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

(11) **EP 1 785 360 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
**14.01.2009 Bulletin 2009/03**

(51) Int Cl.:
***B65D 6/18*** *(2006.01)* ***B65D 21/06*** *(2006.01)*

(21) Application number: **06021514.2**

(22) Date of filing: **13.10.2006**

(54) **Collapsible container**

Zusammenklappbarer Behälter

Conteneur pliable

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR**

(30) Priority: **06.01.2006 GB 0600164**
**02.11.2005 GB 0522341**

(43) Date of publication of application:
**16.05.2007 Bulletin 2007/20**

(73) Proprietor: **Linpac Allibert Limited**
**Birmingham**
**B37 7YN (GB)**

(72) Inventor: **Cope, Andrew Christopher**
**Essington**
**Wolverhampton WV11 2DG (GB)**

(74) Representative: **Jacob, Reuben Ellis et al**
**R G C Jenkins & Co.**
**26 Caxton Street**
**London**
**SW1H 0RJ (GB)**

(56) References cited:
**WO-A-00/66440**
**WO-A-01/44060**
**DE-U1- 9 320 047**
**FR-A1- 2 843 945**
**US-A1- 2003 222 081**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 785 360 B1

Printed by Jouve, 75001 PARIS (FR)

## Description

**[0001]** The present invention relates to a collapsible container that is suitable for stacking.

**[0002]** Stacking containers are widely used in the retail industry for transporting produce such as fresh fruit and vegetables from the growers to the shops, and for displaying those goods for sale. The containers protect the goods during transportation and storage and may be stacked for efficient handling and storage. After the goods have been sold, the containers are washed and returned for re-filling.

**[0003]** In order to minimise shipping costs when returning the empty containers, they are normally designed to be transported in a more compact form. There are two main types of container that have this capability.

**[0004]** The first type of container is nestable and has inclined or stepped walls and a mouth that is larger than the base. This allows an empty container to be nested with similar containers. Nestable containers normally have retractable stacking bars (or "bale arms") that can be positioned over the mouth of the container, allowing it to be stacked with other similar containers in an unnested configuration (also sometimes called a "column stacked" configuration) with virtually no intrusion into the enclosed volume of the container. Sometimes, the stacking bars can be located in a third position to allow stacking in a partially nested condition. The stacking bars also allow slide stacking, in which a container is stacked by placing it on a lower container in an offset position and then sliding it to its final stacking position. This improves handling of the containers. An example of a nestable container is described in EP 0553540.

**[0005]** The second main type of container is collapsible and generally has a rectangular base and four walls that are attached to the edges of the base by hinges. The walls can be folded flat onto the base for transportation and storage when empty. When the container is an erected condition, the walls are vertical and the mouth of the container is the same size as the base.

**[0006]** This allows the container to be stacked with similar containers. An example is described in EP 0911268.

**[0007]** One problem with the collapsible container described in EP 0911268 is that it is not compatible with nestable containers. In other words, nestable and collapsible containers cannot be stacked together, because the base of the nestable container will fit within the collapsible container. An answer to this problem is supplied by the container described in WO 01 /44060. That document describes a collapsible container that has pivoting stacking bars attached to the end walls. The stacking bars can be positioned over the mouth of the container to allow stacking with nestable containers, as well as with similar collapsible containers. The stacking bars also serve as a secondary locking device to retain the walls in the upright configuration, and they allow slide stacking.

**[0008]** There are however a number of problems with the container described in WO 01/44060. First, during washing, the hot cleaning fluid makes the walls pliable and as a result they can collapse preventing thorough washing of the container. In addition, when the stacking bars are located in the stacking position, they partially obstruct the mouth of the container, thereby restricting access to the goods and preventing automatic filling of the container. Moving the bars between the two positions is laborious and can sometimes be forgotten, as a result of which the goods in the container may be damaged if a nestable container is then placed on top. Furthermore, although the folded container occupies less than 25% of the volume occupied by the erected container, there is still a need for an even more compact arrangement.

**[0009]** It is an object of the present invention to provide a collapsible container that mitigates at least some of the aforesaid disadvantages.

**[0010]** According to one aspect of the present invention there is provided a collapsible container that may be configured in a collapsed condition or an erected condition, including a base and a plurality of walls that are pivotally attached to the base and arranged to lie substantially parallel with the base when collapsed and to stand substantially perpendicular to the base when erected, said walls having free edges that define a mouth when the container is an erected condition, and at least one stacking element carried by one of said walls and located towards a free edge of said carrying wall for supporting the base of a second container stacked on the collapsible container, wherein the plurality of walls include two shorter walls that lie adjacent the base when collapsed and two longer walls that overlie the shorter walls when collapsed.

**[0011]** The stacking element is pivotally attached to the carrying wall and is constructed and arranged to be configured in a deployed condition for stacking in which it extends at least partially into the mouth of the container, or a retracted condition in which it is withdrawn from the mouth of the container.

**[0012]** The stacking element is constructed and arranged to deploy automatically when the container is erected, and to retract when the container is collapsed. Because the stacking elements are deployed and retracted automatically, the need for a laborious manual operation is avoided. The risk of damage to the goods through failure to deploy the stacking bars is also avoided.

**[0013]** Resilient biassing means is provided to cause deployment: this may be part of the stacking element, part of a wall or a separate component.

**[0014]** The container described above provides a number of important advantages over the prior art. First, because the end walls have to be folded before the side walls, the side walls cannot easily collapse during the washing process. This makes the process more reliable. Because the stacking element (or elements) does not protrude far into the open mouth of the container, it does not significantly restrict access to the goods in the container. The stacking element(s) are however able to support a second container stacked on top of the folding

container, the base of the second container being smaller than the mouth of the collapsible container. The container can therefore be stacked either with similar collapsible containers or with nesting containers. Further, when the container is in a collapsed condition it occupies less than 25% of the volume occupied when it is in an erected condition, thereby providing greater economies in shipping costs.

**[0015]** The length of the shorter walls is preferably less than the separation of the erected longer walls, so that the shorter walls can pivot between the erected longer walls.

**[0016]** Advantageously, the collapsible container includes a pair of stacking elements carried by an opposed pair of walls. In the following statements of invention, references to a stacking element apply equally to pairs of stacking elements.

**[0017]** According to one preferred embodiment, the stacking element is pivotally attached to an inner face of the carrying wall. Advantageously, the stacking element is constructed and arranged to retract into a recess in the wall. The resulting container is suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container and the fact that the stacking elements can be easily retracted into the recesses if necessary.

**[0018]** Alternatively, the stacking element may be pivotally attached to an upper edge of the carrying wall. The stacking element may be constructed and arranged to retract to an upright position in which it extends upwards from the upper edge of the carrying wall.

**[0019]** Advantageously, the resilient biassing means is constructed and arranged to bias the stacking element when the container is in an erected condition, and to apply no bias when the container is collapsed.

**[0020]** Advantageously, the resilient biassing means is constructed and arranged to engage a support element (for example a flange) on a wall adjacent said carrying wall, when the container is in an erected condition, thereby urging the stacking element towards the deployed condition. When the container is in a collapsed condition, the resilient biassing means disengages the support element, to relieve any stresses in the biassing means.

**[0021]** In an alternative preferred embodiment, the resilient biassing means is provided on a wall adjacent the carrying wall. Preferably, the stacking element includes end portions that are constructed and arranged to engage and support adjacent walls of the erected container when deployed. Advantageously, the stacking element extends along substantially the entire length of the carrying wall.

**[0022]** The stacking element may be pivotally attached to the shorter wall (the end wall), allowing slide stacking from the sides of the container.

**[0023]** Alternatively, the stacking element may be pivotally attached to the longer wall (the side wall). Preferably, the stacking element is arranged to support the shorter walls when deployed, thereby preventing unintended collapse of the walls. Stacking elements may be located towards the ends of the longer walls.

**[0024]** Preferably, the stacking element is pivotally attached to the shorter wall. The stacking element may include locking elements that are constructed and arranged to engage the longer walls when deployed, to prevent unintended collapse of the walls.

**[0025]** Certain embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a first container in an erected condition;

Figure 2 is a perspective view of the first container in a folded condition;

Figure 3 is a perspective view showing part of the first container at an enlarged scale, with a stacking element in a stacking configuration;

Figure 4 is a perspective view of part of the first container showing the stacking element in a stowed condition;

Figure 5 is a cross-section of part of the first container with the stacking element in a stacking condition;

Figure 6 is a cross-section showing the stacking element in a stowed condition;

Figure 7 is a perspective view of a second container in an erected condition;

Figure 8 is a perspective view of the second container in a folded condition;

Figure 9 is a perspective view showing part of the second container at an enlarged scale, with a stacking element in a stacking configuration;

Figure 10 is a perspective view of the second container with the stacking element in a stowed condition;

Figure 11 is a cross-section of part of the second container with the stacking element in a stowed configuration;

Figure 12 is a cross-section of part of the second container with the stacking element in a stacking condition;

Figure 13 is a perspective view of a third container in an erected condition;

Figure 14 is a perspective view of the third container in a folded condition;

Figure 15 is a perspective view showing part of the third container at an enlarged scale, with a stacking element in a stacking configuration;

Figure 16 is a perspective view of part of the third container with the stacking element in a stowed condition;

Figure 17 is a cross-section of part of the third container with the stacking element in a stowed configuration;

Figure 18 is a cross-section of a part of the third container with the stacking element in a stacking condition;

Figure 19 is a perspective view of a fourth container in an erected condition;

Figure 20 is a perspective view of the fourth container in a folded condition;

Figure 21 is a perspective view of part of the fourth container at an enlarged scale;

Figure 22 is a cross-section showing a part of the fourth container;

Figure 23 is a perspective view of a fifth container in an erected condition;

Figure 24 is a perspective view of the fifth container in a folded condition;

Figure 25 is a perspective view showing part of the fifth container at an enlarged scale with a stacking element in a stowed condition;

Figure 26 is a perspective view of part of the fifth container with the stacking element in a stacking condition;

Figure 27 is a cross-section showing a part of the fifth container with the stacking element in a stowed condition;

Figure 28 is a cross-section showing the stacking element in a stacking condition;

Figure 29 is a perspective view of a sixth container in an erected condition;

Figure 30 is a perspective view of the sixth container in a folded condition;

Figure 31 is a perspective view showing part of the sixth container at an enlarged scale;

Figure 32 is a cross-section showing a part of the sixth container;

Figure 33 is a perspective view showing part of a seventh container in an erected condition;

Figure 34 is a perspective view showing part of the seventh container in a folded condition;

Figure 35 is a cross-section showing part of the seventh container in a retracted condition;

Figure 36 is a cross-section showing part of the seventh container in a deployed condition;

Figure 37 is a cross-section showing part of an eighth container with the end wall folded (position 1), partially erected (position 2) and fully erected (position3);

Figure 38 is a perspective view showing part of the eighth container with the end wall folded;

Figure 39 is a perspective view showing part of the eighth container with the end wall partially erected;

Figure 40 is a perspective view showing part of the eighth container with the end wall fully erected;

Figure 41 is a schematic perspective view showing part of the eighth container with the end wall fully erected;

Figures 42 and 43 are perspective views showing a stacking element of the eighth container in disassembled and assembled conditions;

Figure 44 is a cross-section showing part of a ninth container with the end wall folded (position 1), partially erected (position 2) and fully erected (position3);

Figure 45 is a cross-section showing an end wall of the ninth container with a stacking element in a retracted condition (solid lines) and a deployed condition (broken lines);

Figure 46 is a perspective view showing part of the ninth container with the end wall folded;

Figure 47 is a perspective view showing part of the ninth container with the end wall partially erected, and

Figure 48 is a perspective view showing part of the ninth container with the end wall fully erected.

