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(71) Applicant(s):
DS Smith Packaging Limited
(Incorporated in the United Kingdom)
Beech House Whitebrook Park,
68 Lower Cookham Road, Maidenhead, Berkshire,
SL6 8XY, United Kingdom

(72) Inventor(s):
Russell Turner

(74) Agent and/or Address for Service:
Marks & Clerk LLP
90 Long Acre, LONDON, WC2E 9RA, United Kingdom

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(58) Field of Search:
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Other: **Online: EPODOC, WPI**

(54) Title of the Invention: **A box and a blank or kit of parts for creating said box**
Abstract Title: **A box comprising product self management means**

(57) A box comprises a product self management means supported by the side or base or both. Preferably the product self management means is stressed or flexed into a deployed configuration. A plurality of products that are required to be transported and then displayed in the box can be organised individually or in bundles in upright position within the box by using the self-management means. In this manner, the products cannot slip forwards, backwards or on one side when some of the products have been removed by consumers.

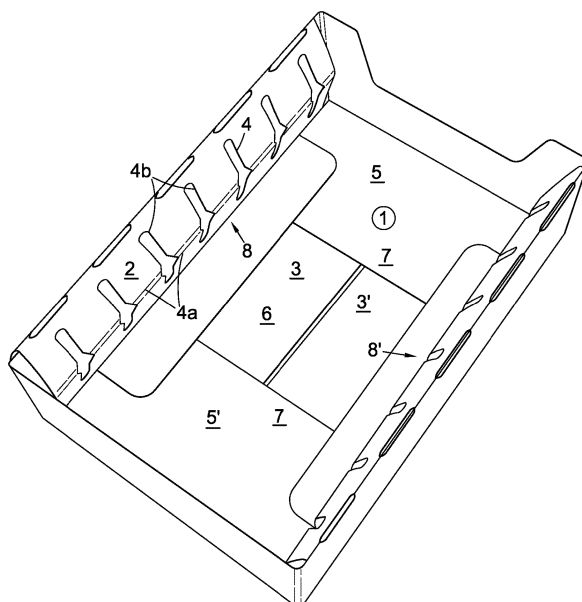


Fig. 6

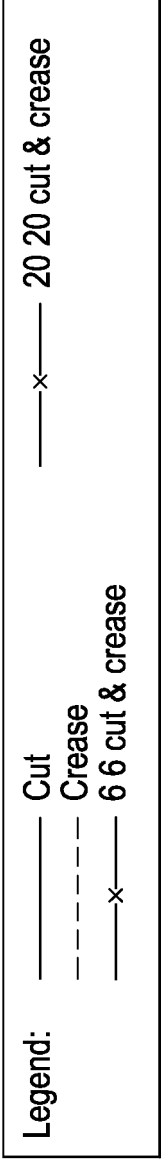
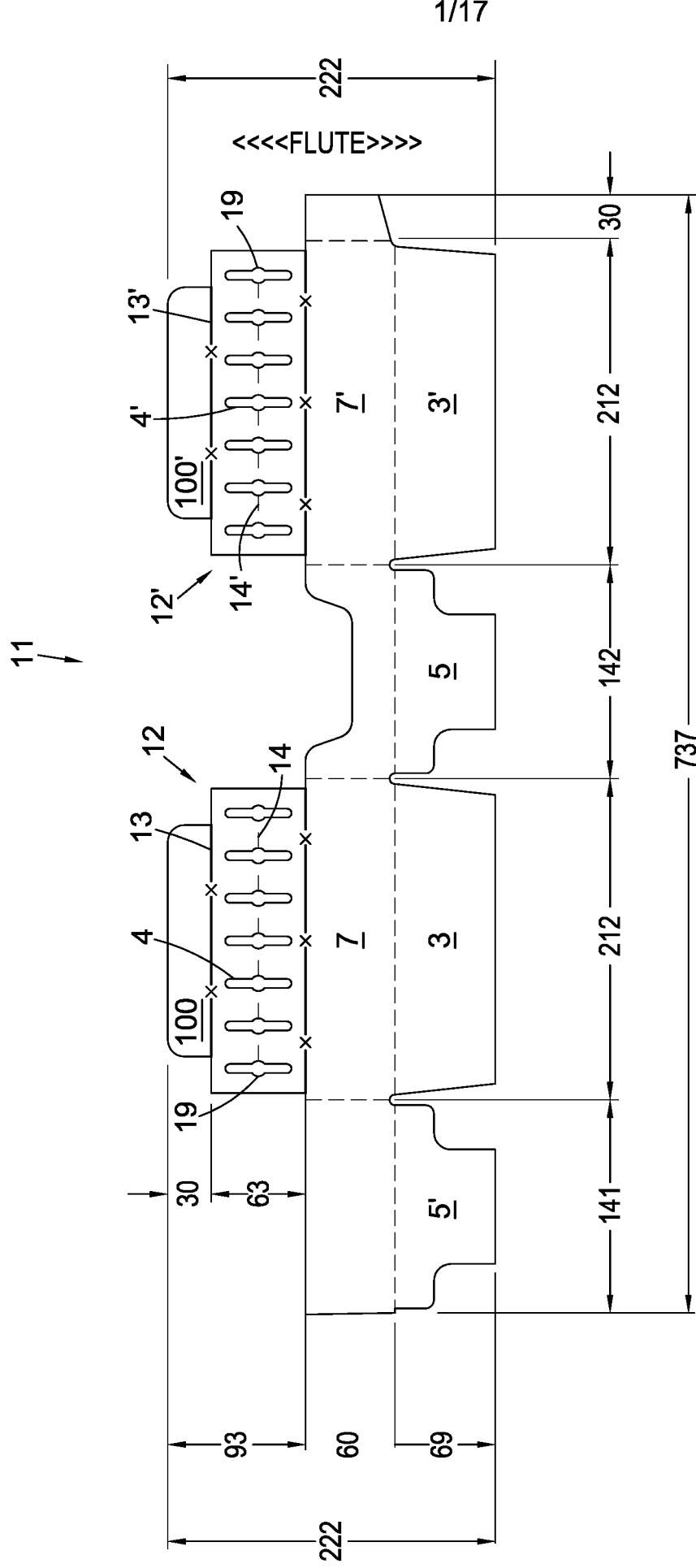


Fig. 1

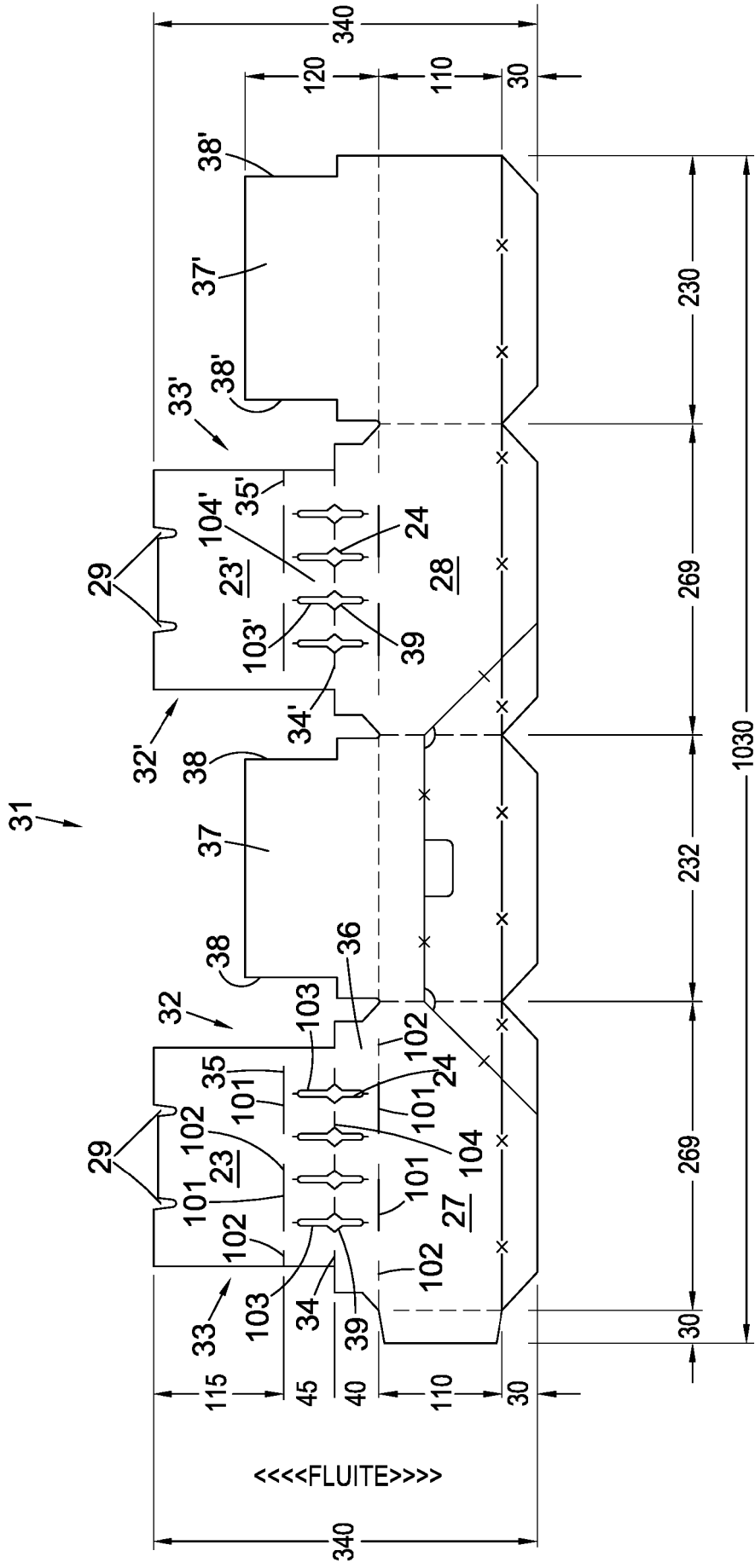


Fig. 2

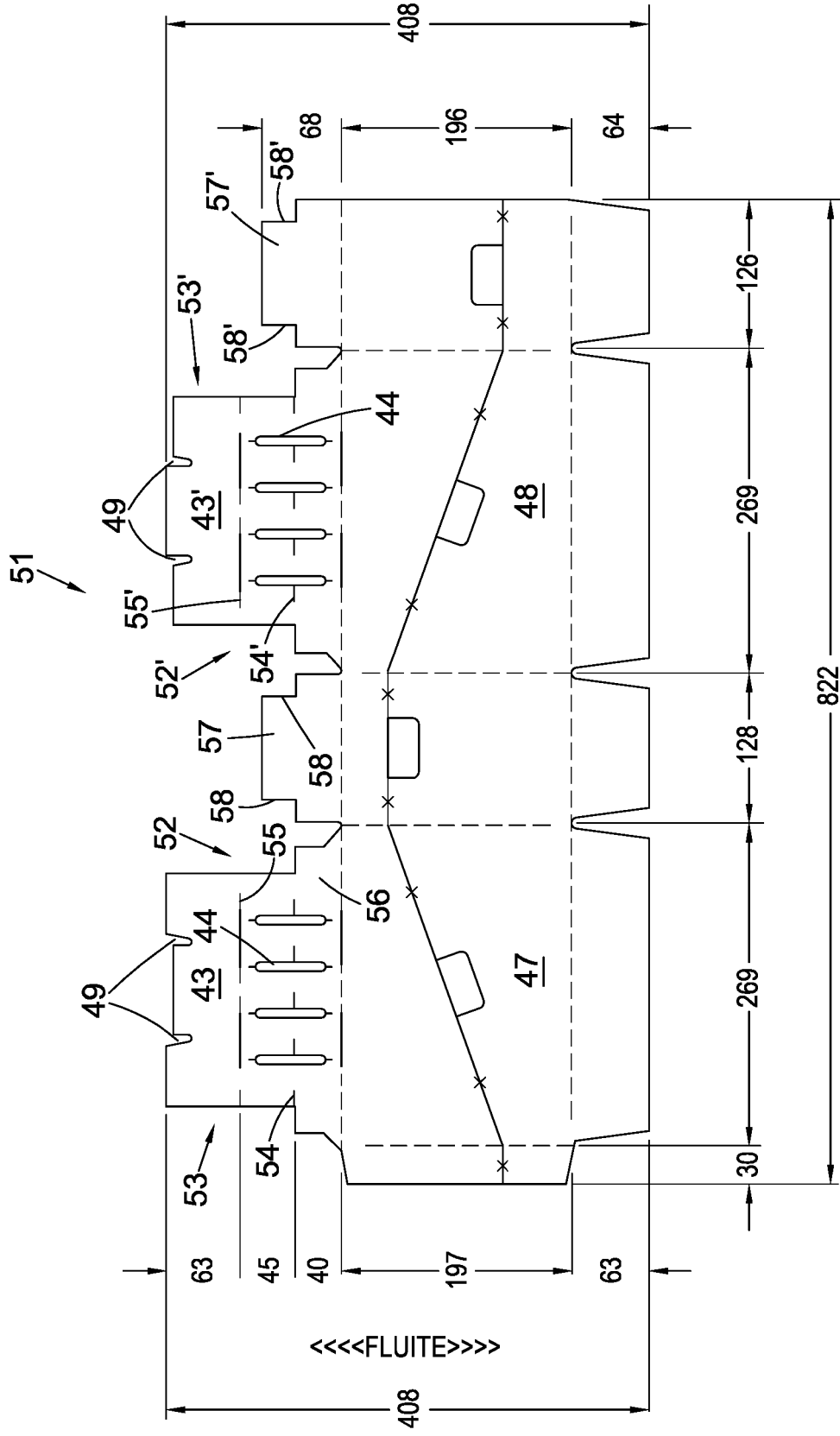


Fig. 3

Legend:

————	Cut	————	Cut Start End 10 Cut 3 Notch
-----	Crease Pointage 2		
-----	Crease Pointage 6		

