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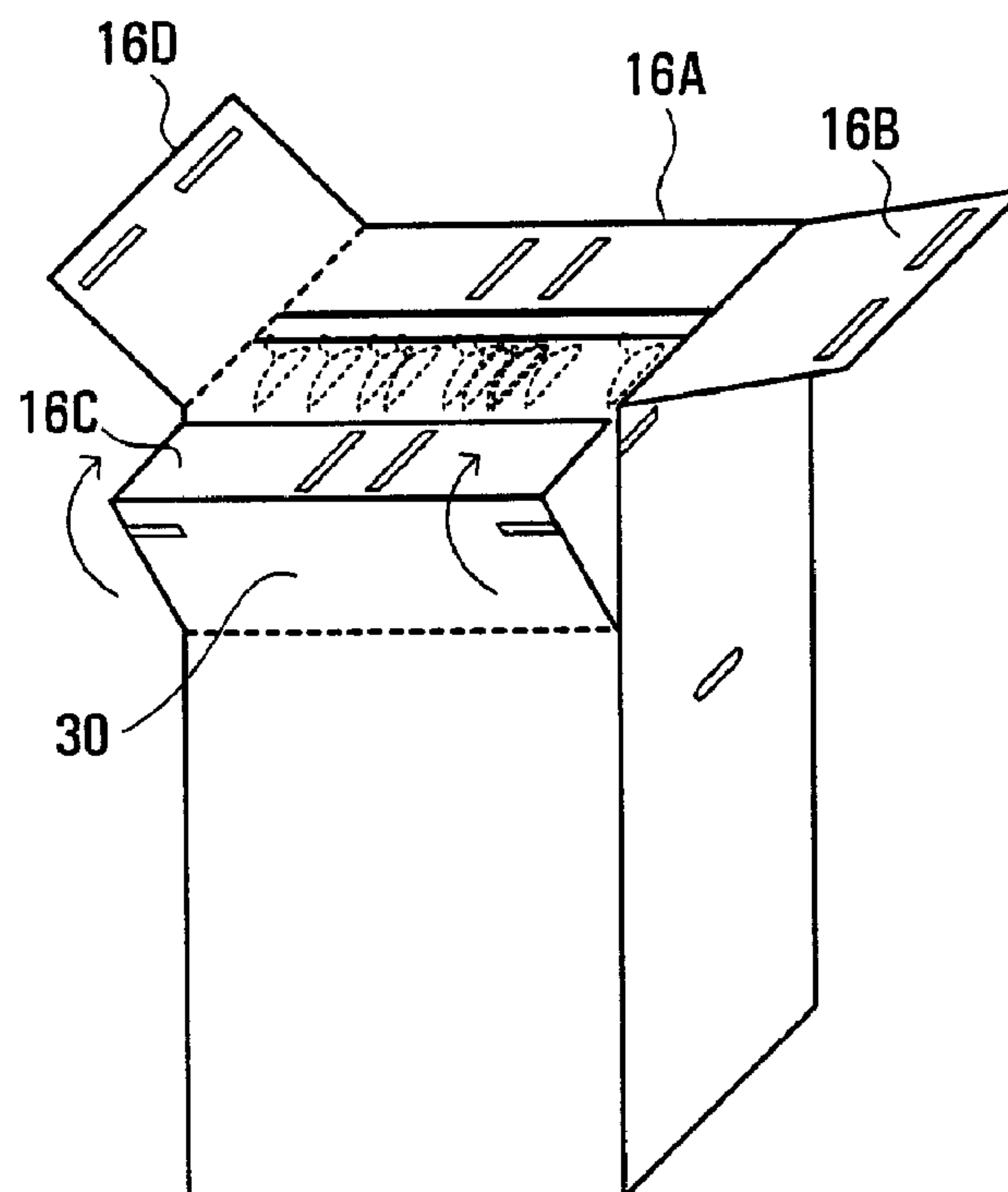
(72) Inventeur/Inventor:
WITT, BRUCE, CA

(73) Propriétaire/Owner:
LOGICAL MOVING SOLUTIONS INC., CA

(74) Agent: SMART & BIGGAR

(54) Titre : BOITE D'EMBALLAGE

(54) Title: PACKING BOX



(57) Abrégé/Abstract:

An improved collapsible shipping container useful to provide packaging for goods in transit is fabricated from a lightweight plastic sheeting material having two parallel walls separated by spaced apart bridging walls to define a series of hollow cells. Hook and pile fastenings are provided which can be secured to retain the container in erected condition, but can be released to allow it to be folded flat when not in use. The container is particularly useful for the transit of clothing on hangers during household moves.



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ABSTRACT OF THE DISCLOSURE

5 An improved collapsible shipping container useful to
provide packaging for goods in transit is fabricated from a
lightweight plastic sheeting material having two parallel walls
separated by spaced apart bridging walls to define a series of
hollow cells. Hook and pile fastenings are provided which can
10 be secured to retain the container in erected condition, but
can be released to allow it to be folded flat when not in use.
The container is particularly useful for the transit of
clothing on hangers during household moves.

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BACKGROUND OF THE INVENTIONA) Field of Invention .

For use as a packaging container. This invention relates to a new or improved packing container useful for providing packaging for goods in transit, and collapsible from an erected working condition to a compact collapsed condition for storage and/or transportation. The invention is particularly applicable to a transport container of the type frequently employed for transporting articles of clothing on hangers, as in shipping the contents of a house from one location to another.

B) Description of the Prior Art

Over the years, many forms of so-called "knock-down" containers have been developed for specific purposes in transporting articles from one location to another when the containers are in an erected condition, the containers being collapsible when not in use into a knock-down condition to minimize the space that they occupy when not in use, e.g. for transit and storage.

In transporting the household contents when a family moves from one dwelling to another, there is a requirement for special-purpose packaging containers in order to transport various household items. A particular requirement is for containers which will transport items of clothing in a convenient and trouble-free manner. A typical household contains several closets filled with articles of clothing suspended on hangers including, inter alia, coats, dresses, shirts, suits, slacks, etc. and in transporting such articles between households it is important that they should be protected from damage and soiling, and also be transported in

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conditions which will not promote the creation of wrinkles in the clothing articles. In this connection, it will be understood that removing the clothing articles from hangers, folding them and storing them in conventional packaging
5 containers will be time consuming and will most likely also result in the creation of wrinkles in delicate fabrics. To overcome these problems, a type of packaging container has been developed in which articles of clothing can be transported while still suspended on clothes hangers, in conditions similar
10 to those pertaining in the closets between which the articles are to be transported. One such packaging container is the readily erectable wardrobe cabinet that is described in U.S. Patent No. 4,512,477 Densen.

Packaging containers in the style of the wardrobe
15 cabinet of Densen have been successfully employed for a number of years in transporting clothing articles. However, they have not been entirely successful, since despite their advantages, and the fact that they are collapsible to a compact condition for storage and/or transport, they are relatively fragile, and
20 typically can be utilized no more than about 5 times before becoming unserviceable. Such wardrobe cabinets or containers typically are fabricated in reinforced corrugated cardboard stock and are susceptible to damage in the rough handling encountered in moving vans and the like so that their service
25 life has been unsatisfactory.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a collapsible packaging container of enhanced durability which will have a significantly lengthened service life as compared
30 to containers of the prior art.

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The invention provides a collapsible shipping container which is capable of selectively assuming an erected condition and a collapsed condition comprising: four rectangular walls of uniform height, said walls being interconnected along parallel edges thereof and in the erected condition being arranged in the form of a rectangular parallelepiped with each wall at right angles to each adjacent wall, said walls in the collapsed condition being arranged such that each wall lies in close confronting relation to one adjacent wall; top and bottom wall structures configured to span the upper and lower ends of said four walls when in erected condition and to form closed upper and lower ends of the container, said top and bottom wall structures being engagable by securing means to retain the shipping container in erected condition; one of said container walls being partially divided from each adjacent wall by a slit which extends from an upper end of said one wall partially along the height of said one wall defining between said slits a panel, said panel being attached to the remainder of said one wall along only one edge and being pivotable about said one edge so as to constitute a flap that can be pivoted out of coplanar relationship with said one wall to provide improved access to an upper part of said container when in erected condition; releasable fastenings that are selectively engagable between edges of said panel and contiguous regions of said adjacent walls to retain said flap in coplanar relationship with respect to said one wall; said container walls being fabricated from a plastic sheet material having parallel spaced layers forming major surfaces that are interconnected through a series of closely spaced integral bridging walls providing a strong lightweight structural sheeting.

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The top and bottom wall structures are preferably provided by respective sets of flaps integral with the upper and lower ends of the four walls, the flaps being designed to fold over on one another to provide top and bottom
5 closures for the container. Any suitable means may be provided for securing the flaps together in the erected condition of the container, but preferably use is made of re-usable fastening means e.g. releasable hook and pile fastenings such as Velcro® strips.

10 A hanger bar is provided to span centrally between a pair of opposed walls of the container when erected, the hanger bar having widened ends that are supported in seats formed at the top of this pair of walls. Clothes supported on hangers can be suspended from the hanger bar so as to be
15 totally enclosed within the container when it is erected. When being transported in such a container articles of clothing are protected from the elements and from other adverse influences much as they would be when stored in a clothes closet, provided that the container during
20 transportation is always maintained in the correct upright orientation. The container is of course sized to have a sufficiently large horizontal cross-sectional area as to comfortably accommodate the articles of clothing. The foldable flap located in the upper portion of the front wall
25 of the container facilitates insertion or removal of the clothing articles with respect to the container.

The plastic sheet material from which the container is fabricated is much more durable than the corrugated cardboard as used in the prior art, and
30 accordingly the container can be reused in the prior art, and accordingly the container can be reused for a large

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number of times, as many as 50. The material is furthermore inherently stronger than cardboard and containers made from it are therefore less susceptible to damage as a result of rough handling, dropping, excessive loading, and the like.

