(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 665 166 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **95300506.3**

(22) Date of filing : **27.01.95**

(51) Int. Cl.[6] : **B65D 5/44,** B65D 5/00

(30) Priority : **27.01.94 GB 9401604**

(43) Date of publication of application :
02.08.95 Bulletin 95/31

(84) Designated Contracting States :
AT BE CH DE DK ES FR GB GR IE IT LI NL PT SE

(71) Applicant : **MITCHELL PACKAGING LIMITED**
P.O. Box 16,
Alma Park Industrial Estate
Grantham, Lincolnshire NG31 9SF (GB)

(72) Inventor : **Finney, Andre Ronald**
165 Manthorpe Road
Grantham, Lincolnshire, NG 31 8DH (GB)

(74) Representative : **Jones, Andrée Zena et al**
CRUIKSHANK & FAIRWEATHER
19 Royal Exchange Square
Glasgow, G1 3AE Scotland (GB)

(54) Container with support posts.

(57) The invention relates to a container particularly for heavy duty use or in harsh storage conditions. The container comprises wall panels (2, 4, 6, 8) formed from a blank (10). In an example illustrated, each wall panel (2, 4, 6, 8) or a reinforcing member thereof (69) is provided with inturned flanges which contribute to the formation of a bottom wall of the container. A lower retainer means (64) may also form part of the bottom wall. The retainer means (64) serves to retain in position each of four interior corner support posts (42) of plastics material which are of generally triangular cross-section so as to provide a flat face (43) confronting the contents of the container. Each post (42) is provided with a top end cap (40) and preferably a lower end cap (56) having knurled outwardly facing surfaces (46, 60) so as to enhance grip on a storage pallet. A lid (72) is provided to close the container but apertures (82) are provided to expose the surfaces (46).

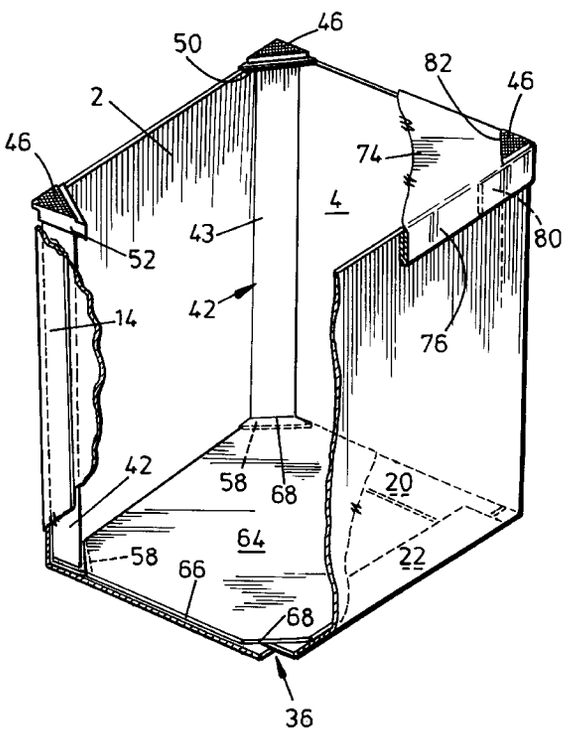

FIG.16

EP 0 665 166 A1

The invention is concerned with improvements in or relating to containers and container systems, particularly but not exclusively reinforced containers suitable for use in severe storage and handling conditions, for example, involving extremes of temperature or other atmospheric conditions.

It is conventional practice to handle medium to large size containers with the use of pallets and therefore containers themselves have been designed with palletisation in mind. A type currently in use may therefore comprise a box-like container formed, for example, from corrugated cardboard or similar material, may be press-cut and folded for assembly by adhesive or stitching wire into the container form and provided with corner posts of suitable material such as wood, received within slots formed in the container wall. The use of wood, however, is undesirable in many contexts, such as use in the food industry, because of the risk of contamination and other disadvantages. Moreover, the slotted corner portions, when inverted inwardly of the container wall to provide a retaining strip for encircling the post, may be found to project, together with the post itself, within the storage space defined by the container, to an extent which is undesirable in situations where it is necessary to make full use of the volume available.

It is therefore an object of the present invention to provide a container suitable for use with a palletised container system, capable of withstanding severe storage and handling conditions, and in which available space for storage of contents is maximised.

The invention therefore provides in one of its aspects, a container comprising a open box erected from foldable sheet material and maintained in shape by the provision of a plurality of posts, each positioned internally at one corner thereof so as to extend throughout the height of the box, said posts each provided with means at an upper end thereof to engage a lip portion of the open box, there being further provided lower retainer means received at a base portion of the box and adapted to impinge against lower end portions of each post present in the box so as to prevent movement of the posts from the box corners, said box being closable by a top closure member.

The invention further provides in another of its aspects a container comprising a box-like means formed from foldable sheet material, said box-like means comprising a plurality of wall panels defining angled corners at adjacent marginal side portions of each panel, lower edge portions of at least selected ones of said panels having inwardly turned flange means securable together to form an at least partial base portion of the box-like means, there being provided a plurality of vertical support posts each adapted to be received in one of said corners, said posts each comprising two side surfaces adapted to confront or to contact said marginal side portions of the panels and a further, free, surface arranged to face inwardly of the box-like means towards a vertical centre-line thereof, said box-like means further comprising a top end cap for each post and lower retainer means adapted to retain each of said posts in position, each said top end cap being provided with means for engaging upper edge portions of said wall panels.

Advantageously, said lower retainer means for said posts may comprise a spreader device received with the container at the base thereof and adapted to impinge against lower end portions of said posts to assist in maintaining the posts in a fully spaced-apart condition in their respective corner positions. Conveniently, said spreader device may comprise a panel member serving to close the base of the container in the manner of a base panel. Where a base panel is already present, for example formed by the inturned flanges of the wall panel, said spreader device may be in the form of a spider or other bracing means.

Where required, additional reinforcement may be provided by a two-part construction of the wall panels, said panels being constructed to include an external sleeve member. If desired, said inwardly turned flange means may be provided on the sleeve member of the said wall panels.

Preferably, in addition to the top end cap, each post may be provided with a lower end cap having a projecting lip adapted to be contacted by said spreader device.

Advantageously, at least end portions of said posts may be at least partially hollow, lugs provided on said top end caps and, if present, said lower end caps, being received within the hollow end portions of the posts.

Conveniently, said free surface of each post may be planar, or may be concave, part-cylindrical or re-entrant so as to minimise the occupation of space by the post within the container.

Advantageously, said container wall portions may be formed from a blank of corrugated cardboard, preferably of at least double or triple-ply heavy duty construction. If desired the cardboard may be plain or may be waxed or otherwise proofed or reinforced. In certain contexts, it may be found preferable to provide a double wall construction. Other reinforcements such as integral tapes or bands may be provided as deemed necessary.

Preferably, the posts may be of ABS plastics material or polypropylene or other suitable plastics material.