Embodiment 1

**[0026]** The first container 100 shown in Figures 1-6 comprises a substantially rectangular base 102, two longer side walls 104 and two shorter end walls 106. The side walls and the end walls are attached to the base 102 by means of hinges 108, which allow the walls to be folded flat onto the base 102 for storage or transportation in a collapsed condition, as shown in Figure 2. It will be noted that the end walls 106 are folded first and that in the collapsed condition they lie adjacent to the base 102. The length of the end walls 106 is less than the separation of the erected side walls 104, so that the end walls can pivot between the side walls. The side walls 104 are collapsed after the end walls 106 and in the collapsed condition overlie the end walls 106. Recesses 109 are provided where necessary in the side walls to allow them to lie flat against the end walls.

**[0027]** Complementary locking formations 110 in the form of resilient detents are provided on the end walls and the side walls, to lock the walls together when the container is in the erected condition as shown in Figure 1. The locking formations 110 are conventional and will not be described in detail.

**[0028]** The upper edges 112 of the side walls 104 and the end walls 106 are designed to receive the edges of the base 102 of a similar container when the containers are stacked in an erected, column stacked condition. The edges and the base may be provided with complementary locking formations 114, to prevent relative movement of the stacked containers.

**[0029]** Each of the end walls 106 carries a retractable stacking element 116, that may be deployed to allow stacking with a nestable container. The retractable stacking element is shown in more detail in Figures 3-6 and comprises a pivotable support bar, mounted in a recess 118 on the inner face of the carrying wall 106, adjacent its upper edge 112. The support bar 116 is attached to the end wall by means of a pivot 120, allowing it to be deployed as shown in Figures 3 and 5, or retracted within the recess 118 as shown in Figures 4 and 6. A spring element 122 attached to the support bar engages the rear face of the recess 118 and urges the support bar outwards into the deployed position. The support bar may however be pushed back into the recess 118 against the resilience of the biassing member 122.

**[0030]** In use, when the container is in an erected condition, the stacking elements 116 automatically adopt the deployed condition as shown in Figures 3 and 5, owing to the resilience of the biassing elements 122. This allows the container to be stacked with a nestable container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be column stacked with similar collapsible containers, which engage the upper edges 112 of the walls 104,106.

**[0031]** In order to fold the container, the end walls 106 are collapsed first and laid flat against the base 102. The locking formations 110 are such that they can be released simply by pressing on the end walls 106. As the stacking elements 116 engage the base, they are pushed back into the recesses 118 against the force of the resilient biassing elements 122. The side walls 104 are then folded down on top of the end walls 106.

**[0032]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls are lifted first, followed by the end walls 106, which are locked into position by the locking formations 110. As the end walls 106 are lifted, the stacking elements 116 deploy automatically, under the force of the resilient biassing elements 122.

**[0033]** The first container described above provides a number of important advantages over the prior art. First, because the end walls 106 have to be folded before the side walls 104, the side walls 104 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 116 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. The stacking elements are deployed and retracted automatically, avoiding the need for a laborious manual operation. The risk of damage to the goods through failure to deploy the stacking bars is also avoided. The container is also suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container and the fact that the stacking elements can be easily retracted into the recesses in the end walls if necessary during the filling operation. The stacking elements also allow slide stacking from the sides of the container. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume when it is in an erected condition, thereby providing greater economies in shipping costs.

**[0034]** In a modification of the embodiment described above (not illustrated), the resilient biassing elements can be formed as separate components or they can be moulded as parts of the supporting walls.

**[0035]** Embodiments 2 to 6 are provided as background art useful for understanding the invention.

**Embodiment 2**

**[0036]** The second container 200 shown in Figures 7-12 comprises a substantially rectangular base 202, two side walls 204 and two end walls 206. The side walls and the end walls are attached to the base 202 by means of hinges 208, which allow the walls to be folded flat onto the base 202 for storage or transportation in a collapsed condition, as shown in Figure 8. It will be noted that the end walls 206 are folded first and that in the collapsed condition they lie adjacent to the base 202. The side walls 204 are collapsed after the end walls 206 and in the collapsed condition overlie the end walls 206.

**[0037]** Complementary locking formations 210 are provided on the end walls and the side walls, to lock the walls together when the container is in the erected con-

dition as shown in Figure 7. The locking formations 210 are conventional and will not be described in detail.

**[0038]** The upper edges 212 of the side walls 204 and the end walls 206 are designed to receive the edges of the base 202 of a similar container when the containers are stacked in an erected condition. The edges and the base may be provided with complementary locking formations to prevent relative movement of the stacked containers.

**[0039]** Each of the side walls 204 carries a retractable stacking element 216, that may be deployed to allow stacking with a nestable container. The retractable stacking element is shown in more detail in Figures 9-12 and comprises a pivotable support bar, mounted in a recess 218 on the inner face of the carrying side wall 204, adjacent its upper edge 212. The support bar 216 is attached to the end wall by means of a hinge 220, allowing it to be deployed as shown in Figures 9 and 12, or retracted within the recess 218 as shown in Figures 10 and 11. The support bar is urged outwards into the deployed position by gravity and is supported in that position by an inclined wall 221. The support bar may however be pushed back into the recess 218 when necessary.

**[0040]** The support bar 216 includes a lower part 216a, a middle part 216b, and an upper part 216c. When the stacking bar 216 is in the deployed position as shown in Figure 12, the lower and upper parts 216a,216b are inclined outwards from the side wall 204, and the middle part 216b is substantially horizontal. During use, the upper edge of the upper part 216c engages the underside of a stacked container. The upper part 216c includes a number of notches 222, which allow it to fold flat against the folded end walls 206. The ends of the support bars 216 are received in shaped recesses 224 provided in the end walls 206, when the container is in an erected condition with the stacking elements deployed (see Figure 9). The support bars 216 thus provide a secondary locking function, to prevent the end walls from being folded inwards. When the container is to be folded, the support bars 216 are first retracted into the recesses 218 in the side walls 204 as shown in Figure 10. This allows the end walls to be folded flat against the base 202, followed by the side walls 204.

**[0041]** In use, when the container is in an erected condition, the stacking elements 216 automatically adopt the deployed condition as shown in Figures 9 and 12, owing to the force of gravity. This allows the container to be stacked with a nestable container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be stacked with similar collapsible containers, which engage the upper edges 212 of the walls 204,206.

**[0042]** In order to fold the container, the stacking elements 216 are retracted and the end walls 206 are collapsed and laid flat against the base 202. The side walls 204 are then folded down on top of the end walls 206. As the stacking elements 216 engage the end walls 206, they are pushed back into the recesses 218 in the side walls.

**[0043]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls 204 are lifted first, followed by the end walls 206, which are locked into position by the locking formations 210 and the stacking elements 216. The stacking elements 216 deploy automatically, under the force of gravity.

**[0044]** The second container described above provides a similar set of advantages over the prior art. First, because the end walls 206 have to be folded before the side walls 204, the side walls 204 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 216 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. The stacking elements are deployed and retracted automatically, avoiding the need for a laborious manual operation. The risk of damage to the goods through failure to deploy the stacking bars is also avoided. The container is also suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container and the fact that the stacking elements can be easily retracted into the recesses in the side walls if necessary. The stacking elements also allow slide stacking from the ends of the container. Because the stacking elements extend along substantially the full length of the side walls, it is possible to stack half-size containers on top of the container in a transverse direction. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume it occupies when it is in an erected condition, thereby providing greater economies in shipping costs.

**[0045]** In a modification of the embodiment described above (not illustrated), detents can be provided on the stacking elements and/or the walls to retain the stacking elements in a retracted condition, for easy loading of the container. After the container has been filled the stacking elements can be popped back to the deployed condition for stacking, either manually or automatically.

**Embodiment 3**

**[0046]** The third container 300 shown in Figures 13-18 is similar in many respects to the second container and comprises a substantially rectangular base 302, two side walls 304 and two end walls 306. The side walls and the end walls are attached to the base 302 by means of hinges 308, which allow the walls to be folded flat onto the base 302 for storage or transportation in a collapsed condition, as shown in Figure 14. It will be noted that the end walls 306 are folded first and that in the collapsed condition they lie adjacent to the base 302. The side walls 304 are collapsed after the end walls 306 and in the collapsed condition overlie the end walls 306.

**[0047]** Complementary locking formations are provided on the end walls and the side walls, to lock the walls together when the container is in the erected condition

as shown in Figure 13. The locking formations are conventional and will not be described in detail.

**[0048]** The upper edges 312 of the side walls 304 and the end walls 306 are designed to receive the edges of the base 302 of a similar container when the containers are stacked in an erected condition. The edges and the base may be provided with complementary locking formations to prevent relative movement of the stacked containers.

**[0049]** Each of the side walls 304 carries a pair of retractable stacking elements 316 adjacent its ends, that may be deployed to allow stacking with a nestable container. The retractable stacking element 316 is shown in more detail in Figures 15-18 and comprises a pivotable support bar that is mounted in a recess 318 on the inner face of the side wall 304, adjacent its upper edge 312. The support bar 316 is attached to the side wall by means of a pivot 320, allowing it to be deployed as shown in Figures 15 and 18, or retracted within the recess 318 as shown in Figures 16 and 17. The support bar is urged outwards into the deployed position by gravity and is supported in that position by an inclined wall 321. The support bar may however be pushed back into the recess 318 when necessary.

