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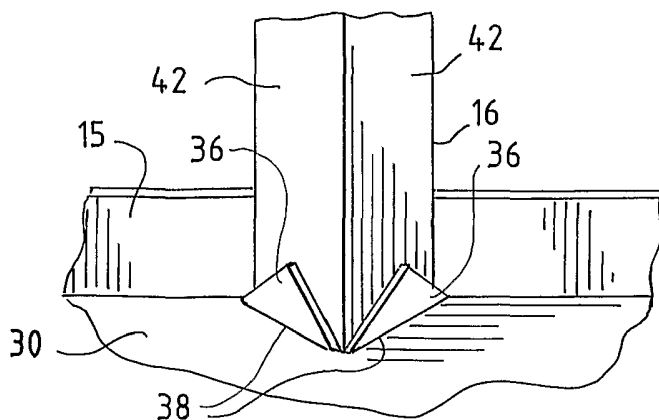
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(54) Title: PRODUCT TRAY INSERT FOR HOLDING A VERTICAL POST



(57) Abstract: A product tray insert (30) that holds a vertical post (16) in place is provided. The insert (30) is placed on the bottom (13) of a product tray (12) and has upwardly folding retaining flaps (36) that capture the bottom of the vertical post (16) between the flaps (36) and a side (15) of the tray (12). The tray insert (30) is particularly useful for packaging systems that do not have a large rectilinear product to fit the posts against and that do not hold the posts (16) at their ends.

TITLE

PRODUCT TRAY INSERT FOR HOLDING A VERTICAL POST

BACKGROUNDField Of The Invention

This patent relates to the packaging arts. More particularly, this patent relates to a product tray insert that helps hold a vertical post in place.

Description Of The Related Art

Wound paper posts are used in the packaging industry to provide structural support to packaging systems and to enable stacking of heavy loads on top of the post during storage and transport. Typically, a vertically oriented post is fitted to the vertical edge of a product (such as a large household appliance) and held in place between the vertical edge of the product and the packing container. In open sided packaging systems such as Sonoco Product Company's SONOVIEW™ packaging system, the vertical posts are often held at their respective ends between the edge of the product and top and bottom caps.

In still other packaging applications there is no product edge to use as a support for the vertical posts. In such cases the post can be pushed, pulled or forced out of position. If the post is not positioning correctly, or is pushed out of position, the load cannot be transferred down through the post.

One example of a packaging system for which there is no product edge to use as a post support is the SONOPOP™ packaging system developed by Sonoco Products Company. The SONOPOP™ packaging system is intended for use by club store and other retailers for displaying products in the same package in which they are shipped from the vendor. The SONOPOP™ system is a post-in-post type system. That is, the system uses a post-inside-a-post structure to give the system strength and stability. The SONOPOP™ packaging system comprises a plurality of corrugated trays for holding products, outer

posts that hold the trays apart, and inner posts that slide inside the outer posts to lock the system together and provide axial compression strength. The entire assembly may be carried on a standard pallet and wrapped in an outer wrap to protect the products from dust and damage during shipment.

5 Each corrugated tray has die-cut openings large enough to allow the inner posts to fit through but not the outer posts. The outer posts space the trays apart and provide a platform on which additional trays may be placed. Significantly, the inner posts help hold and position the outer posts while the system is being assembled and during use.

10 The number of outer posts per tray level can vary, and usually depends on the total weight of the palletized unit and the dimensions of the trays. For example, a 40" by 48" palletized unit having four layers of products and an overall weight of 480 lbs. (218 kg) (120 pounds or 54.5 kg per layer¹) might require just four outer posts located at the corners of each tray. A unit having a total product weight of 800 lbs. (363 kg) (200 pounds or 91 kg per layer) might require six posts, one at each corner and two located at the midpoints
15 of the two longest opposing sides. A unit having a total product weight of 960 lbs. (436 kg) (240 pounds or 109 kg per layer) might require eight posts, one at each corner and one located midway between each pair of corners. If even more outer posts are needed they can be symmetrically arranged away from the sides of the trays toward the center.