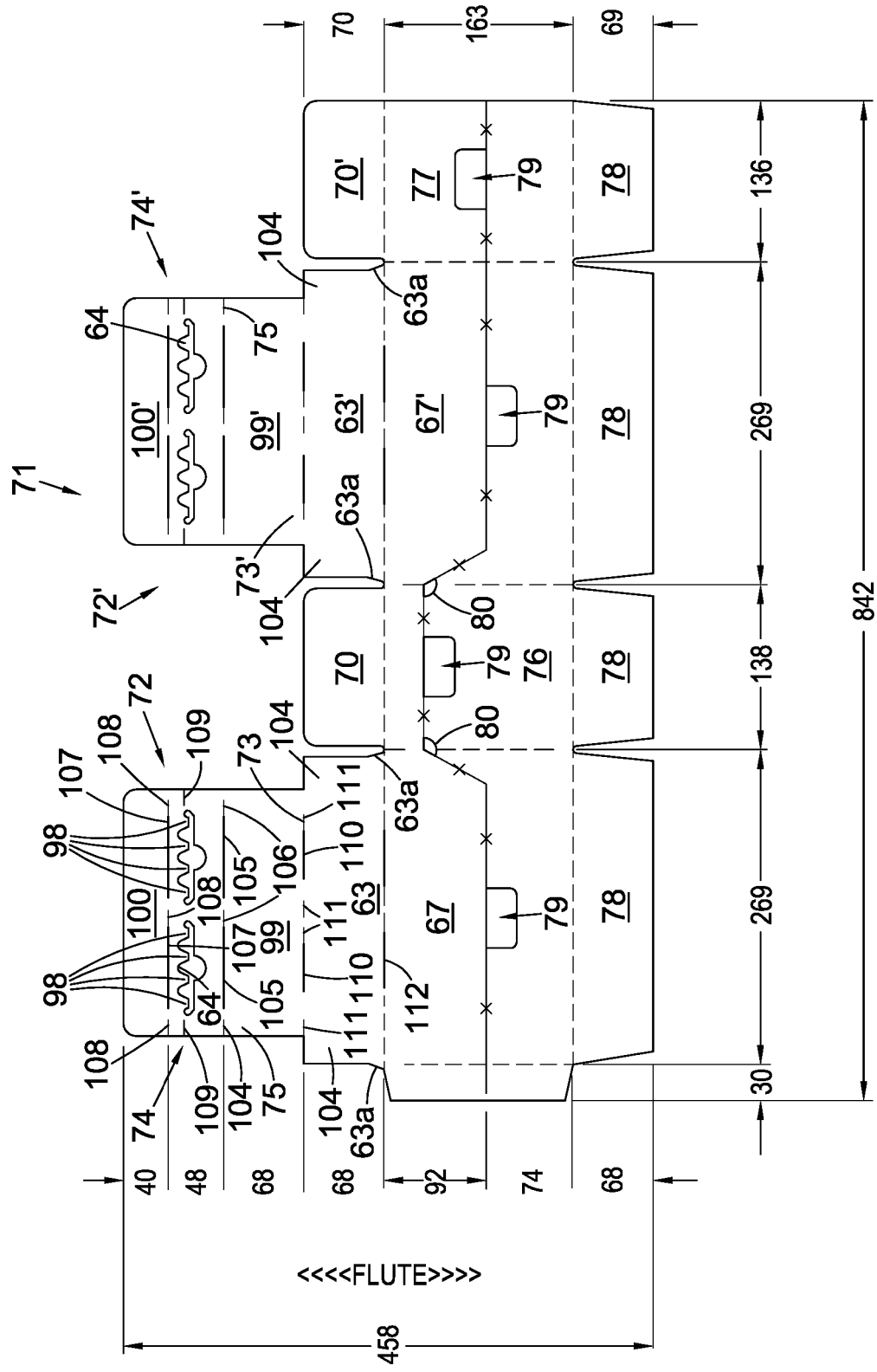


Fig. 4

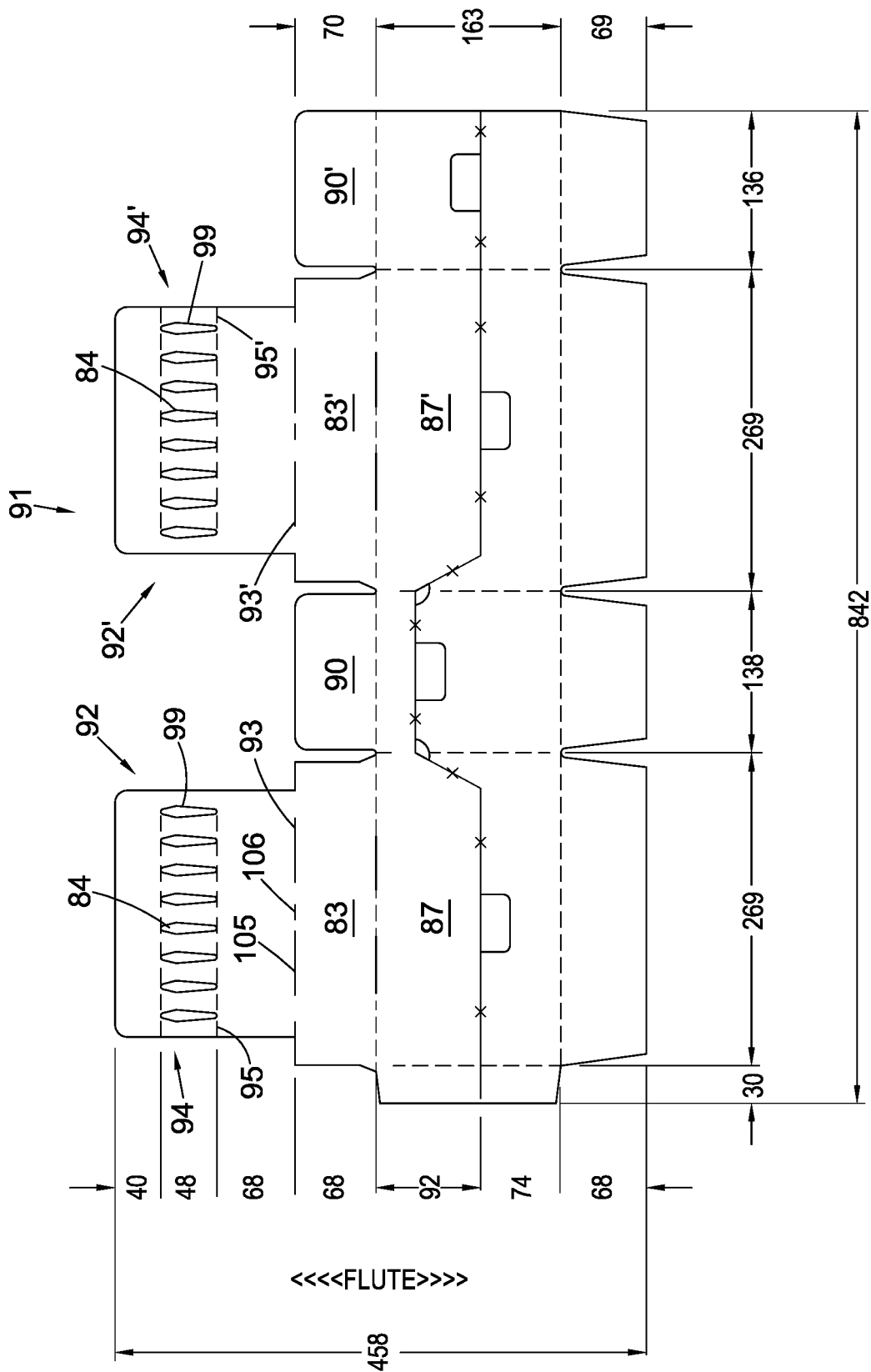


Fig. 5

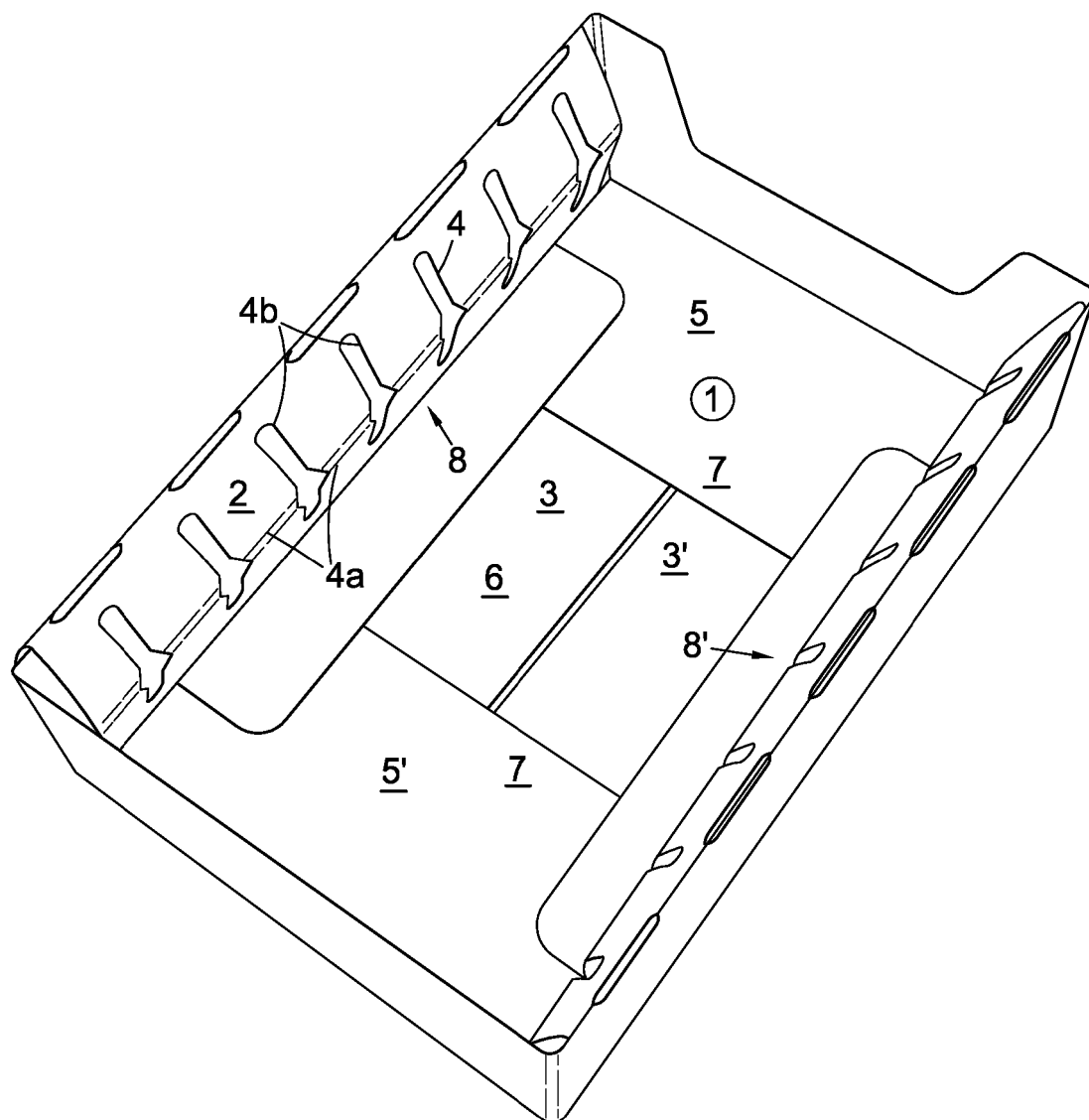


Fig. 6

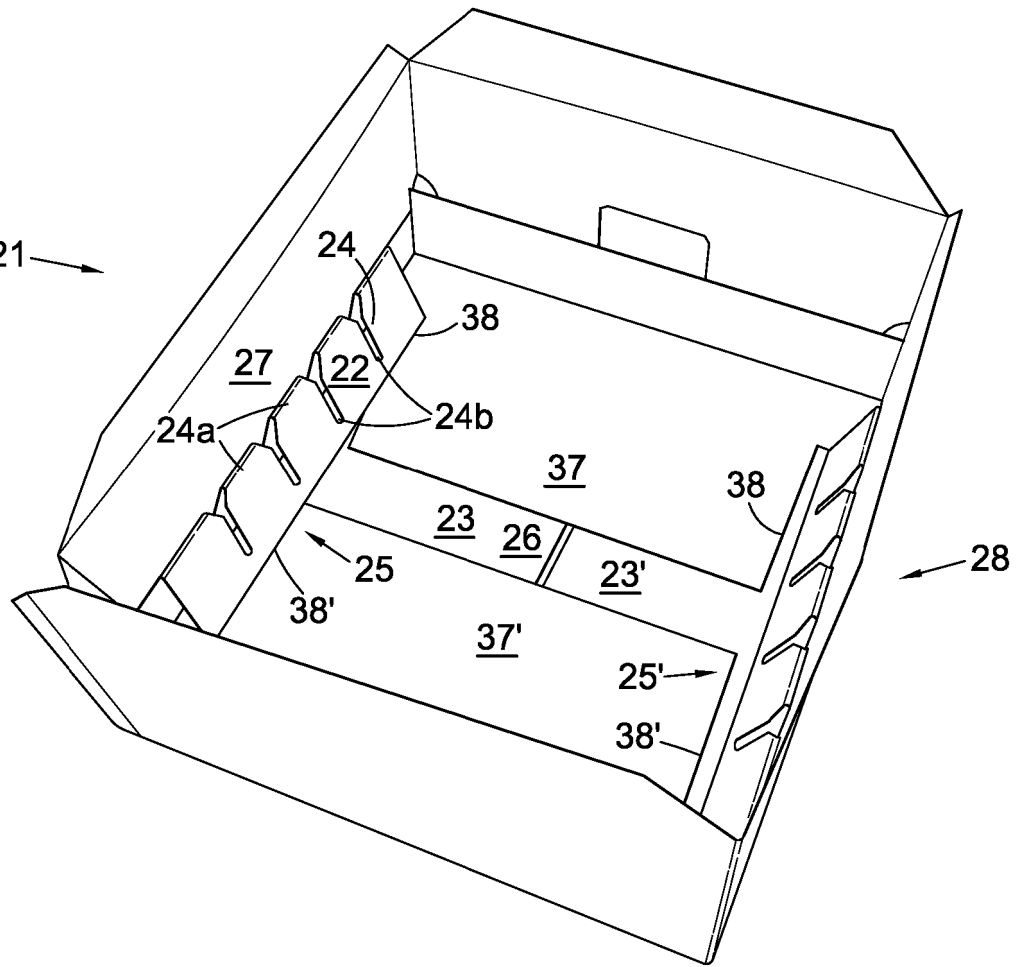


Fig. 7

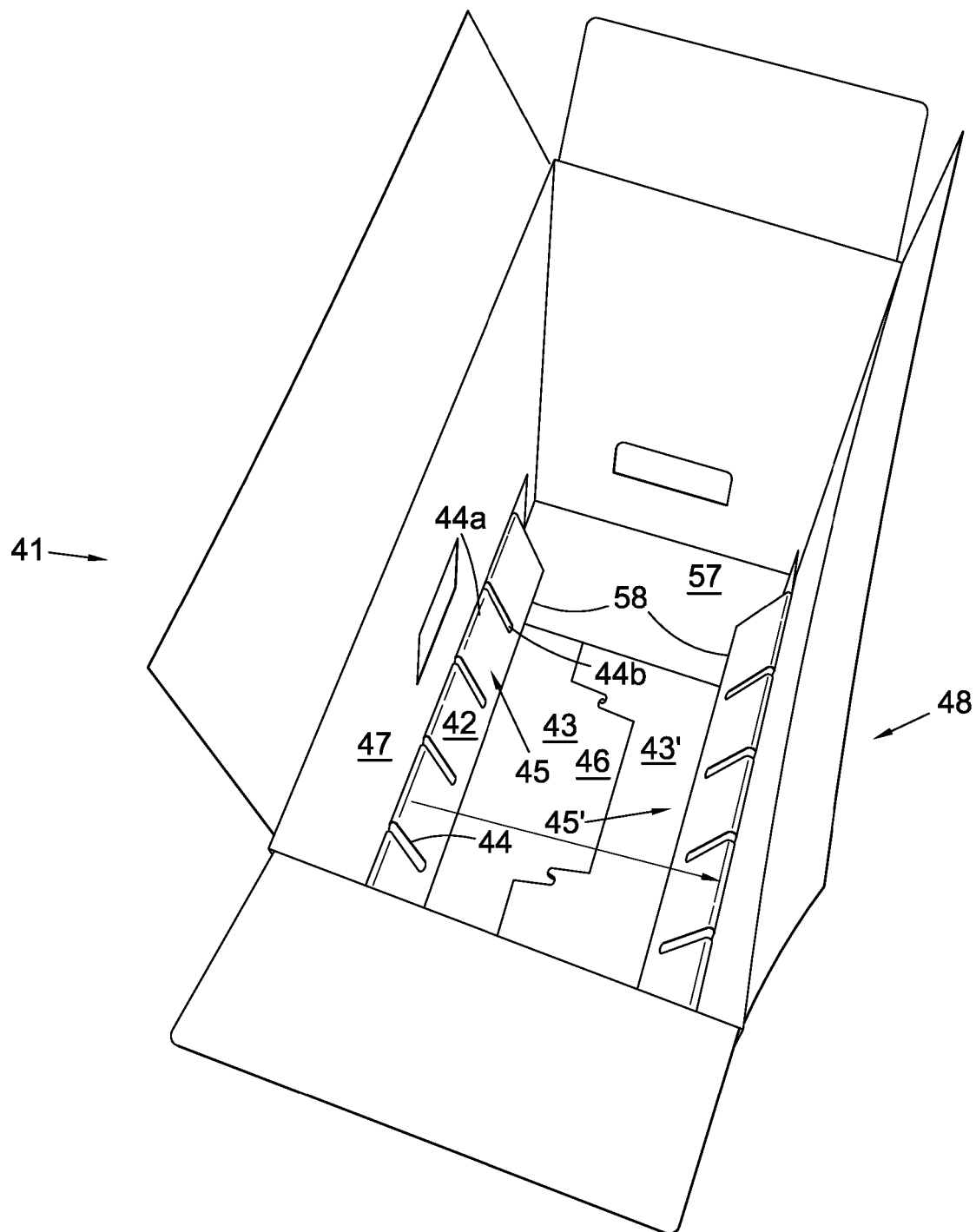


Fig. 8