**[0050]** The support bar 316 includes a lower part 316a, a middle part 316b, and an upper part 316c. When the stacking bar 316 is in the deployed position as shown in Figures 15 and 18, the lower and upper parts 316a,316b are inclined outwards from the side wall 304, and the middle part 316b is substantially horizontal. During use, the upper edge of the upper part 316c engages the underside of a stacked container. The inner and outer ends of the support bars 316 are chamfered, so that as the end walls 306 are folded inwards or outwards the support bars 316 are automatically pushed back out of the way into the recesses. This allows the container to folded and erected easily. When the container is in a folded condition, the support bars 316 are pushed back into the recesses 318 by engagement with the folded end walls. This allows the side walls to lie flat against the end walls 306.

**[0051]** In use, when the container is in an erected condition, the stacking elements 316 automatically adopt the deployed condition as shown in Figures 15 and 18. This allows the container to be stacked with a nestable container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be stacked with similar collapsible containers, which engage the upper edges 312 of the walls 304,306.

**[0052]** In order to fold the container, the end walls 306 are collapsed first and laid flat against the base 302. The side walls 304 are then folded down on top of the end walls 306. As the stacking elements 316 engage the folded end walls 306, they are pushed back into the recesses 318.

**[0053]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls 304 are lifted first, followed by the end walls 306. As the side walls 304 are lifted, the stacking elements 316 deploy automatically, under the force of gravity.

**[0054]** The third container described above provides a similar set of advantages over the prior art to the second container, except that in this case the stacking elements do not allow slide stacking. On the other hand, because the stacking elements 316 are located only towards the ends of the side walls they do not impede access to goods in the container.

**[0055]** In a modification of the embodiment described above (not illustrated), detents can be provided on the stacking elements and/or the walls to retain the stacking elements in a retracted condition, for easy loading of the container. After the container has been filled the stacking elements can be popped back to the deployed condition for stacking, either manually or automatically.

**Embodiment 4**

**[0056]** The fourth container 400 shown in Figures 19-26 comprises a substantially rectangular base 402, two side walls 404 and two end walls 406. The side walls and the end walls are attached to the base 402 by means of hinges 408, which allow the walls to be folded flat onto the base 402 for storage or transportation in a collapsed condition, as shown in Figure 20. It will be noted that the end walls 406 are folded first and that in the collapsed condition they lie adjacent to the base 402. The side walls 404 are collapsed after the end walls 406 and in the collapsed condition overlie the end walls 406.

**[0057]** Complementary locking formations 410 are provided on the end walls and the side walls, to lock the walls together when the container is in the erected condition as shown in Figure 19. The locking formations 410 are conventional and will not be described in detail.

**[0058]** The upper edges 412 of the side walls 404 and the end walls 406 are designed to receive the edges of the base 402 of a similar container when the containers are stacked in an erected condition. The edges and the base may be provided with complementary locking formations 414, to prevent relative movement of the stacked containers.

**[0059]** Each of the side walls 404 carries a set of fixed stacking elements 416. Each set includes two end elements 416a and a centre element 416b, with separating gaps 418. An end stacking element 416a is shown in more detail in Figures 21-22 and comprises a fixed support bracket, which is moulded on the inner face of the side wall 404, adjacent its upper edge 412.

**[0060]** In use, when the container is in an erected condition, the stacking elements 416 extend inwards from the side walls 404, as shown in Figures 21 and 22. This allows the container to be stacked with a nestable container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be stacked with similar collapsible containers, which engage the upper edges 412 of the

walls 404,406, or with half size containers, which are stacked in a transverse direction.

**[0061]** In order to fold the container, the end walls 406 are collapsed first and laid flat against the base 402. The locking formations 410 are such that they can be released simply by pressing on the end walls 406. The side walls 404 are then folded down on top of the end walls 406. The separating gaps 418 between the stacking elements 416a,416b allows the side walls 404 to lie flat against the end walls 406.

**[0062]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls 404 are lifted first, followed by the end walls 406, which are locked into position by the locking formations 410.

**[0063]** The fourth container described above provides a number of important advantages over the prior art. First, because the end walls 406 have to be folded before the side walls 404, the side walls 404 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 416 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. There is no need for the stacking elements to be deployed and retracted, avoiding the need for a laborious manual operation. The risk of damage to the goods through failure to deploy the stacking bars is thus avoided. The container is also suitable for certain automatic filling processes owing to the fact that the stacking elements do not intrude very far into the mouth of the container. The container has no moveable parts apart from the hinged walls and it is therefore relatively simple and cheap to manufacture. The stacking elements also allow slide stacking from the ends of the container. Because the stacking elements extend along substantially the full length of the side walls, it is possible to stack half-size containers on top of the container in a transverse direction. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume when it is in an erected condition, thereby providing greater economies in shipping costs.

**Embodiment 5**

**[0064]** The fifth container 500 shown in Figures 23-28 comprises a substantially rectangular base 502, two side walls 504 and two end walls 506. The side walls and the end walls are attached to the base 502 by means of hinges 508, which allow the walls to be folded flat onto the base 502 for storage or transportation in a collapsed condition, as shown in Figure 24. It will be noted that the end walls 506 are folded first and that in the collapsed condition they lie adjacent to the base 502. The side walls 504 are collapsed after the end walls 506 and in the collapsed condition overlie the end walls 506.

**[0065]** Complementary locking formations are provided on the end walls and the side walls, to lock the walls together when the container is in the erected condition as shown in Figure 23. The locking formations are conventional and will not be described in detail.

**[0066]** The upper edges 512 of the side walls 504 and the end walls 506 are designed to receive the edges of the base 502 of a similar container when the containers are stacked in an erected condition. The edges and the base may be provided with complementary locking formations to prevent relative movement of the stacked containers.

**[0067]** Each of the end walls 506 carries a retractable stacking element 516, that may be deployed to allow stacking with a nestable container. The retractable stacking element 516 is shown in more detail in Figures 25-28 and comprises a pivotable support bar, which is attached to the end wall 506, adjacent its upper edge 512, by means of a pivot 520. This allows it to be deployed as shown in Figures 26 and 28, or retracted within a recess 518 on the outer face of the end wall 506 as shown in Figures 25 and 27. The ends of the support bar include outwardly extending portions 522 that engage recesses 524 in the upper edges 512 of the side walls 504 when in a deployed condition. This provides a secondary locking function to retain the end walls 506 in an upright position.

**[0068]** In use, when the container is in an erected condition, the stacking elements 516 are located in the deployed condition as shown in Figures 26 and 28. This allows the container to be stacked with a nestable container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be stacked with similar collapsible containers, which engage the upper edges 512 of the walls 504,506.

**[0069]** In order to fold the container, the stacking elements 516 are rotated outwards through an angle of approximately 270° to the retracted condition shown in Figures 25 and 27. The end walls 506 are then collapsed and laid flat against the base 502. The side walls 504 are then folded down on top of the end walls 506.

**[0070]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls 504 are lifted first, followed by the end walls 506, which are locked into position by the locking formations. The stacking elements 516 are then rotated to the deployed position, as shown in Figure 26 and 28.

**[0071]** The fifth container described above provides a number of important advantages over the prior art. First, because the end walls 506 have to be folded before the side walls 504, the side walls 504 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 516 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. The container is suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container and the fact that the stacking elements can be easily retracted if necessary. The stacking elements also allow slide stacking from the sides

of the container. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume when it is in an erected condition, thereby providing greater economies in shipping costs.

**Embodiment 6**

**[0072]** The sixth container 600 shown in Figures 29-32 comprises a substantially rectangular base 602, two side walls 604 and two end walls 606. The side walls and the end walls are attached to the base 602 by means of hinges 608, which allow the walls to be folded flat onto the base 602 for storage or transportation in a collapsed condition, as shown in Figure 29. It will be noted that the end walls 606 are folded first and that in the collapsed condition they lie adjacent to the base 602. The side walls 604 are collapsed after the end walls 606 and in the collapsed condition overlie the end walls 606.

**[0073]** Complementary locking formations are provided on the end walls and the side walls, to lock the walls together when the container is in the erected condition as shown in Figure 29. The locking formations are conventional and will not be described in detail.

**[0074]** The upper edges 612 of the side walls 604 and the end walls 606 are designed to receive the edges of the base 602 of a similar container when the containers are stacked in an erected condition. The edges and the base may be provided with complementary locking formations 614, to prevent relative movement of the stacked containers.

**[0075]** Each of the side walls 604 carries a pair of fixed stacking elements 616 adjacent its ends, to allow stacking with a nestable container. A stacking element 616 is shown in more detail in Figures 31-32 and comprises a support bracket that is moulded onto the inner face of the side wall 604, adjacent its upper edge 612.

**[0076]** In use, when the container is in an erected condition, the stacking elements 616 extend inwards from the side walls 604, as shown in Figure 31. This allows the container to be stacked with a nestable container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be stacked with similar collapsible containers, which engage the upper edges 612 of the walls 604,606.

**[0077]** In order to fold the container, the end walls 606 are collapsed first and laid flat against the base 602. The locking formations are such that they can be released simply by pressing on the end walls 606. The side walls 604 are then folded down on top of the end walls 606.

**[0078]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls 604 are lifted first, followed by the end walls 606, which are locked into position by the locking formations.

**[0079]** The sixth container described above provides a number of important advantages over the prior art. First, because the end walls 606 have to be folded before the side walls 604, the side walls 604 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 616 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. There is no requirement for the stacking elements to be deployed and retracted, avoiding the need for a laborious manual operation. The risk of damage to the goods is thus avoided. The container is suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume when it is in an erected condition, thereby providing greater economies in shipping costs.

**Embodiment 7**

**[0080]** The seventh container 700 shown in Figures 33-36 is similar in many respects to the first container 100 and comprises a substantially rectangular base 702, two longer side walls 704 and two shorter end walls 706. The side walls and the end walls are attached to the base 702 by means of hinges, which allow the walls to be folded flat onto the base 702 as shown in Figure 34 for storage or transportation in a collapsed condition, or erected for use as shown in Figure 33. It will be noted that the end walls 706 are folded first and that in the collapsed condition they lie adjacent to the base 702. The length of the end walls 706 is less than the separation of the erected side walls 704, so that the end walls can pivot between the side walls. The side walls 704 are provided with inwardly-extending flanges 708 that help to support the end walls 706 when the container is erected for use.