20 With the SONOPOP™ product packaging system, the greater the product weight on each tray the higher the number of outer posts per tray required. Since the inner posts are used to hold and position the outer posts during assembly and use, increasing the number of outer posts requires increasing the number of inner posts. Yet increasing the

¹ Trays typically are limited to 40 pounds (about 18 kg) for lifting purposes, so a system having 120 pounds or 54.5 kg per layer might have four trays arranged within a larger tray on each layer.

number of inner posts adds to the cost of the system. The present invention solves the problem of increasing material cost by providing a tray insert that includes fold-up and die cut features for holding and positioning the outer posts during assembly and use.

Thus it is an object of the present invention to provide a tray insert that can hold a vertical post in place when there is no large product having an edge against which the vertical post can be secured.

Another object of the invention is to provide a tray insert that can hold a vertical post without the need for adhesive or other holding means.

Another object of the invention is to provide a tray insert that holds and positions outer posts in a post-in-post packaging system while the system is being assembled.

Still another object of the invention is to provide a tray insert that reduces the number of inner posts required in a post-in-post packaging system.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

SUMMARY OF THE INVENTION

The present invention is a product tray insert that helps hold a vertical post in place. The insert can be used with shelving or packaging systems incorporating vertical posts to support shelves or trays. The tray insert has upwardly folding retaining flaps that capture the bottoms of the vertical posts between the flaps and a side of the tray. The tray insert is particularly useful for packaging systems that do not have a large rectilinear product to fit the posts against and that do not hold the posts at their ends. The tray insert can be used with a post-in-post packaging system such as that described in U.S. Patent Application Serial No. 10/615,814 to eliminate or reduce the need for inner posts.

In one embodiment of the invention the tray insert is made from a substantially flat sheet of material and is configured to be placed within a tray. The insert comprises a pair of retaining flaps such that the retaining flaps and the tray sidewall form a base for holding a vertical post upright. The vertical post is held in place by lateral forces imposed on the post by the retaining flaps and the tray sidewall.

The retaining flaps are defined by an edge of the insert, a cut line extending from the edge, and fold lines extending from the cut line to the edge. The fold lines extend diagonally from the cut line. The insert may also comprise cut out sections for accommodating additional posts.

In a second embodiment of the invention, the insert comprises a single retaining flap and the vertical post is held in place by lateral forces imposed on vertical post by the retaining flap and the tray sidewall. The retaining flap is rectangular and is defined by a fold line extending between two die cut lines and an edge of the tray insert.

THE DRAWINGS

Figure 1 is a top plan view of a product tray insert according to the present invention.

Figure 1a is a close up view of an alternative embodiment of the tray insert of Figure 1.

Figure 2 is a perspective view of the product tray insert of Figure 1 in use.

Figure 3 is a perspective view of a product tray insert used in a post-in-post packaging system

Figure 4 is a top view of a portion of the packaging system of Figure 3.

Figure 5 is a cross-sectional view of the post-in-post packaging system of Figure 3 taken along line 5-5.

DETAILED DESCRIPTION OF THE INVENTION

The invention is a tray insert for use with shelving and/or packaging systems that incorporate vertical support posts in their structure, including the post-in-post packaging system described in Sonoco's pending United States Patent Application No. 10/615,814.

5 The tray insert helps hold vertical support posts in place.

Figure 1 shows a tray insert 30 according to one embodiment of the present invention. Figure 2 shows the insert 30 being used in a tray 12 to help hold upright a vertical post 16. The tray comprises a bottom panel 13 and side panels 15 extending upward from the periphery of the bottom panel 13. Preferably the tray insert 30 has
10 dimensions similar to that of the tray bottom panel 13.

Referring to Figure 1, the tray insert 30 preferably is made from a substantially flat corrugated sheet defined by pairs of opposing edges 32, 34. The tray insert 30 comprises matched pairs of post retaining flaps 36 defined by a tray edge 32, diagonal fold lines 38 and a die cut line 40. The die cut line 40 extends a short distance perpendicularly inward
15 from an edge 32 of the tray insert 30 and terminates in a distal end 41. The diagonal fold lines 38 extend diagonally from the distal end 41 of the die cut line to the edge 32.

When folded along the fold lines 38, the retaining flaps 36 become two sides of a three-sided retaining base for holding upright a vertical post 16, as shown in Figure 2. The third side of the retaining base is formed by the tray sidewall 15. The retaining flaps 36
20 and tray sidewall 15 hold the post 16 in an upright position by exerting lateral forces of the post 16.