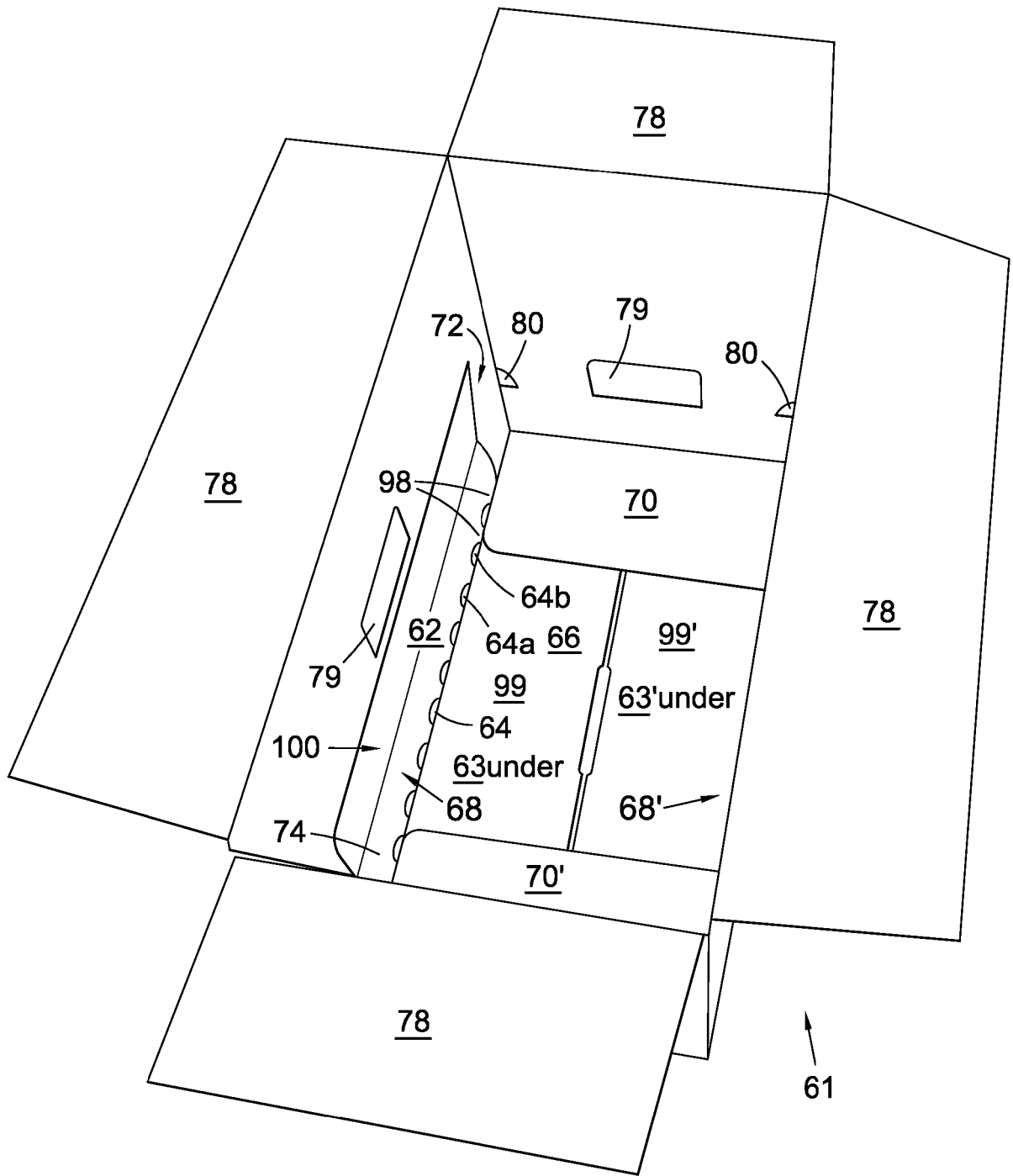


Fig. 9

13 02 14

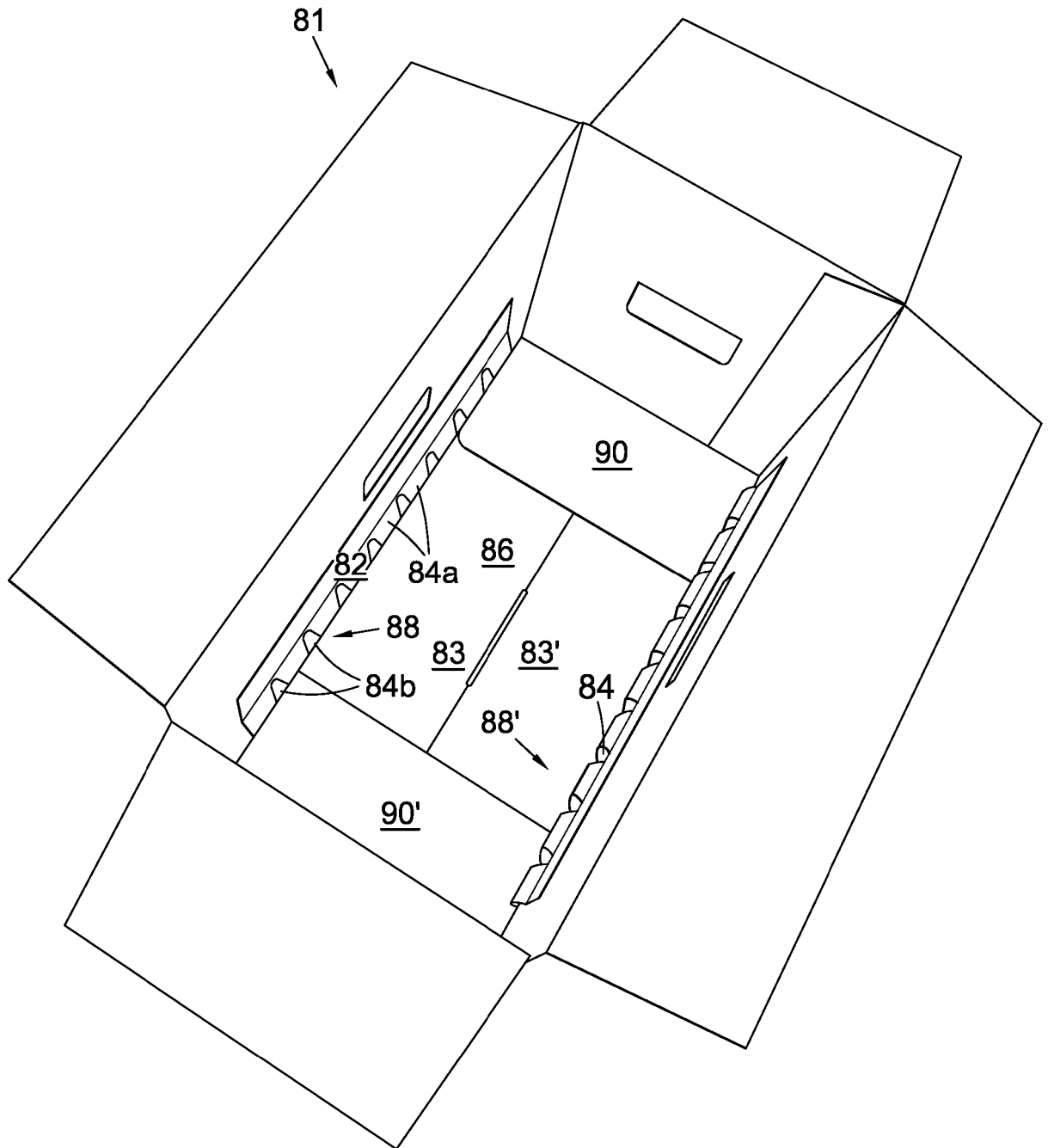


Fig. 10

13 02 14

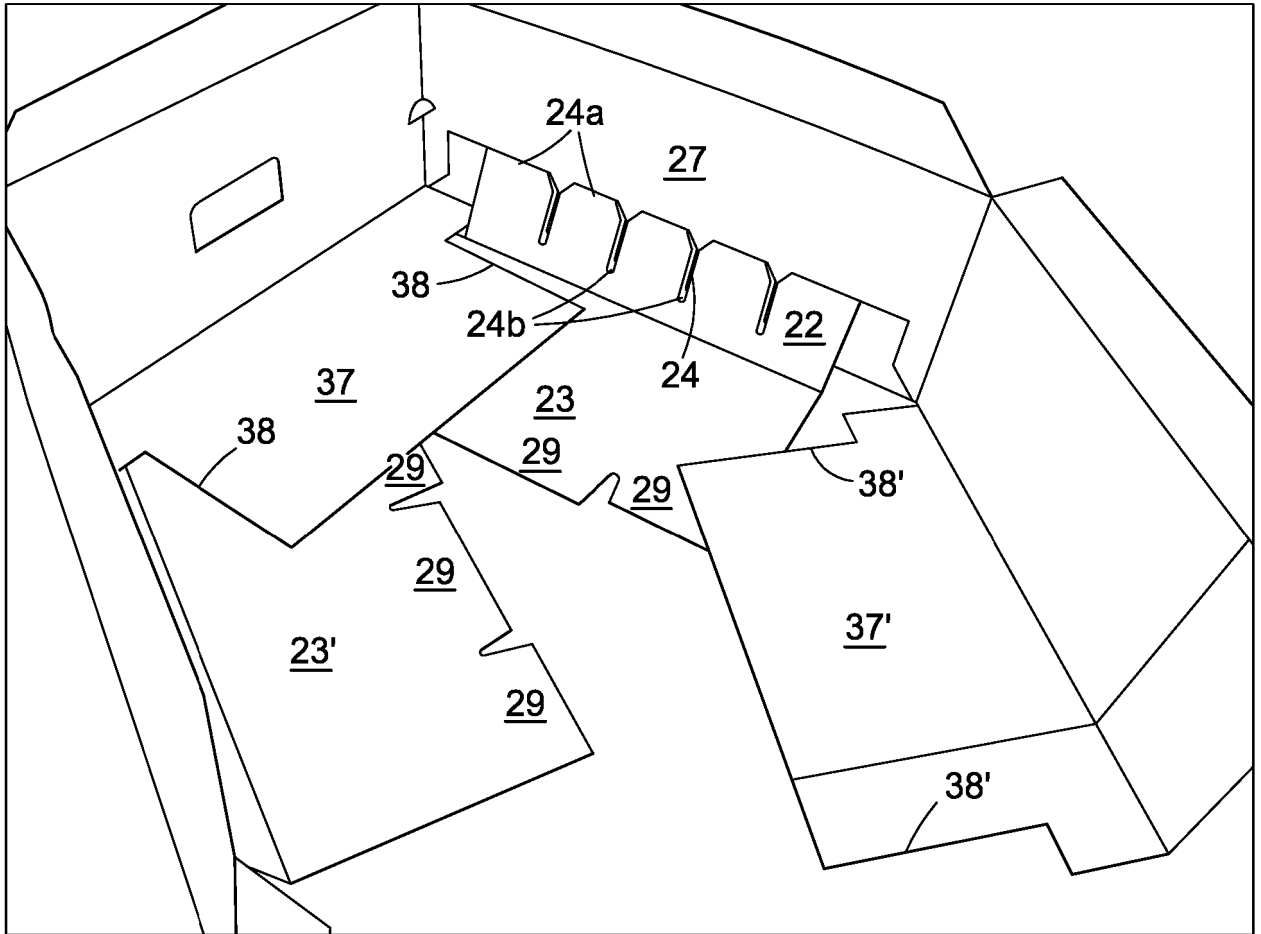


Fig. 11

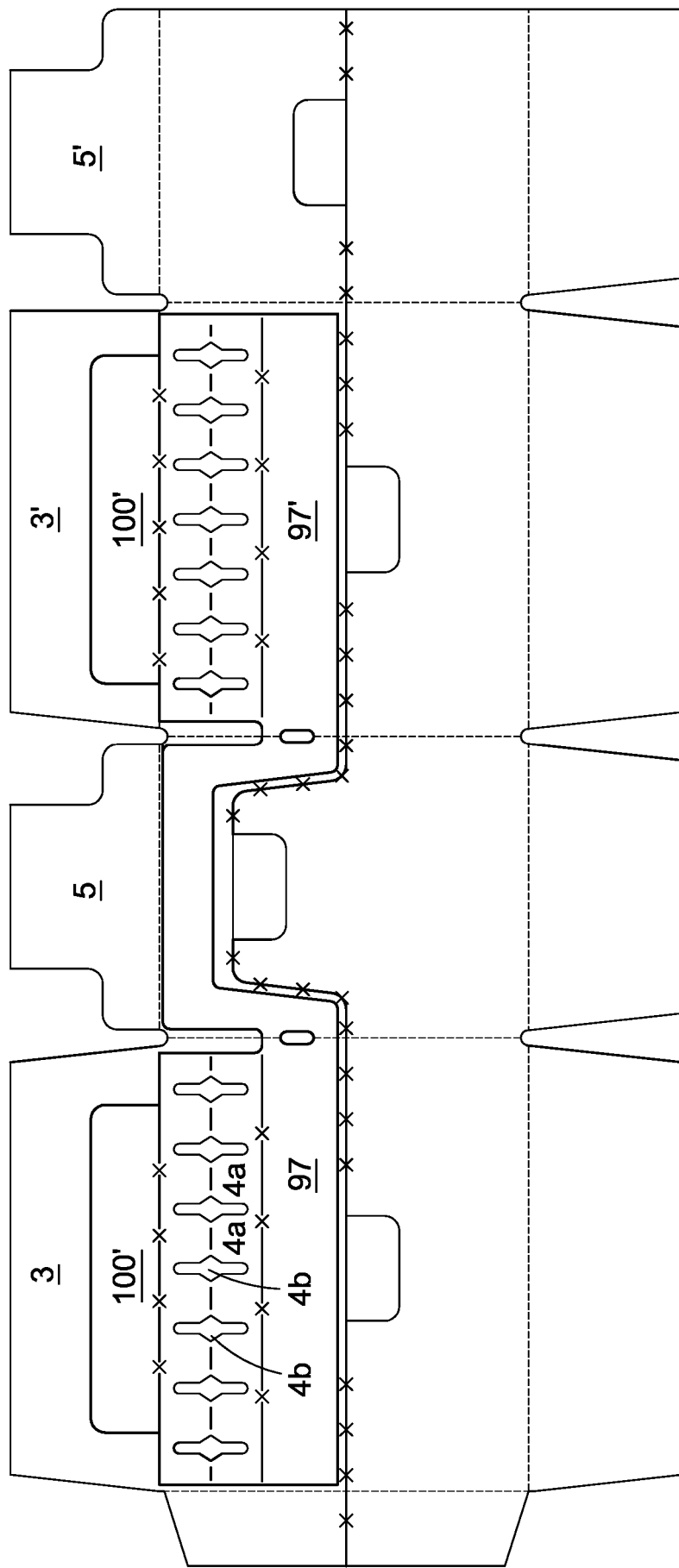
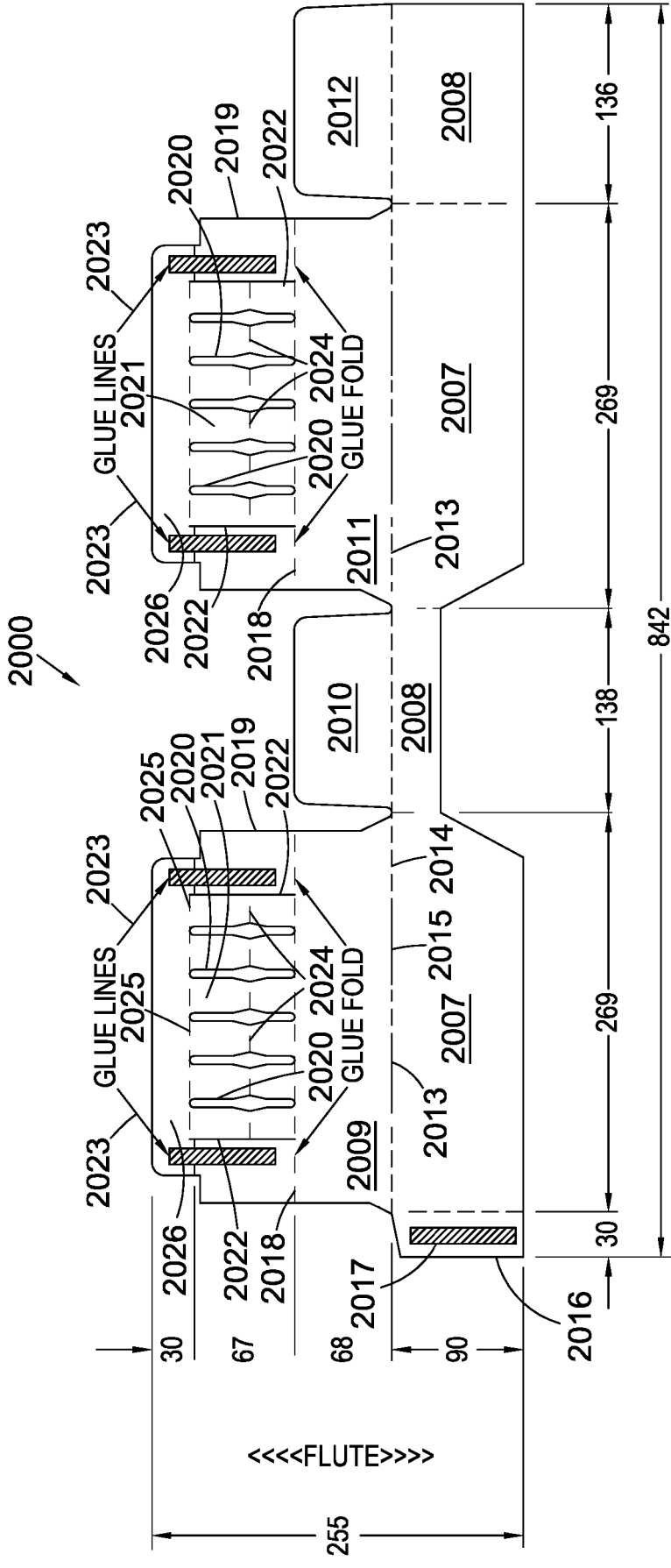


