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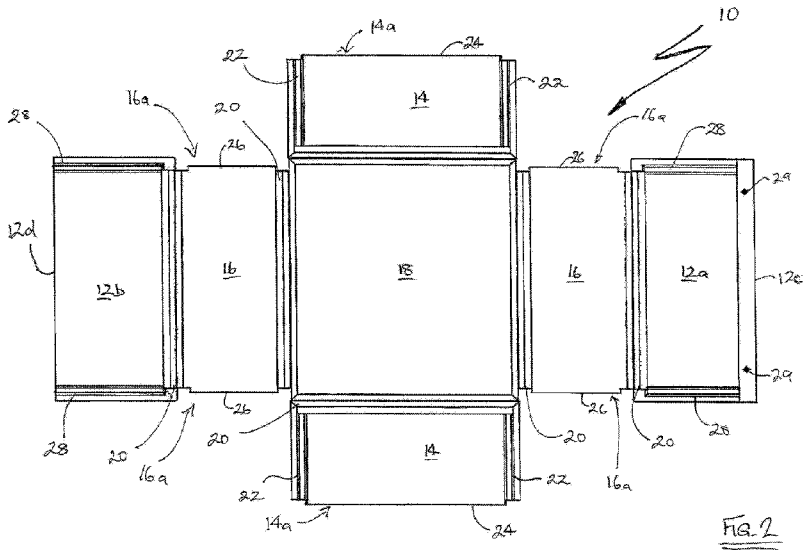

(57) **Abstract**: An expanded polystyrene container consists of a substantially planar blank having a plurality of regions, the regions including a base, side walls, end walls and a lid. The blank is able to be converted into a first unassembled configuration in which regions of the blank are pivoted around the hinges connecting the regions in relation to other regions, to form a rectangular slab in which compact mode blanks are able to be stacked, and a second configuration in which the blank is erected to form the container, which has a cuboidal structure of substantially uniform cross-section, for the storage of articles. The hinge comprises a recess the recess defining a point of minimum cross section. The base of a container may also include ledge portions at each of the comers of the base, which ledge portions provide support for hinges.

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CONTAINER APPARATUS

FIELD OF THE INVENTION

The present invention relates generally to a container apparatus, and in particular, to a container apparatus that is made from a single piece of material that is configured to be folded to form an assembled structure.

BACKGROUND OF THE INVENTION

In an ever increasing consumer society, the need to provide packaging and containers to contain, transport and/or store a variety of items remains an important requirement. Over time, a variety of solutions have been proposed for this satisfying this requirement, with varying degrees of success.

In this regard, cardboard boxes have proven to be a popular form of packaging for a variety of reasons. Cardboard can be created relatively cheaply and can be simply formed into blanks that are able to be stored and transported in a flat form and simply folded to form a box as desired. Cardboard boxes can be made to a variety of sizes and can be reinforced as required through the use of tape or stables to withstand a degree of force. However, due to the nature of cardboard, it has limited durability and can be particularly susceptible to failure when exposed to liquids, impact and other types of treatment which can cause the cardboard boxes to fail and lose structural integrity.

With the widespread acceptance of plastic materials, such as expandable polystyrene (EPS), the ability to utilise these materials and their inherent properties to provide improved containers has been realised. EPS boxes have a particular application for the storage and transport of perishable materials, such as agricultural and horticultural products, as they are largely impermeable and as such provide an environment for storing items which can be temperature regulated as retained in a gas-tight or water-tight state. Due to the nature of EPS, boxes formed from EPS also have a degree of shock and impact resistance which provides protection to the materials stored or carried therein.

However, despite the various benefits that material such as EPS provide for packaging purposes, due to the manner in which EPS is formed to be expanded within a mould, most boxes or packaging formed from such materials are formed to shape as a single piece. Whilst this is useful as it ensures a dimensionally accurate final product, the resultant product occupies a volume even when empty, thereby requiring space to store when not in use and making them less economic

to store and transport when empty. Thus after use, it is common for such EPS boxes to be broken down and placed in land-fill and not be reused.

A variety of systems have been proposed for making EPS boxes in a flat blank form and assembling the boxes for use. This is generally achieved through the formation of hinges in the EPS blank during the moulding process and/or by applying a compression force to the blank at predetermined regions. This method is described in more detail in the Applicant's International PCT Patent Application No. PCT/AU2010/000340.

Whilst the above methods have proven effective in enabling boxes to be assembled from a flat EPS blank, there is a need to further improve the EPS box formed in such a manner to provide improved strength and storability when not in use or when being transported in an empty form.

The above references to and descriptions of prior proposals or products are not intended to be, and are not to be construed as, statements or admissions of common general knowledge in the art. In particular, the above prior art discussion does not relate to what is commonly or well known by the person skilled in the art, but assists in the understanding of the inventive step of the present invention of which the identification of pertinent prior art proposals is but one part.

SUMMARY OF THE INVENTION

The invention according to one or more aspects is as defined in the independent claims. Some optional and/or preferred features of the invention are defined in the dependent claims.

The invention provides container apparatus characterised by:
a substantially planar blank member having a plurality of predetermined regions formed therein for defining a base, side walls, and end walls of the container, each of said plurality of predetermined regions being connectable to at least one other of said plurality of predetermined regions by a hinge member formed within the blank member, said blank member being adapted to be erected into a first configuration whereby the blank member forms the container apparatus, and into a second configuration whereby the blank member forms a substantially rectangular body of substantially uniform cross-section for storage of articles.

The invention also provides a hinge member for facilitating pivotal movement between integrally formed adjacent planar surfaces, characterised by a recess

formed between said integrally formed adjacent planar surfaces, said recess defining a channel of minimum cross section, said channel forming said pivot point about which pivotal movement of the said planar surfaces is facilitated, such that opposing side walls of said recess are configured to interengage when said planar surfaces are pivotally moved through an arc relative to each other, said interengagement comprising meshing of at least one stepped region of one of said side walls with a surface of an opposing one of said side walls.

The invention further provides a container blank including a base and a plurality of side walls, each of said plurality of side walls being connected to said base by a hinge, such that each of said plurality of side walls is able to be pivoted about a respective hinge, relative to said base, to form said container, characterised in that ledge portions are provided on said base, said ledge portions extending from said base, thereby providing support for said hinge when said blank is erected to form said container.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention may be better understood from the following non-limiting description of preferred embodiments, in which:

Fig. 1 is a perspective view of an assembled container in accordance with an embodiment of the present invention;

Fig. 2 is a top view of the unassembled container of Fig. 1;

Fig. 3 is a bottom view of the unassembled container of Fig. 1;

Fig. 4 is a top view of the assembled container of Fig. 1;

Fig. 5 is a cross-sectional top view of the assembled container of Fig. 1;

Fig. 6 is an end view of the assembled container of Fig. 1;

Fig. 7 is a cross-sectional side view of the assembled container of Fig. 1;

Fig. 8 is an enlarged view of a hinge region according to an embodiment of the present invention;

Fig. 9 is an enlarged view of the hinge region of Fig. 8 in assembled form;

Fig. 10 is a perspective view of an assembled container in accordance with

another embodiment of the present invention;

Fig. 11 is a is a top view of the unassembled container of Fig. 10;

Fig. 12 is a side view of the unassembled container of Fig. 10;

Fig. 13 is side view of the unassembled container in compact mode for storage;

Fig. 14 is a perspective view of an assembled container in accordance with an alternative embodiment of the present invention;

Fig. 15 is a top view of the unassembled container of Fig. 14; and

Fig. 16 is a cross-sectional side view of the assembled container of Fig. 14.

DETAILED DESCRIPTION OF THE DRAWINGS

Preferred features and embodiments of the present invention will now be described with particular reference to the accompanying drawings. However, it is to be understood that the features illustrated in and described with reference to the drawings are not to be construed as limiting on the scope of the invention.

The present invention employs the methods and tooling for forming the blanks as described in the Applicant's earlier filed International PCT Patent Application No. PCT/AU2010/000340. As such, no further description will be provides as to the means for forming the blanks.

In the description below, the present invention will be described in relation to its application for a box made from EPS. It will be appreciated that the concepts associated with the present invention could be employed in the formation of a variety of other types of structures made from EPS or similar materials, such as pods used in building construction, ducts for use in air conditioning and the like, as well as any other assembled products not currently envisaged.

Referring to Figure 1, a container 10 in accordance with an embodiment of the present invention is shown. The container 10 is in the form of a blank that is assembled into a rectangular box having a lid 12, opposing side walls 14 and opposing end walls 16. A base 18 forms the base of the container 10 such that the interior of the container represents an enclosed space into which items can be stored or contained as required.

The container 10 is preferably made from EPS with the lid 12, side walls 14, end walls 16 and base 18 having a maximum thickness of between 20 – 30 mm, preferably around 25mm. However, other thicknesses are also envisaged.

As is shown in Figs. 2 and 3, the container 10 is formed from a substantially flat blank. A plurality of hinges 20 are formed between where the lid 12, side walls 14, end walls 16 and base 18 meet to facilitate bending of the lid 12, side walls 14, end walls 16 and base 18 into the position as shown in Fig. 1. The hinges 20 are formed on the internal surfaces of the blank as shown and the manner in which the hinges 20 are configured will be described in more detail below.

To facilitate assembly of the various portions of the blank, the side walls 14 each comprise a groove or channel 22 formed at either end of the side wall 14. The groove or channel 22 extends perpendicular to the hinge 20 that connects the side wall 14 to the base 18 and extends substantially the height of the side wall 14 as is best depicted in Fig. 2. The upper edge 14a of each side wall 14, namely the edge of the side wall 14 opposite and parallel to the hinge 20 that connects the side wall 14 to the base 18 has a lip 24 formed thereon. The lip 24 extends between the grooves or channels 22 formed at opposing ends of the side wall 14 and comprise a continuation of the side wall 14 having a reduced thickness in comparison to the remainder of the side wall 14. In a preferred form, the lip 24 extends approximately 7 mm beyond the upper edge 14a of the side wall and has a thickness of approximately 9 – 10 mm, with the remainder of the side wall having a thickness of around 20 mm.