Conveniently, said top end caps may be provided with a projecting lip arranged to assist in supporting a top panel provided to act as a closure means for said container when filled with the desired contents.

In an example to be described below, outer surfaces of said top end caps and of said lower end caps are provided with knurled or otherwise roughened areas, the arrangement being such that when a plur-

ality of filled containers are stacked one upon another in a column by the use of pallets, the roughened surface of each cap engages with the intervening pallet to stabilise the columns and minimise the risk of slippage. In this way, the number of containers that may be safely stacked one upon the other is maximised.

There will now be described, with reference to the drawings, an example of a container system and of a container for use therein according to the invention. It will be understood that the description is given by way of example only and not by way of limitation.

In the drawings:-

Figure 1 is a perspective view of wall panels of a container according to the invention;

Figure 2 shows a foldable blank from which the panels of Figure 1 are erected;

Figure 3 shows a top plan view of a top cap for a post for use in the container;

Figure 4 shows a side view of the top cap of Figure 3 about to be attached to the posts;

Figure 5 shows an end view of the post of Figure 4;

Figure 6 shows an underneath plan view of the top cap and the position of lugs provided thereon;

Figure 7 shows the interengagement of the lugs of Figure 6 with the end portion of the post;

Figure 8 shows the attachment of a lower cap to the opposite end of the post;

Figure 9 is a top plan view of the lower cap of Figure 8;

Figure 10 is an underneath plan view of the lower cap;

Figure 11 is a perspective view of a spreader device for use in the container;

Figure 12 is a perspective view of an alternative spreader device;

Figure 13 is a view, similar to that of Figure 1 of a second example of a container according to the invention;

Figure 14 is a fragmentary view to an enlarged scale of an upper corner portion of two wall panels of Figure 1;

Figure 15 is a plan view of a blank suitable for use as a lid for the examples of containers illustrated; and

Figure 16 is a perspective view of the assembled container of Figure 1, partially broken away for the sake of clarity.

Wall panels 2, 4, 6 and 8 of a first example of a container are formed by procuring a heavy-duty cardboard blank 10 as shown in Figure 2, and by folding the blank 10 along predetermined fold lines 12. A flange 14 is provided at one longitudinal edge of the panel 2, to which flange adhesive or other bonding means is applied to secure it to longitudinal margins 16 of the wall panel 8. In the present example each panel, 2, 4, 6, 8, is provided with a flange 18, 20, 22, 24, positioned at a lower edge of each panel, respectively. It will be observed that in Fig. 1 the flanges 18, 20, 22, 24 do not extend across the full width of their respective panels. It will be understood that flange 18 may be dimensioned so as to abut with flange 22 and flange 20 with 24, if preferred. There are provided at an upper edge of the blank a number of shallow cut-away portions at 26, 28, 30, 32 and 34. The purpose of these features will be explained below.

The container is erected by folding all flanges and wall portions inwardly about the lines 12 and securing the flange 14 to the margins 16, as indicated above, by suitable means such as gluing or stitching. Flanges 18 and 22 are inturned in a first step in the formation of a part-base construction and flanges 20 and 24 are then secured at end portions thereof to corresponding surfaces of the flanges 18 and 22. It will be observed that in the present example small apertures 36, which may be substantially square as illustrated, or may be triangular, are formed at each bottom corner, together with a large central aperture 38. It will be appreciated that if flanges 18 and/or 20 abut with flanges 22 or 24 respectively, no aperture 38 will be formed. Figures 3 and 4 show one of four top end caps 40 for use in association with upper ends of four support posts 42 (Figures 4, 8 and 13) one of which posts is received in each internal corner of the container. Each top end cap comprises a triangular portion 44 having a knurled upper surface 46 and three contoured lugs 48 provided on its lower surface for engagement with the upper ends of the posts 42. A flange 50 projects from the longest side of the portion 44 at a level slightly below that of the knurling. Further flanges 52 depend from respective ones of the two remaining sides of the portion 44. It will be appreciated that the distance between the flanges 52 and the lugs 48 in use will be selected to accommodate the thickness of the carton wall.

For application, for example, in the food industry the use of wood is undesirable not only because of the risk of contamination from wood splinters, fungal and insect infestation but also because wood has a limited useful life span and is hygroscopic.

For these reasons, each post 42 is, in the present example, formed of ABS plastics material although other materials may be found suitable. The posts are triangular in cross-section and are hollow, being provided with reinforcing webs 54. The lugs 48 are received in a firm fit in cavities formed between the webs and the post walls (Figure 7). In the present example, additional purchase may be given to the engagement of the lugs 48 in the cavity by provision of ribs 49 formed on outwardly facing surfaces of the lugs 48.

At the lower end of each post 42 is received a lower end cap 56, shown in Figures 8 to 10, which comprises a triangular portion 58 having a lower knurled surface 60. In certain circumstances, outer corners 61 of the portion 58 may be liable to damage and may

be dispensed with if preferred. Projecting upwardly from the portion 58 are three lugs 62 provided with ribs 63, so as to engage with the cavities of the post 42 in the same manner as that of the lugs 48 of the top cap.

Figure 11 shows a spreader device in the form of a panel member 64 which is inserted into the erected container to lie flat at the bottom thereof, in the manner of a base plate. Edge portions 66 of the spreader panel are intended to be substantially in contact with the walls 2, 4, 6 and 8 of the container at the fold line with their respective flanges 18, 20, 22 and 24 and cut edges 68 of the corner portions are intended to be in contact with the lower end caps of the posts 46 as will be explained below.

Figure 12 shows an alternative spreader device which comprises a panel member 64', on edges of which are provided flanges 65 which are folded upwardly as shown and lie in a vertical position within the box-like container. The spreader device may if necessary serve as a base plate. The flanges 65 give added thickness to the wall panel arrangement in regions of the container where the weight of contents may be thought likely to cause bulging of the container, say, under particularly adverse conditions of storage. Edge portions 66' are provided at the fold-lines of the member 64'. Conveniently where the material is corrugated cardboard as in the present example, the direction of the fluting is at 90° to the longest side of the container for maximum support.

In other circumstances in which such reinforcements may be deemed necessary, this may be provided by the provision of webbing or strapping of suitable material applied around the outer perimeter of the container in a conventional manner. Alternatively, a hinged metal brace or a close-fitting sleeve may be provided around the container shown in Figure 1. If desired the sleeve may be of similar material to that of the wall panels 2, 4, 6, 8. However, in Figure 13 there is illustrated a second example of a container according to the invention in which a reinforcement member 69 is provided as a structural portion of wall panels 2', 4', 6' and 8'. In this Figure, the wall panels 2', 4', 6' and 8' have no lower flanges as have panels 2, 4, 6, 8 of Figure 1 and thus the container itself is effectively sleeve-like. Surrounding the lower portion of the wall panels 2', 4', 6' and 8' is the reinforcement member 69 in the form of a sleeve, on lower edges of which as shown in Figure 13 are formed flange members 18', 20', 22' and 24' which perform the same function as do the flanges 18, 20, 22 and 24 of Figure 1. As before, flanges 18', 20', 22' and 24' may be formed so as to have sufficient length to abut, if preferred. The sleeve member 69 may be a sliding fit on the container or it may be preformed as, for example, a laminate. If desired, the member 69 may be reinforced with bands or tape.