The retaining flaps 36 may be located wherever there is a need to hold and secure a vertical post. For example, and without limitation, the retaining flaps 36 shown in the figures are located along opposing edges 32 of the insert 30 midway between the corners
25 of the insert 30.

The angle formed by the diagonal fold lines 38 and the die cut line 40 is a function of the geometry of the post to be held by the retaining flaps 36. For example, in the embodiment shown in Figure 2, the outer post 16 is three-sided and the angle formed by the two inward facing sides 42 is 90 degrees. The angle formed by the diagonal fold lines 38 and the die cut line 40 is 45 degrees so that when the retaining flaps 36 are raised they form a ninety degree angle and fit snugly against the inward facing sides 42 of the post 16.

The retaining flaps can be any shape suitable for holding a vertical post. For example and without limitation, as shown in Fig. 1a, a fold line 38a can extend between two parallel die cut lines 40a parallel to the edge 32 of the tray insert, resulting in a rectangular retaining flap 36a. This shape is particularly suitable for a flat post, for example, one having a racetrack-shaped cross section. This shape flap could also be used to secure a corner post having a substantially rectangular cross section.

The product tray insert 30 may also comprise corner cut out sections 44 located at the corners of the insert 30, edge cut out sections 46 located along the edges 34 of the insert 30 and center cut out sections 48 located away from the edges 32, 34 toward the center of the insert 30. These cut out sections 44, 46 and 48 enable posts 18 to be inserted through the tray insert 30 and thus can be located wherever a through post is located. They can be any desired shape. If the tray insert 30 is to be used with the post-in-post type packaging system described below, the cut out sections should be shaped to allow insertion of the inner posts 18 through the cut out sections but not the outer posts 16. The cut out sections also help hold the posts 18 in place, but not as securely as the retaining flaps 36.

The product tray insert 30 can be used with shelving and/or packaging systems to help hold vertical posts in place where the posts cannot be secured against an edge of the product. Without a large rectilinear product such as an appliance to fit the posts against and if not held in place at the ends of the post by, for example, foamed shaped top and

bottom trays, the posts can be pushed, pulled or otherwise forced out of position. If the posts are not positioned correctly, the axial load may not be transferred down through the posts, resulting in crushed or otherwise damaged products. The product tray insert 30 of the present invention solves this problem by holding the posts in their correct positions.

5 The tray insert 30 also makes easier assembly of a post-in-post packaging system 10 such as that described in co-owned U.S. Patent Application Serial Number 10/615,814 and shown in Figures 3-5. The post-in-post packaging system 10 comprises vertically arranged trays 12 for holding products, inner posts 16 inserted through openings 24 in the trays to hold the trays 12 in vertical alignment, and outer posts 16 slid over the inner posts 18 to support the trays 12 and space them apart.. The bottommost tray 12 (Figure 3) rests on a standard pallet 20. The entire assembly is wrapped in transparent plastic film (not shown) to protect the products (not shown) on the trays 12 from dust and damage.

10 The system 10 is referred to as a post-in-post system because the inner posts 18 fit within the outer posts 16 as shown in Figures 4 and 5. The inner posts 18 hold and position the outer posts 18 while the system 10 is being assembled and lock the system 10 together. Both the inner and outer posts 18, 16 preferably are made from wound paperboard, although other materials may be used for the posts, including but not limited to plastic and metal.

15 Each tray 12 comprises a bottom panel 13 and side panels 15 extending upward from the periphery of the bottom panel 13. Openings 24 are die cut in the bottom panel 13. There may be four, five, six, seven, eight or any number of outer posts 16 used to support each tray 12; there should be an equal number of openings 24 die cut in the bottom panel 13 of each tray 12. For example, a seven post system is shown in Figure 3.

20 The outer posts 16 bear the entire stacking load of the system 10. Because of the axial strength of the outer posts 16, the system 10 is strong enough to support the weight of

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the products on the trays 12, withstand the vibration and impact forces that can occur during shipping, and withstand the weight of one or more units 10 stacked on top. The system is particularly suited for shipping and displaying irregularly shaped items and items that cannot withstand vertical stacking forces, such as soft-packaged goods, since the products do not bear the stacking load.

To assemble the post-in-post packaging system 10, the inner posts 18 are inserted through the trays 12 and then the outer posts 16 are slid over the inner posts 18. The inner posts 18 not only hold the outer posts 16 in place, they also keep the trays 12 vertically aligned.