Each of the end walls 16 are attached along a lower edge thereof to the base 18 by hinge 20 and at an upper edge thereof to a portion of the lid 12 by way of another hinge 20. The free ends 16a of the end walls, namely those ends that extend between and orthogonal to the hinges 20, are also provided with a rib member 26 that extends beyond the free ends 16a in a continuous manner as shown in Fig. 2. The rib members 26 function in a similar manner to the lip 24 of the side walls 14 and comprise a continuation of the end wall 16 having a reduced thickness in comparison to the remainder of the end wall 16. In a preferred form, the rib members 26 extend approximately 7 mm beyond the free ends 16a of the end walls and have a thickness of approximately 9 – 10 mm, with the remainder of the end wall having a thickness of around 20 mm.

As shown in Fig. 1, the lid 12 comprises two substantially identical lid members 12a and 12b. Each of the lid members 12a and 12b have a channel 28 formed along opposing sides thereof extending perpendicular to the hinge 20 that

connects the lid members 12a, 12b to the corresponding end walls 16. The channel 28 function in a similar manner to the grooves or channels 22 formed at either end of the side wall 14, the purpose of which will be described in more detail below.

Each of the free ends 12c and 12d of the lid members 12a and 12b respectively, are configured to inter-engage when assembled to facilitate sealing closure of the lid 12, as shown in Fig. 1. In this regard, the free end 12c of lid member 12a has a stepped region formed therein which is of reduced thickness to the remainder of the lid member 12a. The surface of the stepped region of the free end 12c has one or more projections 29a extending therefrom. The projections 29a are preferably formed from as part of the moulding process and are formed from EPS, although other materials are also envisaged. To facilitate engagement between the lid members 12a and 12b, the free end 12d of lid member 12b also has a stepped region formed therein, which substantially matches the stepped region formed in the free end 12c of the lid member 12a when the lid members 12a and 12b are brought together. As is best seen in Fig. 3, the outer surface of the stepped region of the free end 12d has one or more recesses 29b formed therein which are configured to mate with the projections 29a formed on the stepped region of free end 12c thereby providing engagement between the lid members 12a and 12b to close the lid when the container 10 is assembled in the manner shown in Fig. 4.

Referring to Figure 5, the manner in which the end walls 16 and side walls 14 fit together to form the assembled container 10 is shown. The end walls 16 are initially folded into an upright position through a 90° arc. The side walls 14 are then folded into an upright position with respect to the base 18 through a 90° arc such that the rib members 26 of the end walls 16 are received within the grooves or channels 22 formed in the side walls 14. The rib members 26 may have a width slightly greater than the width of the grooves or channels 16 to facilitate a degree of interference fit therebetween to provide a degree of positive engagement between the side walls 14 and the end walls 16 when in the upright position as shown in Fig. 6.

Once the side walls 14 and the end walls 16 are in the upright position, the lid members 12a and 12b are able to be lowered into position to extend across the open container 10 and enclose the space contained therein. In this regard, with the side wall 14 in the upright position, the lip 24 extends above the upper edge 14a thereof. The groove 28 formed along opposing edges of the lid members 12a and 12b is able to be positioned such that the lip 24 is received within the groove

28 thereby providing a positive engagement between the lid members 12a and 12b and the side walls 14 which increases the strength of the container and creates a seal about the container 10.

It is to be understood that the lid 12 of the container 10 may be omitted. Many customers for a container of the type described in this specification require an open-topped container. In such a configuration, the erected container 10, in the absence of a lid 12 or lid members 12a, 12b, is an open topped container, which may be encased in some kind of strapping or wrapping, which may preferably be wound around the side walls 14 to impart strength to the erected container. A preferred type of wrapping may be plastic film of the type commonly used to wrap articles. Alternatively, lid members 12a, 12b may be vestigial, locking into side walls 14 to produce a strong erected container 10, but with that erected container 10 substantially open. A further alternative would be to have a one-piece lid 12, which would be hingedly connected to one of the side walls 14, and adapted to interengage with the other side walls to form an erected container.

Referring to Figures 7 – 9, the manner in which the hinges 20 are configured is depicted. The hinges 20 function to provide pivotal movement between the various portions of the container 10 to enable the container 10 to be formed from flat form into a box form. As previously discussed, the hinges are formed by the process described in the Applicants earlier filed International PCT Patent Application No. PCT/AU2010/000340, and will not be described in further detail below.

Each hinge 20 is formed to define a hinge point 30 about which the portions of the blank may be folded, in this example portions 72, 74. A V-shaped groove 32 is formed in the body of the blank such that the portion of the V-shaped groove on either side of the hinge point 30 is identical, namely assumes, preferably, a 45° angle. Two complementary angles may alternatively be used. The hinge point 30 is constituted by a channel located at the base of the V-shaped groove 32, the base of which channel is the narrowest region 76 of material, which connects portions 72 and 74. Once the hinge point 30 is formed, it defines an axis about which folding of the hinge 20 takes place. The channel 32 functions to improve the ability of the hinge 20 to fold back on itself, as well as to fold in the opposite direction during erection of a container 10, as will next be described.

Rather than the hinge 20 being formed in a V-shape, such that the material provided on each side of the hinge point 30 is formed in a mirror image, the material formed on each side of the hinge point is formed differently in order to

increase the strength of the hinge 20. At the point where the V-shaped groove 32 terminates, on the portion 72 side of the hinge point the V-shaped groove 32 terminates at a vertical wall 33 and on the other portion 74 side of the hinge point 30 the V-shaped groove terminates at a horizontally extending stepped region 34 that then terminates at a vertical wall 35.

As is shown more clearly in Fig. 9, when the hinge 20 is moved, by pivoting in a clockwise direction from the horizontal configuration shown in Fig. 8 to the exemplary 90° configuration of Fig. 9, the various surfaces of the hinge 20 on either side of the hinge point 30 mesh together. In this regard, the horizontally extending stepped region 34 of the hinge 20 on one side of the hinge point 30 is received against the vertical wall 33 of the hinge on the other side of the hinge point and the vertical wall 35 becomes seated on the upper surface of the blank. Such an arrangement ensures that any downward force applied on the container 10 when assembled, as may occur through stacking containers 10 on top of each other, will act in the direction of arrow A. As the hinge 20 comprises a stepped region and not merely two 45° angled faces, the shear forces present on the hinge as a result of the compression force in the direction of arrow A are significantly reduced. As is shown in Fig. 7, by having hinges 20 at each corner of the container 10, the compression strength of the container is significantly increased.

The hinge 20 of Figs. 7 – 9 may also operate in the opposite orientation. Blank portion 74 may be rotated in an anti-clockwise direction from the position shown in Fig. 7, to an exemplary 90° configuration, in which configuration wall 35 would seat on wall 78 of portion 72. In the same way, downward forces on portion 74 would be resisted by wall 78 of portion 72.

Referring to Figures 10 and 11, an alternative embodiment of a container 10 in accordance with the present invention is depicted. This embodiment is similar to the embodiment of the invention depicted in Figs. 1 – 9, with the difference being the inclusion of an additional hinge 20 in the lid members 12a and 12b respectively.

As is shown in Fig. 11, each lid member 12a and 12b comprises an additional hinge 20 to enable the lid members 12a and 12b to open without breaking the engagement between the lid members 12a and 12b and the side walls 14. In this regard, the lid members 12a and 12b are positioned in the manner as discussed above such that the lips 24 of the side walls 14 are received within the grooves 28 formed on the underside of the lid members 12a and 12b.

By providing an additional hinge 20 on each lid member, represented by hinge

line 42 in Fig 10, each lid member 12a and 12b may be opened in the direction of arrow B to facilitate loading/unloading of the container 10 and in doing so a part 40 of the lid member 12a and 12b is retained in place. As the part 40 of each of the lid members 12a and 12b remains in position, the part 40 provides positive engagement with the side walls 14 thereby ensuring that the integrity of the assembled box is retained and the walls 14 remain in the upright position.

Whilst the embodiments of the container 10 described above provide a more robust and easy to assemble container, that is capable of being loaded/unloaded as desired, the container of the present invention also provides considerable improvements in relation to stacking/storing blanks when not in used.

Figure 12 depicts a side view of the blank depicted in Fig. 11 in expanded form. As the hinges 20 are formed on the upper (or inner) surface of the blank as shown, they are able to fold about an angle of 270° to facilitate compact storage. In this regard, by folding the sidewalls 14 under the base 18 and folding the lid members 12a and 12b under the end walls 16, as shown in Fig. 13, the blank 10 is able to be formed into a substantially rectangular slab, which may be styled a "compact mode", defined by the combined surfaces of end walls 16 and base 18, which has a uniform thickness. As a result, unused or unassembled/disassembled blanks 10 are able to be stacked in a convenient and simple manner ensuring that no wastage of space results.

An alternative embodiment of the present invention is depicted in Figs. 14 - 16. In this embodiment, there is depicted a container 50 in accordance with an embodiment of the present invention. The container 50 is in the form of a blank that is assembled into a rectangular box having a lid portion 52, opposing side walls 54 and opposing end walls 56. A base 58 forms the underside of the container 50 such that the interior of the container represents an enclosed space into which items can be stored or contained as required.

The container 50 is preferably made from EPS with the lid 52, side walls 54, end walls 56 and base 58 having a maximum thickness of between 20 – 30 mm, preferably around 25mm. However, other thicknesses are also envisaged.

As is shown in Fig. 15, the container 50 is formed from a substantially flat blank. A plurality of hinges 70 are formed between where the lid 52, side walls 54, end walls 56 and base 58 meet to facilitate bending of the lid 52, side walls 54, end walls 56 and base 58 into the position as shown in Fig. 14. The hinges 70 are formed on the internal surfaces of the blank as shown and the manner in which the hinges 70 are configured are substantially identical to the hinges 20 described

in relation to the above embodiment, with the main difference being that the hinges are arranged in an inverted manner to that shown in the above embodiment. This can be readily noted by comparing the hinge 70 depicted in Fig. 16 with that depicted in Fig. 9 as hinge 20. It will be noted that despite the change in orientation between hinges 20 and 70, the fundamental principles remain the same between the hinges, with horizontal support regions of the opposing surfaces of the hinge functioning to bear the weight of the hinge, thereby reducing pressure present on the angled faces of the hinge.

Referring to Figure 15, the blank of this embodiment also comprises ledge portions 60 which are in the form of substantially flat regions of material located at each corner of the base 58. As depicted, the hinges 70 do not extend into the ledge portions 60.