Fig. 12



Legend:

————	Cut	————x————	10 10 cut & crease
-----	Crease Pointage 2		
-----	Crease Pointage 6		

Fig. 13

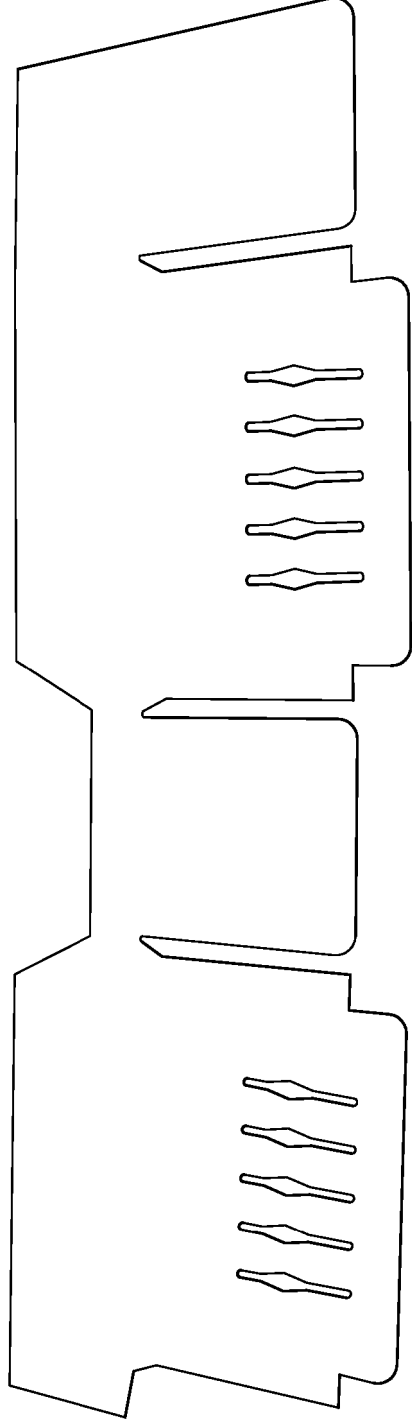


Fig. 14

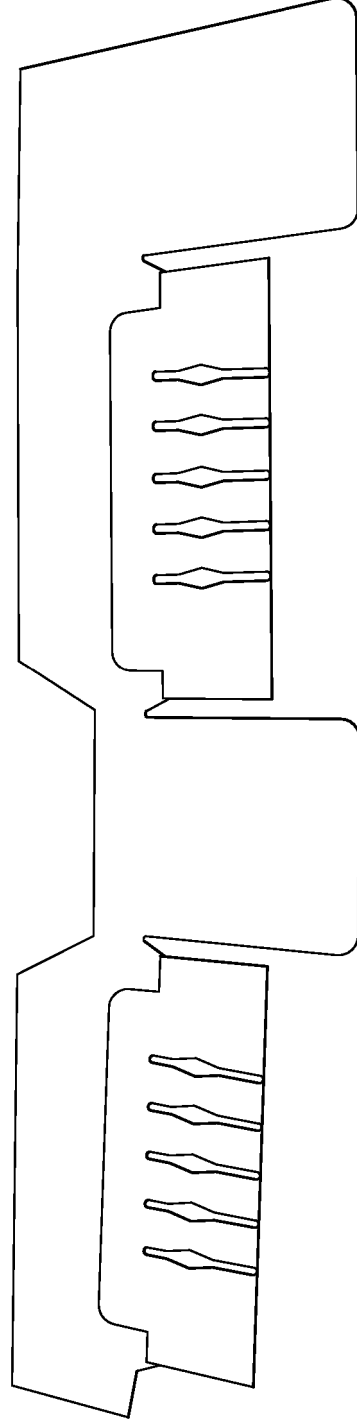


Fig. 15

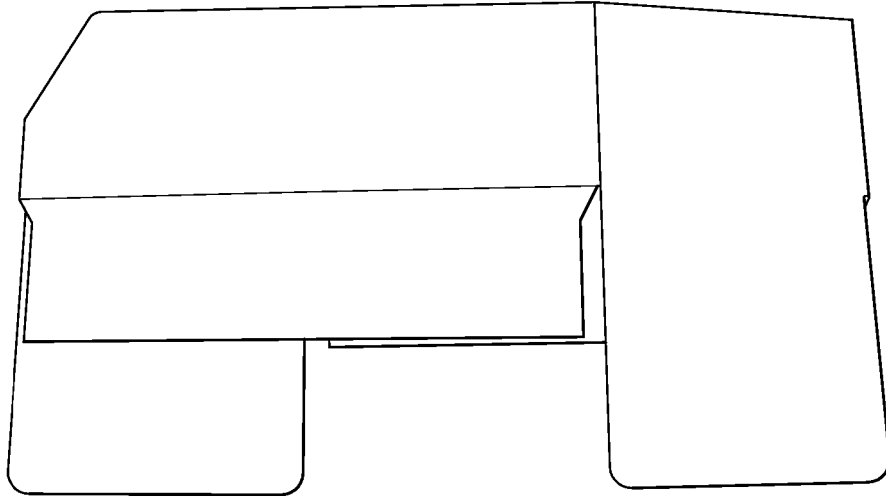


Fig. 16

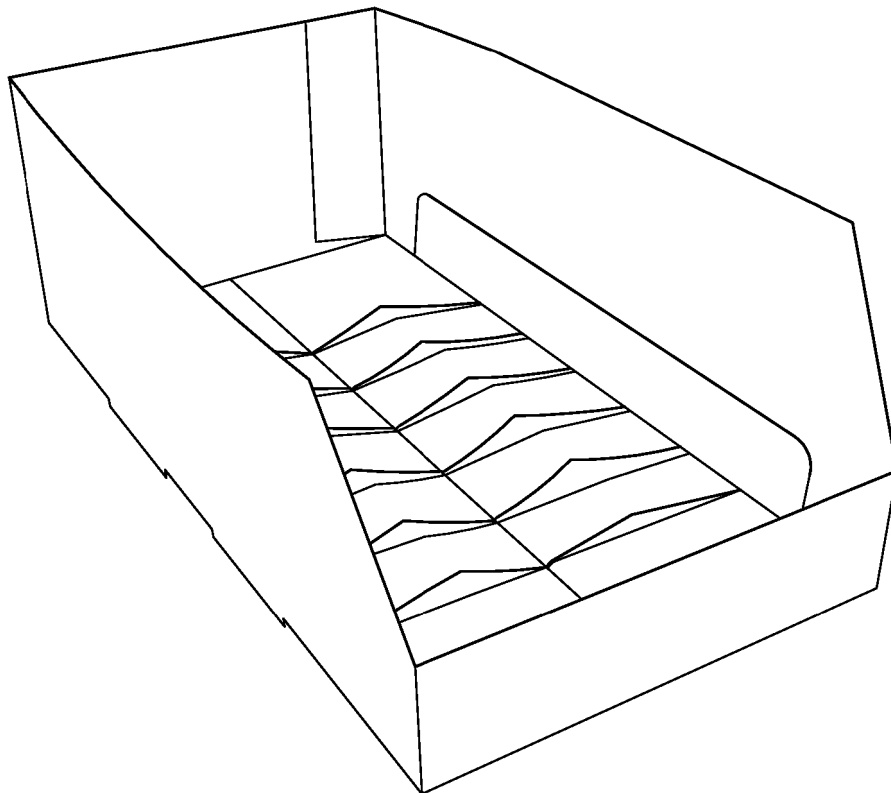


Fig. 17

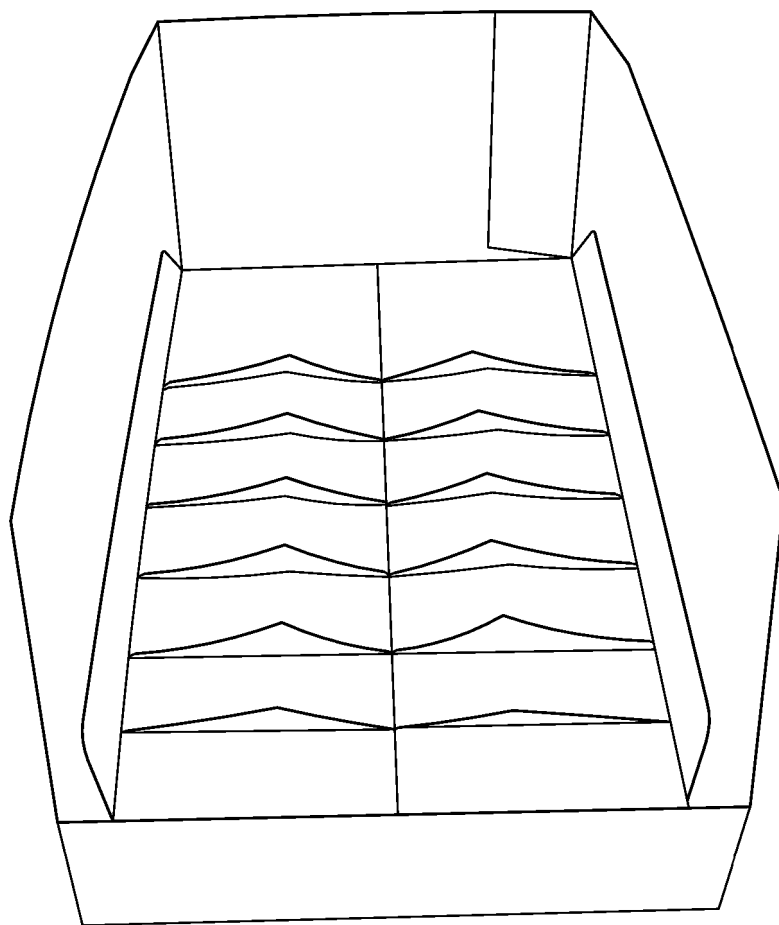


Fig. 18

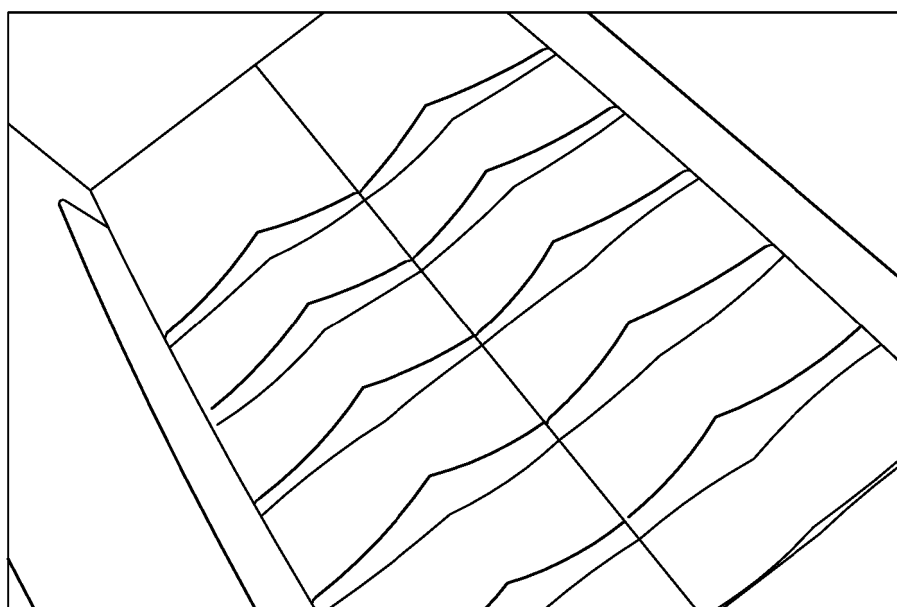


Fig. 19

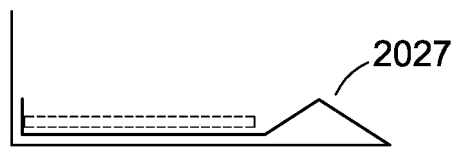
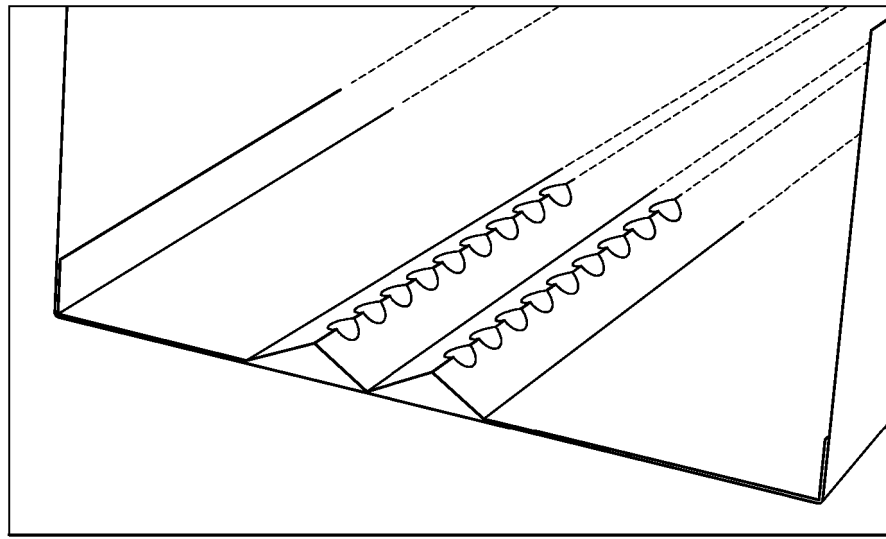


Fig. 20

A box and a blank or kit of parts for creating said box

5 The present invention relates to a box, a blank for erecting the box, a kit of parts for forming said box or said blank for erecting the box, and methods for displaying products for sale using such boxes.