The greater the product weight on each tray 12 the higher the number of outer posts 16 required to support the trays 12 and the overall system 10. Since the inner posts 18 are used to hold and position the outer posts 16, increasing the number of outer posts 16 requires increasing the number of inner posts 18. The product tray insert 30 of the present invention reduces the need for more inner posts 18 by providing an alternate means for holding and positioning the outer posts 16. By placing a tray insert 30 into each tray 12, the outer posts 16 can be held in place by the tray insert retaining flaps 36 instead of additional inner posts 18. Figure 3 shows a tray insert 30 placed within bottom tray 12a to help hold in place the outer posts 16a. Tray inserts 30 could also be used on the other trays as well.

Thus there has been described a product tray insert that helps hold a vertical post in place. The insert can be used with shelving or packaging systems incorporating vertical posts to support shelves or trays. The tray insert has upwardly folding retaining flaps that capture the bottoms of the vertical posts between the flaps and a side of the tray. The tray insert is particularly useful for packaging systems that do not have a large rectilinear product to fit the posts against and that do not hold the posts at their ends. The tray insert

can be used with a post-in-post packaging system such as that described in U.S. Patent Application Serial No. 10/615,814 to eliminate or reduce the need for inner posts.

Other modifications and alternative embodiments of the invention are contemplated which do not depart from the scope of the invention as defined by the foregoing teachings and appended claims. It is intended that the claims cover all such
5 modifications that fall within their scope.

WE CLAIM AS OUR INVENTION:

1. An insert (30) made from a substantially flat sheet of material and having an edge (32), the insert (30) configured to be placed adjacent a tray (12) for holding a vertical post (16), the tray (12) comprising a bottom panel (13) and a sidewall (15) extending perpendicularly upward from the bottom panel (13), the insert (30) comprising:

a pair of retaining flaps (36), the retaining flaps (36) and the tray sidewall (15) defining three sides of a base structure for holding the vertical post (16) upright.

2. The insert (30) of claim 1 wherein the vertical post (16) is held in place by lateral forces imposed on the vertical post (16) by the retaining flaps (36) and the tray sidewall (15).

3. The insert (30) of claim 1 wherein the retaining flaps (36) are defined by the insert edge (32), a cut line (40) extending from the edge (32), and fold lines (38) extending from the cut line (40) to the edge (32).

4. The insert (30) of claim 3 wherein the fold lines (38) extend diagonally from the cut line (40).

5. The insert (30) of claim 1 wherein the vertical post (16) is three-sided and the retaining flaps (36) and tray sidewalls (15) fit snugly against the three sides of the vertical post (16).

6. The insert (30) of claim 1 wherein the insert (30) also comprises cut out sections for accommodating additional posts.

7. An insert (30) made from a substantially flat sheet of material and having an edge (32), the insert (30) configured to be placed within a tray (12) for holding a vertical post (16), the tray (12) comprising a bottom panel (13) and a sidewall (15) extending

perpendicularly upward from the bottom panel (13), the insert (30) comprising:

at least one retaining flap (36a), wherein the vertical post (16) is held in place by lateral forces imposed on the vertical post (16) by the retaining flap (36a) and the tray sidewall (15).

8. The insert (30) of claim 7 wherein the at least one retaining flap (36a) is rectangular and is defined by a fold line (38a) extending between two parallel die cut lines (40a) and an edge (32) of the insert (30).