In use, as depicted in Fig. 15, the ledge portions 60 function to support the hinges at each of the corners of the base of the assembled container 50. When the side walls 54 are folded about the hinges 70 to form the container 50, the corners are supported atop the ledge portions 60. As the base corners of the assembled container 50 are critical load points of the container, the provision of the ledge portion 60 provides a degree of protection to the hinges 70 in these regions, and provides a degree of impact resistance, should the assembled container be dropped and the corner impact with a hard surface. Further to this, the provision of the ledge portions 60 function to separate the base hinges 70 into four distinct sections, which improves the ability to mould the blank and design tooling for the manufacturing process.

It will be appreciated that the resulting container 50, like container 10 provides a strong and robust container that is able to be formed from EPS and which can be stacked in a flat manner when not in use, and assembled for use in a simple and effective folding process.

The ledge portions 60 may be provided elsewhere on the base 58, to support hinges 70. Such ledge portions may be located on and extending from the base 58, beneath hinges 70, and between the corners of base 58, whether or not ledge portions are provided at those corners.

Fig. 16 is a cross-sectional side view of the assembled container of Fig. 14, and is shown with differing hinge arrangements between the base 58 and side walls 54 and the lid members 52a, 52b and side walls 56. It is preferred for the hinge arrangements at the top of the container 50 to be the same as those shown at the base of container 50, in a similar manner as shown in Fig. 7.

Throughout the specification and claims the word "comprise" and its derivatives are intended to have an inclusive rather than exclusive meaning unless the contrary is expressly stated or the context requires otherwise. That is, the word "comprise" and its derivatives will be taken to indicate the inclusion of not only the listed components, steps or features that it directly references, but also other components, steps or features not specifically listed, unless the contrary is expressly stated or the context requires otherwise.

It will be appreciated by those skilled in the art that many modifications and variations may be made to the methods of the invention described herein without departing from the spirit and scope of the invention.

The entire contents of the description, claims and drawings of Australian provisional patent application no. 2013904133, filed on 25 October 2013, and of Australian provisional patent application no. 2014901686, filed on 7 May 2014, are herewith incorporated into this specification.

CLAIMS

1. Container apparatus characterised by:
a substantially planar blank member having a plurality of predetermined regions formed therein for defining a base, side walls, and end walls of the container, each of said plurality of predetermined regions being connectable to at least one other of said plurality of predetermined regions by a hinge member formed within the blank member, said blank member being adapted to be erected into a first configuration whereby the blank member forms the container apparatus, and into a second configuration whereby the blank member forms a substantially rectangular body of substantially uniform cross-section for storage of articles.

2. Container apparatus according to claim 1, characterised in that each of a first pair of opposed side walls has a groove formed at either side thereof, each said groove extending generally perpendicular to the hinge connecting each of said first pair of opposed side walls to said base, and a lip at the top of each of said first pair of opposed side walls, said lip extending between said grooves, and in that each of a second pair of opposed side walls has a lip formed at either side thereof and extending generally perpendicular to the hinge connecting each of said second pair of opposed side walls to said base, such that when said blank is erected into said first configuration, each of said lips on said second pair of opposed side walls engages with a respective one of said grooves in said first pair of side walls, and each of said lips on said first pair of opposed side walls engages with respective grooves in said lid.

3. Container apparatus according to claim 2, characterised in that said lid is in two parts, one of said parts being connected by one of said hinges to one of said second pair of opposed side walls, and the other of said parts being connected to the other of said second pair of opposed side walls.

4. Container apparatus according to any preceding claim, characterised in that the hinges connecting said side walls to said base are configured such that in each case a generally V-shaped groove is provided between each of said side walls and said base, to produce said hinge, said groove terminating on one of said side wall and said base in a wall perpendicular to the plane of said wall or said base, and on the other of said base and said side wall changing to a stepped portion, said stepped portion

terminating in a wall perpendicular to the plane of said wall or said base, such that when said blank is erected into said first configuration, said wall perpendicular to one of said side wall and said base, and said stepped portion on said base or side wall, are adapted to engage one another to provide additional strength to said hinge.

5. Container apparatus according to any preceding claim, characterised in that there is provided a ledge portion extending outwards from said base, such that when said blank is erected into said first configuration, the hinges between said side walls and said base are at least partially supported by said or each ledge portion.

6. Container apparatus according to claim 5, characterised in that said ledge portion is located at a corner of said base.

7. Container apparatus according to claim 5 or 6, characterised in that said ledge portion is located between a first corner of said base and a second corner of said base.

8. Container apparatus according to claim 6 or claim 7, characterised in that said base is substantially rectangular.

9. A hinge member for facilitating pivotal movement between integrally formed adjacent planar surfaces, characterised by a recess formed between said integrally formed adjacent planar surfaces, said recess defining a channel of minimum cross section, said channel forming said pivot point about which pivotal movement of the said planar surfaces is facilitated, such that opposing side walls of said recess are configured to interengage when said planar surfaces are pivotally moved through an arc relative to each other, said interengagement comprising meshing of at least one stepped region of one of said side walls with a surface of an opposing one of said side walls.

10. A hinge member according to claim 8, characterised in that said hinge connects portions of a blank adapted to be erected into a container.

11. A container blank including a base and a plurality of side walls, each of said plurality of side walls being connected to said base by a hinge, such that each of said plurality of side walls is able to be pivoted about a respective hinge, relative to said base, to form said container, characterised in that ledge portions are provided on said base, said ledge portions extending from said base, thereby providing support for said hinge when said blank is erected to form said container.

12. A container blank according to claim 11, characterised in that said ledge portions are located on said base between adjacent side walls

13. A container blank according to claim 12, characterised in that each of said side walls is provided with an end portion extending beyond the respective hinge connecting each of said side walls to said base, such that when said container blank is erected into a container, each said end portion is supported by a respective ledge portion.

14. A container blank according to claim 12 or claim 13, characterised in that one of adjacent side walls has an end portion which is configured as a lip, and the other of adjacent side walls is provided with a groove, which said lip is adapted to engage when said container blank is erected into a container.

15. A container blank according to claim 11 or claim 12, characterised in that said ledge portions are located beneath said hinge.

16. A container blank according to claim 11 or claim 12, characterised in that said base and each of said plurality of side walls are substantially rectangular, and that said ledge portions are located at the corners of said substantially rectangular base.

17. A container blank according to any preceding claim, further characterised by a lid connected to one of said plurality of side walls by a hinge.

18. A container blank according to any one of claims 11 to 16, further characterised by a lid, said lid being formed from lid sections, each of said lid sections being connected to a respective one of said plurality of side walls by a hinge.

19. A container blank according to claim 18, characterised in that each of said lid sections is substantially vestigial, such that when said container is erected, the top of said container is substantially open.