10 Retailers and brand holders require consumer goods (products) to be presented in retail ready packaging (RRP). Retail ready packaging (RRP) allows the products to be shipped in a transport box or container that doubles up as a display box/container. The same box/container is thus suitable for transportation of the products and also for display of the products in the shop. The goods do not require extracting from the box and then reallocating on e.g. shelves ready for purchase.

15 Retailers and brand holders also prefer certain products to be merchandised upright, as this has demonstrated significant uplift in sales compared to having products merchandised lying flat. This upright arrangement can also enable a more efficient utilisation of the space on a sale fixture, e.g. a shelf.

20 Products that are required to be presented upright may tend to fall forward or slide on their back. In the sector the tendency of products to slide on their back is often referred to as the tendency of the products 'to submarine'. This tendency can be triggered by the shopping process itself, e.g. when products are removed by consumers from the RRP, whereby room is generated inside the RRP for the products 'to submarine'. When this happens, it is difficult for later shoppers to identify the products that have
25 slipped backwards and so changed their orientation within the box and significant in-store resources are required to continually correct the orientation of the products in 'part-shopped' RRP – typically in the form of personnel referred to as shelf stackers.

30 In addition, due to the form of some products, sometimes it can be difficult to keep the products upright as they show a continuous tendency to slip.

35 There is therefore a need for an improved box or container that at least helps to resolve or remove the above-mentioned tendency, i.e. the tendency of products to slip within the RRP.

According to a first aspect of the invention, there is provided a box comprising a side, a base and a product receiving space defined therebetween, and further comprising a product self-management means supported by the side or base of the box, or both, said product self-management means being part of the box and extending only part way across the product receiving space. Preferably the self management means is stressed or flexed into a deployed configuration, e.g. as a consequence of the said support, so as to have product self-management elements stressed or flexed into an elevated or out-of plane position, e.g. relative to the side or base of the box. The self management means is part of the box by being an integral part of the blank therefor, or by being attached thereto e.g. by adhesive, stapling or tape. It should not be loose within the box in this embodiment.

According to a second aspect of the invention, there is provided a box comprising a side, a base and a product receiving space defined therebetween, and further comprising a product self-management means supported by the side or base of the box, or both, said product self-management means being part of the box and being stressed or flexed into a deployed configuration so as to have product self-management elements stressed or flexed into an elevated or out-of plane position relative to the side or base of the box. Preferably the product self management means extends fully across the product receiving space, and again it is part of the box by being an integral part of the blank therefor, or by being attached thereto e.g. by adhesive, stapling or tape. It should not be loose within the box in this embodiment.

According to a third aspect of the invention, there is provided a box comprising a side, a base and a product receiving space defined therebetween, and further comprising a product self-management means supported by the side or base of the box, or both, said product self-management means being within the box and being stressed or flexed into a deployed configuration.

By being within the box, the product self management means may be part of the box or it may be a separate component applied to the box. For example, it may be a separate, non-joined component thereof, or it may be an integral part of the blank for the box, or it may be attached to the box or the blank therefor e.g. by adhesive, stapling or tape. It may be either loose within the box or it may be fixed or gripped or secured within the box in a permanent or semi-permanent manner.

5 The product self-management means may have been stressed or flexed in consequence of the said support, e.g. as a result of folding a blank for forming the box into the desired box shape, or due to the insertion of the means into the assembled box, or a combination of the two, or it may be flexed or stressed through some other design, e.g. by being located in the box in a pre-stressed or pre-flexed condition.

10 The product self-management means may extend part way, or fully, across the product receiving space.

In the deployed configuration, it is preferred that a plurality of product self-management elements are in a state of stress or flexure such that they assume an elevated or out-of plane position relative to the side or base of the box, or relative to further, typically planar, members of the product self-management means.

15 By virtue of the self-management means, the box becomes configured such that a plurality of products can be organised individually, or in bundles, according to a desired orientation within the product receiving space of the box, whereby upon removal of one or more products from the box, the remaining products are prevented from undergoing a substantial slip within the product receiving space – i.e. one sufficient to cause submarining, or some other form of significant reorientation of the product or products into an undesired orientation within the product receiving space of the box.

20 Preferably the box has two opposing sides, each being associated with a product self-management means, or a common product self-management means.

Preferably the box is an RRP (retail ready packaging).

30 The sides may be top and bottom sides, left and right sides or front and back sides, but preferably they are left and right sides.

Preferably, the box is made of sheet material, for example a corrugated sheet, or card. Preferred materials include corrugated cardboard. It could alternatively be plastic sheeting including corrugated plastic sheeting.

Preferably, the thickness of the sheet material is between about 1 and about 3 millimetres. These thicknesses are chosen to achieve a good compromise between strength and weight. Heavier target products, however, may require or benefit from heavier, i.e. thicker or stronger, sheet materials, including tri-wall corrugates, or corrugates having a thickness in excess of 3mm.

Preferably, the product self-management means is integral with the box, e.g. formed as a part of the one or more blank used to form the box. Alternatively it may be otherwise attached to the box. These arrangements are so that the box and its product self-management means can easily be disposed of together - it is preferred that they do not separate during use, or once the products have all been removed.

In certain embodiments, the product self-management means is bonded to the box by means of an adhesive material.

In preferred embodiments the product self-management means and the box are obtained from a single blank of material.

In preferred embodiments, the product self-management means and the box are obtained by folding, and potentially gluing or bonding, a single blank of material.

Preferably, the product self-management means comprises a self-management flap. In some preferred embodiments, the self-management flap is a foldable self-management flap which therefore is present in the box in a folded configuration, i.e. as a folded self-management flap. Any reference to a self-management flap shall be taken equally to include a reference to a foldable or folded self-management flap, and vice versa.

Preferably, the box and the folded self management flap are folded from a single blank of material.

In preferred embodiments, a single blank of material can be folded to obtain both the box and its product self-management means including, where present, the self-management flap.

Preferably, the side of the box, or at least part of the base of the box, are provided respectively by a folded side flap or by a folded base flap of the box. Thus the box, in an unfolded configuration, will still comprise said side or base flap, or both.

5 Preferably, the self-management flap is an extension of the side or base flap of the box, i.e. there is no discontinuity between said side or base flaps and the self-management flap, or, in different words, the self-management flap is a continuation of the sheet of material forming the side or base flap.

10 Preferably, the folded self-management flap and the folded side or base flap are separated by a line of weakness.

15 Preferably, the folded self-management flap is an upper extension of the side of the box. In particular, the self-management flap can extend from an upper end of the folded side flap of the box.

20 Preferably, the folded self-management flap is folded inwardly with respect to the box, towards the base of the box, such that the folded self-management flap extends over at least a portion of a depth of the side of the box.

25 Preferably, the folded self-management flap extends substantially over all of the side depth.

30 Preferably, a portion of said folded self-management flap extends further than the side depth and over at least a portion of the base of the box.

35 Preferably, said further extending portion of the folded self-management flap is connected to a portion of the base of the box. In certain embodiments, an adhesive is used. Alternatively, a tape or an interlocking arrangement can be used.

40 Preferably, the portion of the base of the box is the folded base flap of the box, said base flap being folded to provide at least part of the base of the box, as mentioned above.

Preferably, there is a line of weakness in the further extending portion of the folded self-management flap, said line of weakness being provided generally in correspondence with a lower end of the side of the box, but at a slight offset towards the base of the box, said line of weakness being configured for locating in place in a folded corner formed between the lower end of the side of the box and the base of the box upon folding in place the base flap of the box, such that said product self-management means is caused to move away from said side of the box, thereby erecting itself in place, upon same folding in place of the base flap of the box. Likewise, the product-self management means will then easily be able to be collapsed, i.e. retracted, by reversing the folding of the base flap.

In certain embodiments, the folded self-management flap is a lower extension of the side flap of the box. In particular, the self-management flap can extend from a lower end of the folded side flap of the box.

Preferably, the folded self-management flap is folded inwardly with respect to the box, and over at least a portion of the side of the box or the side flap of the box.

Preferably, said folded self-management flap is connected to the side or side flap of the box.

Preferably, said folded self-management flap further comprises an extension portion separated from a rest of the self-management flap by means of a line of weakness, said extension portion being configured for being folded to provide at least part of the base of the box, or in other words a base flap of the box.

Preferably, said folded self-management flap and its extension portion form a generally z-type fold.

In certain embodiments, the folded self-management flap is a lower extension of the base flap of the box, said base flap providing at least a part of the base of the box when folded.

Preferably, the folded self-management flap is folded inwardly with respect to the box, i.e. towards the side of the box, such that the folded self-management flap extends over at least a portion of the base flap of the box.

5 Preferably, the folded self-management flap extends over a full width of the base flap.

Preferably, a portion of said folded self-management flap extends further than the full width of the base flap and over at least a portion of the side of the box.

10 Preferably, the further extending portion of the folded self-management flap is connected to the side of the box.

Preferably, there is a line of weakness in the portion of the folded self-management flap extending over the base flap, said line of weakness being provided generally in
15 correspondence with, and optionally at a slight offset away from, a lower end of the side of the box, said line of weakness being configured for locating in place in a folded corner between the lower end of the side of the box and the base of the box upon folding in place the base flap of the box, such that said product self-management means is caused to move away from the side of the box, thereby erecting itself in
20 place, upon folding in place the same base flap of the box. Likewise, the product-self management means can easily be collapsed, i.e. retracted, by reversing the folding of the base flap.

25 Preferably, said product self-management means extends in the direction of the side of the box.

Preferably, the box comprises a pair of opposing sides.

30 Preferably, the opposing sides are substantially parallel.

Preferably, said product self-management means extends in the direction of said pair of opposing and substantially parallel sides.

35 Preferably, said product self-management means comprises two parts, the first part of said two parts extending along one side of said pair of opposing parallel sides, and the

second part of said two parts extending along the other side of said pair of opposing parallel sides.

5 Preferably, the two parts of the product self-management means are configured such that they can cooperate with each other for organising in place the plurality of products in the desired orientation.

10 Preferably, said two parts are specularly arranged within the box, e.g. in an mirrored or symmetrical arrangement.

Preferably, the product self-management means is supported jointly by the side of the box and by the base of the box.

15 Preferably, said self-management means comprises at least one ridge and one valley, wherein said valley is configured for receiving at least one of said plurality of products, and wherein said ridge is configured for retaining in position at least one of said plurality of products.

20 Preferably, said product self-management means comprises a plurality of ridges and valleys.

25 Preferably, said plurality of ridges and valleys is arranged to form a series of ridges and valleys, wherein said series of ridges and valleys comprises a periodic repetition of ridges and valleys along the self-management means, wherein two adjacent ridges or valleys are spaced apart by a period length.

Preferably, said period length is about 10mm, or about 50mm, or between 10 and 50 millimetres.

30 Preferably, said at least one valley is provided by a slot or slit.

Preferably, said slit or slot has closed ends.

35 Preferably, said slot or slit comprises a cut-through opening cutting through a thickness of a material of the box.

Preferably, said slot comprises two substantially parallel sides.

5 Preferably, the substantially parallel sides each comprise an inwardly extending recess, said recesses being substantially opposite each other.

Preferably, the recesses are provided approximately mid-way along the sides.

10 Preferably, the recesses are located generally on a ridge of the product self-management means.

Preferably, said product self-management means has a generally triangular perimeter shape with regard to a notional transversal plane cutting across the self-management means.

15 Preferably, said self-management means has a substantially toast-rack type arrangement. In other words, preferably the self-management means is adapted to support products within the box in an arrayed or aligned arrangement, either singly or in groups, like toast in a toast rack, each single or group of product being held by one or more element of the self-management means, and preferably by one or more pair of elements, e.g. a pair on either side of the box, or a pair on either side of the product, either or both to the front and back of the product or to two opposing edges or sides of the product.

20 Preferably, said box is classed as a retail-ready packaging (RRP).

Preferably the box is formed of sheet material faced with printed images. Both sides may be printed, or just one.

30 Preferably, said box further comprises a lid.

Preferably, said lid is detachable.

35 Preferably, said detachable lid is detachable by means of a line of weakness.

Preferably, said line of weakness is a score line or perforation.

Preferably, said box has transport walls extending above the self-management means, e.g. up to a top or lid of the box.

5

Preferably, said transport walls are detachable. By detaching them the box may be converted into a display condition – one where the product is more accessible or more visible. The transport walls may extend around the left and right sides of the box, plus the front and back sides of the box, or may extend only for part of the left and right sides and across the front and top of the box, thus allowing a front window or slot to be opened.

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Preferably, said transport walls are detachable by means of a line of weakness.

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Preferably, said line of weakness is a score line or perforation.

Preferably the box has bottom flaps forming part of the bottom of the box. Preferably these bottom flaps are arranged to be folded into the bottom plane of the box prior to folding the product self-management means. The bottom flaps then can cause the product self-management means to fold correctly.

20

Preferably the box has first pair of bottom flaps in the form of a pair of front and back bottom flaps, and a second pair of bottom flaps in the form of a pair of left and right side bottom flaps, one of the two pairs being adapted to carry or comprise a further flap that forms or extends from the product self-management means, wherein the other pair of bottom flaps each have a profile to avoid overlapping the further flap when the two pairs of bottom flaps are folded to form the bottom.

25

Preferably, the box further comprises a retaining flap, and said product self-management means is retained in place by means of the retaining flap of the box when this has been folded in position. The retaining flap may be one of the bottom flaps.

30

According to a further aspect of the invention, there is provided a blank of material which can be formed into a flat, folded state and which can subsequently be erected to provide a box according to the previous aspect of the present invention.

35

According to a further aspect of the invention, there is provided a kit of parts which can be assembled to form a blank or a box according to the previous aspects of the present invention.

5

The invention can equally cover a box configured for holding a number of products having substantially the same shape, products having different shape, or bundles of different products, different shapes being present within each bundle of products. However, preferred embodiments are those where the box is configured for receiving, whether for transportation, display, or both, a number of products of the same shape, e.g. packs of pre-packed food-stuff, such as meats.

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The present invention also provides a method for displaying products for sale using such boxes.

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The present invention also provides a method for displaying products for sale within retail ready packaging to a customer, the method comprising providing a box with a side, a base and a product receiving space defined therebetween, and a product self-management means supported by the side or base of the box, or both, the product self-management means being within the space and having elements that are stressed or flexed into a deployed configuration, loading a plurality of products into the space by placing them between respective pairs of such elements, delivering the loaded box to a retail location, and locating the loaded box on shelving in that retail location, the box being the retail ready packaging providing access to the products to the customer.

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The box may be as described above or below.

The method may comprise the step of ripping off a cover or lid from the box before or after locating the box on the shelf.