**[0081]** The side walls 704 are collapsed after the end walls 706 and in the collapsed condition overlie the end walls 706. Recesses are provided where necessary in the side walls to allow them to lie flat against the end walls.

**[0082]** Complementary locking formations in the form of resilient detents are provided on the end walls and the side walls to lock the walls together when the container is in the erected condition. The locking formations are conventional and will not be described in detail.

**[0083]** The upper edges of the side walls 704 and the end walls 706 are designed to receive the edges of the base of a similar container when the containers are stacked in an erected, column stacked condition. The edges and the base may be provided with complementary locking formations, to prevent relative movement of the stacked containers.

**[0084]** Each of the end walls 706 carries a retractable stacking element 714, that may be deployed to allow stacking with a nestable container. The retractable stacking element 714 is shown in more detail in Figures 35-36 and comprises a pivotable support bar 716, mounted in a recess 718 on the inner face of the end wall 706, adjacent its upper edge. The support bar 716 is attached to the end wall by means of a pivot 720, allowing it to be deployed as shown in Figures 33 and 36, or retracted within the recess 718 as shown in Figures 34 and 35. A

spring element 722 is attached to the support bar 716 and extends outwards through an aperture 724 in the rear face of the recess 718 when the support bar 716 retracted into the recess 718 (Figures 34 and 35). When the container is in an erected condition, the spring element 722 engages the side wall flange 708 and urges the support bar 716 outwards into the deployed position (Figure 36). The support bar may however be pushed back into the recess 718 against the resilience of the spring element 722.

**[0085]** In use, when the container is in an erected condition, the stacking elements 714 automatically adopt the deployed condition as shown in Figures 33 and 36, owing to the engagement of the spring elements 722 with the side wall flanges 708. This allows the container to be stacked with a nestable container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be column stacked with similar collapsible containers, which engage the upper edges 712 of the walls 704,706.

**[0086]** In order to fold the container, the end walls 706 are collapsed first and laid flat against the base 702. The locking formations are such that they can be released simply by pressing on the end walls 706. As the support bars 716 engage the base, they are pushed back into the recesses 718 as shown in Figure 35. The resilient spring elements 722 protrude through the apertures 724 and are therefore unstressed in the retracted condition. The avoids the risk of the spring elements being weakened through prolonged deformation. The side walls 704 are then folded down on top of the end walls 706.

**[0087]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls are lifted first, followed by the end walls 706, which are locked into position by the locking formations. As the end walls 706 are lifted, the stacking elements 714 deploy automatically, under the force of the resilient spring elements 722 as they engage the side wall flanges 708.

**[0088]** The seventh container described above provides a number of important advantages over the prior art. First, because the end walls 706 have to be folded before the side walls 704, the side walls 704 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 714 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. The stacking elements are deployed and retracted automatically, avoiding the need for a laborious manual operation. The risk of damage to the goods through failure to deploy the stacking bars is also avoided. The container is also suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container and the fact that if necessary the stacking elements can be easily retracted into the recesses in the end walls against the resilient bias of the spring elements during the filling operation. The stacking elements also allow slide stacking from the sides of the container. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume when it is in an erected condition, thereby providing greater economies in shipping costs.

## Embodiment 8

**[0089]** The eighth container 800 shown in Figures 37-43 is similar in many respects to the seventh container and comprises a substantially rectangular base 802, two longer side walls 804 and two shorter end walls 806. The side walls and the end walls are attached to the base 802 by means of hinges, which allow the walls to be folded flat onto the base 802 as shown in Figure 38 for storage or transportation in a collapsed condition, or erected for use as shown in Figure 40. The end walls 806 are folded first and in the collapsed condition they lie adjacent to the base 802. The side walls 804 are collapsed after the end walls 806 and in the collapsed condition overlie the end walls 806. Recesses are provided where necessary in the side walls to allow them to lie flat against the end walls.

**[0090]** The length of the end walls 806 is less than the separation of the erected side walls 804, so that the end walls can pivot between the side walls. The side walls 804 are provided with inwardly-extending flanges 808 that help to support the end walls 806 when the container is erected for use. Complementary locking formations in the form of resilient detents 810 are provided on the end walls and the side walls to lock the walls together when the container is in the erected condition. The locking formations are conventional and will not be described in detail.

**[0091]** The upper edges of the side walls 804 and the end walls 806 are designed to receive the edges of the base of a similar container when the containers are stacked in an erected, column stacked condition. The edges and the base may be provided with complementary locking formations 812, to prevent relative movement of the stacked containers.

**[0092]** Each of the end walls 806 carries a retractable stacking element 814, that may be deployed to allow stacking with a nestable container. The retractable stacking element 814 is shown in more detail in Figure 37 and comprises a pivotable support bar 816, mounted in a recess 818 on the inner face of the end wall 806, adjacent its upper edge. The support bar 816 is attached to the end wall by means of a pivot 820, allowing it to be deployed as shown at position 3, or retracted within the recess 818 as shown at positions 1 and 2.

**[0093]** A spring element 822 is attached to the support bar 816 and extends outwards through a window 824 in the rear face of the recess 818 when the support bar 816 retracted into the recess 818. When the container is in an erected condition (position 3), the spring element 822 engages the side wall flange 808 and urges the support bar 816 outwards into the deployed position. The support bar may however be pushed back into the recess 818 against the resilience of the spring element 822, for ex-

ample to allow automatic filling of the container.

**[0094]** The support bar 816 also includes an ear 826 for engaging the edge of a stacked container. The ear 826 extends through a second window 828 in the rear face of the recess 818 when the support bar 816 retracted into the recess 818.

**[0095]** The ends 830 of the support bar 816 extend outwards beyond the side edges of the end wall 806, as shown in figures 38 and 41. Curved grooves 832 are formed on the inner surfaces of the side walls 804 to accommodate the bar ends 830 and allow folding of the end wall 806. At the upper ends of the grooves 832 latching support elements 834 are provided, which engage the bar ends 830 when the end wall 806 is erected, to help support the bar 816 and retain the end wall in the erected position. The latching effect may however be overcome by applying sufficient force to the end wall 806. As shown in figure 43, the bar ends 830 may include terminal flanges 832 that are located over the latching elements 834 when the end wall 806 is erected, to help support the side wall 804.

**[0096]** Optionally, as shown in figures 42 and 43, the spring elements 822 may be moulded separately from the support bar 816 and attached to the support bar by clipping into a groove 834 in its lower edge. This allows the spring elements 822 to be made from a plastics material that is resilient and relatively elastic, while the support bar 816 is made from a cheaper, more rigid plastics material. Alternatively, the support bar 816 can be moulded from two different plastics materials, for example by using a twin-shot moulding technique.

**[0097]** In use, when the container is in an erected condition as shown in figure 37 (position 3) and figure 40, the stacking elements 814 automatically adopt the deployed condition owing to the engagement of the spring elements 822 with the side wall flanges 808. This allows the container to be stacked with a nestable container having a base smaller than the mouth of the collapsible container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be column stacked with similar collapsible containers, which engage the upper edges of the walls 804,806.

**[0098]** In order to fold the container, the end walls 806 are collapsed first and laid flat against the base 802 as shown in Figure 37 (position 1). The locking formations are such that they can be released simply by pressing on the end walls 806. As the support bars 816 engage the base, they are pushed back into the recesses 818. The resilient spring elements 822 protrude through the apertures 824 and are therefore unstressed in the retracted condition. This avoids the risk of the spring elements being weakened through prolonged deformation. The side walls 804 are then folded down on top of the end walls 806.

**[0099]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls 804 are lifted first, followed by the end walls 806, which are locked into position by the locking formations 810 and the latching elements 834. As the end walls 806 are lifted, the stacking elements 814 deploy automatically, under the force of the resilient spring elements 822 as they engage the side wall flanges 808.

**[0100]** The eighth container described above provides a number of important advantages over the prior art. First, because the end walls 806 have to be folded before the side walls 804, the side walls 804 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 814 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. The stacking elements are deployed and retracted automatically, avoiding the need for a laborious manual operation. The risk of damage to the goods through failure to deploy the stacking bars is also avoided.

**[0101]** The container is also suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container and the fact that if necessary the stacking elements can be easily retracted into the recesses in the end walls against the resilient bias of the spring elements during the filling operation. The stacking elements also allow slide stacking from the sides of the container and they help to support the side walls in the erected condition. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume when it is in an erected condition, thereby providing greater economies in shipping costs.

**Embodiment 9**

**[0102]** The ninth container 90 shown in Figures 45-48 is similar in certain respects to the eighth container and comprises a substantially rectangular base 902, two longer side walls 904 and two shorter end walls 906. The side walls and the end walls are attached to the base 902 by means of hinges, which allow the walls to be folded flat onto the base 902 as shown in Figure 46 for storage or transportation in a collapsed condition (position 1), or erected for use as shown in Figure 48 (position 3). The end walls 906 are folded first and in the collapsed condition they lie adjacent to the base 902. The side walls 904 are collapsed after the end walls 906 and in the collapsed condition overlie the end walls 906. Recesses are provided where necessary in the side walls to allow them to lie flat against the end walls.

**[0103]** The length of the end walls 906 is less than the separation of the erected side walls 904, so that the end walls can pivot between the side walls. The side walls 904 are provided with inwardly-extending flanges 908 that help to support the end walls 906 when the container is erected for use. Complementary locking formations 910a,b in the form of resilient detents are provided on the end walls and the side walls to lock the walls together when the container is in the erected condition. The locking formations are conventional and will not be described

in detail.

**[0104]** The upper edges of the side walls 904 and the end walls 906 are designed to receive the edges of the base of a similar container when the containers are stacked in an erected, column stacked condition. The edges of the walls and the base may be provided with complementary locking formations 912, to prevent relative movement of the stacked containers.

**[0105]** Each of the end walls 906 carries a retractable stacking element 916, that may be deployed to allow stacking with a nestable container. The retractable stacking element 916 is shown in cross-section in Figures 44 and 45 and comprises a pivotable support bar mounted at the upper edge of the end wall 906. The support bar 916 is attached to the end wall by means of a pivot 920, allowing it to be deployed as shown in Figure 45 in broken lines, or retracted as shown in solid lines by rotating it through 90° to a position in which it lies in the same plane as the end wall 906. When the end wall 906 is in a vertical erected condition, the support bar 916 lies substantially horizontally when deployed and stands vertically above the end wall 906 when retracted.