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The four walls forming the container can be fabricated from a single sheet of the plastic material, requiring only one longitudinal seam between the edges of the sheet to form a horizontal enclosure. The joint may be

5 provided by a vertically extending gripper member having groove recesses to receive the marginal edges of the sheet and having teeth or the like interacting with the marginal region at the edge of the sheet to retain it in the groove. To further enhance this engagement a gripper bar is designed to be

10 inserted into a longitudinally extending cell in the marginal edge portion of the sheet located within the groove of the gripper thus to prevent collapsing of this marginal edge region and preventing its withdrawal from the groove. Typically the gripper will be located at the junction between two walls of

15 the container, and thus will comprise two jaw sections each defining a groove to receive an edge region of a wall of the sheet. The jaw sections are pivotally interconnected about a longitudinal axis so that they can readily be swung between a flattened orientation when the container is in collapsed

20 condition and an L-shaped configuration when the container is in an erected condition.

The plastic sheet material employed having spaced major walls separated interconnected by a series of integral bridging walls is sometimes referred to as "I-beam" constructed

25 material, and is a very durable product. Because of the characteristics of this material, a shipping container for clothing can be used very many times without becoming unservicable. By making use of hook and pile releasable fasteners to secure the shipping container in erected

30 condition, there is no need whatever to employ adhesive tape. In contrast to adhesive tape, the performance of hook and pile fastenings is not subject to temperature deterioration.

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The material described provides increased downloading capacity as compared with known shipping containers for the transportation of clothing on hangers.

BRIEF DESCRIPTION OF THE DRAWINGS

5 The invention will further be described, by way of example only, with reference to the accompanying drawings wherein:

Figure 1 is a planned view of a planar blank from which the shipping container can be erected;

10 Figure 1A is an enlarged fragmentary view on the line 1A-1A of Figure 1;

Figure 2 is a prospective view indicating the folding of the walls of the container blank;

15 Figure 3 is an enlarged fragmentary prospective view of a gripper component of the container;

Figure 4 illustrates how the gripper is engaged to the container wall;

20 Figure 5 is an enlarged fragmentary perspective view illustrating the connection between the gripper and two walls of the container;

Figure 6 is an oblique pictorial view showing the container in partially erected condition;

Figures 7 and 8 show the container in further stages of erection;

25 Figures 9, 10, 11 and 12 show stages in the closing of the container; and

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Figures 13 and 14 are fragmentary end views showing alternative joint configurations.

Referring to Figure 1, the blank 10 is fabricated from a plastic sheeting material which as shown in Figure 1a
5 comprises parallel coextensive major walls 6 separated by bridging walls 7 which define a series of cells 8 which extend in parallel longitudinally of the blank 10. The sheeting is preferably formed by extrusion from a feed stock material comprising a mixture of polypropylene and ethylene copolymer
10 pellets together with a small amount of stabilizers. Such sheeting is available from Montel Canada Inc. of Mississauga, Ontario under the Product Identifier Pro-Fax SV256.

The sheeting material can be fabricated in any desired size, but for application as a shipping container for
15 articles of clothing, sheeting having the following properties has been found to be satisfactory:

Overall thickness: 4mm;

Thickness of outer walls and bridging walls 0.25mm;

Dimension of cells: 5mm x 3.5mm.

20 The sheeting material described has a number of advantages as compared to corrugated cardboard material. For the same thickness of material, the Pro-Fax sheeting material is stronger and lighter. It is furthermore of greater structural rigidity and is therefore more resistant to crushing
25 forces, it is waterproof and therefore does not deteriorate in the presence of moisture while at the same time protecting the contents of the container from such moisture; and is resistant to staining.

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The blank 10 can be fabricated in conventional die-cutting press equipment such as is used for producing corrugated cardboard carton blanks and is formed with four major walls 12a, 12b, 12c, and 12d separated by crease lines 14, and from opposite ends of which walls extend top flaps 16a, 16b, 16c and 16d, and bottom flaps 20a, 20b, 20c and 20d, these flaps being separated from the allocated walls by crease lines 18 and 22 respectively.

The wall 12c in the erected container will constitute the front wall, the wall 12a being the rear wall, and the side walls being designated 12b and 12d. Horizontal slots 24 in the side walls 12b, 12d provide hand-hold grips for the container. At the upper end of the walls 12b and 12d there is a horizontal slot 25. The upper and lower flaps are separated laterally by slots 26 to avoid interference when these flaps are folded over in the erect condition. The slots defining the upper flap 16c of the front wall 12c are extended vertically as at 28 and define between them a front flap 30 the lower end of which is formed by a horizontal crease 32 about which the flap 30 can be folded, in use as discussed more fully below.

To transform the blank into an article useful as an erected shipping container, the walls are folded about the vertical crease lines 14 as indicated by the arrows A in Figure 2, the free edges 12aa and 12dd of the outermost walls being drawn towards one another to be secured together to form an enclosure. For this purpose use is made of an elongate gripper 34 which is shown in more detail in Figure 3, 3 and 5. The gripper 34 has a length corresponding to that of the edges 12aa and 12dd and (See Figure 3) is of constant profile, being formed of a plastics extrudate comprising two U-shaped jaws 36 each defining a socket groove 38 between opposed limbs 40

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thereof, the free ends of the limbs 40 having opposed teeth 42. Each tooth has a gently angled outer flank 44 and a sharply angled inner flank 46 facing the bottom of the socket groove 38. The jaws 38 are generally stiff, but can accommodate
5 limited flexure of the limbs 40 thereof to facilitate engagement with the marginal portions of the walls 12a and 12d as explained below. The jaws 36 are interconnected by a longitudinally extending corner hinge 48 and can be pivoted
10 from the position shown in the drawings where the jaws are oriented at right angles in an L-shaped configuration, to a positions where the jaws lie parallel to each other, either back-to-back or overlapped.

To attach the gripper it is pressed on to an edge 12aa and 12dd in the direction indicated by the arrow 50 in
15 Figure 4, the wall edge first engaging the outer flanks 44 of the teeth 22 so that through a combination of compression of the wall edge and deflection of the limbs 40, the wall edge can be inserted to the extent shown in Figure 5. This insertion action will be facilitated if it is performed by arranging the
20 jaw 36 at a slight angle to the wall edge in the longitudinal direction and introducing it gradually from one end to the opposite end.

Once fully inserted, the resilience of the sheet material will restore it to its original shape within the
25 socket groove 38 as shown in Figure 5 in the left side socket groove 38, the cell which is at that time registered with the teeth 42 however being slightly deformed as shown. Because of the configuration of the teeth, retraction of the wall edge out of the jaw requires much more effort than its insertion, this
30 being due to the sharp angle of the inner flanks 46 of the teeth 42.

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To further secure this connection a rod 52 is inserted longitudinally through the end cell of the wall edge within the socket groove 38 as indicated at the right socket 38 in Figure 5. The rod 52 is of a round profile having a diameter slightly in excess of the width of the cell thus forming an interference fit therewith and slightly deforming the sides of the cell into engagement with the sides of the limbs 40 of the jaw 36. This arrangement provides an extremely secure connection between the gripper 34 and the walls 12a and 12d.

With the walls 12a and 12d securely interconnected by the gripper 34, it will be seen that the blank can now be readily erected to a rectangular parallelepiped configuration as shown in Figure 6, or moved into a flattened configuration (not shown) wherein adjacent sides are brought into confronting relation, the container in this configuration having an increased area, but having a thickness roughly corresponding to twice the thickness of the material of the walls.

From the configuration shown in Figure 6 all that is necessary to complete erection of the container is to fold the top and bottom flaps 16a, 16b, 16c, 16d and 20a, 20b, 20c and 20d respectively into horizontal positions thus closing the upper and lower ends of the container. This is demonstrated in Figures 9 to 12 in respect of the upper end of the container, and it will be understood that closing of the lower end of the container is done in similar manner, although here there is no front flap 30 to contend with.

While the container may be made in any convenient size, it is preferred that the flaps 16b and 16d which will be the outermost flaps as shown in Figure 12, have a width that corresponds to half the width of the front wall 12c so that

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when they are overlain as shown in Figure 11 to 12 their free edges butt closely together forming a complete closure at the top of the container. The same holds true in respect of the bottom flaps 20b and 20d.

5 Figure 7 shows the container partially erected with the front flap 30 folded downwardly. The slots 25 at the upper ends of the walls 12b and 12d form seats for the ends of a metal rod 54 intended for the purpose of supporting the hangers of clothing items (not shown) to be transported within the
10 container. The rod 54 must be of sufficient strength as to bear the weight of the contents to be transported, and the ends thereof are sufficiently broad in relation to the strength of the wall material, that they can be supported in the slots 25 without damage to the wall material. Figure 8 shows the metal
15 rod in position at the top of the container, and it will be observed that with the top flaps extending upwardly and the front flap 30 folded downwardly, there is generous access to the interior of the container to facilitate insertion therein of clothing items suspended on hangers which will be carried on
20 the metal rod 54.

Once the container has been filled as indicated in Figure 9 with clothing items (shown in broken lines 56) closing of the container can be completed. In this connection the front flap 30 is folded upwardly to be coplanar with the rest
25 of the front wall 12c with top flap 16c being arranged horizontally in line with the opposite top flap 16a. At this stage the remaining top flaps 16b and 16d can be folded to a horizontal position overlying the top flaps 16a and 16c as shown in Figure 11 until the condition shown in Figure 12 is
30 reached and the container is closed. To secure the flaps 16a to 16b in the closed condition, releasable fasteners in the

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form of strips hook and pile closures such as Velcro® are provided in registering positions on the flaps as shown at 58 in Figures 9 and 10. The Velcro® is provided in strips adhered in corresponding positions on the surfaces of the flaps 16a to 5 16d and 20a to 20d so that when the flaps are folded as indicated in Figures 11 and 12, the Velcro strips 58 in the top flaps 16b, 16d are aligned with and come into engagement with the Velcro strips 58 on the remaining flaps 16a, 16c thus securely retaining the flaps in the closed position. Further 10 releasable Velcro strips 60 are provided to act between the front flap 30 and the adjacent parts of the side walls 12b and 12d. In this way the front flap 30 is held securely in position when the container is erected, and the Velcro strips 60 act to strengthen the upper end of the container by 15 preventing displacement of the front flap 30 under load.