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These and other features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings in which:

Figure 1 is a schematic drawing representing a blank of corrugated cardboard for forming a box according to a first embodiment of the invention;

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Figure 2 is a schematic drawing representing a blank of corrugated cardboard for forming a box according to a second embodiment of the invention;

5 Figure 3 is a schematic drawing representing a blank of corrugated cardboard for forming a box according to a third embodiment of the invention;

Figure 4 is a schematic drawing representing a blank of corrugated cardboard for forming a box according to a fourth embodiment of the invention;

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Figure 5 is a schematic drawing representing a blank of corrugated cardboard for forming a box according to a fifth embodiment of the invention;

15 Figure 6 is a perspective view of an erected box according the first embodiment of the invention;

Figure 7 is a perspective view of an erected box according the second embodiment of the invention;

20 Figure 8 is a perspective view of an erected box according the third embodiment of the invention;

Figure 9 is a perspective view of an erected box according the fourth embodiment of the invention;

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Figure 10 is a perspective view of an erected box according the fifth embodiment of the invention;

30 Figure 11 is a perspective view of a partially erected box according to the second embodiment of the invention;

Figure 12 is a variant of the first embodiment, illustrating an alternative approach for forming a blank into a condition ready for distribution or use, the blank being in accordance with a sixth embodiment of the present invention;

35

Figure 13 is a schematic drawing representing a blank of corrugated cardboard for forming a box according to a seventh embodiment of the invention;

Figures 14 to 19 illustrate folding a blank as shown in Figure 13 into a box shape; and

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Figure 20 shows a variation for the product self-management means of the seventh embodiment

Where dimensions are provided in the drawings, these are expressed in millimetres. Lengths, heights and widths can be altered as necessary to alter the size of the boxes. Likewise, a different number (more or less) of apertures/slots/holes can be provided in the product self management means either for the boxes when made to the illustrated sizes, or when altering the sizes – larger or smaller. The illustrations are as such illustrating just individual examples of embodiments and should not be seen as limiting in their scope. For example, for thicker products, fewer, and potentially wider, apertures/slots/holes can be provided and for thinner products, additional, and potentially narrower, apertures/slots/holes can be provided.

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The embodiments described herein each represent either a blank for a, or an assembled, RRP packaging solution in the shape of a box (or container) 1, 21, 41, 61, 81 that is designed to “self-manage” an array of a specific type of pre-packaged product. This self management is achieved through the provision of a product self management means in or near the base or sidewall of the box or container, which product self management means has apertures, slots or holes in it by means of which individual products, or groups of products, can be individually or collectively gripped by the product self management means, independent of the gripping of other individual products, or groups of products.

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The types of product designed to be “self-managed” by the embodiments described herein are typically pre-packaged products, such as meat packs, e.g. bacon, chops, steaks or the like, which can commonly be found in supermarkets, e.g. with a vacuum packed overwrap. Typically, these packs have a front and a back, with the back often taking the form of a stiffened member with a relatively flat back face and relatively narrow sides or edges, with the consumable product vacuum packed in front of that back so as to extend therefrom to form a front bulging face of the product, wherefrom

the consumable product can be extracted upon the packet being opened by the consumer by cutting or pulling therefrom either the vacuum wrap or a protective film applied thereon. Alternatively, the product may be another form of packet wherein a final product may lie, e.g. with the front face being the flat face, and that front face being slightly wider than the back face in both directions because it has a rim that is typically included to provide a sealing surface for a seal between a protecting film on the top or front of the pack and the rearward pocket formed by a base bowl. A common characteristic of these products is a narrow rim, and that narrow rim provides a beneficial characteristic for use with the product self management means of the present invention, although that narrow rim is not essential.

“Self-management” in the present context has the following meaning: some or all of the products inside the boxes or containers are gripped or supported so as to help keep them upright, such that they have a reduced tendency to fall forwards or backwards during the shopping process, e.g. upon removal of a neighbouring product.

In the described embodiments, product self-management means 2, 22, 42, 62, 82 are integrated into the box or container 1, 21, 41, 61, 81 such that a separate accessory is not required for achieving the desired functionality. This integration is important both to the operator filling the box/container in the first place, and also to the retailer, since the box can both be easily assembled and later disposed of - there are no loose accessories for assembling into the box at the time of assembly, and further no such loose accessories remain in the box at the time of disposal.

Two broad design concepts are presented herein, each including toast-rack type features formed during the process of folding base flaps 3, 3', 23, 23', 43, 43', 63, 63', 83, 83' of the box. The toast-rack type features, however, can have variable sizes and can have different type of location features for keeping the products upright. The location features presented herein are specific apertures, holes, slots or slits 4, 24, 44, 64, 84, designed to accommodate particular products individually – e.g. flat-topped product packs for foodstuffs, but alternatively they could be generated in generic locations for defining a plurality of spaced spring-members 8 that generally keep each product upright.

The first broad design concept is illustrated in Figures 2, 3, 7, 8 and 11 and it involves members (here with triangular sections) 25, 25', 45, 45' that run along the base 26, 46 of the box, front to back (or one side to the other side), inside the box 21, 41, in the base corners, as formed between two longitudinal sides 27, 28, 47, 48 of the box and the base 26, 46. The triangular sectioned members 25, 25', 45, 45' are each created by forming a z-fold member on the base flaps 23, 23', 43, 43'.

In preferred arrangements, the blank for the box is pre-prepared using a glue machine to glue a part 36, 56 of the z-fold to the side 27, 28, 47, 48 of the box during the manufacturing process. This might be after shipment of the flat blanks to the end-user.

In the embodiment shown in for example figures 2 and 3, the boxes are made out of a single blank 31, 51 obtained from a single piece of corrugated (e.g. cardboard) and are supplied flat to the pack filler.

The triangular sectioned members 25, 25', 45, 45' automatically form when the base flaps 23, 23', 43, 43' are folded, and the degree of flattening of the members is restricted in these embodiments by a pair of interlocking interlocks 29, 49 on each base flaps 23, 23', 43, 43' – they intermesh so as to resist relative sliding of the two flaps 23, 23', 43, 43', although glue between the base flaps and side-bottom flaps 37, 37', 57, 57' can likewise restrain the flattening of the members.

The side-bottom flaps additionally have recessed edge parts 38, 38', 58, 58'. As shown in Figure 7, these recessed edge parts allow for the members 25, 25', 45, 45' – which stick outwards from the walls 27, 28 at their bases, but yet will be engaged by those members as those members flatten, thus resisting further flattening of the members. The glue between the walls 27, 28 and the part 36, 56 of the z-fold (the glued part not being visible in Figure 7, since it is attached to the wall), also prevent flattening of the members once the location of the base 26 is set by the co-location of the flaps 37 and 23 that define the base 26.

As the base flaps are opened (during the disposal process of the empty box) the triangular sectioned members 25, 25', 45, 45' automatically are allowed to fold generally flat again if glued, or fully flat again if not.

These members 25, 25', 45, 45' define toast-rack type sections that can create a series of location positions 24, 44 for products to be located into during the box filling process – e.g. by slotting narrowed edges of the products into the slots or slits, or by having the spring-members between the slots grip the products. The members thus grip the products and this helps to keep the products upright inside the box 21, 41 during the shopping process, i.e. as neighbouring products are removed from the box.

The second type of broad concept is shown instead in Figures 1, 4, 5, 6, 9, 10 and 12. It is constructed from either a single blank 11, 71, 91 of material, i.e. one-piece of material (Figures 1, 4, 5, 6, 9 and 10), or two-pieces glued together (see Figure 12). The choice of which type may depend on size requirements, i.e. when the required size is larger than a predetermined value it may no longer be practical or cost effective to print and cut in the same machine a single blank for forming the box. Two blanks would therefore be used and glued together, as appropriate, in order to obtain a two-piece blank for forming a box having the same functionalities. This is explained further below.

The second concept uses two beams 8, 8', 68, 68', 88, 88' (here with a triangular section) that are formed generally horizontally along the side walls 7, 7', 67, 67', 87, 87' (front to back, or side to side) inside the box 1, 61, 81. These beams 8, 8', 68, 68', 88, 88' are also automatically erected respectively when each of the base flaps 3, 3', 63, 63', 83, 83' is folded through 90 degrees to form the base 6, 66, 86 of the box, and here the side wall base flaps, or retaining flaps 5, 70, 90, can assist with the correct folding of those beams since they will, by being folded first, restrain the beams from expanding up from the base 6, 66, 86 of the box.

This second form for the product self management means – the beams rather than the members - is slightly different compared to the first concept in that the members of the first concept are formed upwardly from the base, whereas the beams of the second concept are formed outwards of the sides of the box. Indeed, whereas the bottom members are formed simply through the act of folding the card into the shape for the base, in the second concept the beams are formed due to the structure of the side flaps – as they are folded through their 90 degrees to form the base of the box, said base flaps squeeze the beams into a flexed outwardly position out from a respective side of the box. This is made possible in preferred embodiments, as it will be described

in further detail below, by connections respectively between a) an end of the flap for forming the self-management means 2, 62, 82 and a base flap; and b) another end of the same flap, and a respective side of the box.

- 5 In the embodiments of Figures 9 and 10, the box 61, 81 is obtained by folding a single corrugated cardboard blank 71, 91, the respective blanks being shown in Figures 4 and 5.

10 Referring now to Figures 4 and 5, consistent with all of the illustrated embodiments, the blank comprises a front wall section 76, a rear wall section 7, and two side wall sections 67, 67'. For these two embodiments, and also the third embodiment, from each of those sections 76, 77, 67, 67', top flaps 78 are provided, as is conventional with boxes of this nature where they provide an integral top. They can be closed in the final assembly and glued or taped down, as per conventional boxes. If absent,
15 however, the box will be an open-topped box, for which a separate lid might be provided (not shown).

The front, rear and side wall sections also are provided in the fourth and fifth embodiments with cut-outs 79 in the side panels, and two further corner cut-outs 80.
20 These cut-outs all align against a frangible line of weakness which allows a top half of the box to rip off the bottom half of the box for opening the box ready for display of the products inside on the supermarket or shop shelf. The line of weakness is profiled in this embodiment to provide a lowered front compared to the back and sides. This is to better display the products on the shelf. Angled fronts to the sides are also provided,
25 again to offer a better customer presentation for the products. All but the rear cut-out are provided in the top half side of the line of weakness, although other arrangements are possible. The corner cut-outs, however, are preferred to be in the top half since this will help to ensure that upon ripping the top half of the box off the bottom half, a clean finish will be provided to the front face of the box – i.e. the face most visible to the
30 customer, especially at the corner – a position where the corrugated might otherwise tend to rip inappropriately.

Figures 2 and 3 also have a rip-off portion, although for Figure 3, the whole of the sidewalls have an angled line so that the front most part tapers upwardly all the way
35 back to the backmost part, and for Figure 2, only a front part is removable (with an

angled part of each side). Further, whereas the third to fifth embodiments all have integral tops, the second embodiment has a set of four short top flaps which can be folded over and glued to the inside of a lid.

- 5 A side-jointing flap extends to one side of the blank – in each of these five embodiments to the edge of one of the side wall sections 67. It might alternatively be on the other end of the blank, i.e. on the rear wall part. This side-jointing flap allows the blank, upon being folded into its generally rectangular, tubular, form, to be glued or taped in that shape to hold that general configuration.

10

Referring again to Figures 4 and 5, base flaps 63, 63', 83, 83' are also provided on the blank 71. They extend from the opposite edges of the blank to the top flaps 78. They can have a generally similar configuration to the corresponding one of the top flaps 78, although two of them do have a separate extension extending from their otherwise free edges, which extensions will be described further below – they form the beams (as discussed below). However, in this illustrated embodiment, they have a slightly different form to the top flaps. Whereas the top flaps each have a generally trapezoidal shape, whereby triangular cut-outs separate them (albeit with a rounded tip at the point of intersection with the side walls to allow for reduced bunching in the corners of the box upon folding the box into the generally tubular shape), the base flaps have a more rectangular shape. This shape is preferred, particularly for the retaining flaps 70, 70', since it helps those base flaps to provide an increased rigidity to the final box (or tray/container), e.g. once located on the shop's shelf).

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The top flaps can be similarly shaped, although the simple trapezoidal form is preferred for simplicity of design – the top half is discarded after being ripped off the bottom half, so its design is less critical in terms of its use for providing rigidity to the RRP.

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The more rectangular form for the base flaps involves making the width of the retaining flaps slightly narrower than the front and back walls – preferably a difference of approximately double the thickness of the corrugated sheeting used for the beams/blank. This allows for the thickness of the corrugated beams upon folding the beams around the retaining flaps 70, 70'.

The rectangular shape for the other base flaps 63, 63' is less critical, but is considered to give a cleaner base appearance on the shelf. That rectangular form is tapered inwardly from the edge of the base by a short tapered section 63a.

5 The bases in the other three embodiments are formed in a different manner.

Still referring to Figures 4 and 5, the extensions 72, 72' extend from the free edges of the side wall base flaps 63, 63', and have three sections all with parallel sides in this embodiment. There is a base-overlying portion 99, 99', a further extending portion 74, 74' and an end portion 100, 100'. These three sections are each separated by fold-lines or creases, and can have partial cuts along their lines of attachment to facilitate clean folding, rather than bunching.

15 The base-overlying portion has the same width as the side base flaps 63, 63' to which they are attached – 68mm in the illustrated embodiment of Figure 4.

The further extending portion 74, 74' forms the beam and thus has slots or slits cut into it. In Figure 4, the slots are formed in two connected halves, each with four protruding tabs 98. In Figure 5, on the other hand, 8 separate slots are provided, thus providing 9 spring members in the final beam, and 8 slots therebetween. The shape of the slots are kite shaped to encourage folding at the narrowed parts of the spring members upon forming the beams.

25 The final end portion 100, 100' is provided for attaching to the sidewalls 67, 67' prior to folding the base flaps 63, 63'. This is to ensure that upon folding the base flaps into the box configuration, the beams form themselves into their deployed configuration.

In use, the extensions 72, 72' are basically folded back on themselves, about the crease line that separates the extensions 72 from the side base flaps 63 such that the end portions 100, 100' can be glued to the internal side walls 67, 67', 87, 87', inside the box 61, 81. This is typically done during the box assembly process, although it can be done prior to distribution of the blanks. The extensions 72 have a series of creases on them that facilitate the automatic formation of the beams 68, 68', 88, 88' along the side walls 67, 67', 87, 87', when the base of the box is folded into position. The retaining flaps, 70, 70', 90, 90' hold the base overlying portions down against the side base flaps

63, 63', 83, 83' and since the extensions are folded inside the outer wall of the box, and yet have a fixed and common length, this folding will cause the extension to tend to bulge away from the outer skin. Since the base overlying part is fixed by the retaining flaps 70, and since the end portions 100 are glued in position, the further extending portions will tend to bend or flex away from the side walls 67, 67', 87, 87' to make sure that the beams 68, 68', 88, 88' are formed. Due to the provision of a single crease in the middle of the further extending portions 74, they form the triangular sections 68, 68', 88, 88', with the tabs forming inwardly extending spring members, with grooves between them. As such, the beams define specific slots or slits 64 or spring members 98 for locating products in a supported manner, thus achieving the required product self management means.

In Figure 5, the slots instead bend at the reduced width section as provided by the kit-shaped slots. These may tend to have a more rounded bulge since crease lines are not provided.

See Figures 9 and 10 for the two assembled arrangements, where the slots 64 and spring members 98 can clearly be seen in the inner sidewalls, towards the bottoms of the boxes.

The embodiment of Figures 1 and 6 differs from those of Figures 9 and 10 in that the extensions 12, 12' extend from the side panels 7, 7' from a different edge to the base flaps. They again have an end portion 100, 100' and a portion that forms the beam by flexing into a beam shape upon folding the flaps into the box shape. Further, they are again folded back on themselves with the end portion 100, 100' typically being glued down, but this time they are glued to the side base flaps 3, 3' rather than the side panels. An equivalent functionality is however achieved, as can be seen in Figure 6 – once folded into a box, the beams form spring members 4a and slots 4b.

In this embodiment, to ensure that the bottom 6 of the box 1 is not too thick or uneven, the retaining flaps 5, 5' are profiled on their edges to not overlap the end portions 100, 100'. They could be provided with longer tongues 7, such that the tongues meet in the middle, if preferred. Likewise the end portions 100 could be shaped to meet in the middle. This would then provide a flat bottom across the full extent of the bottom. However, this is typically not needed.