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FIG. 1

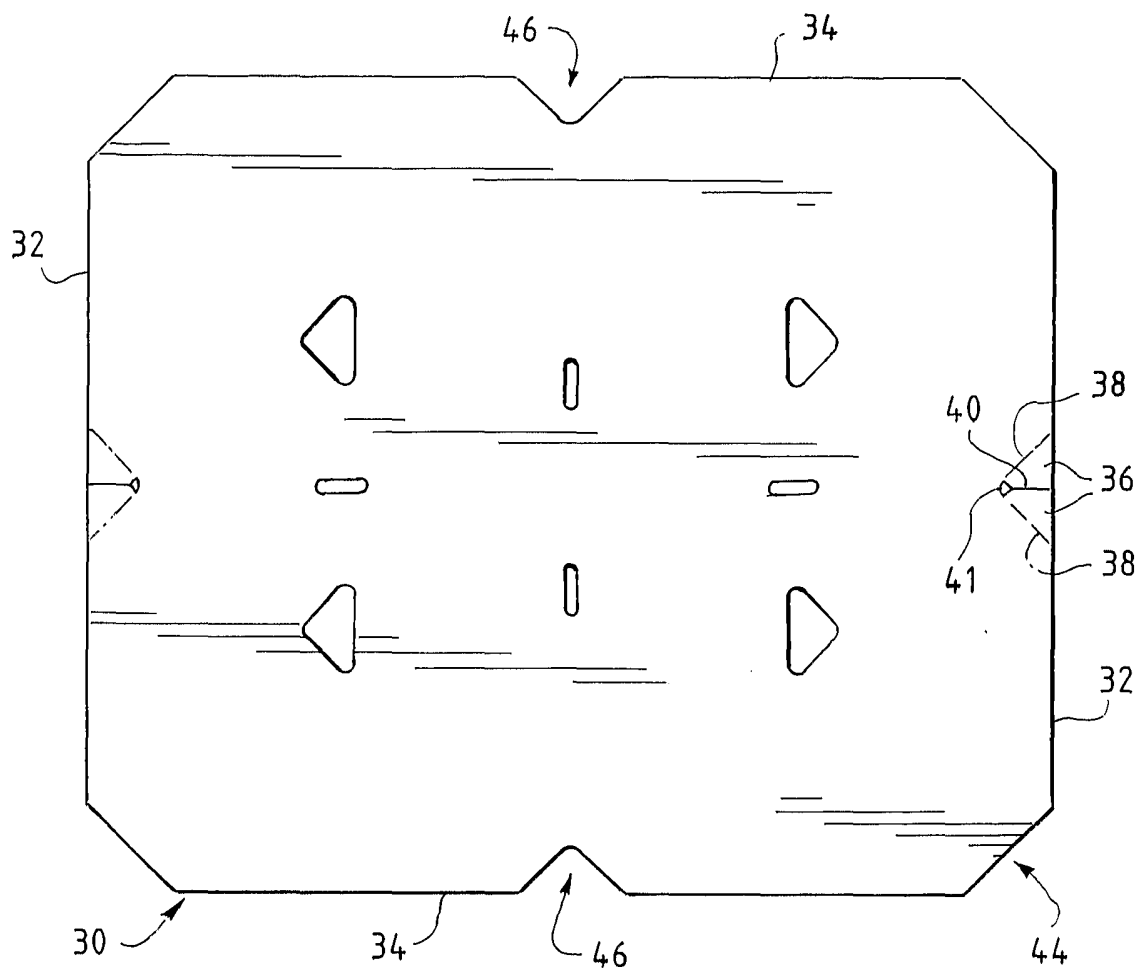


FIG. 1a

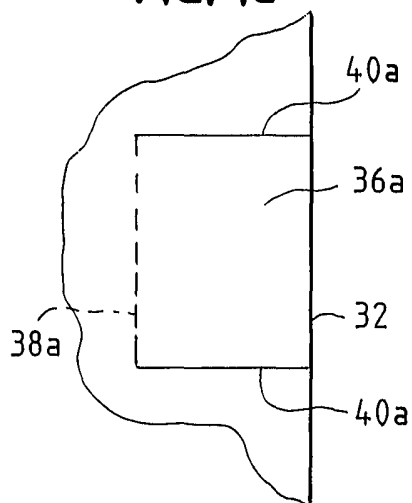
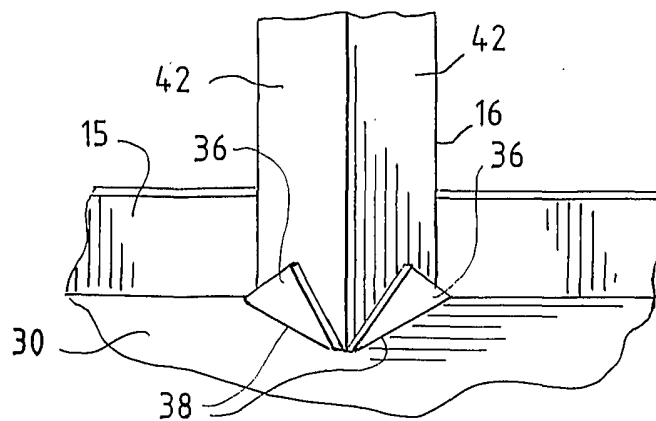