Figure 14 illustrates a suitable three-ply construction of corrugated cardboard used to provide the blank for the container wall panels. The cardboard may be waxed, if desired, and will have a substantial heavy-duty capability. It will be understood that for heavy duty use, it is necessary for the container to resist crushing in a vertical direction because of the weight of the stacked containers and also resist bursting in a horizontal direction when filled and stacked. These strengths are respectively provided in the present example by the provision of the posts 42 and by the use of three plies of treated corrugated cardboard in the wall panels. Figure 12 also illustrates one of the cut-away portions 28 which receives one of the top end caps.

Figure 15 illustrates a cardboard blank 72 suitable to be erected as a lid for use in closing the container when filled. The lid comprises a top wall portion 74 of the container, each edge portion of the top wall 74 having a downwardly folded flange portion 76. 78, 76, 78, which are interengaged by means of extension tabs 80 formed at each end of flange portions 78 so as to be held captive in the double-fold of the flange portions 76. Such formation of a lid is conventional in the art.

In this example, there are provided at the corners of the top wall portion 74 of the lid, four triangular apertures 82, the purpose of which will become apparent from the following description.

The assembly of the first container beyond the stage shown in Figure 1 will now be described with reference to Figure 16.

With the top end caps 40 and the low end caps 56 inserted in the hollow end portions thereof, the four posts 42 are placed one in each of the four internal corners of the container. The flanges 52 of the top caps 50 are arranged so as to engage the upper edge of the container wall panels in the vicinity of the cut-out portions 28, 30, 32 and 34 respectively. Thus the posts are firmly held in position at their upper ends so as to be firmly held, in their respective corners, in contact with the wall panels. The spreader panel 64 is now introduced into the container and pressed downwardly to the bottom with the aid of an appropriate tool if necessary, the edge portions 68 contacting the respective surfaces 43 of the posts 42 and resting upon the flange 58 of each of the lower end caps 56. Thus the lower ends of the posts are maintained in a spread-apart condition by the panel 64 which acts as a base panel in the present example to close over the aperture 38. The posts are thus firmly held, at top and bottom, in a vertical position. In addition, the base panel 64 is in firm contact with the flanges 18, 20, 22, 24 inturned beneath the panel, and when the container is filled the additional weight forces the panels into firm contact with the pallet therebeneath.

When the container is filled with the goods to be stored therein, the closure lid member 72 will be placed on the top of the container. The closure mem-

ber is provided with corner apertures 82 adjacent each top end cap 40 to allow the knurled portion 46 thereof to be received therewithin so as to lie generally flush with the top surface of the lid. The closure member being of a one-piece cardboard construction, die cut, is capable of being folded to form the desired configuration without the need for fasteners or adhesive. The integrally formed downwardly turned flanges 76, 78 are deep enough to cover the flanges 52 of the top caps 40 and adequate to remain firmly in place during storage and handling. It will be understood that where the goods are in particulate form or comprise small items of produce, the goods may be received within a plastics bag which acts as a liner for the container.

The containers may then be stacked one upon the other when filled. Additional stability is given to a column of containers by the provision of the knurled portions 46 and 60 on the top end caps 40 and lower end caps 56 which enhances contact with the pallets used in the handling process and which are retained between each container in the column or stack. The heavier the load the better this contact becomes, and the presence of the posts 42 assist in the prevention of buckling or deformation of the container in severe conditions, such as long-term cold storage and the like.

Various modifications may be made within the scope of the invention as defined by the following claims.

Claims

1. A container comprising a open box erected from foldable sheet material (10) and maintained in shape by the provision of a plurality of posts (42), each positioned internally at one corner thereof so as to extend throughout the height of the box, said posts (42) each provided with means (50) at an upper end thereof to engage a lip portion (26, 28, 30, 32) of the open box, there being further provided lower retainer means (64) received at a base portion of the box and adapted to impinge against lower end portions of each post (42) present in the box so as to prevent movement of the posts from the box corners, said box being closable by a top closure member (74).

2. A container comprising a box-like means formed from foldable sheet material (10), said box-like means comprising a plurality of wall panels (2, 4, 6, 8; 69) defining angled corners at adjacent marginal side portions of each panel, lower edge portions of at least selected ones of said panels having inwardly turned flange means (18, 20, 22, 24) securable together to form an at least partial base portion of the box-like means, there being provided a plurality of vertical support posts (42) each adapted to be received in one of said corners, said posts each comprising two side surfaces adapted to confront or to contact said marginal side portions of the panels and a further, free, surface (43) arranged to face inwardly of the box-like means towards a vertical centre-line thereof, said box-like means further comprising a top end cap (40) for each post (42) and a lower retainer means (64) adapted to retain each of said posts in position, each said top end cap (40) being provided with means for engaging upper edge portions (26, 28, 30, 32) of said wall panels.

3. A container as claimed in either one of claims 1 and 2, wherein said lower retainer means (64) for said posts (42) comprises a spreader device received with the container at the base thereof and adapted to impinge against lower end portions of said posts (42) to assist in maintaining the posts in a fully spaced-apart condition in their respective corner positions.

4. A container as claimed in claim 3, wherein said spreader device comprises a panel member (64) serving to close the base of the container in the manner of a base panel.

5. A container as claimed in claim 3, wherein the spreader device (64) is in the form of a bracing means.

6. A container as claimed in any one of the preceding claims, wherein there is further provided a lower end cap (56) having a projecting lip (58) adapted to be contacted by said lower retainer means (64).

7. A container as claimed in any one of the preceding claims, wherein said posts (42) have end portions which are at least partially hollow, lugs (48) on said end caps (40) being received within the hollow end portions of the posts.

8. A container as claimed in any one of the preceding claims, wherein said top end caps (40) are provided with a projecting lip (50) to engage with and support a lid means (74).

9. A container as claimed in any one of the preceding claims, wherein said end caps (40;56)are provided with knurled or otherwise roughened areas (46;60).

10. A container as claimed in any one of the preceding claims, wherein said wall portions (2', 4', 6', 8') incorporate reinforcement means (69) adapted to reduce any tendency for the container to

bulge outwardly when filled.

11. A container as claimed in claim 9, wherein said top closure member (74) is provided with corner apertures (82) in which are received said knurled portions (46) so as to lie at least substantially flush with a top surface of the member (74).