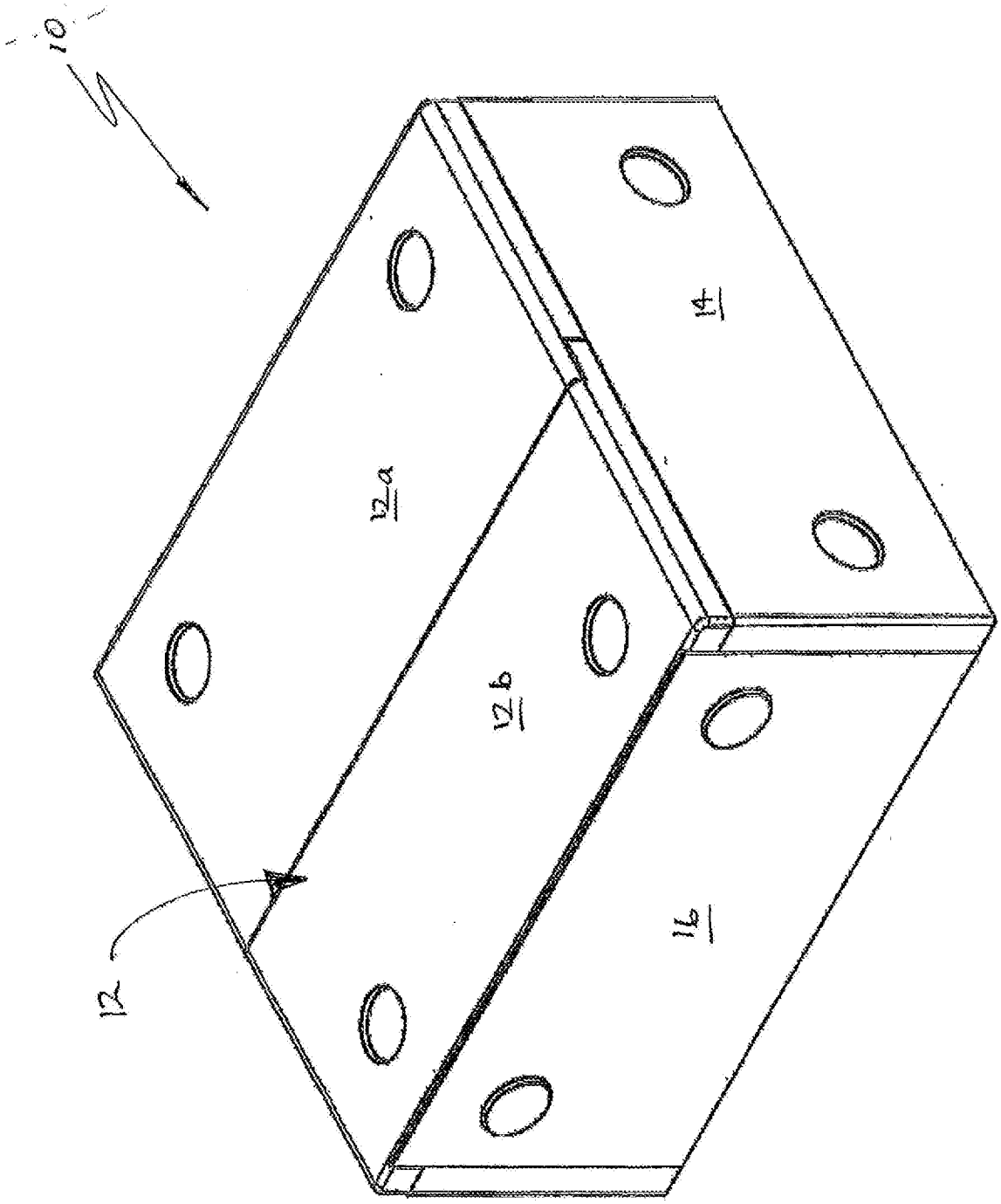


Fig. 1

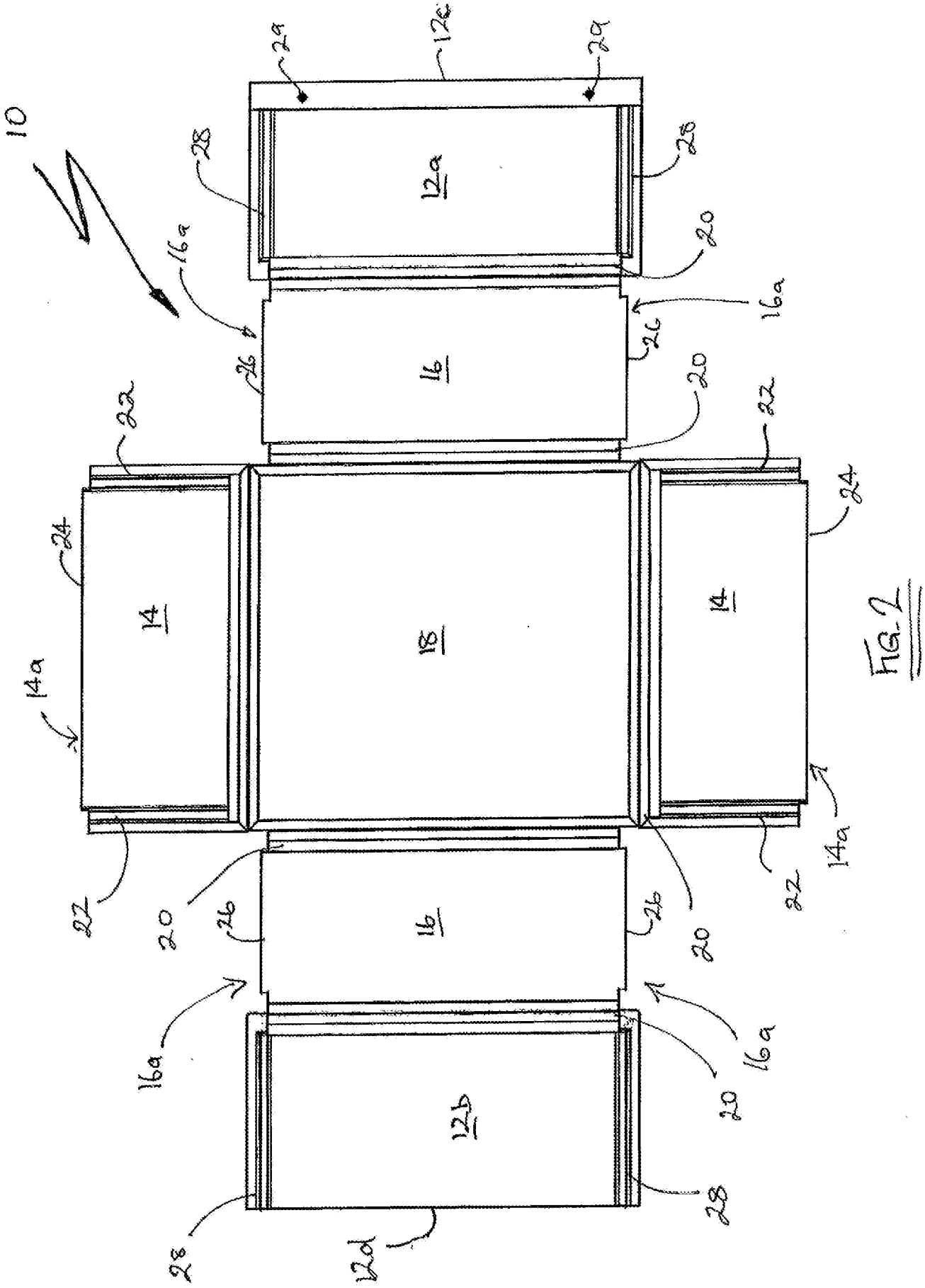


FIG. 1

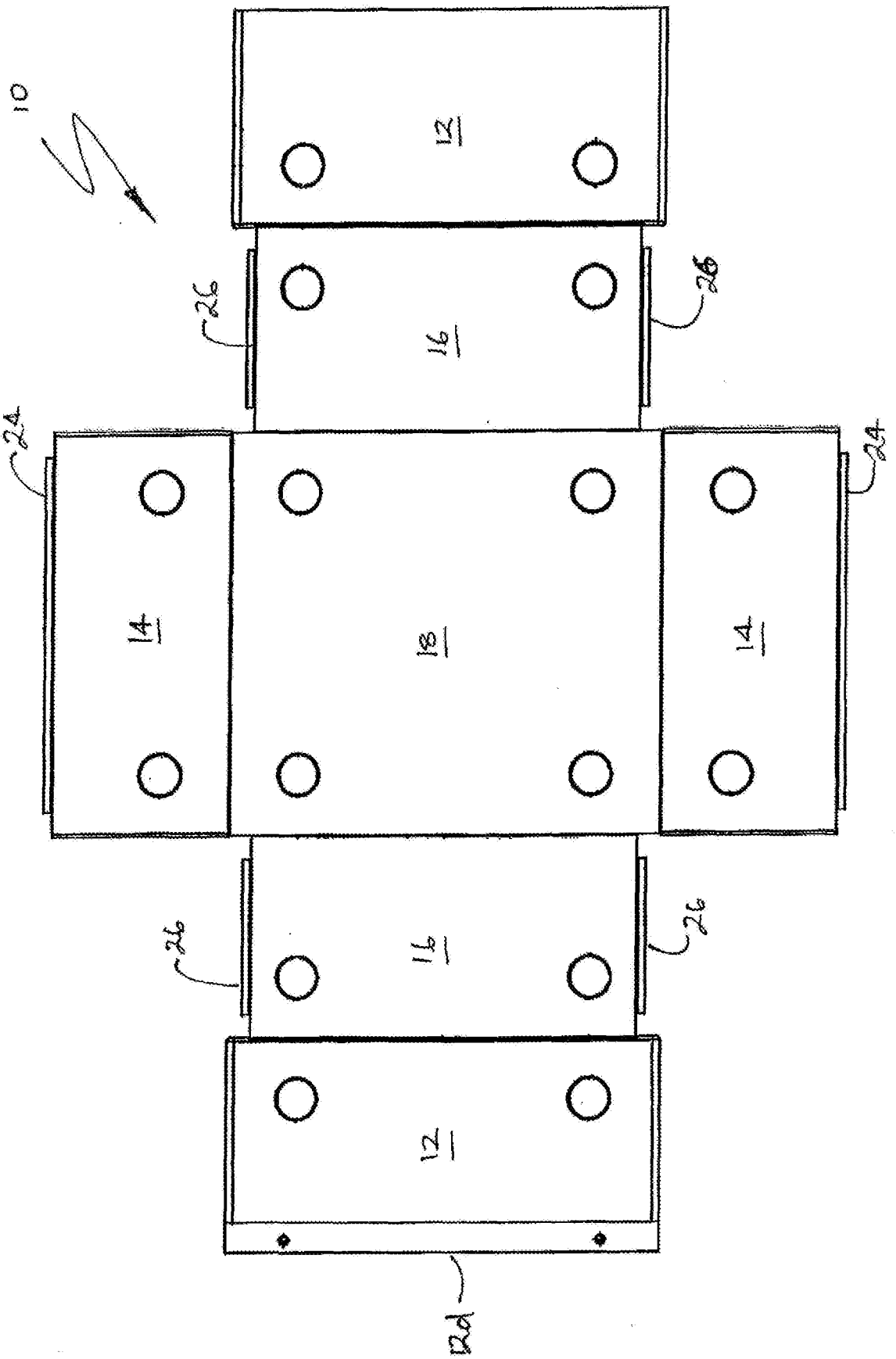


FIG. 3

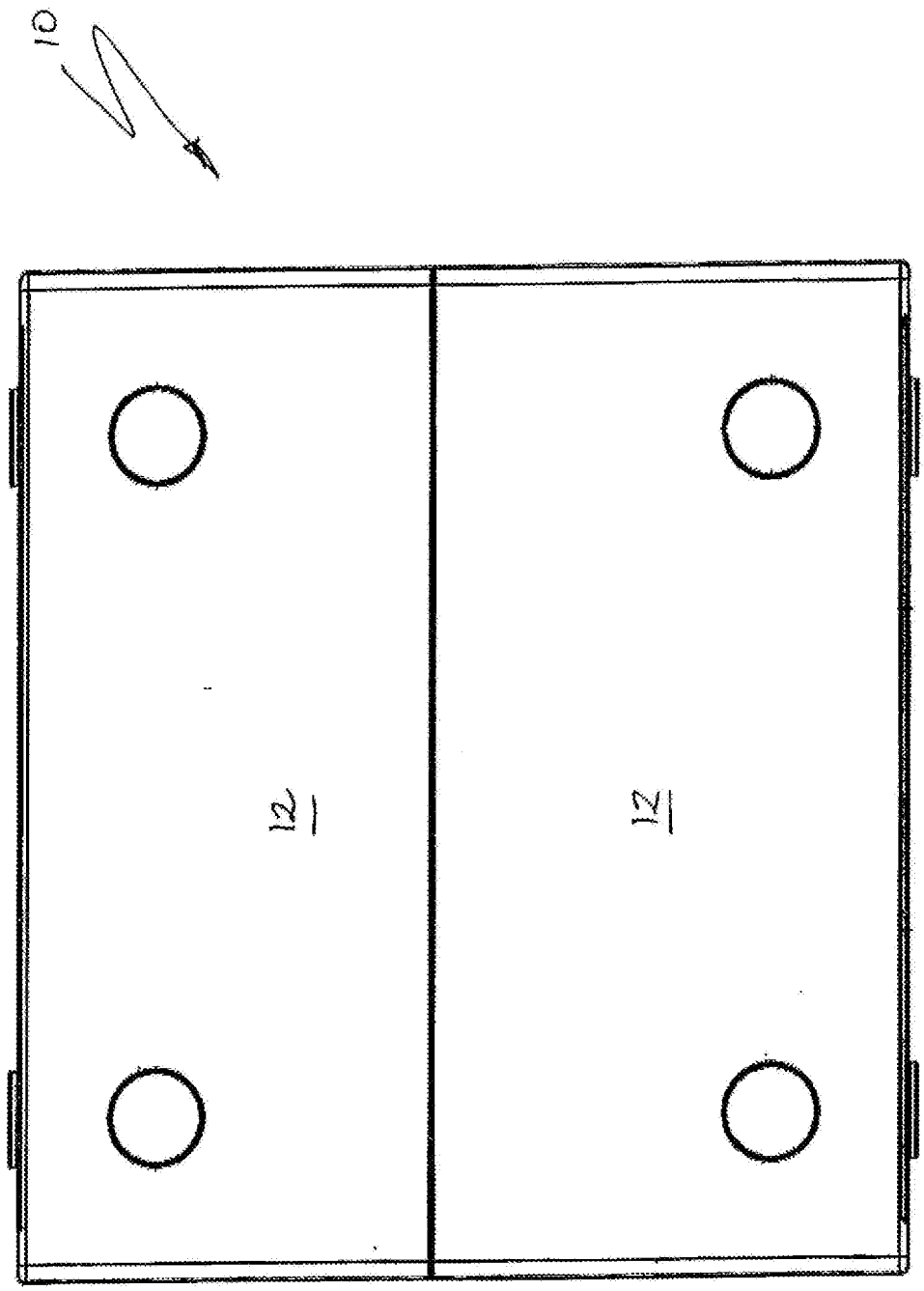


FIG. 4

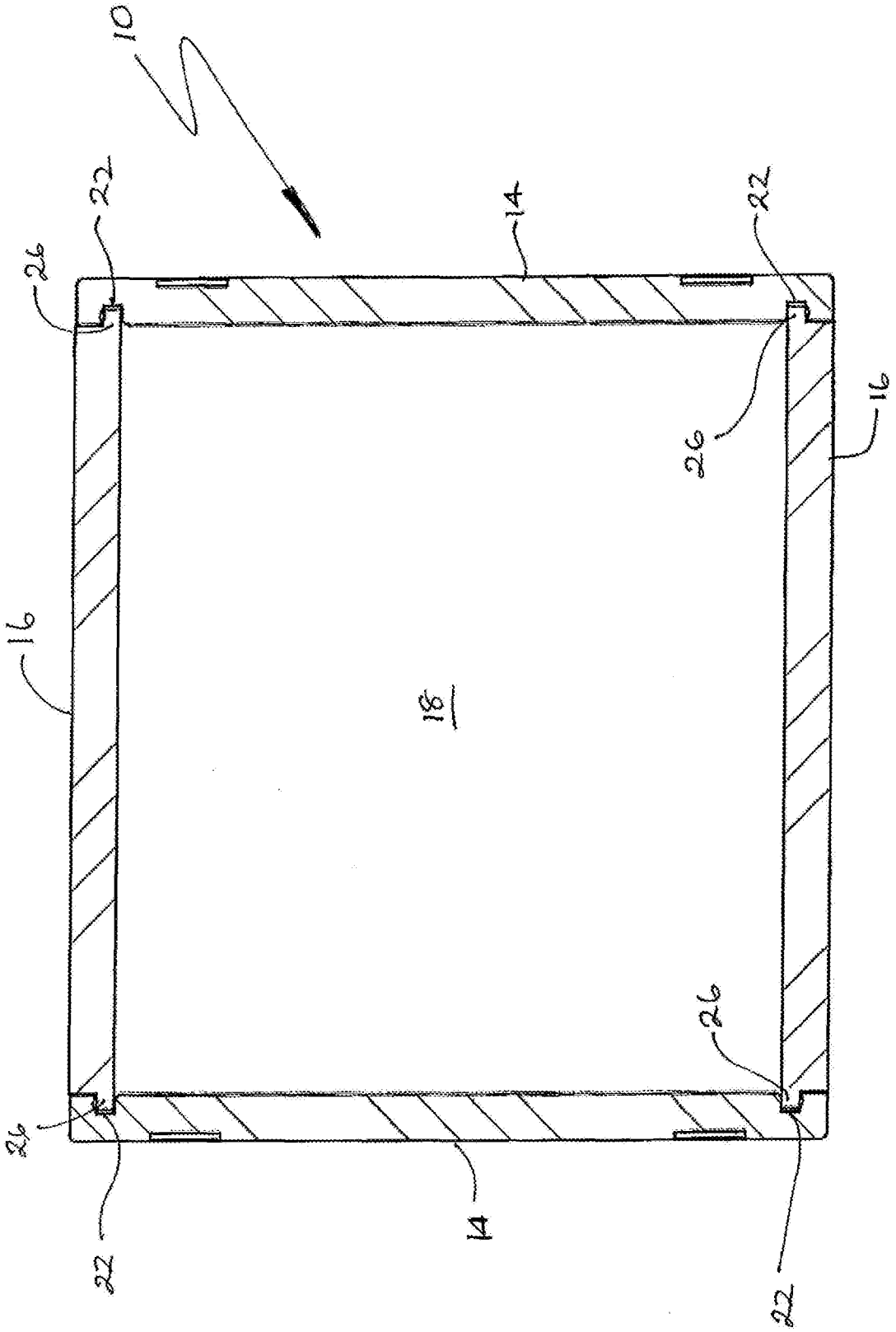


Fig 5

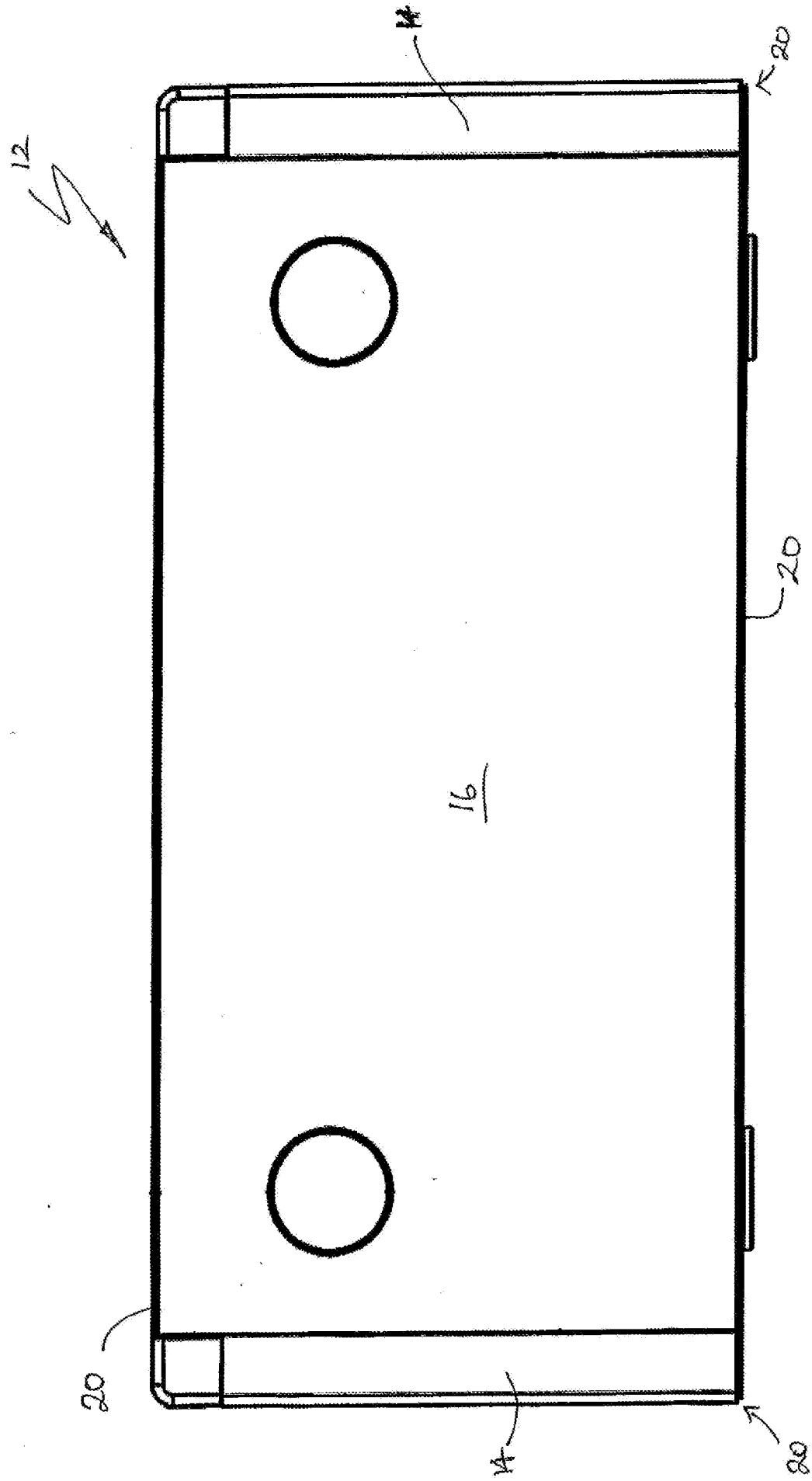