**[0106]** A spring element 922 comprising a flexible tab is provided at the upper edge of each side wall flange 908. When the container is in an erected condition, the spring element 922 engages the support bar 916 and urges it downwards into the deployed position. The support bar 916 may however be rotated back to the retracted position against the resilience of the spring element 922, for example to allow automatic filling of the container.

**[0107]** The ends 930 of the support bar 916 extend outwards beyond the side edges of the end wall 906. Curved grooves 932 are formed on the inner surfaces of the side walls 904 to accommodate the bar ends 930 and allow folding of the end wall 906. At the upper ends of the grooves 932 support elements 934 are provided, which engage the bar ends 930 when the end wall 906 is erected, to help support the bar 916 when it is carrying the weight of a stacked container.

**[0108]** In use, when the container is in an erected condition, the stacking elements 916 automatically adopt the deployed condition as shown in figure 44 (position 3) and figure 48, owing to the engagement of the spring elements 922 with the stacking elements 916. This allows the container to be stacked with a nestable container having a base smaller than the mouth of the collapsible container, without the nestable container intruding significantly into the enclosed volume of the container. The container can also be column stacked with similar collapsible containers, which engage the upper edges of the walls 904,906.

**[0109]** In order to fold the container, the end walls 906 are collapsed first and laid flat against the base 902. The locking formations 910a,b are such that they can be released simply by pressing on the end walls 906. As the support bars 916 engage the base, they are rotated back to the retracted position as shown in Figure 46 and Figure 44 (position 1). The side walls 904 are then folded down on top of the end walls 906.

**[0110]** Erecting the collapsed container for use is simply a reverse of the procedure described above. The side walls 904 are lifted first, followed by the end walls 906, which are locked into position by the locking formations 91 0a,b. As the end walls 906 are lifted, the stacking elements 916 deploy automatically, under the force of the resilient spring elements 922.

**[0111]** The ninth container described above provides a number of important advantages over the prior art. First, because the end walls 906 have to be folded before the side walls 904, the side walls 904 cannot easily collapse during a washing process. This makes the process more reliable. Further, because the stacking elements 916 do not protrude far into the open mouth of the container, they do not significantly restrict access to the goods in the container. The stacking elements are deployed and retracted automatically, avoiding the need for a laborious manual operation. The risk of damage to the goods through failure to deploy the stacking bars is also avoided.

**[0112]** The container is also suitable for automatic filling owing to the small intrusion of the stacking elements into the mouth of the container and the fact that if necessary the stacking elements can be easily retracted against the resilient bias of the spring elements during the filling operation. The stacking elements also allow slide stacking from the sides of the container and they help to support the side walls in the erected condition. Finally, when the container is in a collapsed condition, it occupies less than 25% of the volume when it is in an erected condition, thereby providing greater economies in shipping costs.

## Claims

1. A collapsible container (100) that may be configured in a collapsed condition or an erected condition, including a base (102) and a plurality of walls (104,106) that are pivotally attached to the base (102) and arranged to lie substantially parallel with the base (102) when collapsed and to stand substantially perpendicular to the base (102) when erected, said walls (104,106) having free edges (112) that define a mouth when the container (100) is in an erected condition, and at least one stacking element (116) carried by one of said walls (104,106) and located towards a free edge (112) of said carrying wall (104,106) for supporting the base of a second container stacked on the collapsible container (100), wherein the plurality of walls (104,106) include two shorter walls (106) that lie adjacent the base (102) when collapsed and two longer walls (104) that overlie the shorted walls (106) when collapsed, wherein the stacking element (116) is pivotally attached to the carrying wall (104,106) and is constructed and arranged to be configured in a deployed condition

for stacking in which it extends at least partially into the mouth of the container (100), or a retracted condition in which it is withdrawn from the mouth of the container (100), **characterised in that** the stacking element (116) is constructed and arranged to deploy automatically when the container (100) is erected, and to retract when the container (100) is collapsed, and the container (100) further comprises resilient biassing means (112) to cause deployment.

**2.** A collapsible container (100) according to claim 1, wherein the length of the shorter walls (106) is less than the separation of the erected longer walls (104), whereby the shorter walls (106) can pivot between the erected longer walls (104).

**3.** A collapsible container (100) according to claim 1 or claim 2, including a pair of stacking elements (116) carried by an opposed pair of walls (104,106).

**4.** A collapsible container (100) according to claim 1, in which the stacking element (116) is pivotally attached to an inner face of the carrying wall (104,106).

**5.** A collapsible container (100) according to claim 4, in which the stacking element (116) is constructed and arranged to retract into a recess (118) in the wall (104,106).

**6.** A collapsible container (100) according to claim 1, in which the stacking element (116) is pivotally attached to an upper edge of the carrying wall (104,106).

**7.** A collapsible container (100) according to claim 6, in which the stacking element (116) is constructed and arranged to retract to an upright position in which it extends upwards from the upper edge (112) of the carrying wall (104,106).

**8.** A collapsible container (100) according to claim 1, in which the resilient biassing (122) means is constructed and arranged to bias the stacking element (116) when the container (100) is in an erected condition, and to apply no bias when the container (100) is collapsed.

**9.** A collapsible container (100) according to claim 8, in which the resilient biassing (122) means is constructed and arranged to engage a support element on a wall (104,106) adjacent the carrying wall (104,106) when the container (100) is in an erected condition.

**10.** A collapsible container (100) according to claim 8, in which the resilient biassing (122) means is provided on a wall (104,106) adjacent the carrying wall (104,106).

**11.** A collapsible container (100) according to any one of claims 1 to 10, in which the stacking element (116) includes end portions that are constructed and arranged so that when deployed they engage and support adjacent walls (104,106) of the erected container (100).

**12.** A collapsible container (100) according to any one of claim 1 to 11, in which the stacking element (116) extends along substantially the entire length of the carrying wall (104,106).

**13.** A collapsible container (100) according to any one of claims 1 to 11, in which stacking elements (116) are located towards the ends of the longer walls (104).

**14.** A collapsible container (100) according to any one of claims 1 to 13, in which the stacking element (116) is pivotally attached to a shorter wall (106).

**15.** A collapsible container (100) according to any one of claims 1 to 13, in which the stacking element (116) is pivotally attached to a longer wall (104).

**Patentansprüche**

**1.** Zusammenklappbarer Behälter (100), der in einem zusammengeklappten Zustand oder einem aufgerichteten Zustand konfiguriert werden kann, der eine Basis (102) und mehrere Wände (104, 106) aufweist, die schwenkend an der Basis (102) befestigt und eingerichtet sind, um im Wesentlichen zu der Basis (102) parallel zu liegen, wenn sie zusammengeklappt sind, und im Wesentlichen senkrecht zu der Basis (102) zu stehen, wenn sie aufgerichtet sind, wobei die Wände (104, 106) freie Kanten (112) haben, die eine Öffnung definieren, wenn der Behälter (100) in einem aufgerichteten Zustand ist, und mindestens ein Stapelelement (116), das von den Wänden (104, 106) getragen wird und sich zur freien Kante (112) der Tragewand (104, 106) hin befindet, um die Basis eines zweiten Behälters zu stützen, der auf dem zusammenklappbaren Behälter (100) gestapelt ist, wobei die mehreren Wände (104, 106) zwei kürzere Wände (106) aufweisen, die im zusammengeklappten Zustand neben der Basis liegen, und zwei längere Wände (104), die über den kürzeren Wänden (106) liegen, wenn sie zusammengeklappt sind, wobei das Stapelelement (116) schwenkend an der Tragwand (104, 106) befestigt sowie aufgebaut und eingerichtet ist, um in einem aufgefalteten Zustand, in dem es sich zumindest teilweise in die Öffnung des Behälters (100) erstreckt, zum Stapeln konfiguriert zu werden, oder in einem zurückgezogenen Zustand, in dem es von der Öffnung des Behälters (100) zurückgezogen ist, **dadurch**

**gekennzeichnet, dass** das Stapelelement (116) aufgebaut und eingerichtet ist, um sich automatisch aufzufalten, wenn der Behälter (100) aufgerichtet wird, und sich zurückzuziehen, wenn der Behälter (100) zusammengeklappt wird, und wobei der Behälter (100) ferner ein federndes Vorspannmittel (122) aufweist, um das Auffalten zu veranlassen.

**2.** Zusammenklappbarer Behälter (100) nach Anspruch 1, wobei die Länge der kürzeren Wände (106) kleiner ist als die Trennung der aufgerichteten längeren Wände (104), wobei die kürzeren Wände (106) zwischen den aufgerichteten längeren Wände (104) schwenken können.

**3.** Zusammenklappbarer Behälter (100) nach Anspruch 1 oder 2, der ein Paar Stapelelemente (116) aufweist, die von einem entgegen gesetzten Paar von Wänden (104, 106) getragen werden.

**4.** Zusammenklappbarer Behälter (100) nach Anspruch 1, bei dem das Stapelelement (116) schwenkend an einer Innenseite der Tragwand (104, 106) befestigt ist.

**5.** Zusammenklappbarer Behälter (100) nach Anspruch 4, bei dem das Stapelelement (116) aufgebaut und eingerichtet ist, um sich in eine Vertiefung (118) in der Wand (104, 106) zurückzuziehen.

**6.** Zusammenklappbarer Behälter (100) nach Anspruch 1, bei dem das Stapelelement (116) schwenkend an einer Oberkante der Tragwand (104, 106) befestigt ist.

**7.** Zusammenklappbarer Behälter (100) nach Anspruch 6, bei dem das Stapelelement (116) aufgebaut und eingerichtet ist, um sich zu einer aufrechten Stellung zurückzuziehen, in der es sich von der Oberkante (112) der Tragwand (104, 106) aufwärts erstreckt.

**8.** Zusammenklappbarer Behälter (100) nach Anspruch 1, bei dem das federnde Vorspannmittel (122) aufgebaut und eingerichtet ist, um das Stapelelement (116) vorzuspannen, wenn sich der Behälter (100) in einem aufgerichteten Zustand befindet, und keine Vorspannung anzulegen, wenn der Behälter (100) zusammengeklappt ist.

**9.** Zusammenklappbarer Behälter (100) nach Anspruch 8, bei dem das federnde Vorspannmittel (122) aufgebaut und eingerichtet ist, um in ein Tragelement auf einer Wand (104, 106) neben der Tragwand (104, 106) einzugreifen, wenn sich der Behälter (100) in einem aufgerichteten Zustand befindet.

**10.** Zusammenklappbarer Behälter (100) nach Anspruch 8, bei dem das federnde Vorspannmittel (122) auf einer Wand (104, 106) neben der Tragwand (104, 106) bereitgestellt ist.

