having the corrugated element 12, a single facing sheet 13 on one side, and double facing sheets 14b-14b on the other side.

Referring again to FIG. 1, it will be noted that the corrugations of the corrugated board run in the direction as indicated by the double-headed arrow 15. Across the blank, there is formed a double scoring, as generally indicated at 16, consisting of a scoring 17 and a scoring 18 in spaced relation, each scoring having its male side or score on the upper side of the blank as viewed in FIG. 1. The distance as indicated at X in FIG. 5, between the

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scorings 17 and 18 corresponds to the thickness of the corrugated board that is being used. A line of cut 19 is formed in the blank extending in a direction at right angles to the double scoring. This cut is interrupted at the center in order to form a central pivot or hinge 20 adjacent the double scoring which is useful during the folding and gluing of the prepared blank in accordance with the method of our invention. Also, the cut 19 on each side of the central hinge 20 is interrupted at intervals by a plurality of very narrow connecting portions or necks 21, which, as shown in FIG. 6, serve to initially tie double panels A and B together. These necks are made so narrow that they are very readily tearable or separable and thus permit the two panels to be very easily and conveniently separated by the operator, when desired.

Each of the panels A and B is divided into two parts by the double scoring 16. Panel A is thus composed of two panels 25 and 26 while panel B is composed of two panels 27 and 28. The double panels A and B as thus constructed are disconnectably attached to each other by the central pivot 20 and the necks 21.

The panels 25 to 28 must have matchable constructions. For example, in the blank illustrated there are openings 30 and 30a through which pipes may be extended, and these openings must be so positioned and oriented that, when the panels are assembled so as to cooperably form a composite packaging member, the openings will be in the proper and desired portions for registration.

In the process of assembling, the blank is first laid out flat on a supporting surface as shown in FIG. 1, and the entire upper exposed surface of the facing sheet is then covered with glue, after which the operator may proceed with the folding process in a manner now to be described. In the folding process, it has been found most convenient for the operator to stand at a position as indicated by the numeral 32 in FIG. 7. The operator now engages the panel 25 and swings it into a substantially vertical position. This is readily done, first, because the double scoring forms a hinge, and, second, because the necks 21 are so fragile that they may be torn or severed with practically no effort.

The operator, while holding the repositioned panel 25 in one hand, now proceeds to engage the double panel B and bodily swing it upwardly with respect to hinge 20 in the direction indicated by the arrow 33. This is possible because the center hinge 20 permits easy hinging movement and because the necks 21 between the panels 26 and 28 are easily severed. As the double panel B is swung upwardly, the individual panels 27 and 28 are inwardly folded towards panel 25 along the double scoring 16 so as to bring them into the positions indicated respectively by dotted lines 27a and 28a.

When the hinged connection between the panels 27 and 28, as thus folded, reaches the side edge wall 34 of the panel 25, the panels 27 and 28 will then be in a position as indicated by dotted lines 27b and 28b in FIG. 8. The operator then engages these panels with the palms and fingers of his hands and pushes them to a final position against the panel 25, and in which position the previously applied glue now becomes effective to attach the three panels 25, 27 and 28 together. As shown in FIG. 9, because of the shape of the hinge formed by the scorings 17 and 18 and because the distance X therebetween is the same as the thickness of the corrugated board, the three panels 25, 27 and 28 will be flat in full surface contact with each other.

It will be understood that, as the panel B is swung from the position shown in FIG. 7 into the position shown in FIG. 8 the material comprising the hinge 20 will be torn so that the two double panels A and B become detached from each other at their previous hinge connection, but the panels will nevertheless remain secured to each other by virtue of the glue.

The operator then holds the three glued panels 25, 27 and 28 in an upright position, and his next operation is

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to swing the panel 26 in the direction indicated by the arrow 35 to bring it into the dotted line position 26a, where the previously applied glue on its surface becomes effective to connect panels 26 and 28 together. In this case the hinge portion of the double panel A forms a pocket between the two panels 25 and 26, which receives the panel 28 in a manner like that shown in FIG. 9.

The operator now makes sure that the edges of the panels positioned in the pockets formed by the hinge portions of the double panels, are firmly and properly seated. This may be done by engaging the vertical edges of the assembly with his hands and pushing inwardly while lifting the entire assembly and dropping it forcibly against the supporting surface. This will also assure a proper registry of the four pairs of openings 30 and 30a of the panels. This last operation is possible since the glue is still soft and will permit relative movement between the various panels.

The above described process and method of operations on the blank 11, forms a composite packaging assembly as shown in FIG. 10. If desired, the assembly may be placed in a suitable press or the like and retained under a holding pressure on the panels until the glue has fully set.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of our invention, and, hence, we do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

We claim:

1. A blank of relatively stiff sheet material foldable into a pad support of multiple thickness, comprising:
 - (a) side by side panels joined throughout the length of adjacent edges by a transverse double hinge connection formed by spaced apart scoring line;
 - (b) a third integrally formed panel having a side edge connected to a side edge of one of said side by side panels along a tear line extending throughout the length of the side edges from and in a direction normal to said hinge connection, said tear line including spaced apart severable neck portions; and
 - (c) a pivot connection at the inner end of said hinge connection formed of the sheet material for joining the third panel and said one of said side panels after being separated along said tear line.
2. A blank according to claim 1 including an integrally formed fourth panel having a side edge connected by a double hinge connection to the third panel and forming therewith a second set of side by side panels, said double hinge being formed by continuations of the spaced apart score lines forming the hinge connection between the first side by side panels.
3. A blank according to claim 2 wherein the fourth panel has another side edge connected to the other of said first side by side panels by a tear line similar to that connecting said third panel, and extending in an opposite direction from said hinge connection.
4. A blank according to claim 2 wherein the pivot connection is formed by material in the hinge connections lying between the spaced apart scoring lines.
5. An initially flat blank of sheet material having unidirectional extending corrugations therein, and being foldable into a pad support of multiple layers in flat surface engagement with the corrugations of adjacent layers extending in right-angled relation, said blank comprising:
 - (a) a generally rectangular blank composed of four integrally formed substantially rectangular panels;
 - (b) hinge means extending transversely between opposite edges of said blank, and separating said blank into two substantially similar sections each containing two of said panels, said hinge means being formed by spaced apart parallel scoring lines on one surface of the blank;
 - (c) a perforated tear line joining the two panels of each section the tear line of one section extending

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outwardly from the adjacent of said scoring lines, and the other of said tear lines extending outwardly from the other of said scoring lines, whereby upon separation of the panels in each section at their tear lines, the material between the scoring lines at the inner ends of the tear lines provides a pivotal connection for holding and orienting the panels during folding thereof.

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