The position of the metal rod 50 at its location immediately beneath the flaps 16b and 16d means that this rod provides structural support to the upper end of the container so that in fact the finished container when erected provides 20 good resistance against imposed loads applied to its upper end.

The alternative joint configuration shown in Figure 13 between the walls 12A and 12D of the carton avoids the need to provide a gripper as shown at 34 in Figures 2 through 5. Instead, a more conventional kind of joint is provided. Here 25 the edge regions of the sheets 12A, 12D are compressed to form tongues 72, 74 by crushing the material of the sheet so that the overlapping tongues have a combined thickness no greater than that of the sheet material itself. The overlapped tongues are secured together by any suitable means such as by rivets 30 76, or by heat-sealing or adhesive indicated at 78.

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Although for practical reasons it is preferred that the joint required to complete the horizontal enclosure formed by the walls 12A to 12D is positioned at the junction between the edges of two of the sheets 12A, 12D as shown in Figure 13, in principle there is no reason why the joint should not be formed intermediate the length of one of the sides 12A to 12D, and this is illustrated in Figure 13 where the wall 12A is shown in broken lines as extending laterally to the left of the joint. In this event, the corresponding top and bottom flaps 16D and 20D respectively (not shown) would be of composite form having interruptions therein corresponding to the tongues 72, 74.

A further alternative is shown in Figure 14 where a representative wall 12X is illustrated as having a joint 78 formed therein. In this case the adjacent edges 80 of the sheet forming the joint are hollowed out (by removing one or several of the bridging walls 7) to define a pocket 82 in which is received an elongate bar 84 of suitable material, e.g. lightweight plastic, which fills the pockets, the joint being secured together then by any suitable means such as by layers of adhesive 86 connecting the joint bar 44 to the walls 6, or by heat sealing or the like. The joint can further or alternatively be secured by rivets (not shown) as in Figure 13. To further strengthen the joint adhesive tapes 88 could be applied to the external surfaces of the walls 6.

The bar 86 would terminate, or at least be interrupted in the region of the upper and lower creases 18 and 22 to enable the flap associated with the wall 12X to be folded over.

Since the plastic sheet material is readily fabricated by extrusion, it could equally well be extruded in

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tubular form rather than as a flat sheet. In that event, of course, no joining arrangement would be necessary thus eliminating the need for the gripper bar. A tubular formed section of the material could simply be creased longitudinally
5 to define corner areas and notched at its ends and creased circumferentially to define the top and bottom flaps.

Whereas particular embodiments of the invention have been described above and illustrated in the drawings, it will be recognized that modifications and variations in the details
10 thereof may readily occur to those skilled in the art, and consequently all such modifications and equivalents are intended to be covered within the scope of the appended claims.

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CLAIMS:

1. A collapsible shipping container which is capable of selectively assuming an erected condition and a collapsed condition comprising:

5 four rectangular walls of uniform height, said walls being interconnected along parallel edges thereof and in the erected condition being arranged in the form of a rectangular parallelepiped with each wall at right angles to each adjacent wall,

10 said walls in the collapsed condition being arranged such that each wall lies in close confronting relation to one adjacent wall;

top and bottom wall structures configured to span the upper and lower ends of said four walls when in erected
15 condition and to form closed upper and lower ends of the container, said top and bottom wall structures being engagable by securing means to retain the shipping container in erected condition;

one of said container walls being partially divided
20 from each adjacent wall by a slit which extends from an upper end of said one wall partially along the height of said one wall defining between said slits a panel, said panel being attached to the remainder of said one wall along only one edge and being pivotable about said one edge so as to constitute a
25 flap that can be pivoted out of coplanar relationship with said one wall to provide improved access to an upper part of said container when in erected condition;

releasable fastenings that are selectively engagable between edges of said panel and contiguous regions of said

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adjacent walls to retain said flap in coplanar relationship with respect to said one wall;

said container walls being fabricated from a plastic sheet material having parallel spaced layers forming major
5 surfaces that are interconnected through a series of closely spaced integral bridging walls providing a strong lightweight structural sheeting.

2. A collapsible shipping container as claimed in claim 1 wherein said securing means comprise releasable closures.

10 3. A collapsible shipping container as claimed in claim 2 wherein said top and bottom wall structures are provided by respective sets of flaps which are integral with the upper and lower ends of said rectangular walls.

4. A collapsible shipping container as claimed in claim
15 3 wherein, in the erected condition, said flaps are overlapped to close the ends of said container, said releasable closures comprising releasable hook and pile fasteners which are operable to retain the flaps in overlapping relation.

5. A collapsible shipping container as claimed in any
20 one of claims 1 to 4 wherein said releasable fastenings comprise hook and pile fasteners.

6. A collapsible shipping container as claimed in any one of claims 1 to 5 wherein said four walls are integral with each other and are formed from a continuous sheet having
25 longitudinal edges, said longitudinal edges being engaged in a joint structure to form said walls into a continuous hollow enclosure.

7. A collapsible shipping container as claimed in claim 6 wherein said joint structure comprises a gripper arranged
30 longitudinally of said walls and having a pair of socket

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grooves extending longitudinally thereof, each socket groove defining a slot to receive one longitudinal edge region of said sheet.

8. A collapsible shipping container as claimed in claim 5 7 wherein said gripper includes on opposite sides of each said socket groove teeth structure adapted to engage with and grip opposed marginal surfaces of said sheet adjacent one edge thereof.

9. A collapsible shipping container as claimed in claim 10 8 including a retainer bar which is sized for insertion through the marginal region of said sheet received within said slot, said gripper bar being sized to prevent compression of said sheet in the marginal region to the area of the sheet and thus prevent withdrawal of said marginal region out of said groove 15 past said teeth.

10. A collapsible shipping container as claimed in claim 9 wherein said bridging walls define within said sheet a series of cells which extend longitudinally of the walls, said cells having a cross-sectional dimension, and said gripper bar having 20 a round profile of a diameter slightly greater than said cross-sectional dimension.

11. A collapsible shipping container as claimed in claim 6 wherein said gripper is arranged between the edges of two adjoining walls of the container, said gripper section 25 comprising two groove-defining structures which are pivotably attached so as to be capable of swinging between an L-shaped relationship in the erected condition of the shipping container and a flat configuration when the shipping container is in collapsed condition.

30 12. A collapsible shipping container as claimed in any one of claims 1 to 11 wherein at the upper end of each of a

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pair of walls which are opposed in the erected condition, there is a horizontal seat centrally positioned and adapted to support a respective end of a mounting bar structure which can be positioned therein to span an upper end of said container
5 and provide support for clothes hangers carrying clothing to be transported in the container.

13. A collapsible shipping container as claimed in claim 12 in combination with said support bar; in the erected condition of the container said top wall structure being
10 positioned above and in close proximity to said support bar which aids in strengthening the upper end of the container to withstand superimposed loads.

SMART & BIGGAR

OTTAWA, CANADA

PATENT AGENTS

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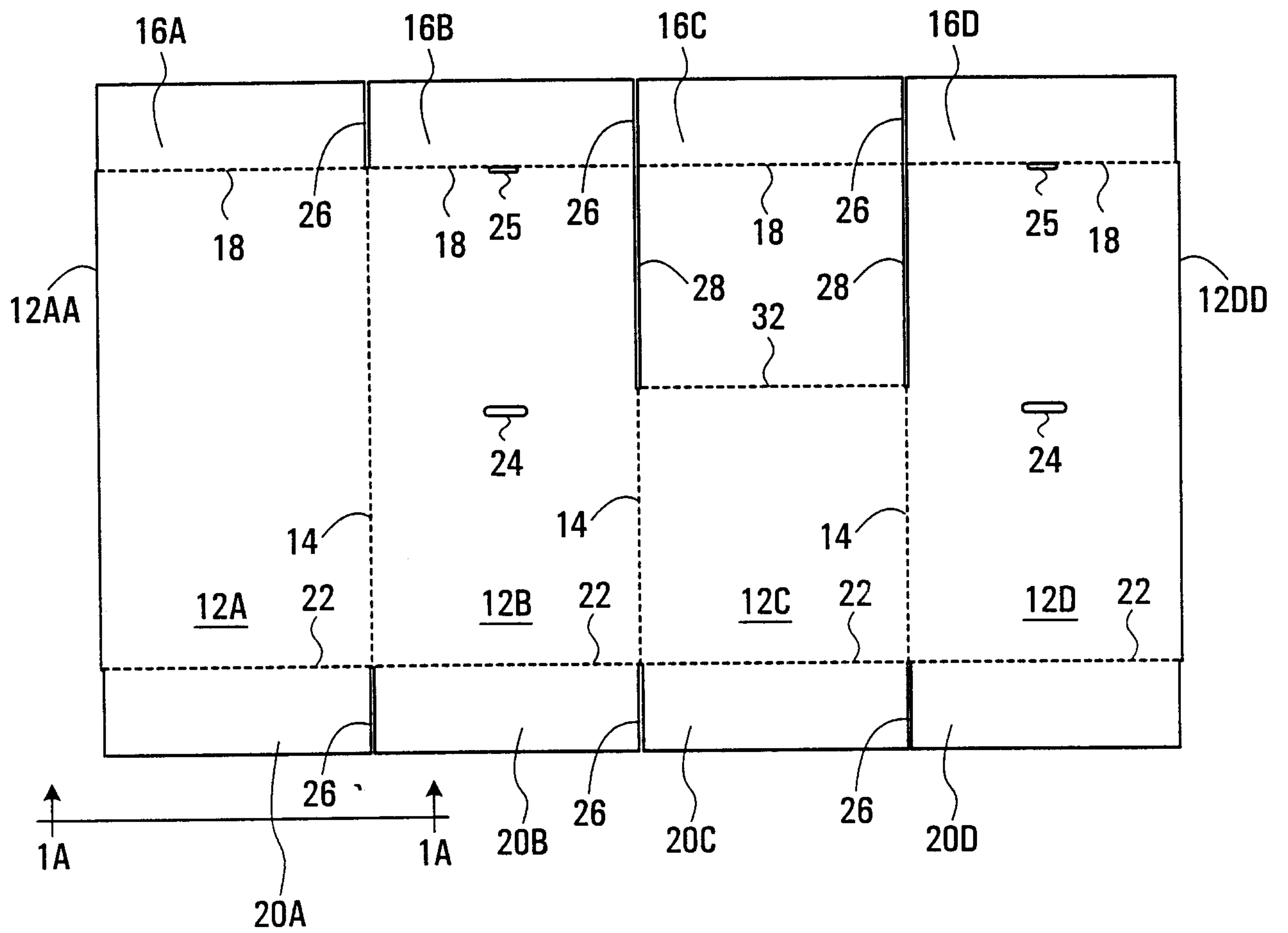