**11.** Zusammenklappbarer Behälter (100) nach einem der Ansprüche 1 bis 10, bei dem das Stapelelement (116) Endabschnitte aufweist, die aufgebaut und eingerichtet sind, so dass sie, wenn sie aufgefaltet sind, in benachbarte Wände (104, 106) des aufgerichteten Behälters (100) eingreifen und diese stützen.

**12.** Zusammenklappbarer Behälter (100) nach einem der Ansprüche 1 bis 11, bei dem sich das Stapelelement (116) im Wesentlichen entlang der gesamten Länge der Tragwand (104, 106) erstreckt.

**13.** Zusammenklappbarer Behälter (100) nach einem der Ansprüche 1 bis 11, bei dem sich die Stapelelemente (116) zu den Enden der längeren Wände (104) hin befinden.

**14.** Zusammenklappbarer Behälter (100) nach einem der Ansprüche 1 bis 13, bei dem das Stapelelement (116) schwenkend an einer kürzeren Wand (106) befestigt ist.

**15.** Zusammenklappbarer Behälter (100) nach einem der Ansprüche 1 bis 13, bei dem das Stapelelement (116) schwenkend an einer längeren Wand (104) befestigt ist.

**Revendications**

**1.** Conteneur pliable (100) qui peut être configuré dans un état replié ou dans un état redressé, comportant une base (102) et une pluralité de parois (104, 106) qui sont fixées sur la base (102) de façon à pouvoir pivoter et agencées en vue de reposer de façon essentiellement parallèle à la base (102) lorsqu'elles sont repliées et de se tenir essentiellement perpendiculaires à la base (102) lorsqu'elles sont redressées, lesdites parois (104, 106) présentant des bords libres (112) qui définissent une ouverture lorsque le conteneur (100) se trouve à l'état redressé, et au moins un élément d'empilement (116) supporté par l'une desdites parois (104, 106) et placé vers un bord libre (112) de ladite paroi de support (104, 106) afin de supporter la base d'un second conteneur empilé sur le conteneur pliable (100), dans lequel la pluralité de parois (104, 106) comprend deux parois plus courtes (106) qui reposent de façon adjacente à la base (102) lorsque repliées et deux parois plus longues (104) qui recouvrent les parois plus courtes (106) lorsque repliées, dans lequel l'élément d'empilement (116) est fixé à pivotement sur la paroi de support (104, 106) et est construit et disposé pour

être configuré dans un état déployé en vue d'un empilement dans lequel il s'étend au moins partiellement dans l'ouverture du conteneur (100), ou dans un état rétracté dans lequel il est retiré de l'ouverture du conteneur (100), **caractérisé en ce que** l'élément d'empilement (116) est construit et agencé en vue de se déployer automatiquement lorsque le conteneur (100) est redressé, et de se rétracter lorsque le conteneur (100) est replié, et le conteneur (100) comprend, de plus, des moyens de rappel élastiques (122) pour entraîner un déploiement.

**2.** Conteneur pliable (100) selon la revendication 1, dans lequel la longueur des parois plus courtes (106) est inférieure à la distance de séparation des parois plus longues redressées (104) de sorte que les parois plus courtes (106) peuvent pivoter entre les parois plus longues redressées (104).

**3.** Conteneur pliable (100) selon la revendication 1 ou la revendication 2, comportant une paire d'éléments d'empilement (116) supportés par une paire opposée de parois (104, 106).

**4.** Conteneur pliable (100) selon la revendication 1, dans lequel l'élément d'empilement (116) est fixé à pivotement sur une face interne de la paroi de support (104, 106).

**5.** Conteneur pliable (100) selon la revendication 4, dans lequel l'élément d'empilement (116) est construit et agencé de façon à se rétracter dans un évidement (118) formé dans la paroi (104, 106).

**6.** Conteneur pliable (100) selon la revendication 1 dans lequel l'élément d'empilement (116) est fixé à pivotement sur un bord supérieur de la paroi de support (104, 106).

**7.** Conteneur pliable (100) selon la revendication 6, dans lequel l'élément d'empilement (116) est construit et agencé de façon à se rétracter à une position verticale dans laquelle il s'étend vers le haut à partir du bord supérieur (112) de la paroi de support (104, 106).

**8.** Conteneur pliable (100) selon la revendication 1, dans lequel les moyens de rappel élastiques (122) sont réalisés et agencés en vue de rappeler l'élément d'empilement (116) lorsque le conteneur (100) se trouve à l'état redressé et en vue de ne pas appliquer de force de rappel lorsque le conteneur (100) est replié.

**9.** Conteneur pliable (100) selon la revendication 8, dans lequel les moyens de rappel élastiques (122) sont réalisés et agencés de façon à s'engager avec un élément de support sur une paroi (104, 106) adjacente à la paroi de support (104, 106) lorsque le conteneur (100) se trouve dans une situation redressée.

**10.** Conteneur pliable (100) selon la revendication 8, dans lequel les moyens de rappel élastiques (122) sont prévus sur une paroi (104, 106) adjacente à la paroi de support (104, 106).

**11.** Conteneur pliable (100) selon l'une quelconque des revendications 1 à 10, dans lequel l'élément d'empilement (116) comporte des parties d'extrémité qui sont réalisées et agencées de façon que, lorsqu'elles sont déployées, elles s'engagent avec, et supportent, des parois adjacentes (104, 106) du conteneur redressé (100).

**12.** Conteneur pliable (100) selon l'une quelconque des revendications 1 à 11, dans lequel l'élément d'empilement (116) s'étend essentiellement sur toute la longueur de la paroi de support (104, 106).

**13.** Conteneur pliable (100) selon l'une quelconque des revendications 1 à 11, dans lequel les éléments d'empilement (116) sont placés vers les extrémités des plus longues parois (104).

**14.** Conteneur pliable (100) selon l'une quelconque des revendications 1 à 13, dans lequel l'élément d'empilement (116) est fixé à pivotement sur une paroi plus courte (106).

**15.** Conteneur pliable (100) selon l'une quelconque des revendications 1 à 13, dans lequel l'élément d'empilement (116) est fixé à pivotement sur une paroi plus longue (104).

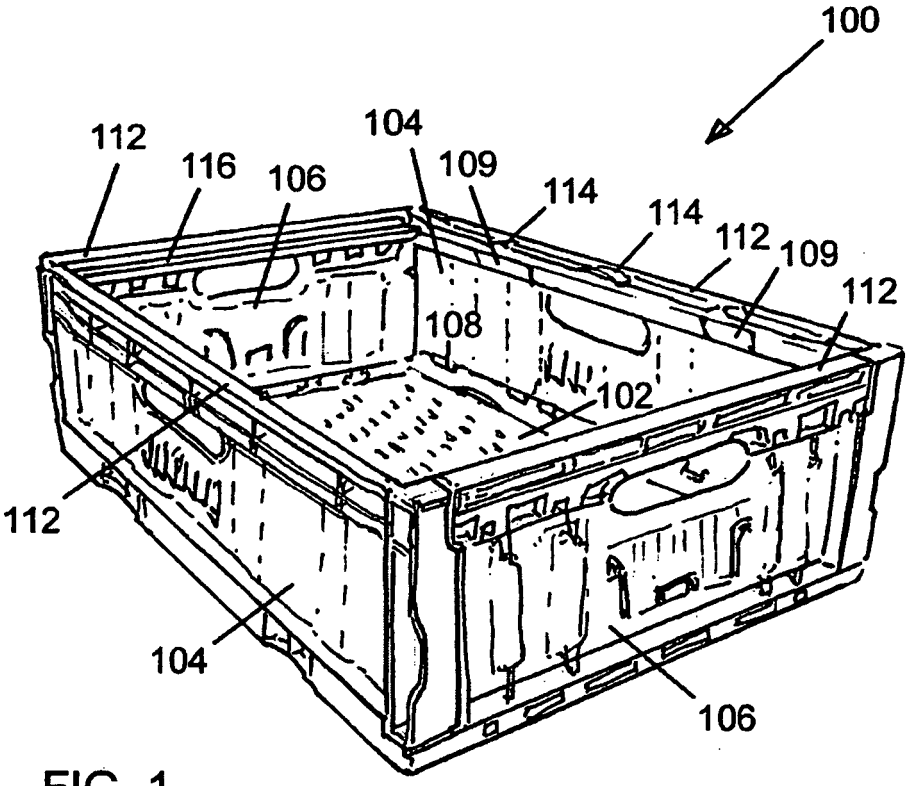
100
112
116
106
104
109
114
114
112
109
112
108
102
112
104
106