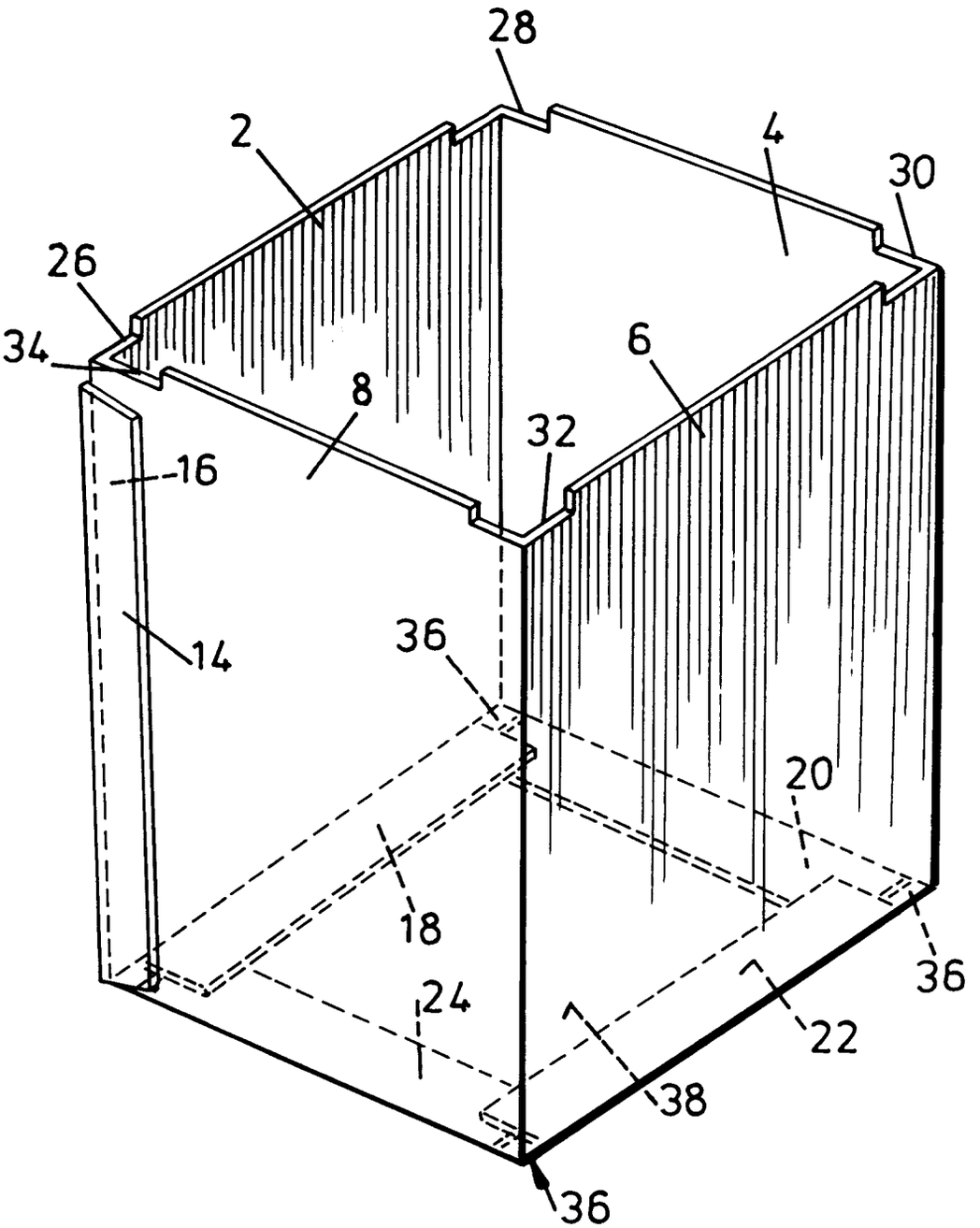

FIG. 1

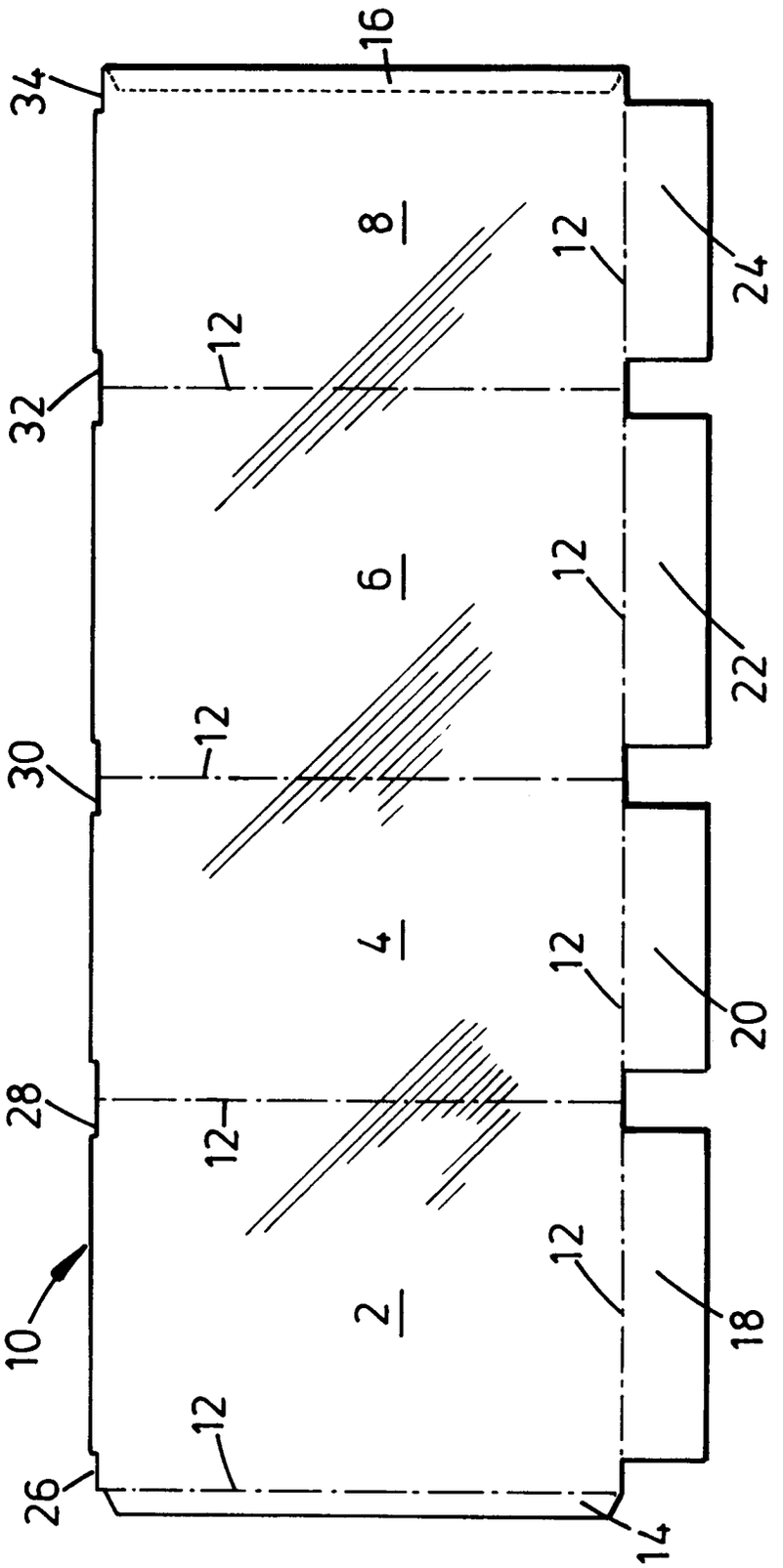

FIG. 2

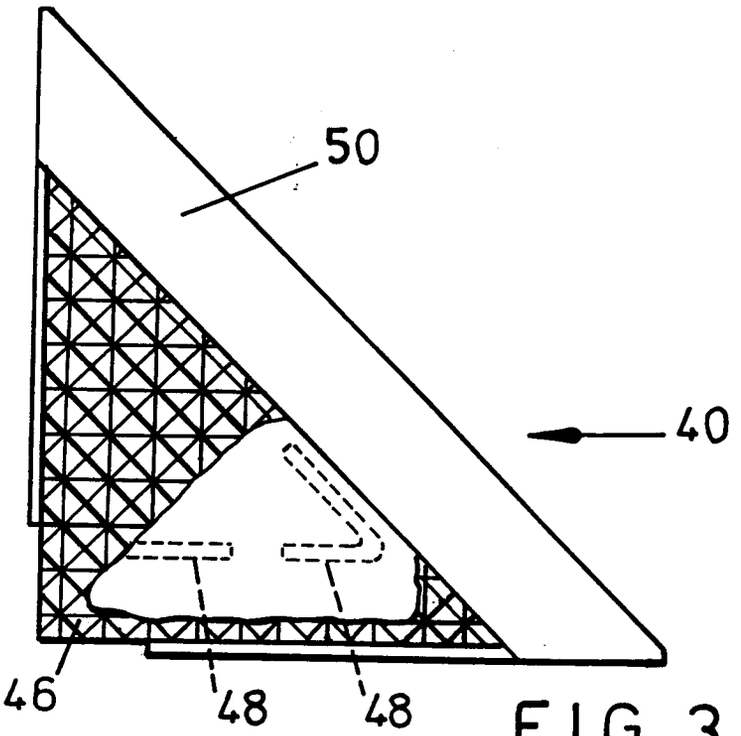

FIG. 3

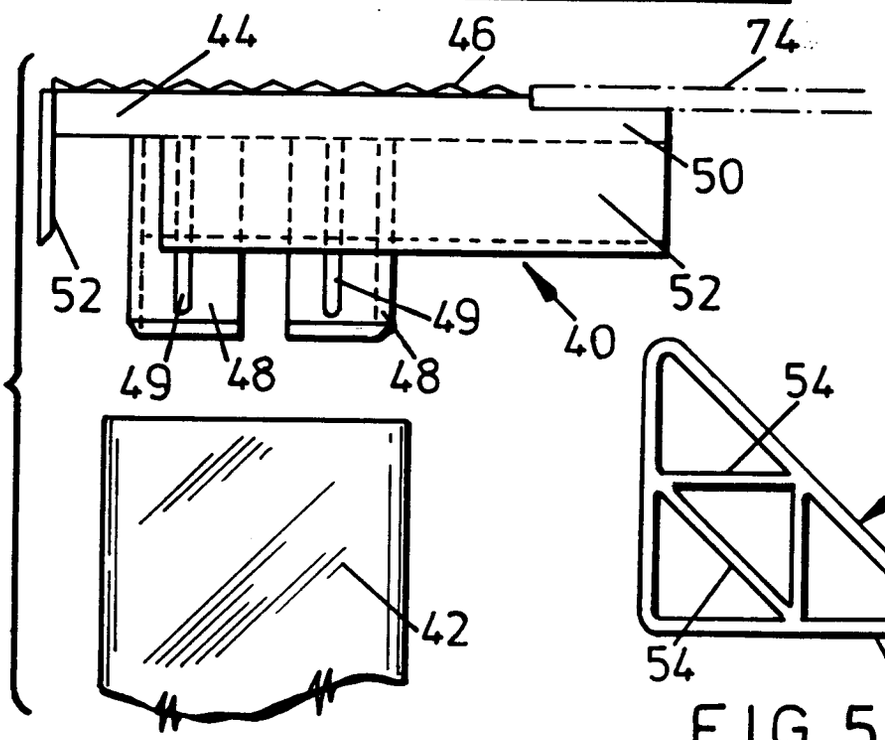

FIG. 4

FIG. 5

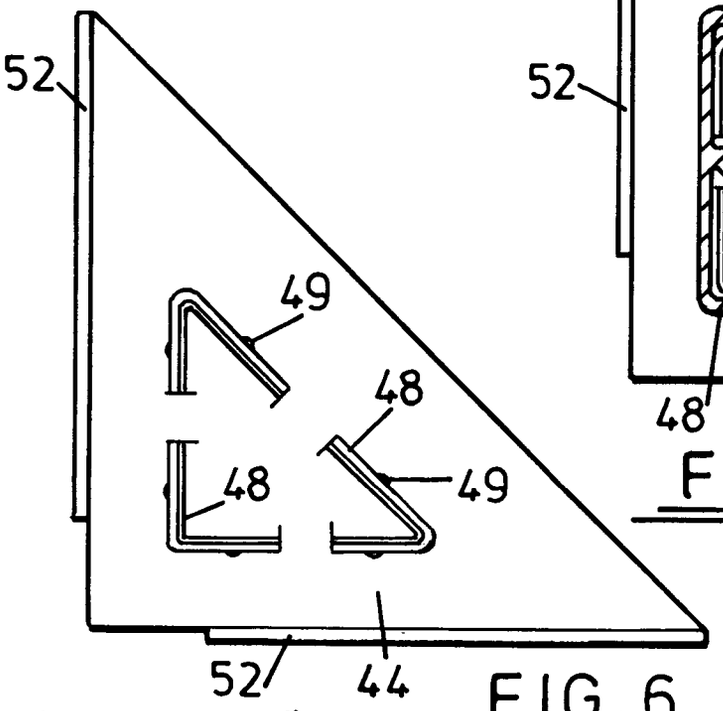

FIG.6