FIG. 1

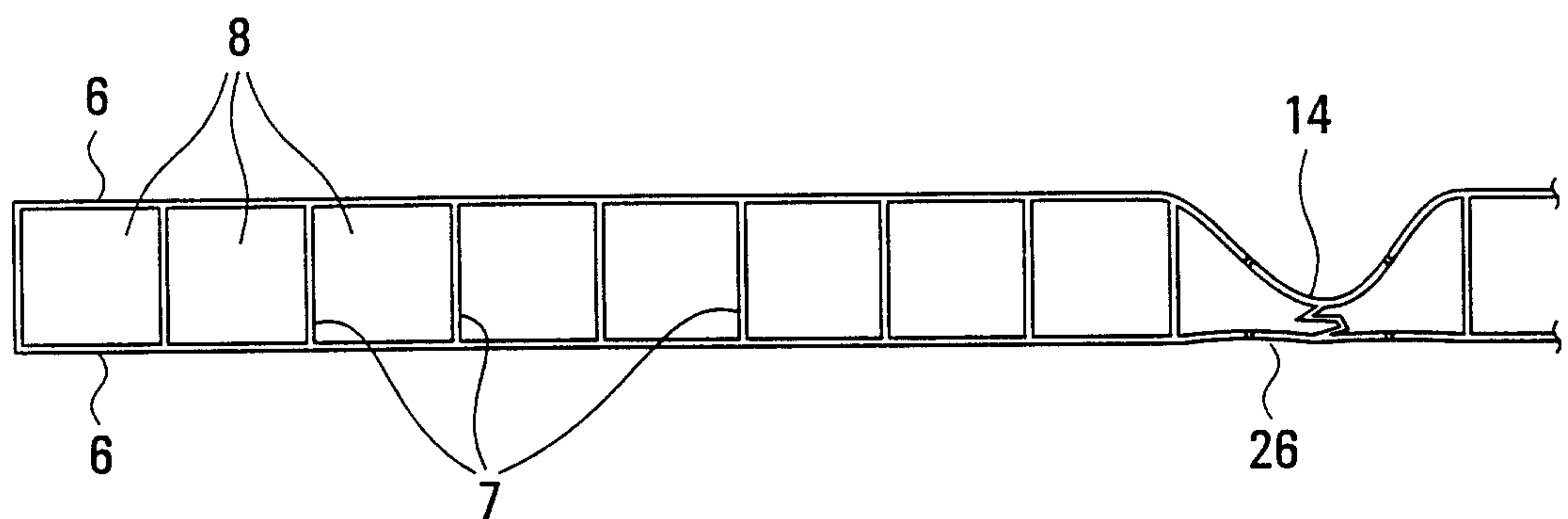
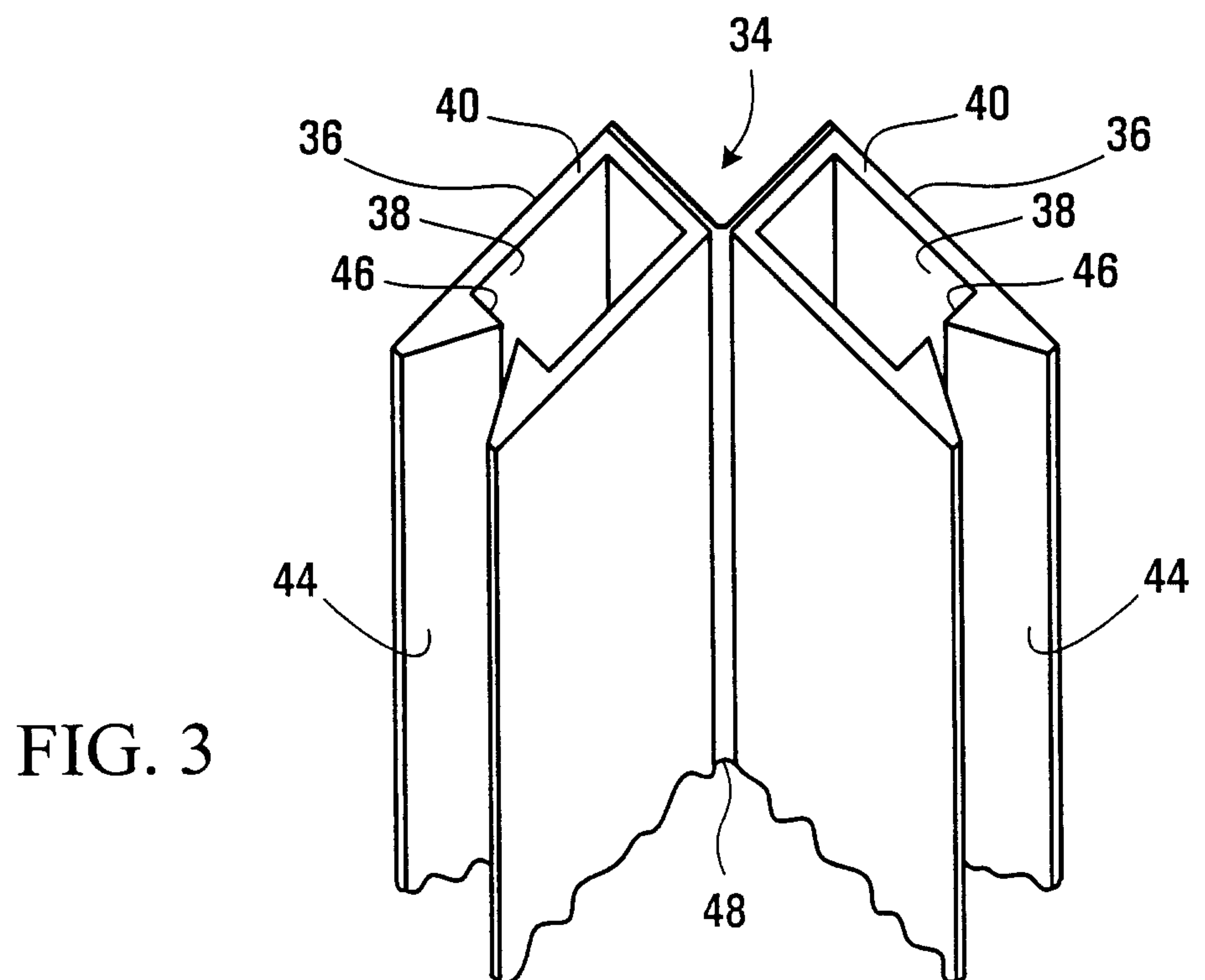
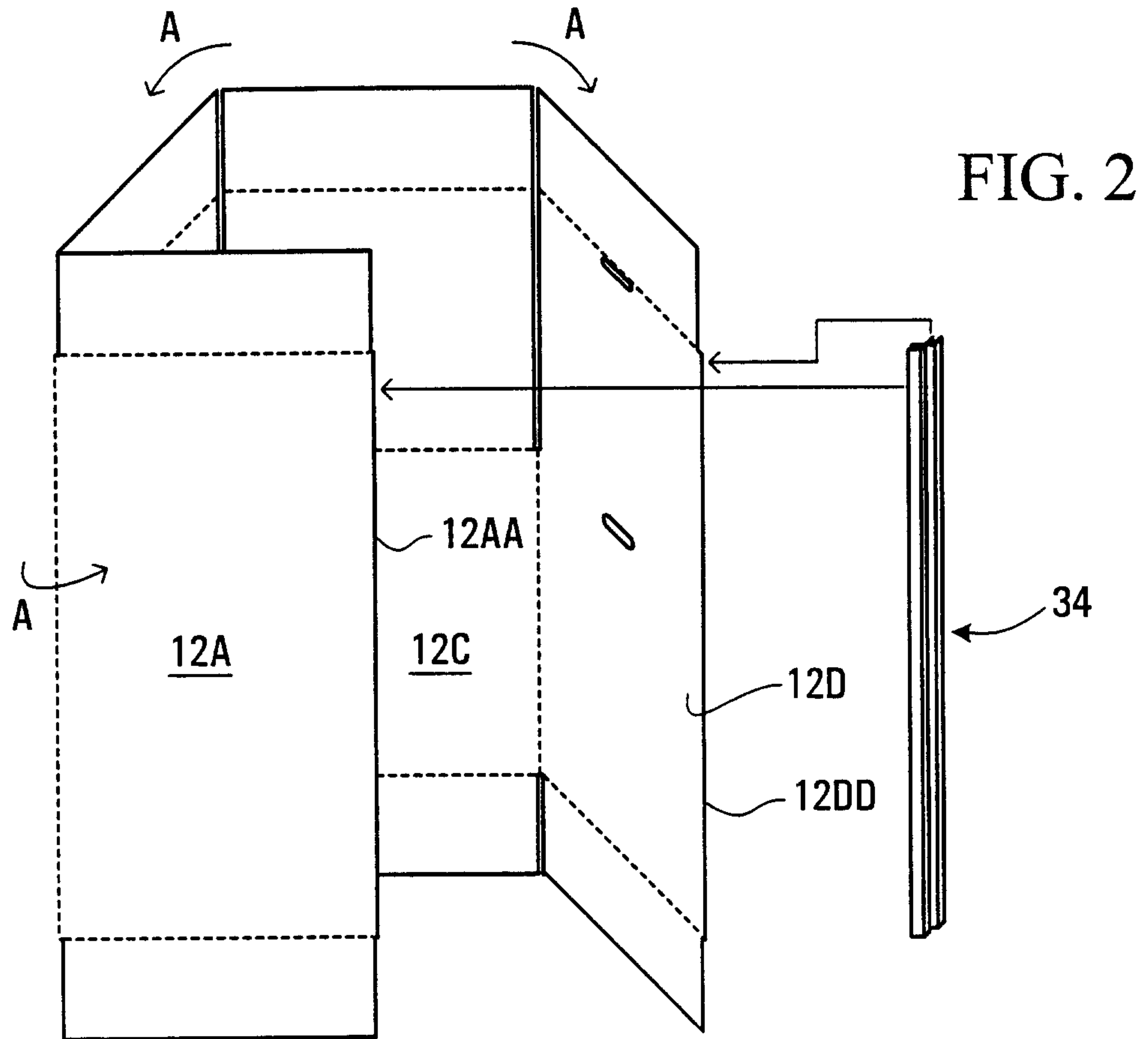