FIG. 2



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FIG. 3

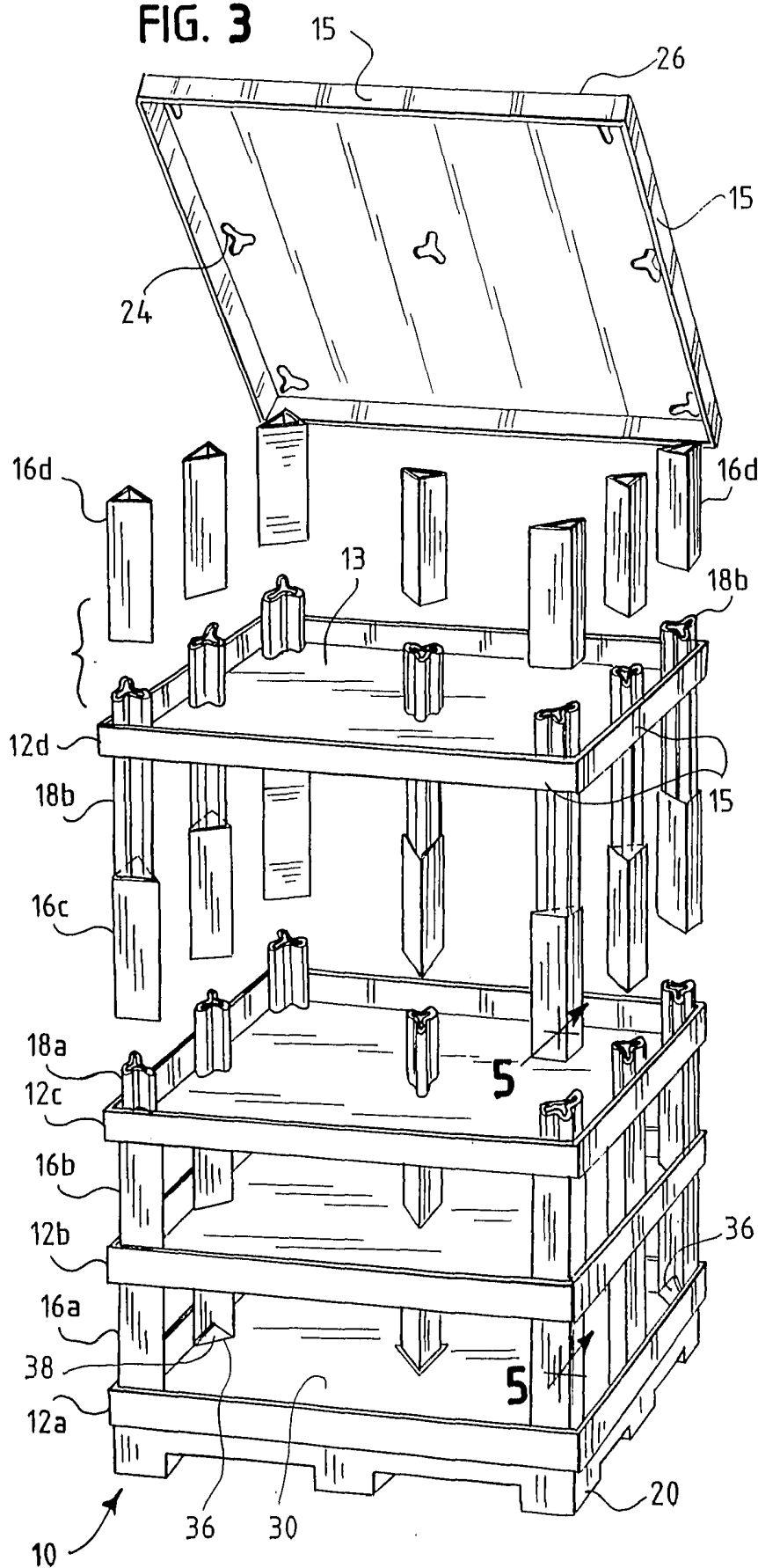


FIG. 4

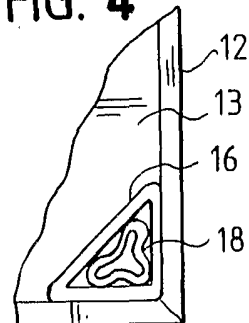


FIG. 5