Fig 6

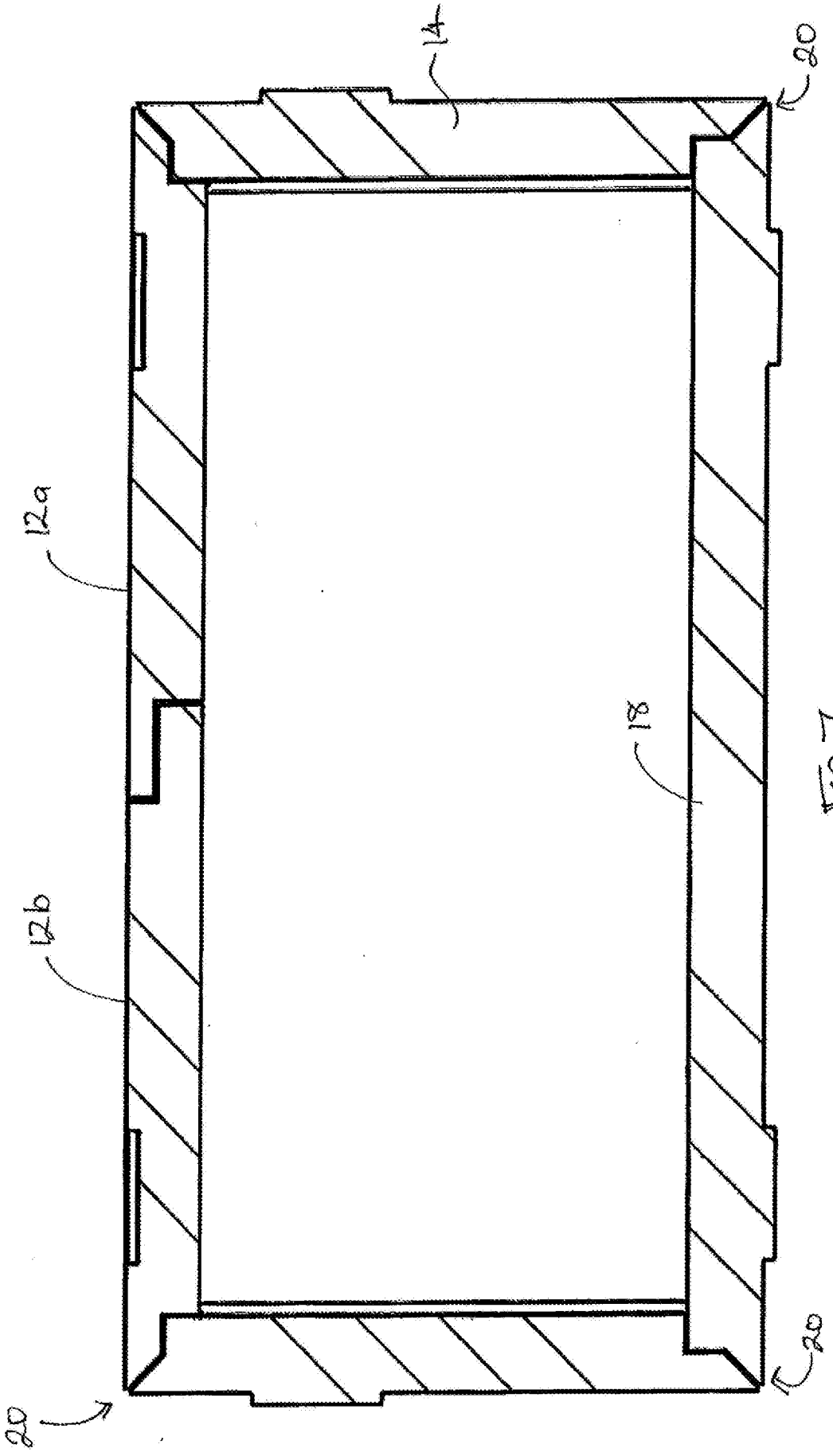


FIG. 7

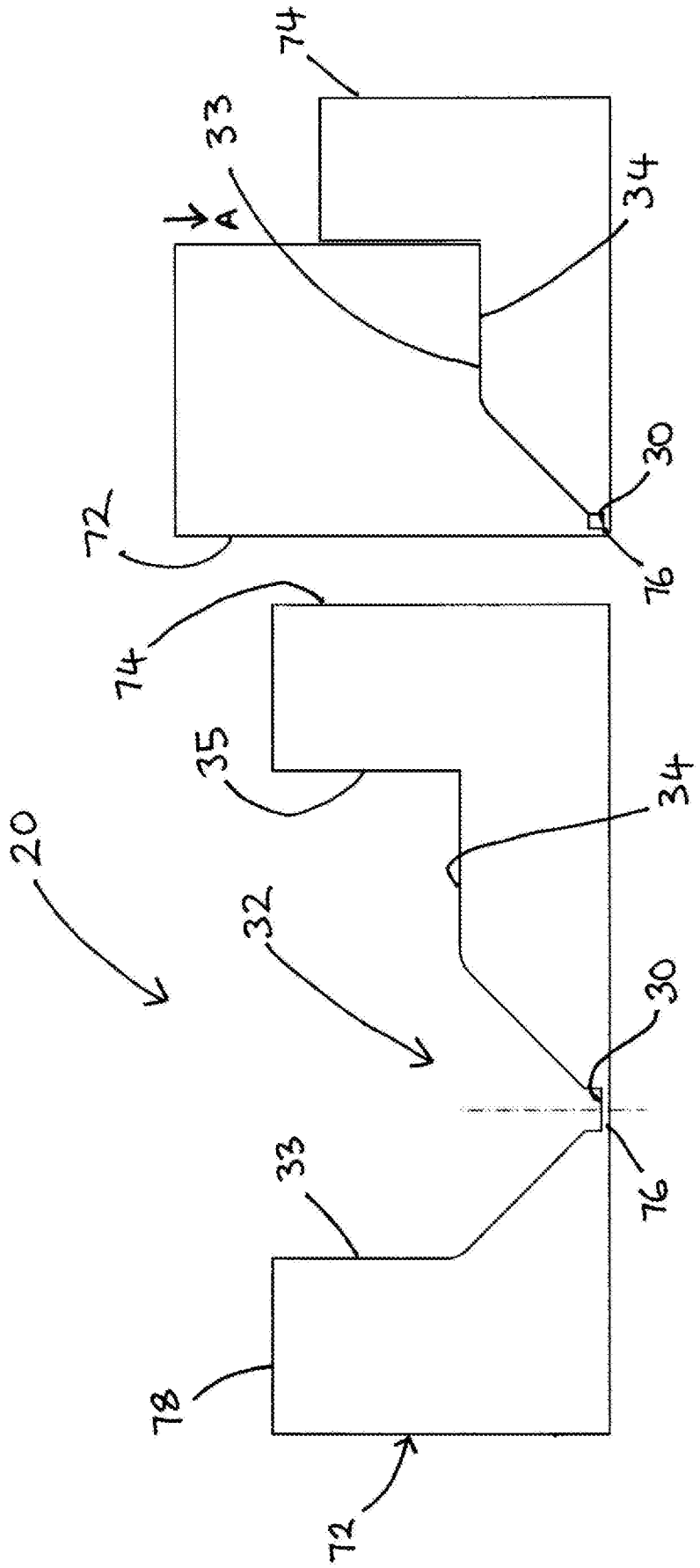


Fig. 9

Fig. 8

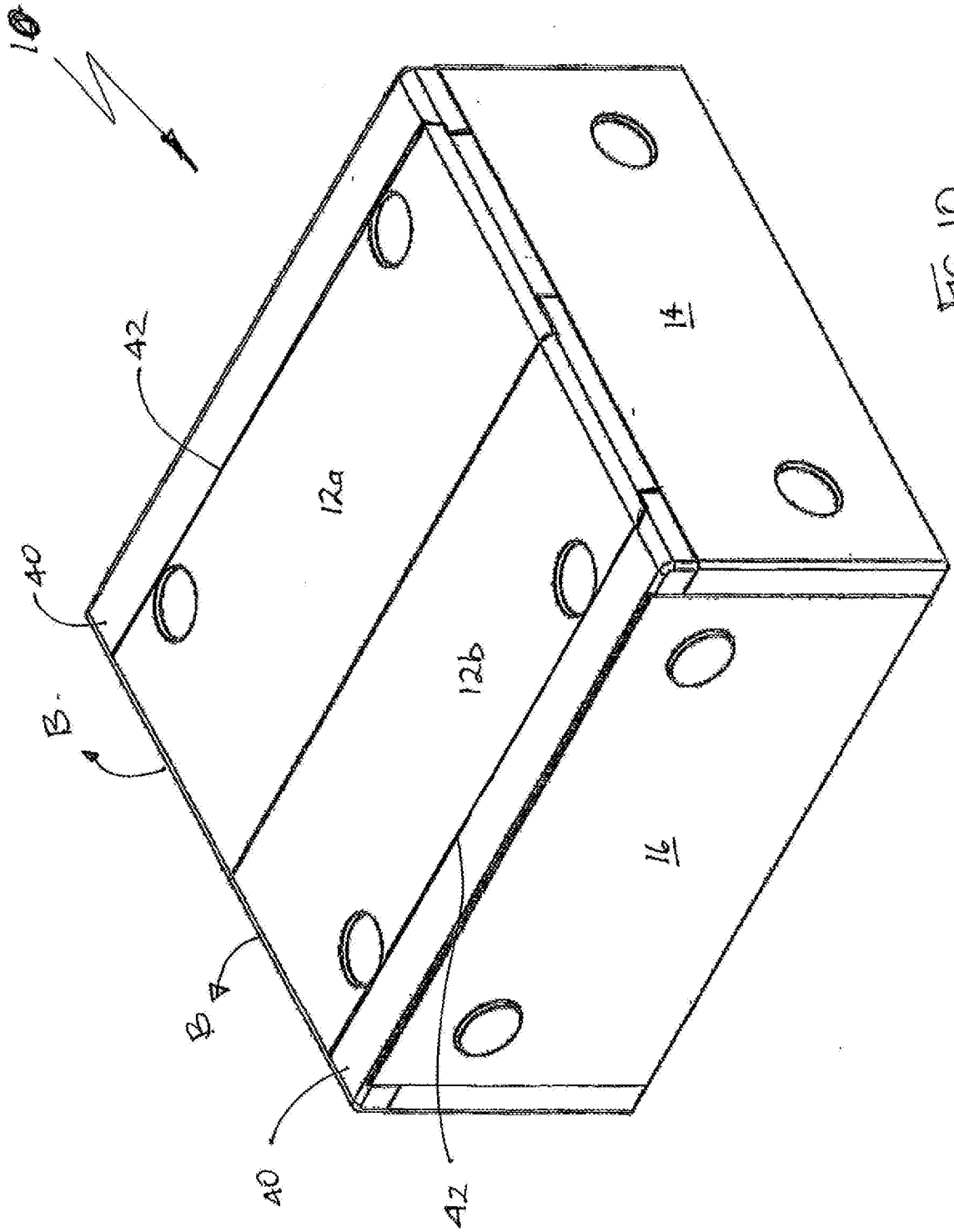


FIG. 10

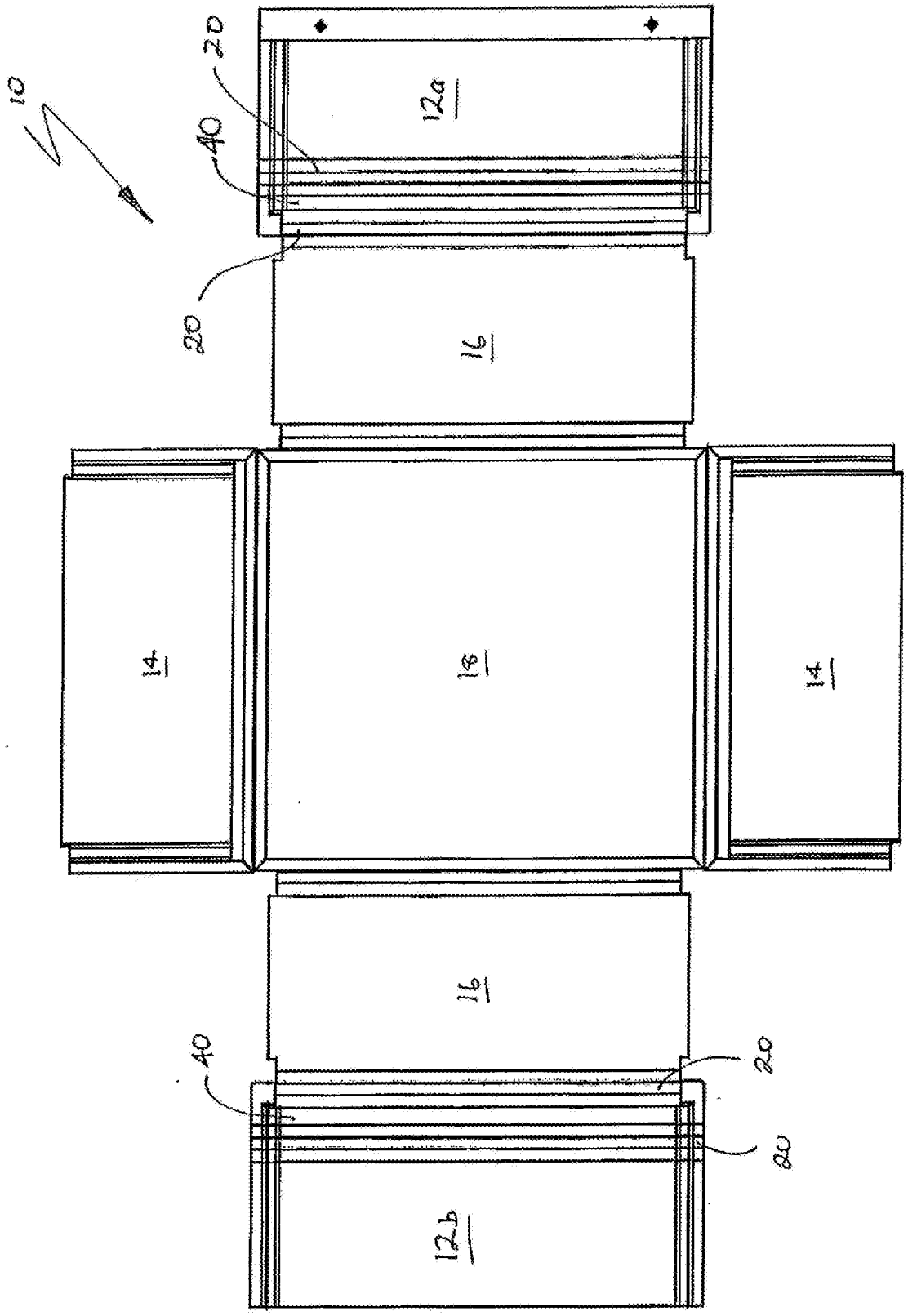
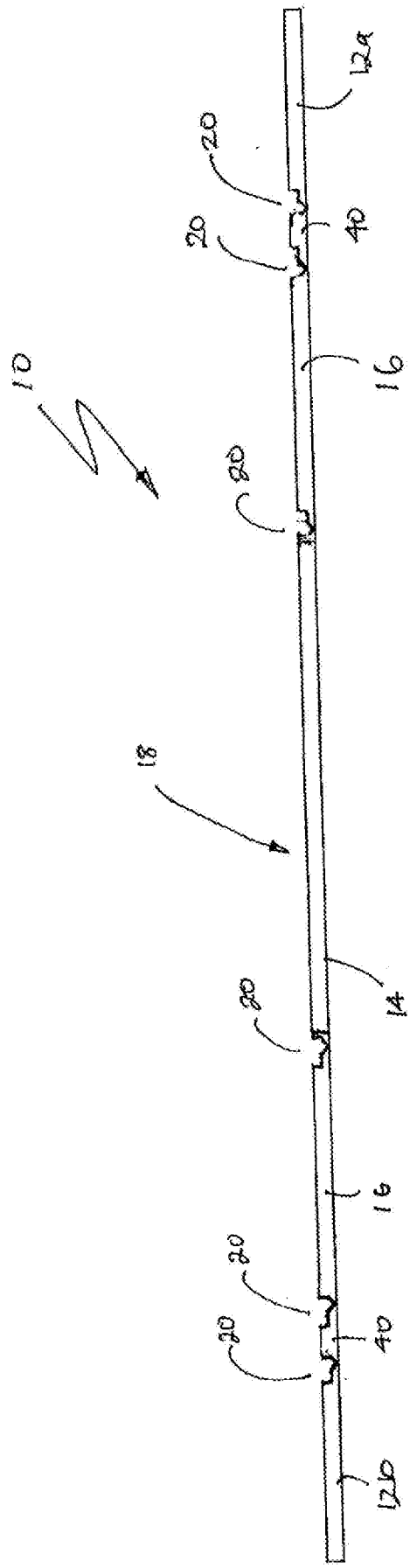