FIG. 1A

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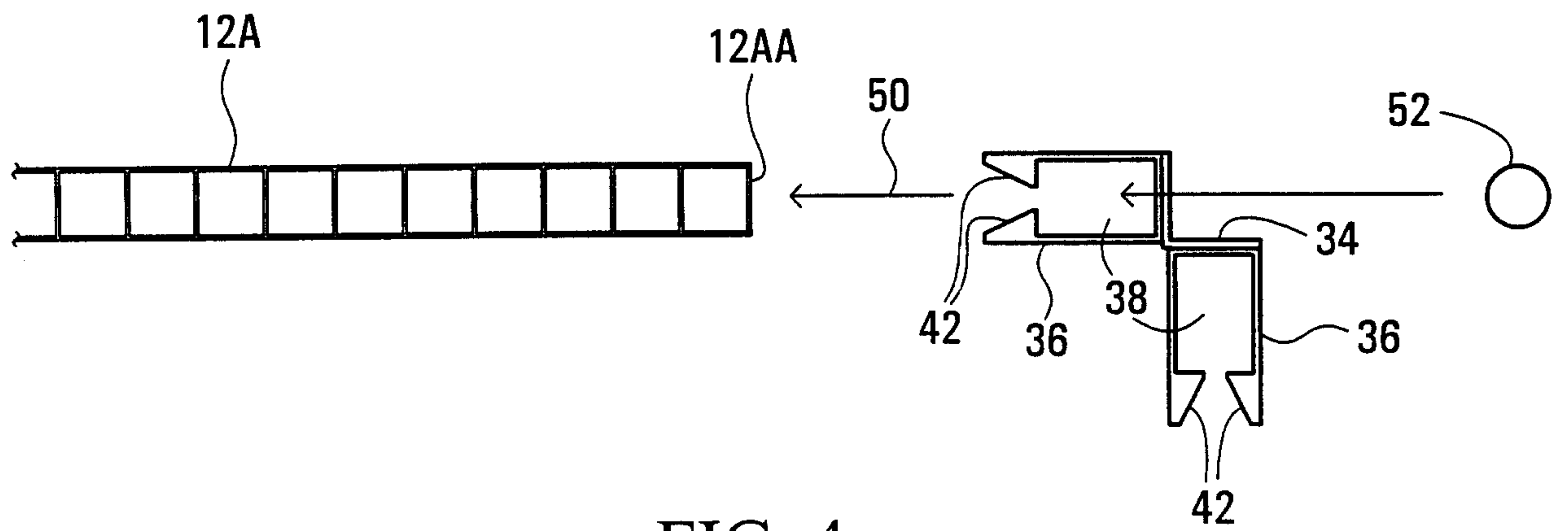