FIG. 1

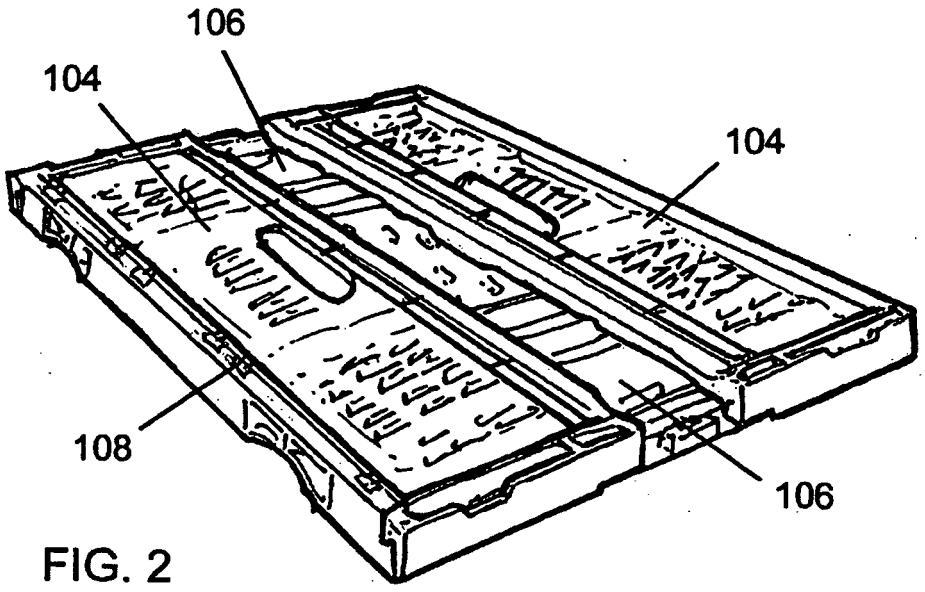
106
104
104
108
106

FIG. 2

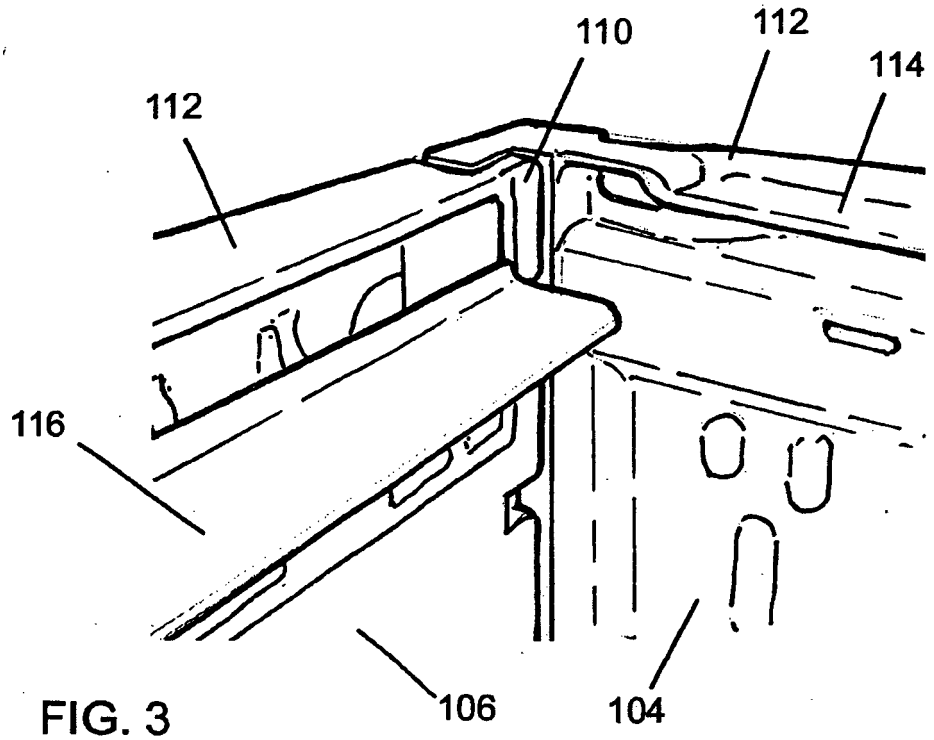


FIG. 3

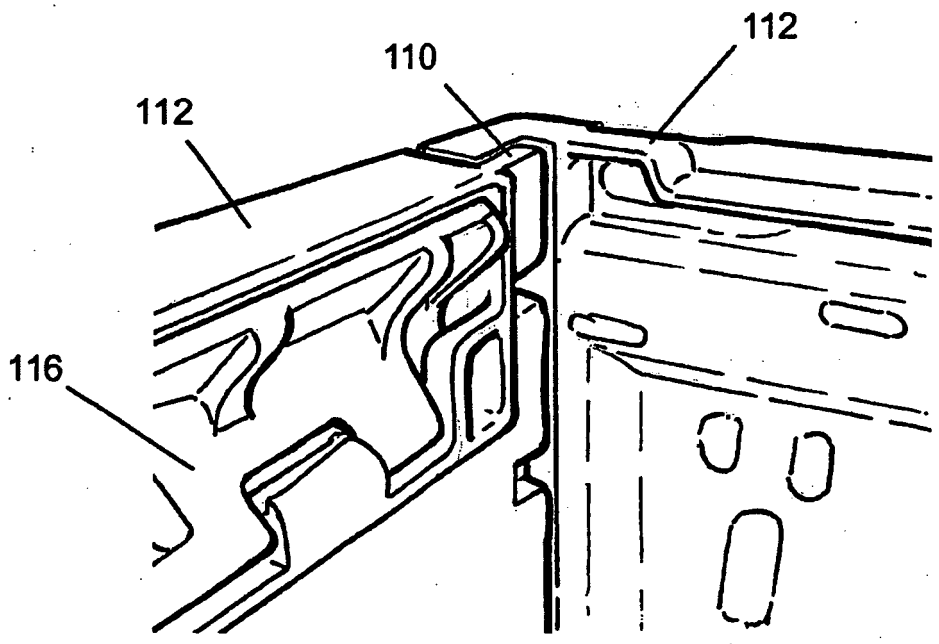


FIG. 4

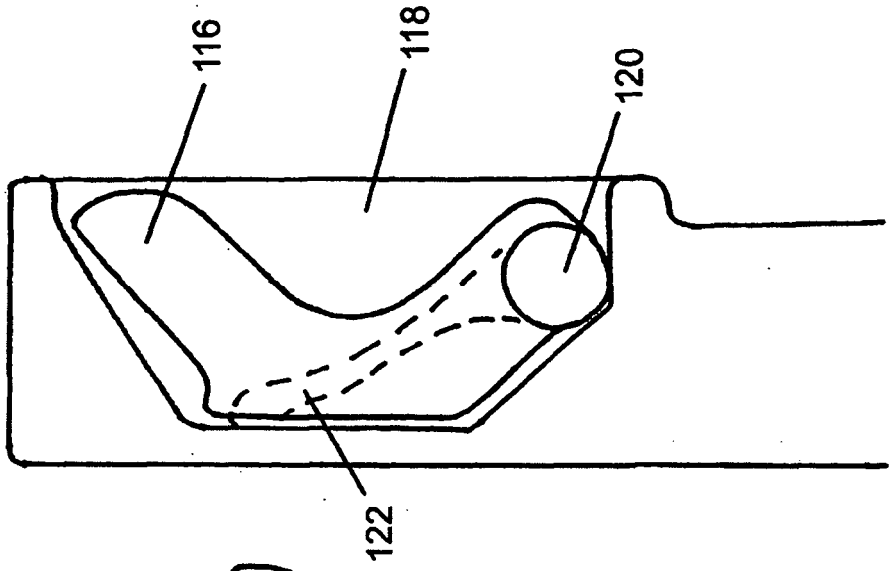


FIG. 6

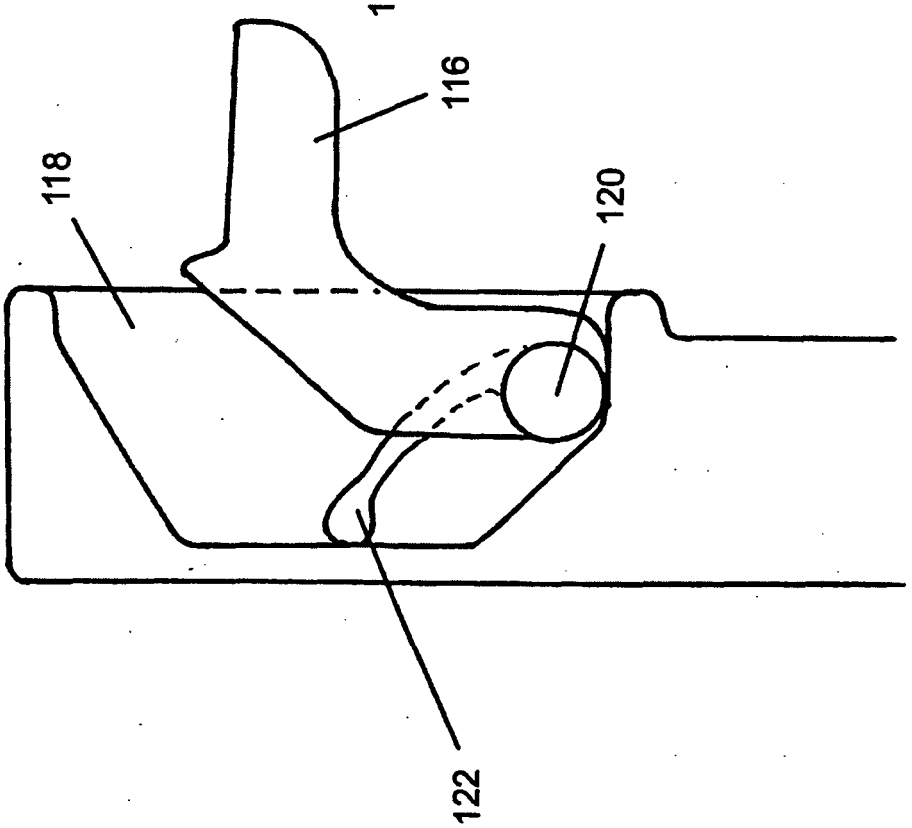


FIG. 5