FIG. 11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12a
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20
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16
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18
14
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16
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20
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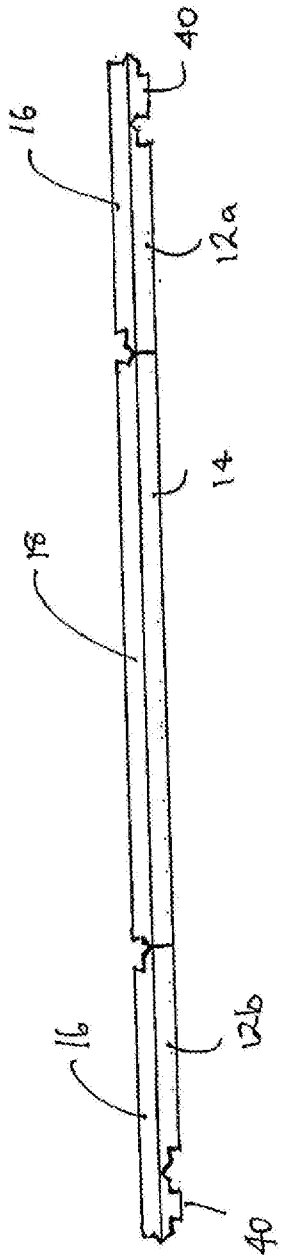
12b

Fig 12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12b
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Fig 13