FIG. 4

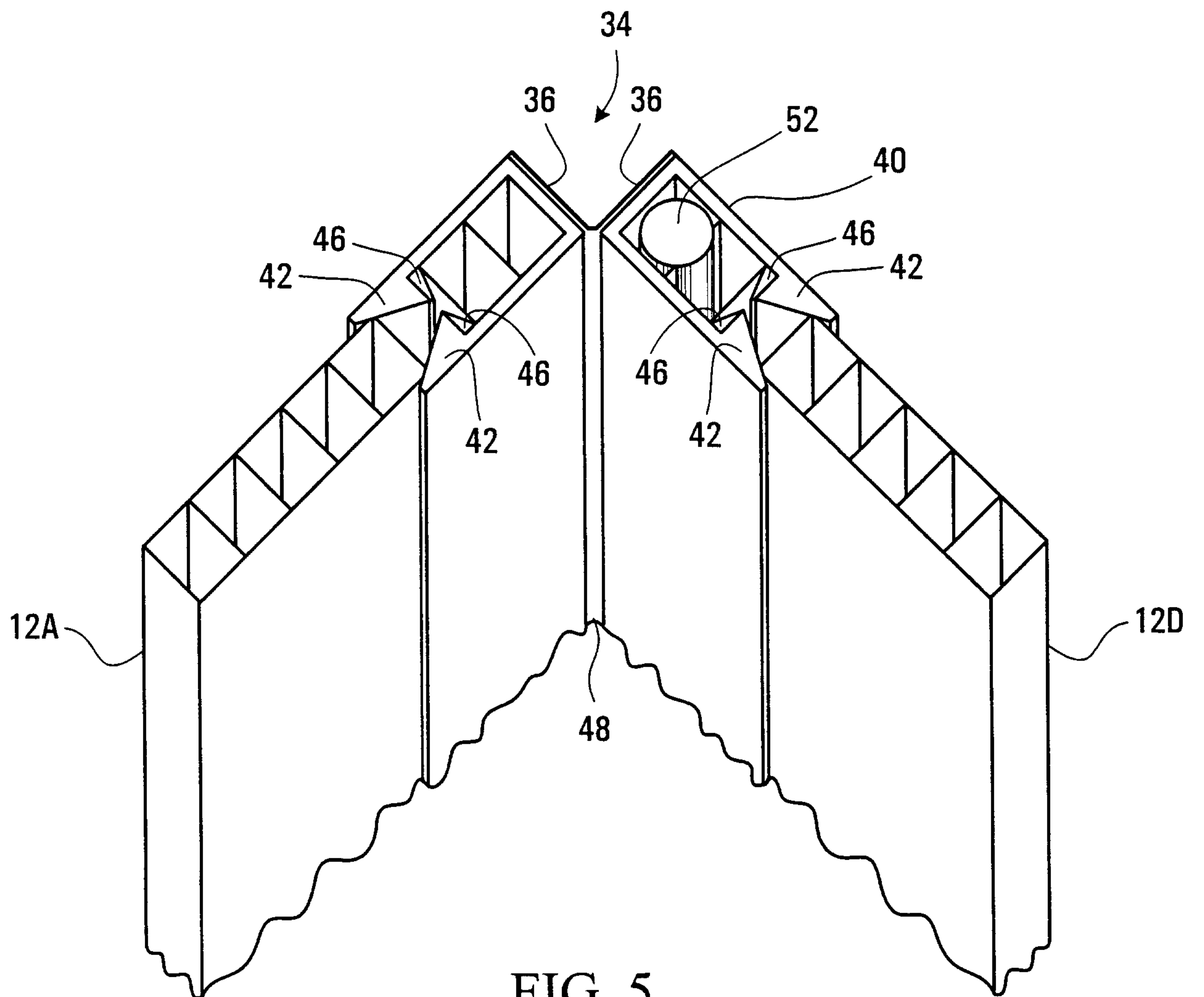


FIG. 5

FIG. 6

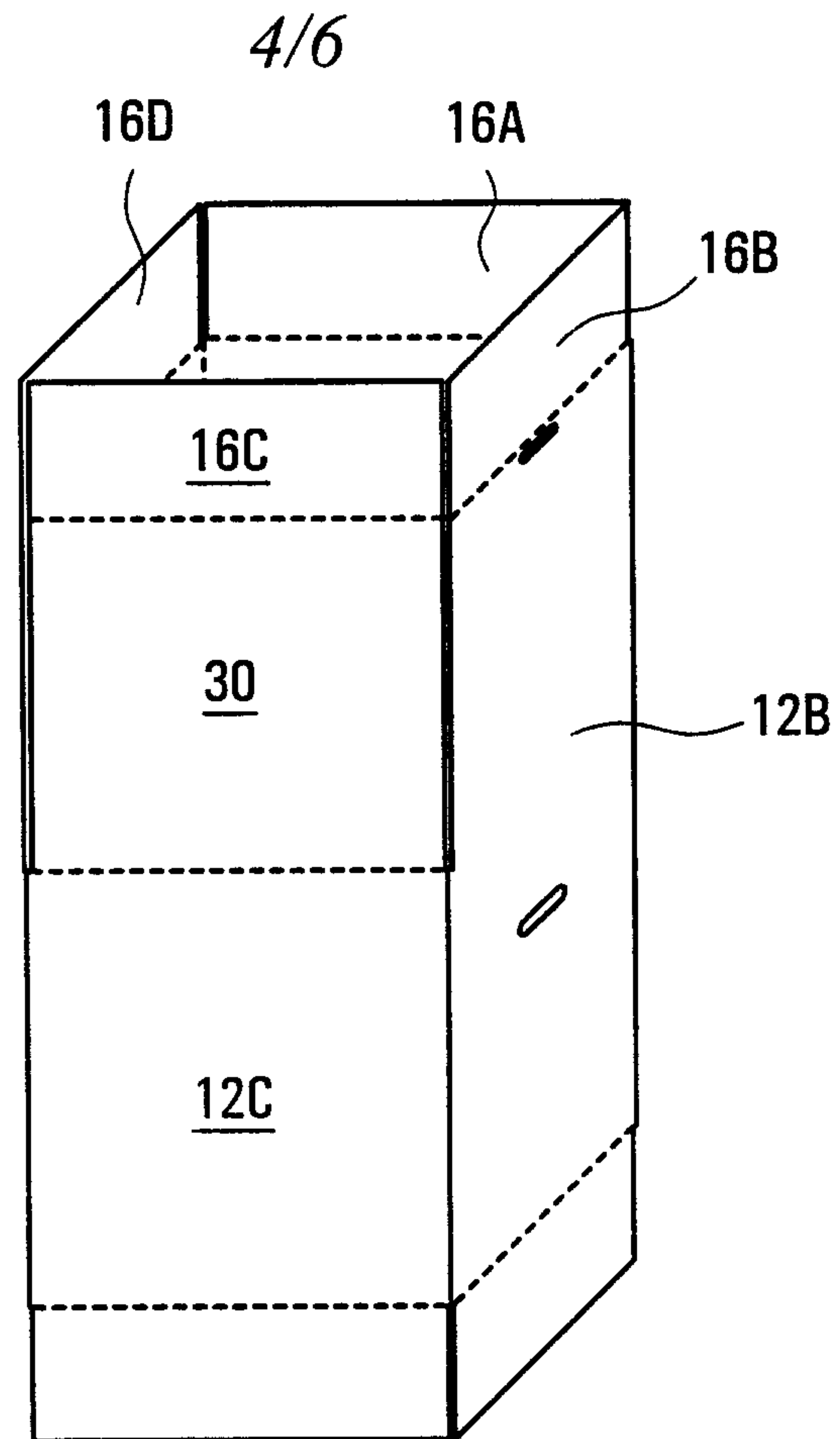


FIG. 8

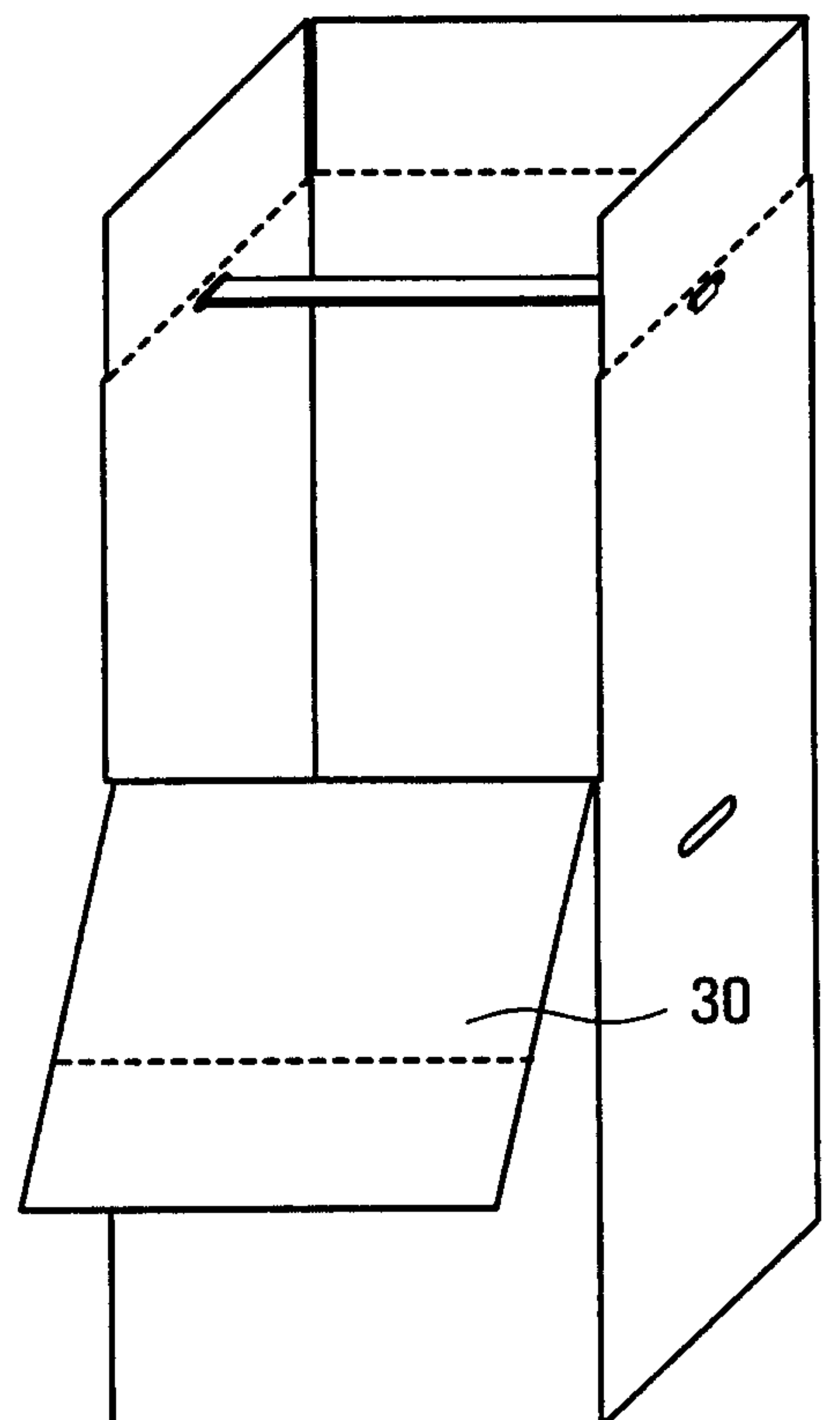
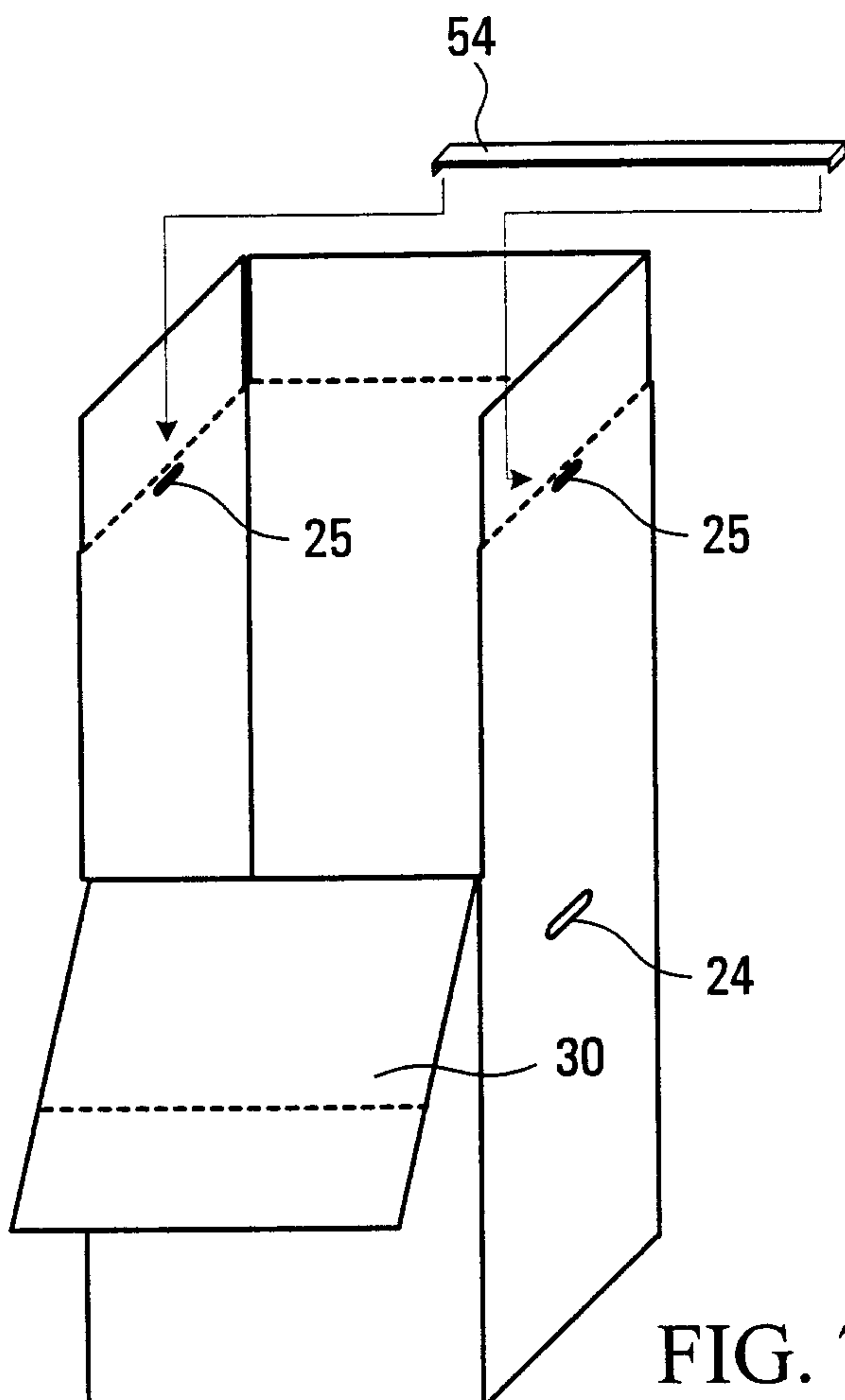