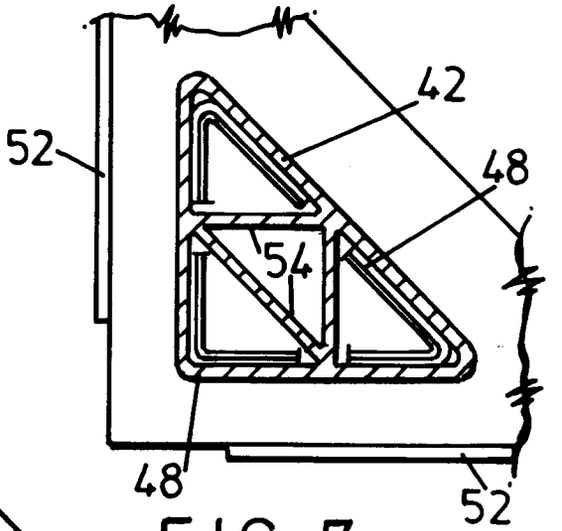

FIG.7

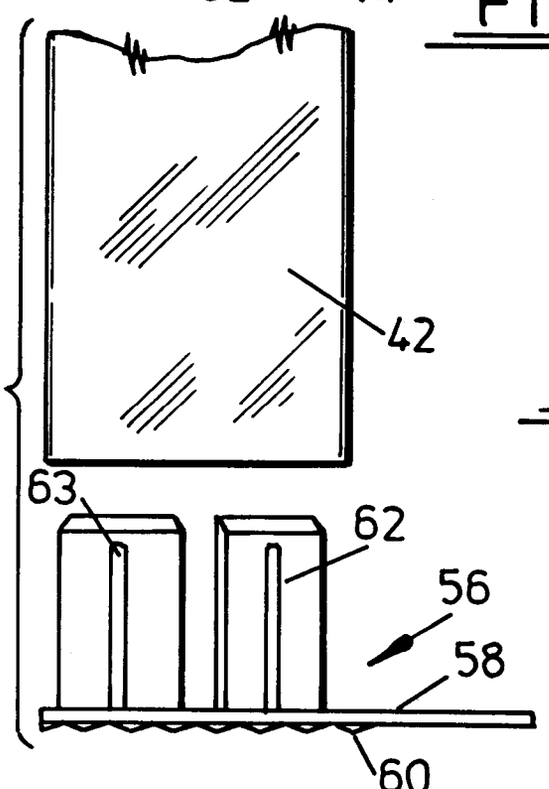

FIG.8

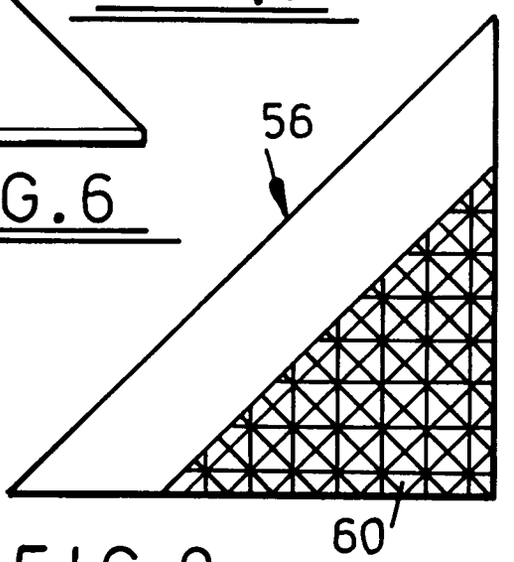

FIG.9

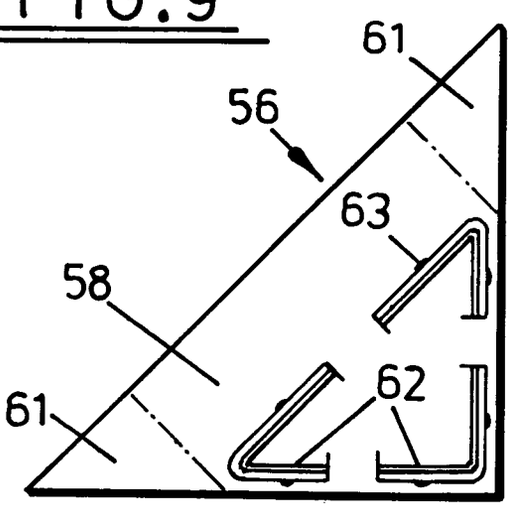

FIG.10

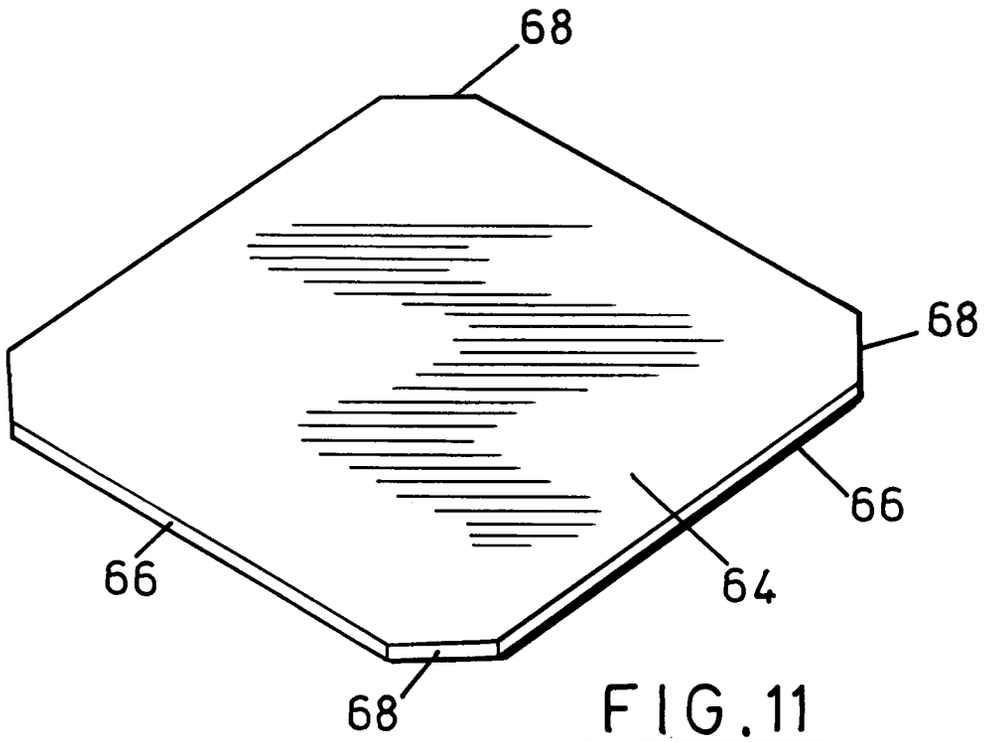

FIG.11

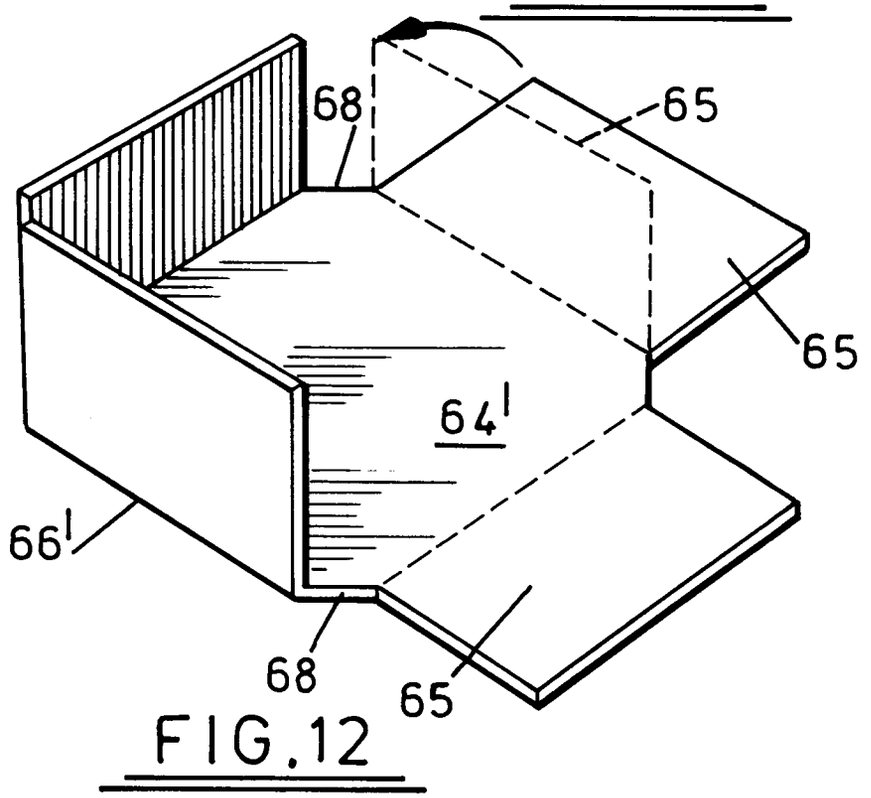