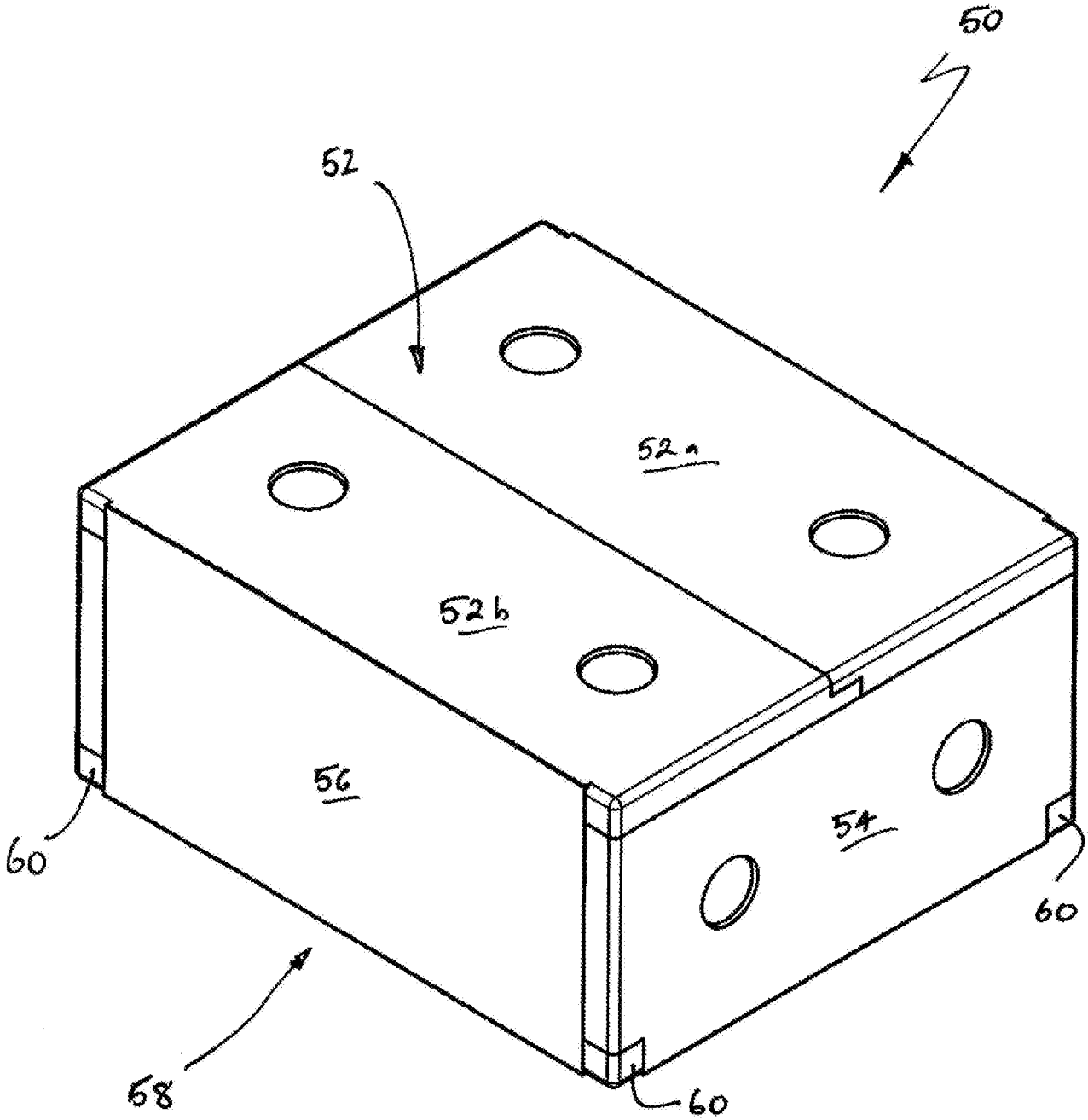

Fig. 14

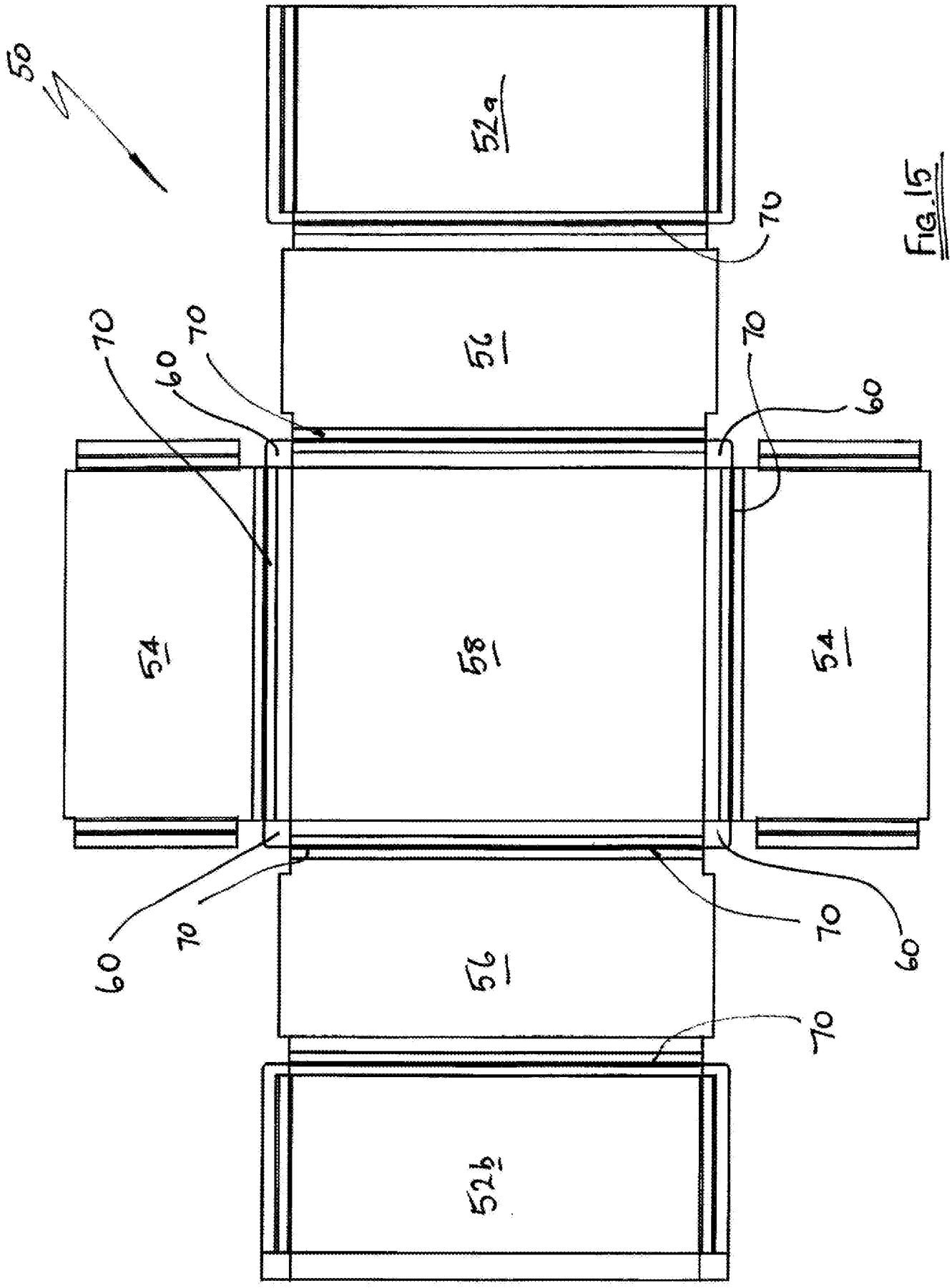

Fig. 15

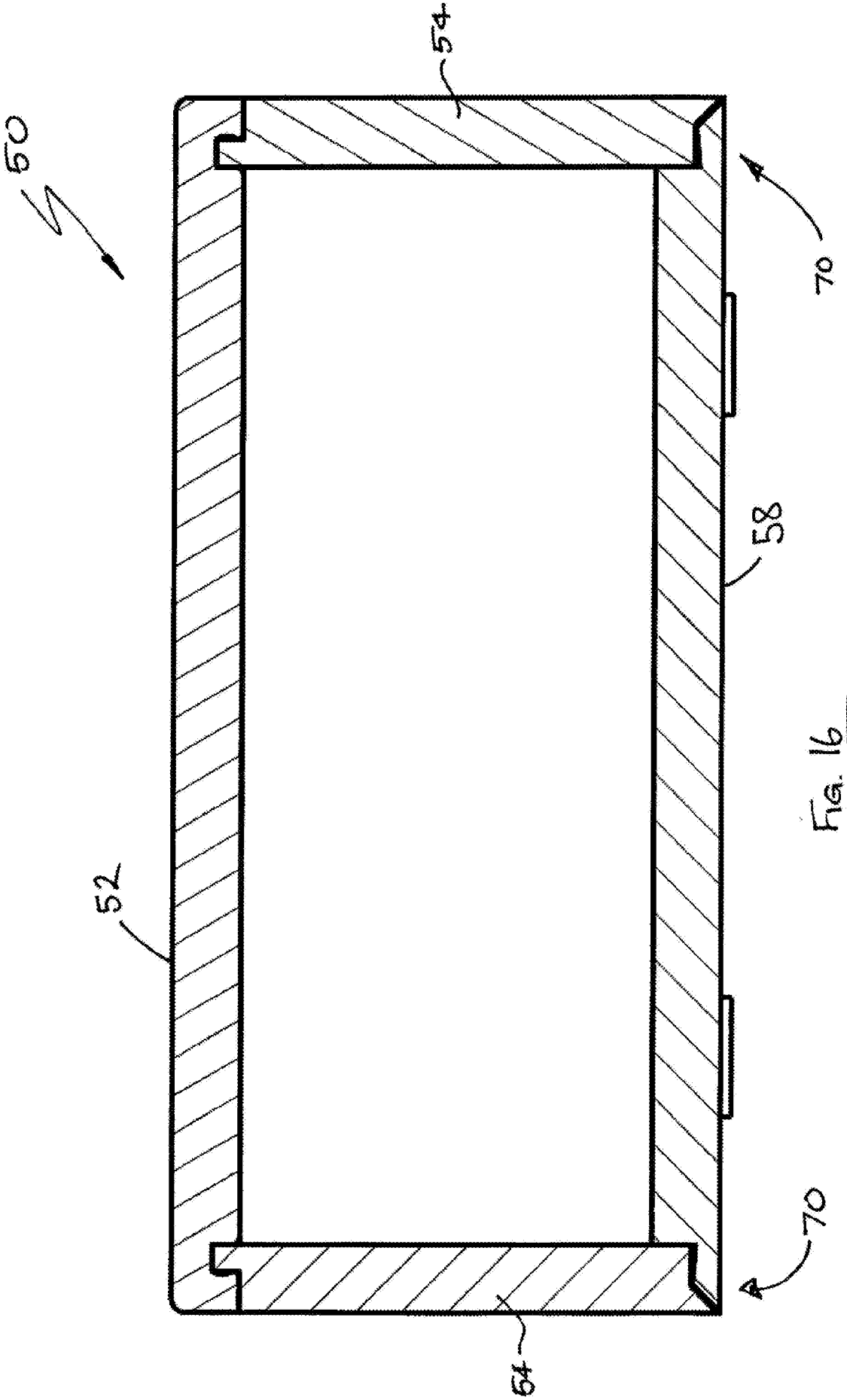

Fig. 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2014/001004

A. CLASSIFICATION OF SUBJECT MATTER

B65D 5/18 (2006.01) B65D 5/36 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC and all full text English databases, IPC and CPC: B65D5/- and keywords: edge, end, extent, boundary, border, cusp, groove, trench, channel, indent, cutting, canal, path, ledge, shoulder, shelf, ridge, rim, sill, support, abut, bolster, brace, reinforce, hold, EPS, polystyrene, styrene, mould, blank and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 December 2014	23 December 2014

Name and mailing address of the ISA/AU

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Authorised officer

Shane Kilcullen
AUSTRALIAN PATENT OFFICE
(ISO 9001 Quality Certified Service)
Telephone No. 0399359640

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/AU2014/001004**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 05/139441 A (KANEGAFUCHI CHEMICAL IND.) 08 June 1993 Fig. 1-11, para 13	1-2, 4-8
A	GB 2138782 A (HALSEY et al.) 31 October 1984 Fig. 1-10	1-8
A	US 2012/0024941 A1 (SKINNER) 02 February 2012 Fig. 1-2, 4, 12-13	1-8
A	US 4170313 A (CAVES et al.) 09 October 1979 Fig. 1, 11-12	1-8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2014/001004

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:

because they relate to subject matter not required to be searched by this Authority, namely:

the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including

2. ☐ Claims Nos.:

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box for Details

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-8

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT	International application No. PCT/AU2014/001004

Supplemental Box

Continuation of: **Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-8 are directed to a container blank. The feature of the container whereby the blank member forms a second configuration that is substantially rectangular is specific to this group of claims.

- Claims 9-10 are directed to a hinge member. The feature of a hinge is specific to this group of claims.

- Claims 11-19 are directed to a container blank. The feature of the container having a base and ledge portions extening from this base is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/AU2014/001004**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		**Patent Family Member/s**	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
JP 05/139441 A	08 June 1993	None	
GB 2138782 A	31 October 1984		
US 2012/0024941 A1	02 February 2012	AU 2010230836 A1	10 Nov 2011
		CA 2757182 A1	07 Oct 2010
		CN 102395512 A	28 Mar 2012
		EP 2408676 A1	25 Jan 2012
		JP 2012522690 A	27 Sep 2012
		KR 20120007029 A	19 Jan 2012
		NZ 595743 A	30 May 2014
		SG 174376 A1	28 Nov 2011
		WO 2010111729 A1	07 Oct 2010
US 4170313 A	09 October 1979		

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.