FIG. 7



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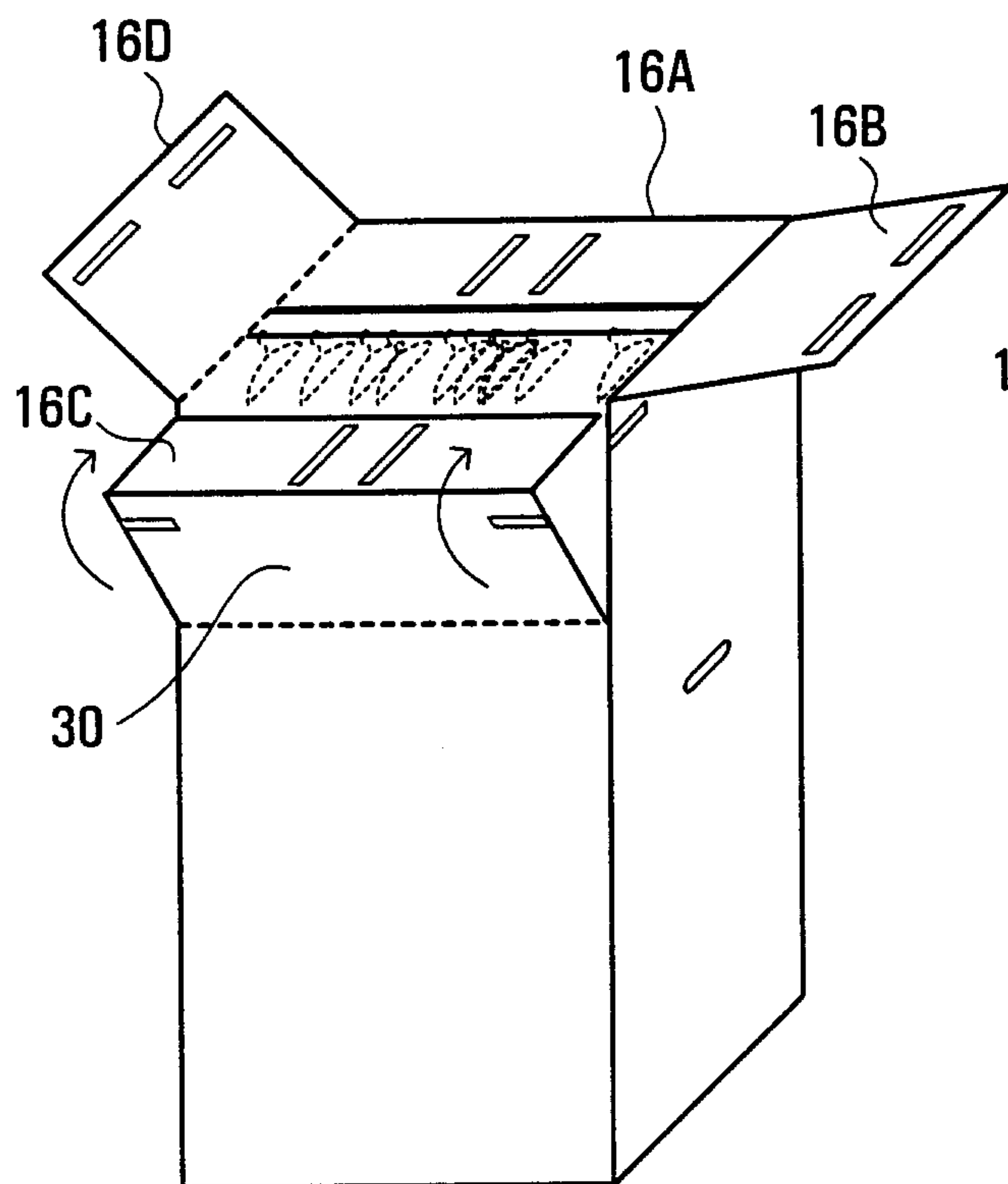