FIG.12

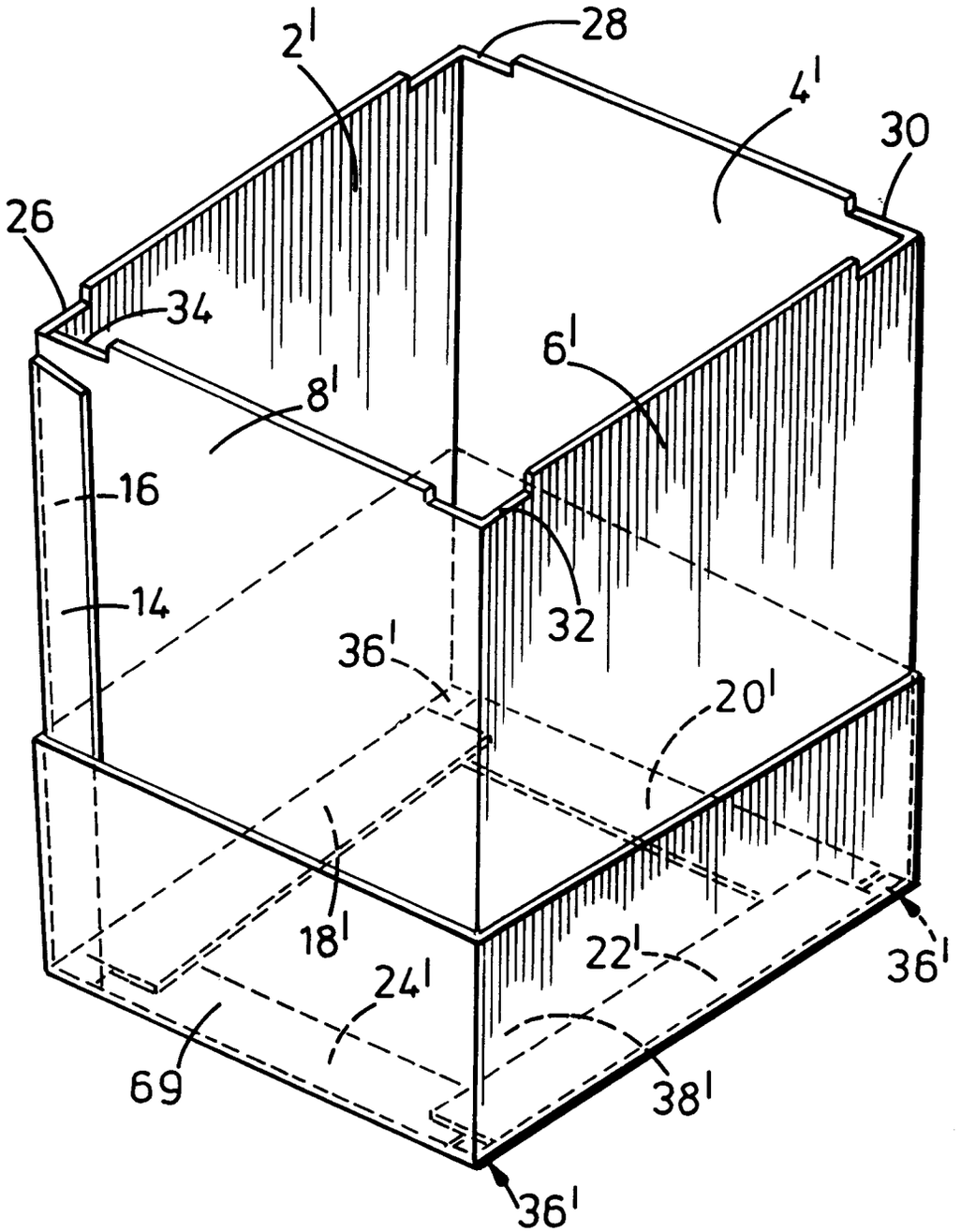

FIG. 13

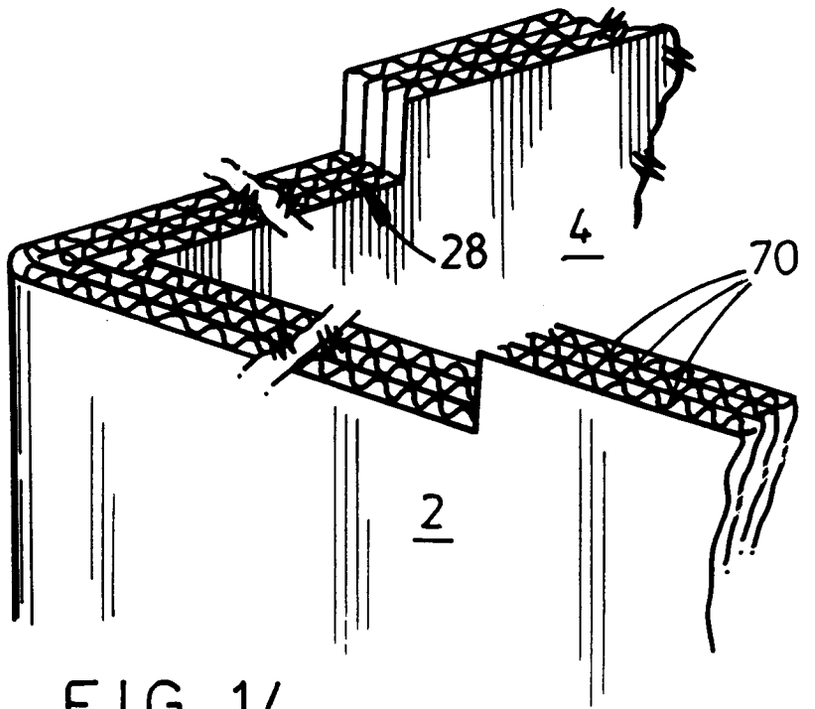

FIG. 14

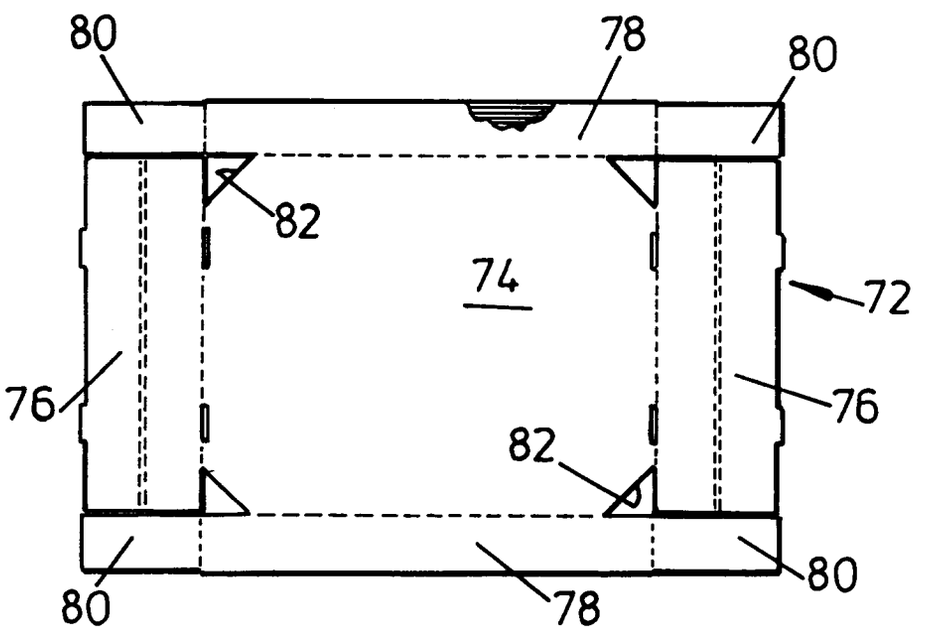

FIG. 15

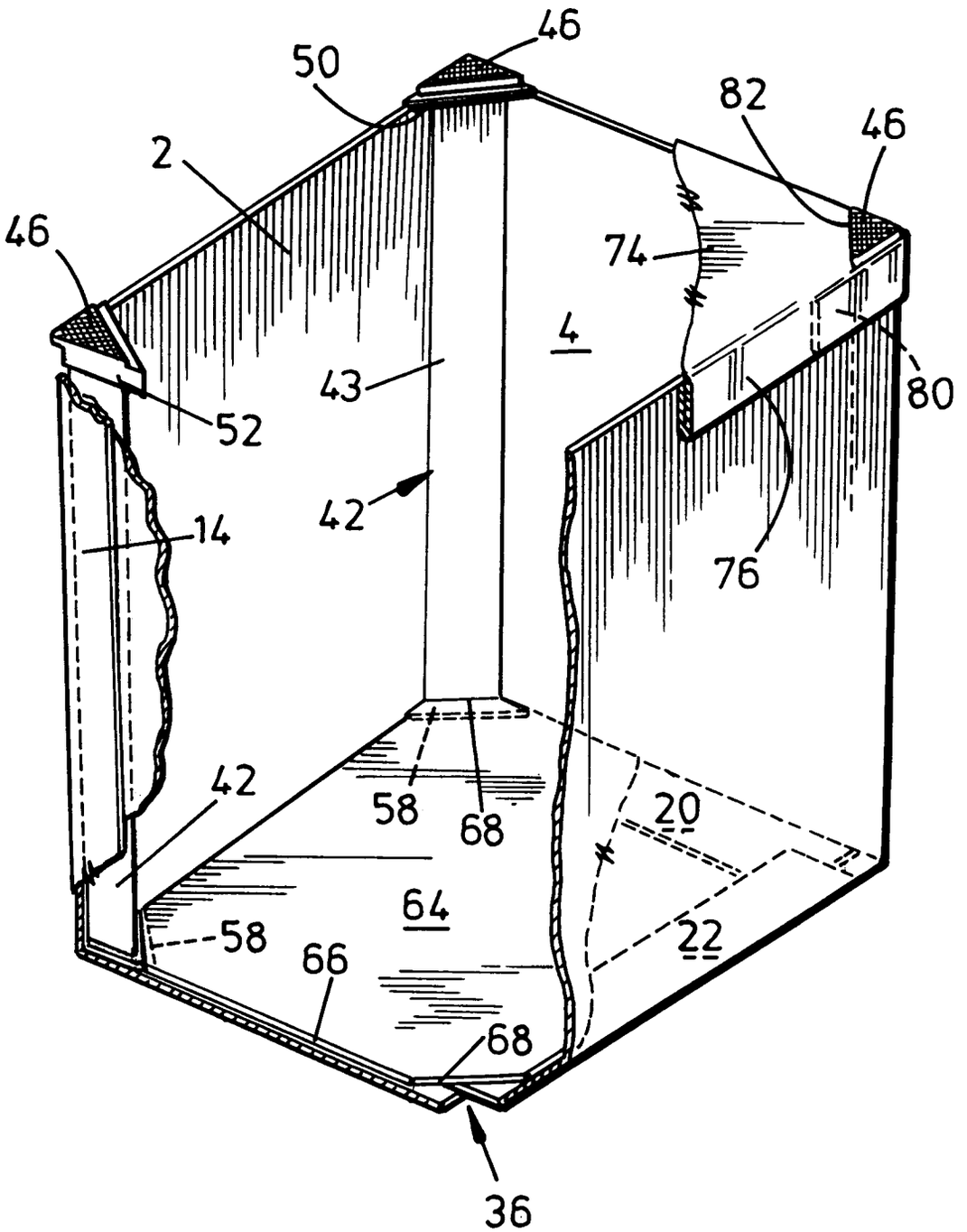

FIG.16

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 30 0506

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	FR-A-2 624 478 (DISPAC) * abstract; claims; figures * ---	1-4,10	B65D5/44 B65D5/00
A	EP-A-0 270 343 (HOSKINS) * column 3, line 52 - line 59; figures 3,4 * ---	8,9	
A	FR-A-775 752 (ANEGA) * page 1, right column, line 47 - line 54; figure 2 * ---	11	
A	FR-A-2 409 204 (CARTONNERIES D'AUVERGNE) * page 2, line 9 - line 36; figure 2 * -----	6,8	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27 April 1995	SERRANO GALARRAGA, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)