Referring next to Figure 12, a two-piece design is shown. This is similar to the arrangement in Figure 1, albeit with a removable top for the box – the box in Figure 1/6 has no top, whereas the box formed with the blank of Figure 12 will have a top half that is joined to the bottom half with a frangible perforation, as per Figures 4 and 5. By virtue of the use of two pieces, glued together in the illustrated alignment, a folding of the blank to bring the extension down over the sides is not needed. Further, in this embodiment a reinforced front wall is provided. This could be achieved in a single piece design too.

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Where the second piece overlies a fold line in the corners of the box, a cut-out can be provided in the second layer. This is to minimise bunching upon folding the box into its assembled form.

15

The end portion 100 still overlies the base flap 3 and is glued thereto. Further there is a further extending portion that flexes to form the spring members 4a and the slots 4b. However, since the extension is not integral at its other end to the side, it instead needs to be adhered thereto. A side overlying portion 97, 97' thus provides that function.

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This final embodiment works in the same way, apart from comprising a separate piece of corrugate cardboard that is glued internally to the side base flaps 3, 3' and to the sides 7, 7' during the blank manufacturing process. This internally bonded additional piece of cardboard creates the beam, and flexes at its narrowed portion – in this embodiment the narrowing is provided by circular cut-outs towards the middle of slots 4b.

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The thickness of the corrugated board used in the embodiments shown in the Figures is about 2 millimetres. Other thicknesses are possible.

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The product self-management means 2, 22, 42, 62, 82 comprise self-management flaps, slots, slits, spring members, apertures and holes.

The self-management means are in a flexed or folded configuration in the formed box.

The sides of the box, and the base, are provided respectively by a folded side panels and folded base flaps.

Each self-management means is provided as either an extension of a side panel or a base flap, i.e. there is no discontinuity in the material between said side or base flaps and the self-management means, or it is provided as a separate piece and glued to either or both a side panel or a base flap.

Referring now again to Figures 1 to 5, and 12,, as explained in the respective legends, several lines of weakness, or creases, or cut and creases, are formed in the blanks 11, 31, 51, 71, 91. These crease lines or cut and crease lines, are preferred to be provided as indicated, although other arrangements are possible, and some crease or cut lines may be non essential since many of the folds can still occur without a pre-formed crease, although the pre-formed crease can assist with the assembly process by ensuring folds occur in the correct place, and further the rip-off top is optional.

It is preferred that the creases are formed on the inside of a bend, rather than an outside of the bend. Further, it is preferred that cut lines or perforations extend through both sides of the corrugated sheet.

It is also preferred that the flute of the cardboard extends in the direction shown – i.e. perpendicular to the crease lines for the top flaps or parallel to the longitudinal axes of the slots used to separate the individual spring members within the self management means.

In the shown embodiment of Figure 1, the extension used to form the product self-management means has a length that allows it, once folded over the main body of the blank, to extend substantially over all of the side's depth, and then further than the side's depth – with its end portion 100 extending over to cover a portion of the base flap 3, 3'. That end portion 100 is then connected to the underlying portion of the base flap. An adhesive is used. The middle portion that forms the spring members is not adhered to the side, but instead it attached at one end by the fold line 13 and at the other by the adhered end portion 100. The portion that forms the self management means, however, may extend for less of the height of the sides, e.g. by having a top portion that is bonded to the sides at the top of the sides.

The length of the middle portion is longer than the side – by 3mm in Figure 1. This ensures that the self management means bulges out from the inside of the sidewall as the base flap (with attached end portion 100) is folded into position – the longer length of the middle portion compared to the side wall forces the flexure of the middle portion, which flexure is controlled by the crease lines 14 extending across the middle of the middle portion – between the slots 19.

There is a line of weakness 13, 13' or crease between the end portion 100 and the middle portion, said line of weakness, upon folding the extension 12 over the main body of the blank, being located close to the crease between a lower edge of the box and a bottom flap 3, but slightly offset across that flap 3 – by the 3mm in this embodiment as defined by the difference between the heights of the respective panels, as mentioned above. This then puts that line of weakness 13, 13' internally displaced from the outer folded corner upon folding the base flap 3, thus reducing bunching, and while still permitting flexing of the middle portion as that base flap 3 is folded. Accordingly, the product self-management means 2 is caused to move away from said side of the box as it flexes and so erects itself in place upon folding in place of the base flap 3, 3' of the box.

The line of weakness is preferably cut and creases since it allows a reduced bunching compared to just a crease due to it being perpendicular to the flutes of the corrugated material. It also does not need the strength of the base flaps – the creases for the base flaps are preferably just that – creases, rather than cut and creases, even though they extend perpendicular to the flutes.

Just as the product-self management means 2 are easily erected, they are easily collapsed, i.e. retracted, by reversing the folding of the base flap 3, 3'.

A weakness line or more preferably just a crease 14, 14', generally in the middle of the self-management means, helps to encourage the flexing of the spring members between the slots of the middle portion. Preferably these creases 14, 14' are on the top surface of the blank, such that upon folding the extension 12, 12', the creases 14, 14' are facing towards the side 7 of the box, rather than internally. This further facilitates this flexing process.

In Figures 2 and 3, the extensions 32, 32', 52, 52' to be folded to form the self-management means are extensions from respective side panels 27, 28, 47, 48 of the box. In particular, the extensions extend from the (in use) bottom edges of the side panels. Each of the extensions are folded inwardly with respect to the finished box, about cuts 101 and creases 102 so as to place the part for gluing 36 over at least a portion of the inner skin of the side panel 27, 28, 47, 48 of the box. Said folded extension 32, 32', 52, 52' remains connected to the side of the box. The part for gluing 36 is a first half of a middle portion of the extension, and extending to the side of that middle portion – away from the side panel, is an extension portion 33, 33', 53, 53'. The crease and cut line 35, 35' that separates these parts provides some of the cuts 101 and creases 102 mentioned above for the inward folding of the extension.

The middle portion in Figure 2 also features slots 103 that separate individual spring members 104, and a further line of weakness 34, 34', 54, 54' for assisting in the flexing of the self management means upon assembly of the box. Figure 3 has a slightly different configuration of slots – no central circular regions for providing an increased tendency to flex in the middle.

Said extension portion extending from the middle portion is configured for being folded to provide at least part of the base of the box, or in other words a base flap 23, 23', 43, 43' of the box.

The extension, with these various parts and fold/crease lines, form a generally z-type fold.

Referring next to Figures 4 and 5, the extensions 72, 72', 92, 92' extend from the base flaps 63, 63', 83, 83' of the box, said base flaps providing at least a part of the base 66, 86 of the box when folded. The extensions 72, 72', 92, 92' are folded inwardly with respect to the box, i.e. over and onto the side panels 67, 67' 87, 87' of the box, such that the extensions extend over at least a portion of the base flaps of the box 63, 63', 83, 83' and over to the side panels. The folded extensions 72, 72', 92, 92' extend over a full width of the base flap, but not the full length – end areas 104 are not covered, although in alternative embodiments they might be.

Further portions 74, 74', 94, 94' of said extensions then extend further than the full width of the base flaps 63, 63', 83, 83' - over at least portions of the side panels 67, 67' 87, 87' of the box. The further extending portions 74, 74', 94, 94' are connected to the sides 67, 67' 87, 87' of the box once folded – typically with an adhesive at the end portions 100. A middle portion, however, remains separate from the sides since it forms the beams with the spring members 98 and slots 64.

There are lines of weakness or creases 75, 75', 95, 95' in the extensions. First lines of weakness or creases (marked in Figure 4 by reference signs 105 (for cuts) and 106 (for creases) and second lines of weakness or creases (107 and 107) define the middle portion with slots between them for forming the spring members 98 and slots 64. Those slots can have further creases 109 at their ends to help the beam correctly to form.

Yet further cuts 110 and creases 111 then define the line of attachment 73 for the extensions 72, 72' to the base flaps 63, 63'.

Similar or identical creases and cuts can be provided for both extensions.

The cuts are provided, rather than just creases, to reduce bunching.

The first lines of weakness 75, 75', 95, 95' are provided such that upon folding the extension over the base flap they will lie generally in correspondence with the line of attachment 112 of the base flap 63 to the side panel 67. For that purpose the two overlying panels have the same width. The panel of the extension might, however, be slightly shorter so as to minimise resistance to the folding of the base flap. In use the first lines of weakness 75, 75', 95, 95' are configured for locating in the folded corner between the lower end of the side panel of the box and the base flap 63, 83 of the box upon folding in place the base flaps 63, 63', 83, 83' of the box.

As for the end panel 100, upon it being adhered to the side panel, that folding of the base panel will cause the length of the middle portion to be too long – the thickness of the corrugated sheet is finite – typically around 3mm, whereupon something must flex or bend to allow that fold to occur. That middle portion thus flexes since the end portion 100 cannot, due to it being glued in place. Accordingly, the product self-management means 62, 82 is automatically caused to form by that middle portion flexing to move

away from the sides of the box and erect in place upon folding in place the base flaps 63, 63', 83, 83'.

5 The product-self management means 62, 82 can easily be collapsed, i.e. retracted, by reversing the folding of the base flaps 63, 63', 83, 83'.

10 Referring next to Figures 6 to 11, the product self-management means 2, 22, 42, 62, 82 in each box can be seen to be extending along the sides of the box. Each box comprises a pair of opposing and parallel side panels, and there are two rows of product self-management means 2, 22, 42, 62, 82, the first extending along one side panel and the second extending along the other side panel. The two rows of product self-management means 2, 22, 42, 62, 82 are configured such that they can cooperate with each other for organising in place the plurality of products in the desired orientation. This is achieved by having the spring members and slots aligned with the
15 corresponding members on the opposing row of product self-management means.

The two rows of product self management means are thus specularly arranged within the box, and are supported respectively by the sides and the base of the box.

20 The slots or slits 4, 24, 44, 64, 84 in the product self management means form a plurality of ridges (spring members due to the resilience of the corrugated material) 4a, 24a, 44a, 64a, 84a and valleys 4b, 24b, 44b, 64b, 84b, said valleys being configured for being the usual part utilised for receiving at least one of the products, and the ridges being configured for retaining in position the products, although the spring members
25 may alternatively provide the locating/receiving function, dependent upon the shape of the products to be held.

30 Two adjacent ridges or valleys are spaced apart by a period length, and a regular period length may be found between all adjacent ridges or valleys. In the illustrated embodiments, the period lengths are respectively about 28mm in Figure 6, about 38mm in Figures 7 and 8, about 20mm in Figure 9 and about 25mm in Figure 10. Other periods and non regular periods are also possible, although typically regular periods are preferred since the products tend to have a regular size or shape.

Recesses 19, 39, 99 are present within the slots 4, 44, 84 of Figures 1, 2 and 5 to help with accommodating the products in place, and also to facilitate folding of the respective flaps according to the lines of weakness 14, 14', 34, 34' in the case of Figure 1 and 2. In Figures 1 and 2 the recesses 19, 39 are provided approximately mid-way along the sides of the respective slits/slots 4, 24. Further, said recesses are located generally on a ridge 4a, 24a of the product self-management means 2, 22 when this is in its erected configuration.

In the embodiments illustrated in Figures 6, 7, 8, 10 and 11, the product self-management means 2, 22, 42, 82 has a generally triangular perimeter shape with regard to a notional transversal plane cutting across the self-management means 2, 22, 42, 82. This confers to the means 2, 22, 42, 82 a generally "toast-rack type" arrangement.

In the embodiments of Figure 7 and 8, the toast-rack is generally horizontally oriented, whereas it is generally vertically oriented in the embodiments of Figures 6 and 10. The embodiment of Figure 9 has a different arrangement, less resembling a "toast-rack".

A further arrangement as shown in Figures 13 to 19 has the toast rack arrangement on the base of the box across the full width of the base, albeit in two parts. See Figure 13 for a suitable blank for forming this further arrangement. See also Figures 18 and 19 for a view of the assembled box.

As can be seen in Figure 13, this further arrangement again comprises a single piece blank 2000 and on this occasion there is no top for the assembled box. The blank 2000 thus comprises side panels 2007, end panels 2008 and base flaps 2009, 2010, 2011, 2012 extending from the bottom edges 2013 of respective side panels 2007 and end panels 2008 at creases 2014 and cut lines 2015.

Further, one of the side panels 2007 has a jointing tab 2016 for allowing the two sides 2007 and ends 2008 to be joined in a rectangular ring so as to form the general box shape upon folding up the base flaps 2009, 2010, 2011, 2012. That jointing tab 2016 is provided with a glue line 2017 for that purpose. That glue line 17 may be provided at the time of forming the blank, or later such as at the end customer's premises.

If the blank is pre-folded into the loop, albeit in a lay flat state of the loop, as shown in Figure 16, it might more preferably be put into this arrangement, and glued, at the factory for the blank rather than at the end user's factory or premises.

5 On an outward edge 2018 of the two base flaps 2009, 2011 that are attached to the bases 2013 of the two side panels 2007, there are provided respective extending portions, which extending portions 2019 form the product self management means, including the spring elements thereof. These extending portions 2019, as with the previous embodiments, have slots 2020 cut therein, here an array of five slots in each
10 one, with each slot 2020 having a narrow end and a widened central portion for encouraging the correct folding of the spring elements 2021 between the slots 2020 upon the flexure or stressing of the extending portions into their final position. There are also creases to provide predefined lines for the folding of those spring elements - at the right parts of the spring elements - to prevent unintentional creasing or twisting of
15 those spring elements 2021.

The slots further have rounded ends to reduce stress concentrations and thus minimise the likelihood of failure of the spring elements upon said flexure or during later in-store use of the box.

20

At either end of the array of slots 2020, further cut lines 2022 are provided which provide limitations to the extent of the product self-management means' deployment area – that deployment area is defined by the space between those two cut lines 2022.

25 Outside of that deployment area, but still in the extending portions 2019, two further glue lines 2023 are provided and these are for securing the extending portions 2019 in their initially folded locations, which folding will be described below with reference to figures 14 and 15. As with the earlier glue line 2017, these further glue lines 2023 can be provided either at the factory for the blank, or later, such as by the end user.

30

The extending portions 2019 further comprise additional crease lines 2024, 2025 which additional crease lines 2024, 2025 cooperate with the outward edge 2018, which is also a crease line, to define the parts at which the spring elements 2021 will fold during later deployment of the product self management means during assembly of the box.

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The additional crease lines 2024, 2025 include an outer additional crease line 2025 provided at a distal end of each of the slots 2020 and a middle additional crease line 2024, the outer additional crease line 2025 defining a line outside which a further tab 2026 extends to a free end of the extending portions 2019 and out to which the further glue lines 2023 also extend.

A yet further glue line may also extend across the length of that further tab, although this is not shown since it is non-essential where the further glue lines 2023 already extend into that further tap. The yet further glue line might also instead replace those further glue lines.

For the other base tabs 2010 and 2012, these are simple generally trapezoidal base tabs, although they may alternatively be rectangularly formed, or other shapes known in the art or disclosed herein.

As shown in Figures 14 and 15, the assembly of the box comprises an initial stage of folding the blank 2000 about a first crease line axis. This folding comprises an initial step of folding the extending portions 19 about the crease lines formed at the outward edges of the respective base flaps 2009, 2011 provided along the bottoms of the side panels of the box. That first pair of folds brings the deployment area of the extending portions 2019 over and into registration with the respective base flaps from which they extend so as to overlie them. The further glue lines 2023 can thus secure those extending portions 2019 down onto those base flaps, and also onto a part of the side panels – at locations where the further glue lines overlie those side panels. The extending portions 2019 are thus adhered in place in that folded position.

The first folding steps are preferably involving folds that are perpendicular to the flutes of the material used for the blank, assuming the blank is made of a fluted material such as corrugated cardboard.