FIG. 9

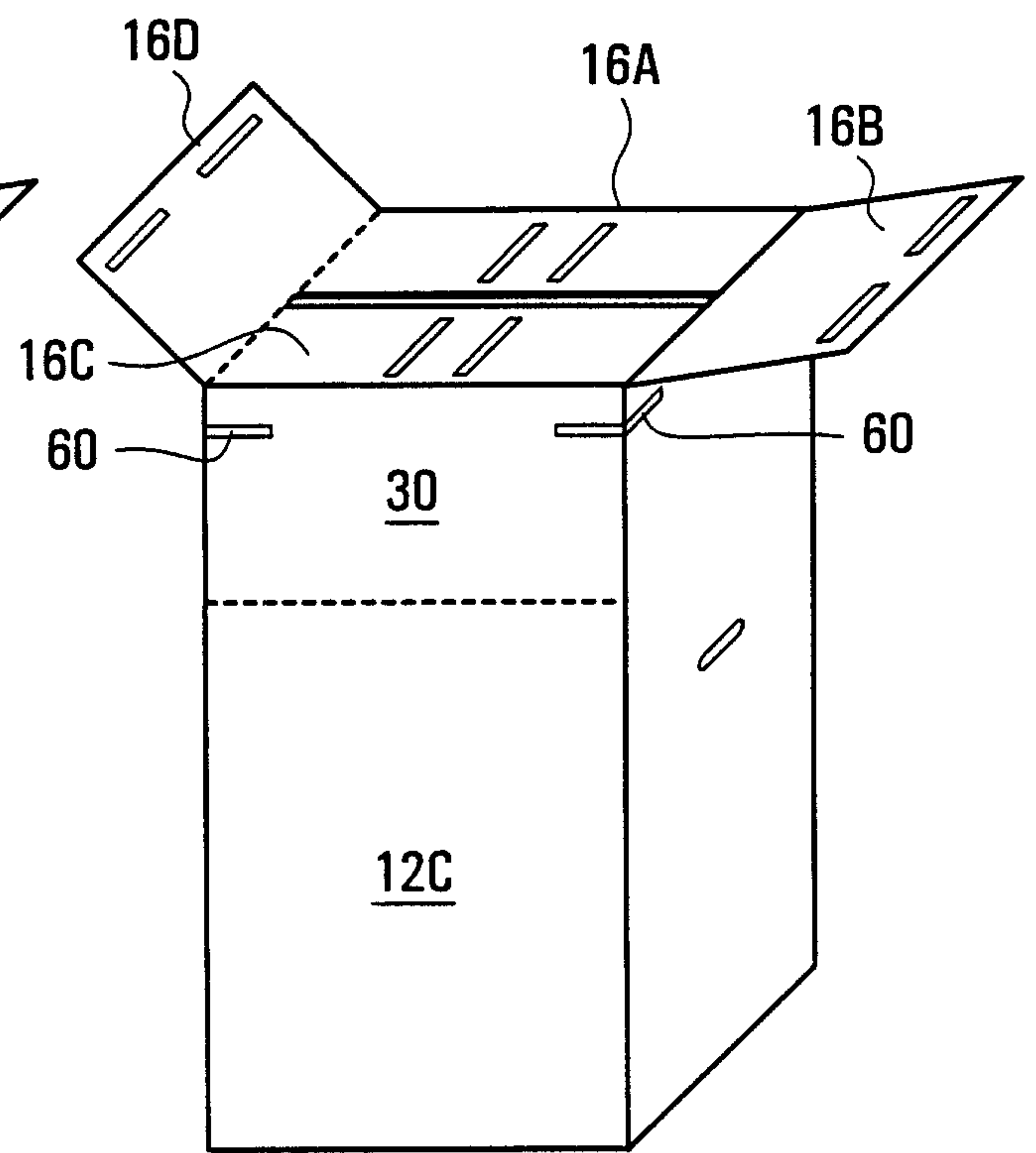


FIG. 10

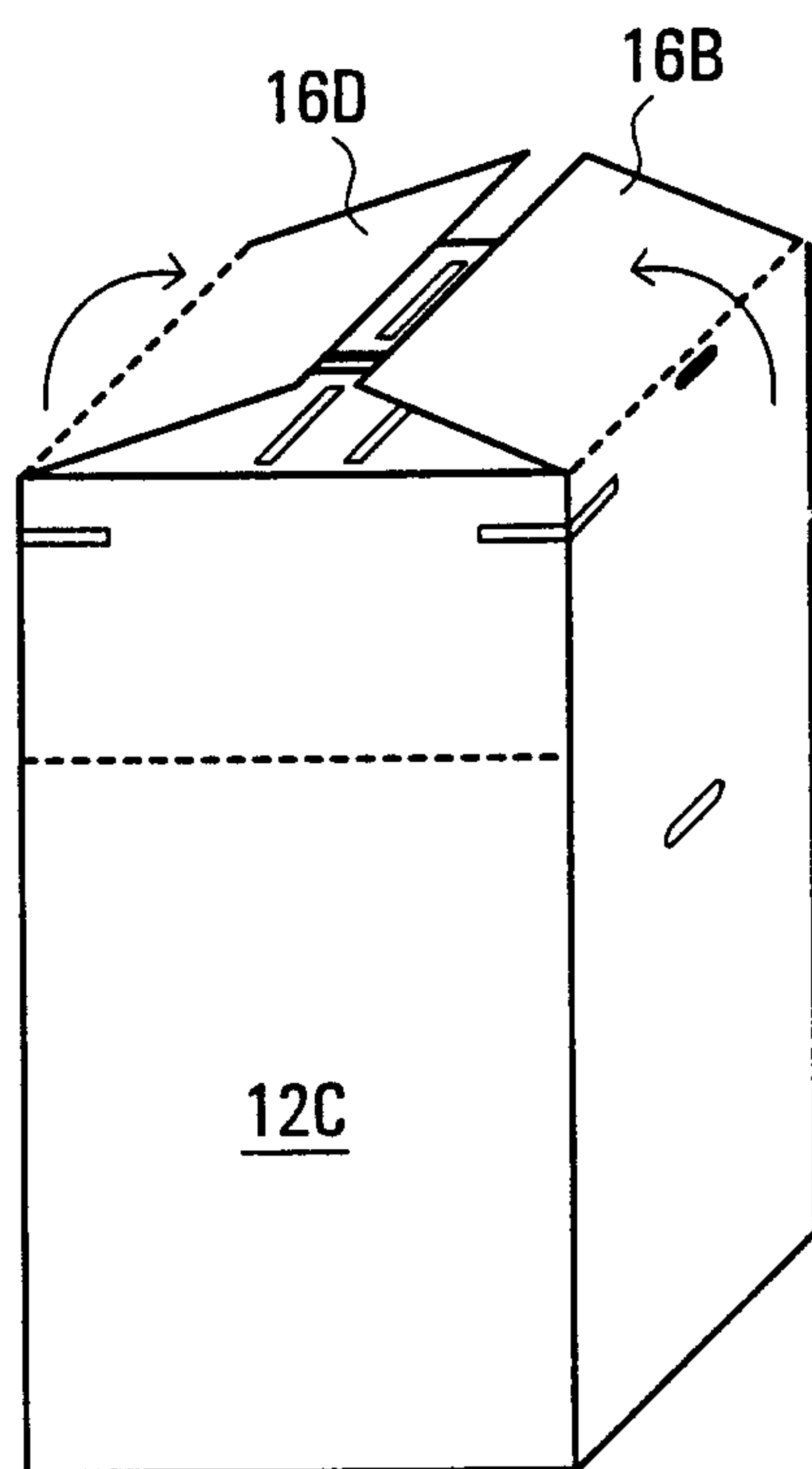


FIG. 11

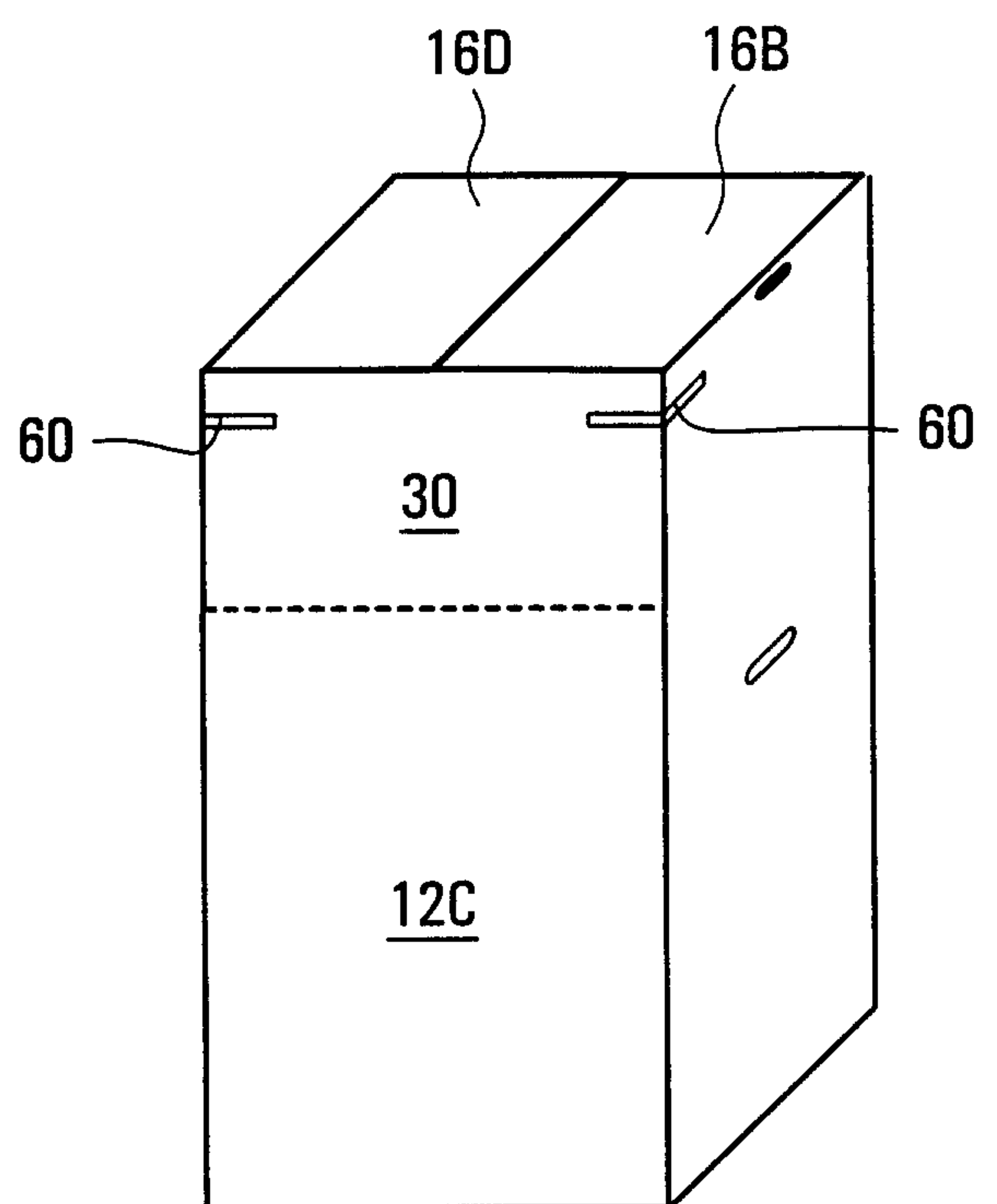


FIG. 12

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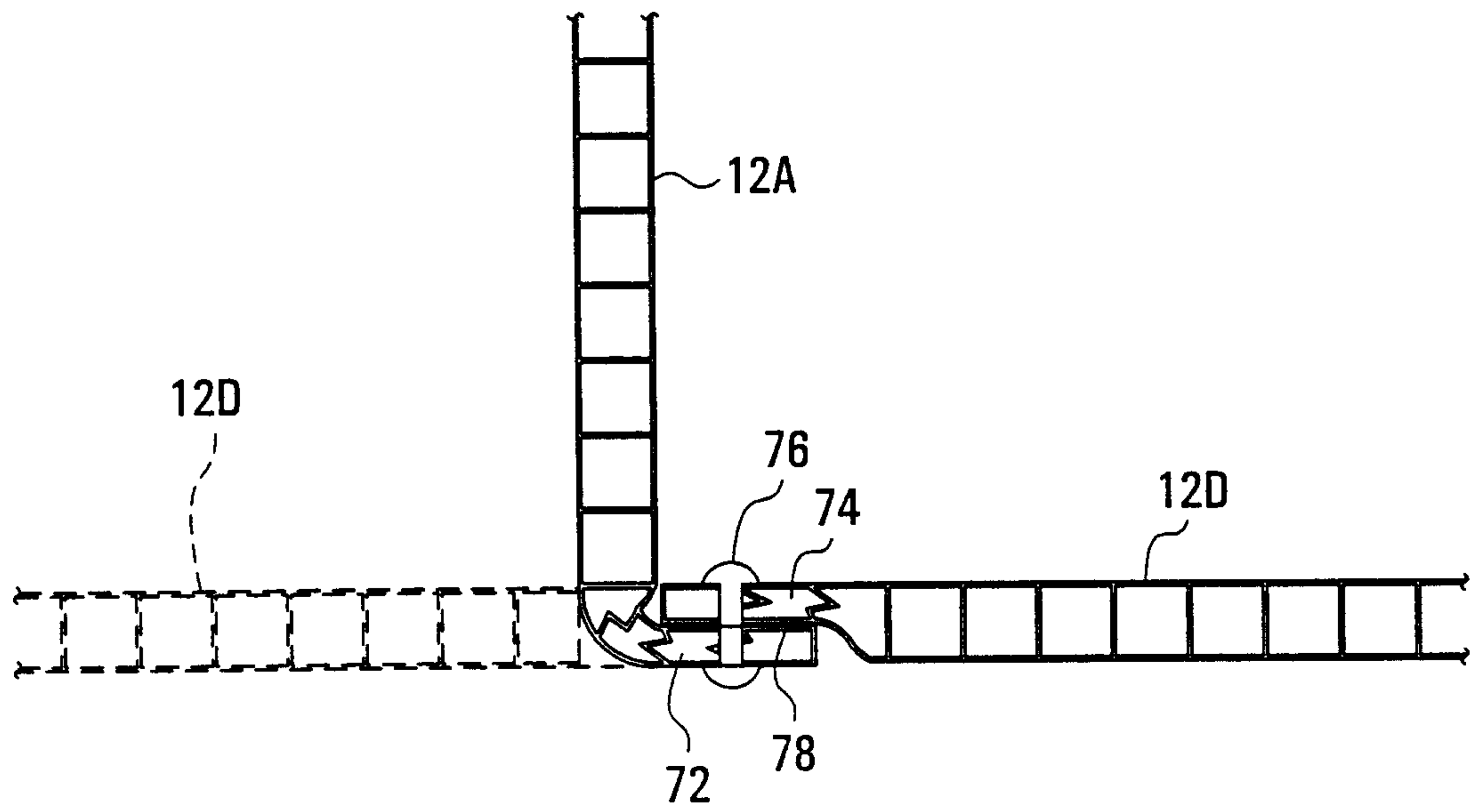


FIG. 13

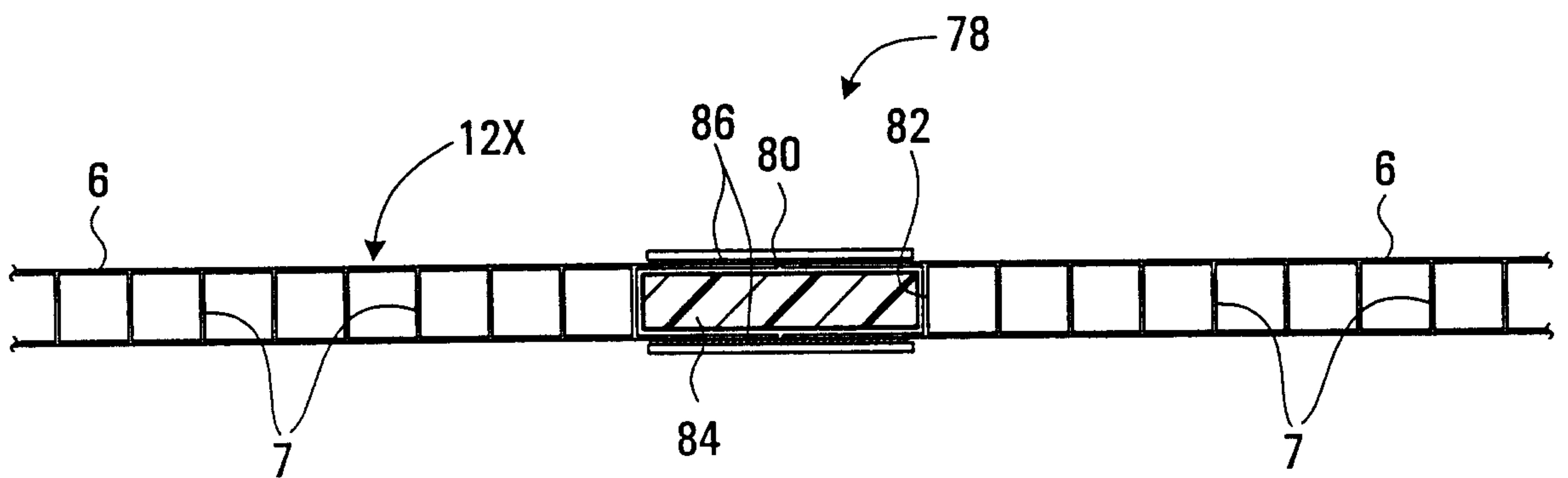


FIG. 14