A second folding step is then taken, whereby the glue line 2017 on the jointing tab 2016 can then be used, as shown in Figure 16, to secure that prefolded blank into its “ring” formation, albeit a flat ring formation. This is done by attaching that glue line 2017 to the opposing end panel 2008, preferably on an inside face thereof, as illustrated in Figure 17. These folds all result in a relatively flat blank arrangement, although each

folding step makes the “blank” progressively thicker due to the building up of the layers thereof due to the folding.

5 The blanks may be distributed in any of these forms, such as the ring form of Figure 16, the preceding initially prefolded form of Figure 15, or in the entirely unfolded and most flat state of Figure 14, depending on the desired amount of pre-processing to be done by the blank factory or the end user.

10 If the end user does not wish to apply any glue, or if a smaller supply format is required for the distribution package, then the fully prefolded condition of Figure 16 would be the most likely distribution condition, whereas Figure 15 might be the preferred option for end users wanting a smaller form factor than the completely unfolded state. T the arrangement of Figure 14, the entirely flat state, may be the preferred option, however, for end users requiring the low-cost option – minimal post cutting steps are involved, and thus the unfolded blank is likely to be the cheapest option for the end user.

15 To facilitate distribution, the glue lines may be preapplied and covered with a cover strip, thus allowing end users to take blanks in any of these three conditions and still not need to apply glue.

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Various other requirements of the end user can also be met irrespective of which of these three arrangements is desired, such as pre-printing of the boxes/blanks, or provisions of cover-surfaces or food-safe surfaces.

25 To finish assembling the box, as shown in Figure 17, the base flaps 2009, 2010, 2011, 2012 can be folded up once the loop of Figure 16 has been opened into its rectangular shape and this is done first by folding the base flaps 2009, 2011 that are attached to the side panels 2007 of the box followed by the base flaps 2010, 2012 that are attached to the end panels 2008. Tape can then be used to hold the box in that assembled form, or else glue can be applied for example to the base flaps 2010, 2012 that were folded up second, either of which securement is standardised in the art. Staples can also (or instead) be used if preferred.

30 The process of folding up the base flaps 2009, 2011 attached to the side panels causes a flexure or stressing of the spring elements 2021 in the extending portions

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2019 due to the length of the flexing portion of the extending portions 2019 being longer than the length of the respective base flap 2009, 2011 less the thickness of the blank. Therefore they will flex and deploy. This occurs automatically since the extending portions 2019 are folded onto the inside of the box, and thus will be folded internally of the box by the folding of the base flaps (the further glue lines 2023 prevent sliding or lifting of the sides of those extending portions, thus requiring the spring elements 2021 to flex as shown in Figure 17, Figure 18 and Figure 19 – they will tend to flex rather than crush; the glued portions are instead prevented from flexing due to the glue, and thus they instead crush.

The additional crease lines 2024, 2025 help to ensure that this flexure occurs in a controlled manner, thus defining specific peaks for the spring elements 2021, here all aligned with one another, as shown in Figures 17, 18 and 19.

Because the side panels and end panels 2007, 2008 have the form shown in Figure 13, with angled ends for the two side panels 2007, each at only one end thereof, and with one of the end panels being shorter than the other, the finished and assembled box, as shown in Figures 17 and 18, has a lowered front wall compared to the rest of the sides and the back. This assists a user to remove products from the front of the box.

As shown, the fluting for the blank 2000 extends perpendicular to the long axis of the blank, i.e. perpendicular to the length of the sides and thus vertically in the side walls in the assembled box. This provides vertical stiffness for the assembled box.

Many of the features described above for this last embodiment are common with the previous embodiments and thus as described herein they will also apply to each of the other embodiments. Likewise, features from the other embodiments can work with this embodiment, including a lid or a rip-off top.

Finally, a modification to this final arrangement is shown in Figure 20. In this modification, rather than the slots 2020 extending the full length of the part of the extending portions 2019 that overlie the base flap from which it extends, the slots will only be located towards the outermost ends thereof. As such, a smaller or narrower deployment part is defined. Likewise, the crease lines are only provided towards those

outermost ends, i.e. in association with those modified slots. This is to provide the product self management means only towards the middle line of the assembled box, rather than across the full width of the box as shown in Figure 17.

- 5 Note that Figure 20 shows a perspective view of such a modified arrangement, plus also a partial front elevation of one of the base flaps, with its extending portion overlying it and flexed upwardly to define a raised portion 2027. The non-flexed part may be glued to the base flap, or it may be held down as shown by a further member, such as a base flap that might be located on a lower edge of an end panel – the base
10 flap may be bifurcated to extend down the two sides of the side panel mounted base flaps.

Although in these embodiments, the product self management means are described either as being integral with the rest of the blank for the box, or as a separate
15 component that is pre-adhered to that blank, it should also be appreciated that the product self management means may be provided as a separate component for fitting into the box after the folding of the box, such as by being pushed into the base of the box, as a retrofit component. A stressing or flexure of that separate component to cause spring elements defined by slots will still be required in preferred embodiments
20 in order to ensure that the spring elements displace out of the plane of the board used to form them, and as such that board should be oversized compared to the internal dimensions of the box such that upon insulation they flex, and such that the box can retain said displaced configuration. As such, the component used for those product self management means need not be provided as a part of the initial blank for the box.

25 All the embodiments illustrated herein are classed as retail-ready packaging (RRP). In particular, the embodiments of Figures 8, 9 and 10 comprises upper flaps to form a lid. The lid is detachable via a further line of weakness, a score line or perforation more specifically.

30 The embodiments of Figures 9 and 10 comprise retaining flaps, and the self-management means 62, 82 are retained in place by the retaining flaps 70, 70', 90, 90' when these have been folded in position.

The present invention therefore provides a box wherein products can be displayed in a desired orientation, and wherein if a product is removed from the box the remaining products are not affected – there is a reduced or eliminated tendency to slip and relocate into an undesired orientation since the products are kept in the desired orientation by means of the product self-management means within the box.

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The present invention has been described above purely by way of example. The skilled person will recognise that modifications in detail may be made to the invention within the scope of the claims appended hereto.

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CLAIMS:

1. A box comprising a side, a base and a product receiving space defined therebetween, and further comprising a product self-management means supported by the side, or by the base, or both said product self-management means being part of the box and extending only part way across the product receiving space.
2. The box of claim 1, wherein the self management means is stressed or flexed into a deployed configuration.
3. A box comprising a side, a base and a product receiving space defined therebetween, and further comprising a product self-management means supported by the side or base of the box, or both, said product self-management means being part of the box and being stressed or flexed into a deployed configuration so as to have product self-management elements stressed or flexed into an elevated or out-of plane position relative to the side or base of the box.
4. The box of claim 3, wherein the product self management means extends fully across the product receiving space.
5. A box comprising a side, a base and a product receiving space defined therebetween, and further comprising a product self-management means supported by the side or base of the box, or both, said product self-management means being within the box and being stressed or flexed into a deployed configuration.
6. A box according to any one of claims 2, 3, 4 or 5, wherein the product self-management means has been stressed or flexed in consequence of the said support.
7. A box according to any one of the preceding claims, wherein the product self-management means is integral with the box.
8. A box according to any one of the preceding claims, wherein the product self-management means is bonded to the box by means of an adhesive material.

9. A box according to any one of the previous claims, wherein the product self-management means is formed from a folded flap.

5 10. A box according to claim 9, wherein the folded flap comprises a generally z-type fold.

10 11. A box according to any one of the previous claims, wherein the side of the box, or at least a part of the base of the box, or both, are provided respectively by a folded side flap or by a folded base flap of the box.

12. A box according to claims 9 and 11, or to claims 10 and 11, wherein the folded flap is an extension from the side or base flap of the box.

15 13. A box according to claim 12, wherein the folded flap and the side or base flap are separated by a line of weakness or crease.

14. A box according to claim 12 or 13, wherein the folded flap extends from the side panel, preferably from the top thereof.

20 15. A box according to claim 14, wherein the folded flap is folded inwardly with respect to the box, towards the base of the box, such that the folded flap extends over at least a portion of a depth of the side of the box.

25 16. A box according to claim 15, wherein said folded flap extends substantially over all of the side depth.

17. A box according to claim 16, wherein a portion of said folded flap extends further than the side depth and over at least a portion of the base of the box.

30 18. A box according to claim 17, wherein the portion of said folded flap extending over at least a portion of the base of the box is connected to said portion of the base of the box.

35 19. A box according to claim 18, wherein said connection is by means of an adhesive material.

20. A box according to claim 17, 18 or 19, wherein said portion of the base of the box is a folded base flap of the box, said base flap being folded to provide part of the base of the box.

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21. A box according to claim 20, there being a line of weakness in the further extending portion of the folded flap, said line of weakness being provided generally in correspondence with a lower end of the side of the box, but at a slight offset towards the base of the box, said line of weakness being configured for locating in place in a folded corner between the lower end of the side of the box and the base of the box upon folding in place the base flap of the box, such that said product self-management means is caused to move away from said side of the box, thereby erecting itself in place, upon folding in place the same base flap of the box.

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22. A box according to claim 12 or 13, wherein the folded flap extends from a bottom of the side panel.

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23. A box according to claim 22, wherein the folded flap is folded inwardly with respect to the box, and over at least a portion of the side or side panel of the box.

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24. A box according to claim 23, wherein said folded flap is connected to said side of the box.

25. A box according to claim 24, said folded flap further comprising an extension portion separated from a rest of the folded flap by a line of weakness, said extension portion being configured for being folded to provide at least part of the base of the box.

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26. A box according to claim 25, said folded flap comprising a generally z-type fold.

27. A box according to claim 12 or 13, wherein the folded flap is an extension of the base flap of the box, preferably extending from a free edge thereof.

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28. A box according to claim 27, wherein the folded flap is folded inwardly with respect to the box, towards the at least one side of the box, such that the folded flap extends over at least a portion of the base flap.

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29. A box according to claim 28, wherein the folded flap extends over all of the width of the base flap.

5 30. A box according to claim 29, wherein a portion of said folded flap extends further than all of the width of the base flap and over at least a portion of the side or side panel of the box.

10 31. A box according to claim 30, wherein the portion of said folded flap extending further than the width of the part of the base is connected to said side or side panel of the box.

15 32. A box according to claim 31, there being a line of weakness in the portion of the folded flap extending over the base flap, said line of weakness being provided generally in correspondence with a lower end of the side of the box, said line of weakness being configured for locating in place in a folded corner between the lower end of the side of the box and the base of the box upon folding in place the base flap of the box such that said product self-management means is caused to move away from said side of the box, thereby erecting itself in place, upon folding in place of the same
20 base flap of the box.

33. A box according to any one of the previous claims, wherein said product self-management means extends in the direction of the at least one side of the box.

25 34. A box according to any one of the previous claims, the box comprising pairs of opposing sides.

30 35. A box according to claim 34, wherein at least a pair of said opposing sides are substantially parallel.

36. A box according to claim 35, wherein said product self-management means extends in the direction of said pair of opposing and substantially parallel sides.

35 37. A box according to claim 36, wherein said product self-management means comprises two parts, the first part of said two parts extending along one side of said

pair of opposing parallel sides, and the second part of said two parts extending along the other side of said pair of opposing parallel sides.

5 38. A box according to claim 37, wherein the two parts of the product self-management means are configured such that they can cooperate with each other for organising in place the plurality of products in the desired orientation.

10 39. A box according to claim 38, wherein said two parts are specularly arranged within the box.

40. A box according to any one of the previous claims, wherein the product self-management means is supported jointly by the at least one side of the box and by the base of the box.

15 41. A box according to any one of the previous claims, said self-management means comprising at least one ridge and one valley, wherein said valley is configured for receiving at least one of said plurality of products, and wherein said ridge is configured for retaining in position at least one of said plurality of products.

20 42. A box according to claim 41, wherein said product self-management means comprises a plurality of ridges and valleys

25 43. A box according to claim 42, wherein said plurality of ridges and valleys is arranged to form a series of ridges and valleys, wherein said series of ridges and valleys comprises a periodic repetition of ridges and valleys along the self-management means, wherein two adjacent ridges or valleys are spaced apart by a period length.

30 44. A box according to claim 43, wherein said period length is between 10 and 50 millimetres.

45. A box according to any one of claims 41 to 44, wherein said at least one valley is provided by a slot or slit.

35 46. A box according to claim 45, wherein said slit or slot has closed ends.

47. A box according to claim 45 or 46, wherein said slot or slit comprises a cut-through opening cutting through a thickness of a material of the box.

5 48. A box according to claim 45, 46 or 47, said slot comprising two substantially parallel sides.

49. A box according to claim 48, wherein the substantially parallel sides each comprise an inwardly extending recess, said recesses being substantially opposite
10 each other.

50. A box according to claim 49, wherein the recesses are provided approximately mid-way along the sides.

15 51. A box according to claim 49 or 50, wherein the recesses are located generally on a ridge of the product self-management means.

52. A box according to any one of the previous claims, wherein said product self-management means has a generally triangular transversal shape.
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53. A box according to any one of the previous claims, wherein said self-management means has a substantially toast rack-type arrangement.

54. A box according to any one of the previous claims, said box being classed as
25 retail-ready packaging (RRP).

55. A box according to any one of the previous claims, said box further comprising a lid.

30 56. A box according to claim 55, wherein said lid is detachable.

57. A box according to claim 56, wherein said detachable lid is detachable by means of a line of weakness.

35 58. A box according to claim 57, wherein said line of weakness is a score line.

59. A box according to any one of the previous claims, wherein the box further comprises a retaining flap, and wherein said self-management means is retained in place by means of the retaining flap.

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60. A box according to any one of the preceding claims, obtained by folding a single blank of material.

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61. A box substantially as hereinbefore described with reference to any one or more of Figures 6, 7, 8, 9 or 10.

62. A kit of parts comprising one or more blanks that fold to form a box according to any one of the preceding claims.

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63. A blank which can be folded to form a box according to any one of claims 1 to 61.

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64. A blank for forming a box substantially as hereinbefore described with reference to any one of Figures 1, 2, 3, 4, 5, 11 or 12.

65. A method for displaying products for sale using one or more box according to any one of claims 1 to 61.

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66. A method for displaying products for sale within retail ready packaging to a customer, the method comprising providing a box with a side, a base and a product receiving space defined therebetween, and a product self-management means supported by the side or base of the box, or both, the product self-management means being within the space and having elements that are stressed or flexed into a deployed configuration, loading a plurality of products into the space by placing them between
30 respective pairs of such elements, delivering the loaded box to a retail location, and locating the loaded box on shelving in that retail location, the box being the retail ready packaging providing access to the products to the customer.

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67. The method of claim 66, wherein the box is in accordance with any one of claims 1 to 61.

68. The method of claim 66, further comprising the step of ripping off a cover or lid from the box before or after locating the box on the shelf.
- 5 69. A method of folding a blank substantially as hereinbefore described with reference to any one of Figures 1 to 5, or 11, to 20 for forming a box according to any one of claims 1 to 61.



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Claims searched: 1-69

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Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-16, 22-31, 33-40, 52-60, 66 and 68	US 2012/0273383 A1 (BAHR): see figures 2-7
X	1-7, 9, 11-20, 25-31, 33-40, 53-60, 66 and 68	US 5913426 A (LOTZ et al): see abstract and figures 3-5
X	1-19, 22-31, 33-40, 52-60, 66 and 68	US 5505309 A (TARAVELLA et al): see abstract and figures 1-3
X	1-9, 11-16, 25-40, 54-60, 66 and 68	US 3756385 A (STEINBOCK): see abstract and figures 2-4
X	1 at least	US 4485922 A (DESMOND et al): see abstract and figure 2
X	1 at least	EP 1302403 A2 (SAULAS): see figure 6
X	1 at least	EP 2033899 A1 (WONNACOTT): see abstract and figure 2
X	1 at least	US 2012/0091078 A1 (HAAF): see abstract and figures

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.



& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.
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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

Worldwide search of patent documents classified in the following areas of the IPC

B65D

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

International Classification:

Subclass	Subgroup	Valid From
B65D	0005/50	01/01/2006
B65D	0025/10	01/01/2006