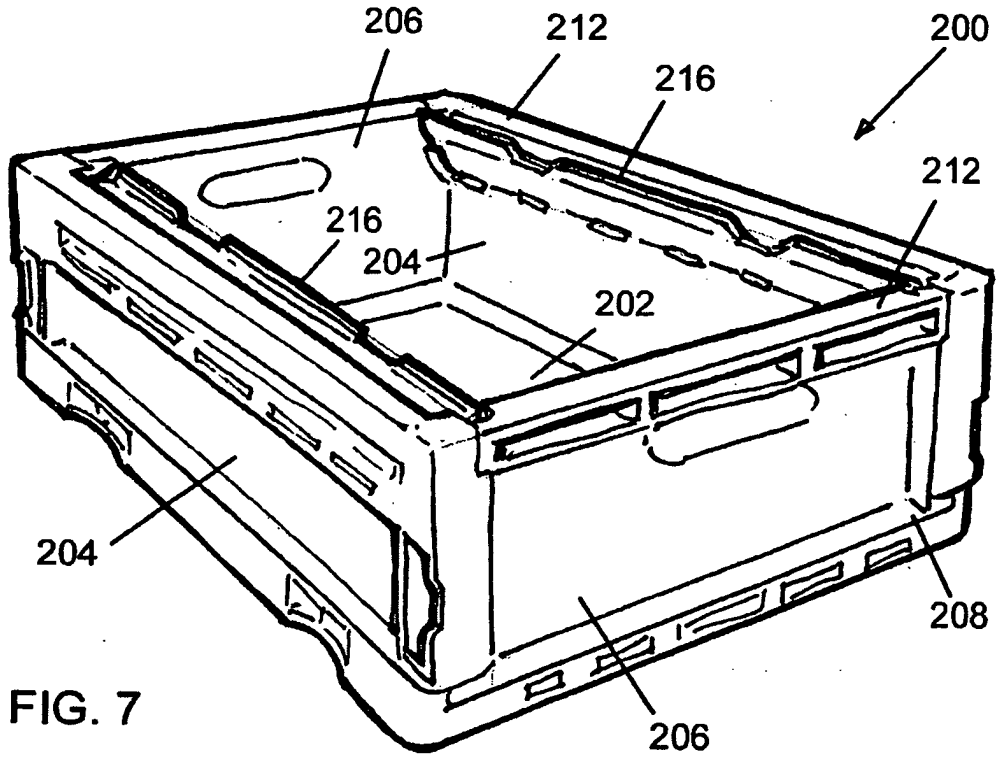


FIG. 7

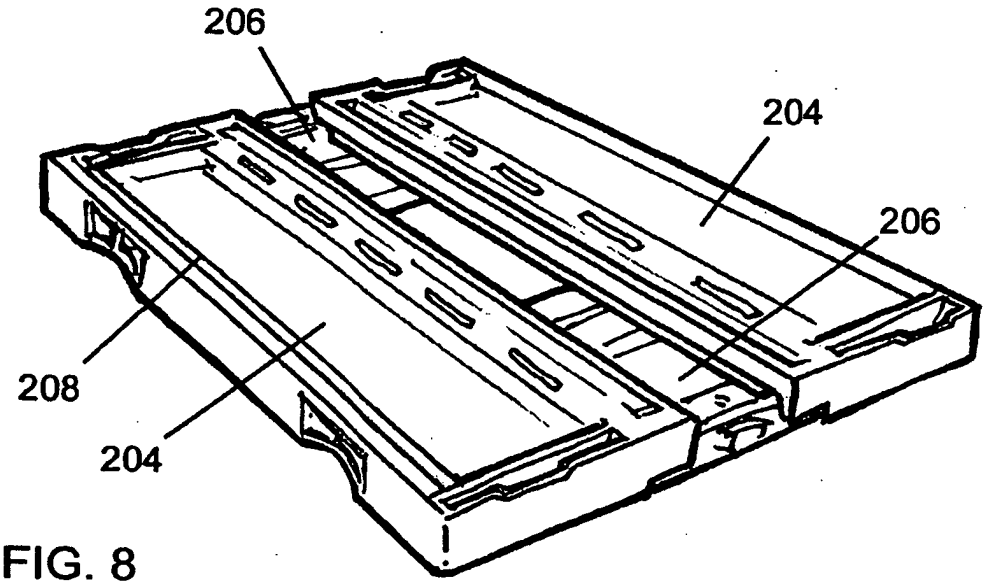


FIG. 8

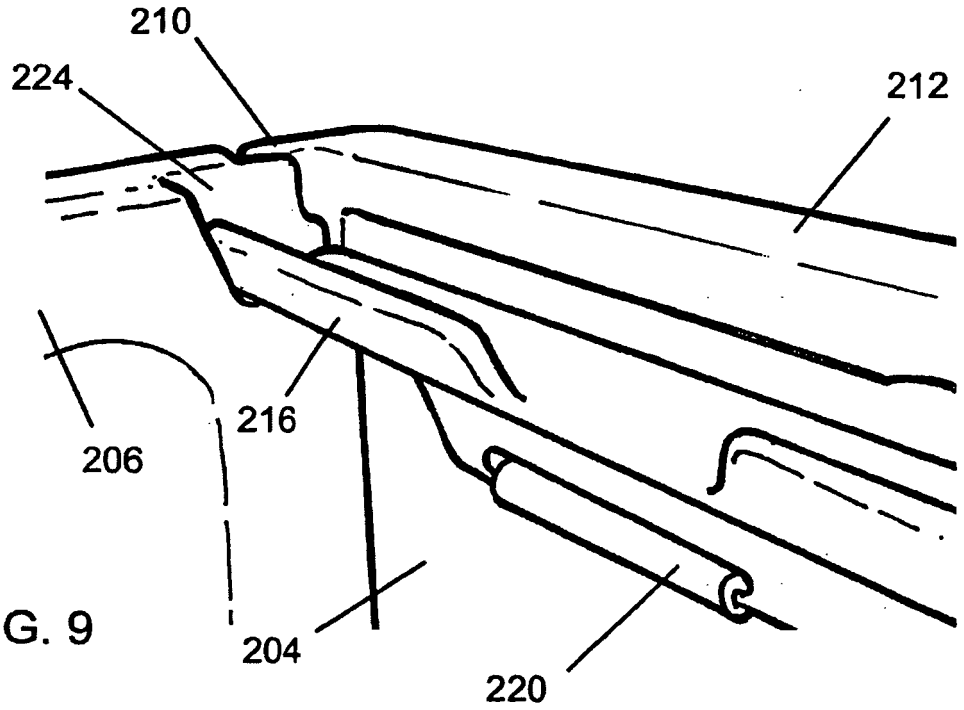


FIG. 9

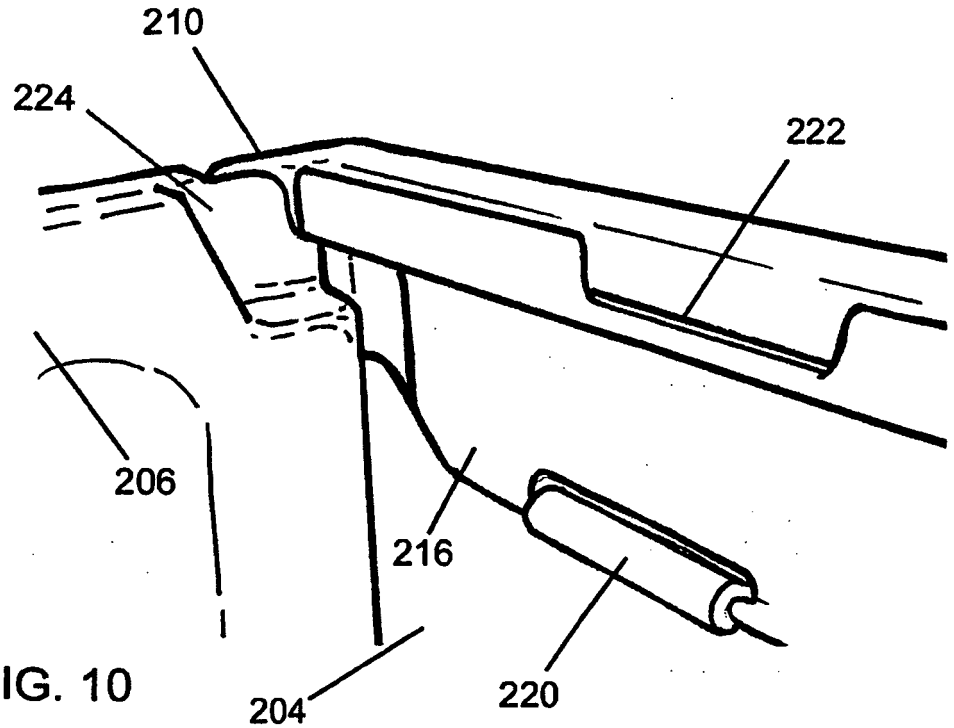


FIG. 10

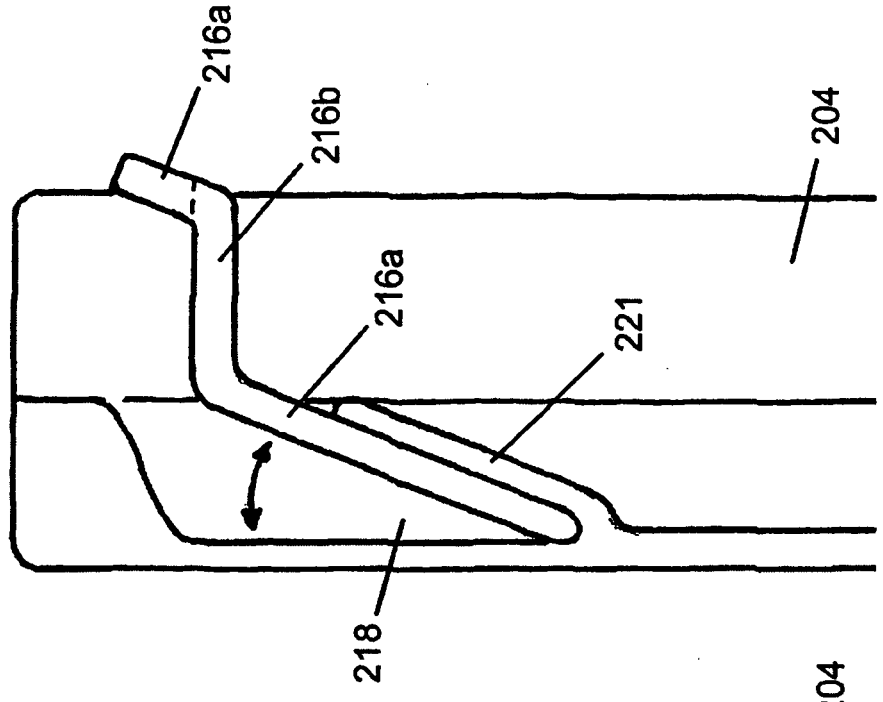


FIG. 12

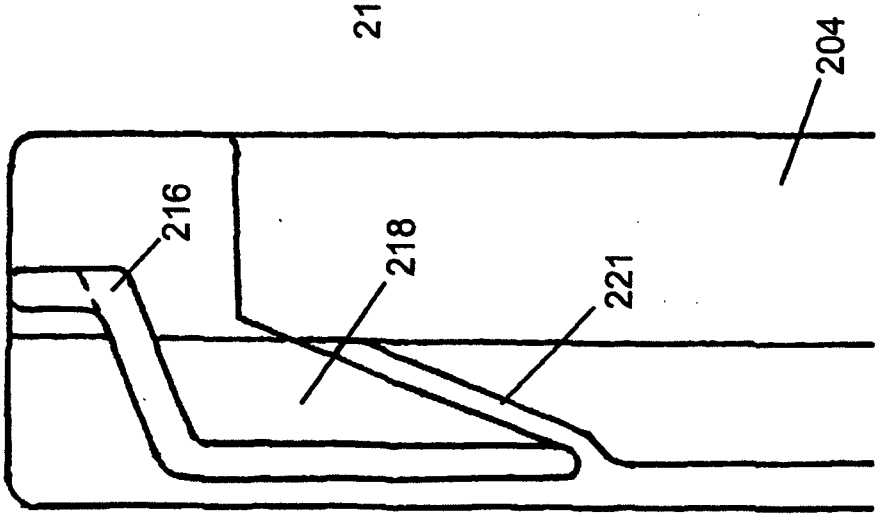


FIG. 11

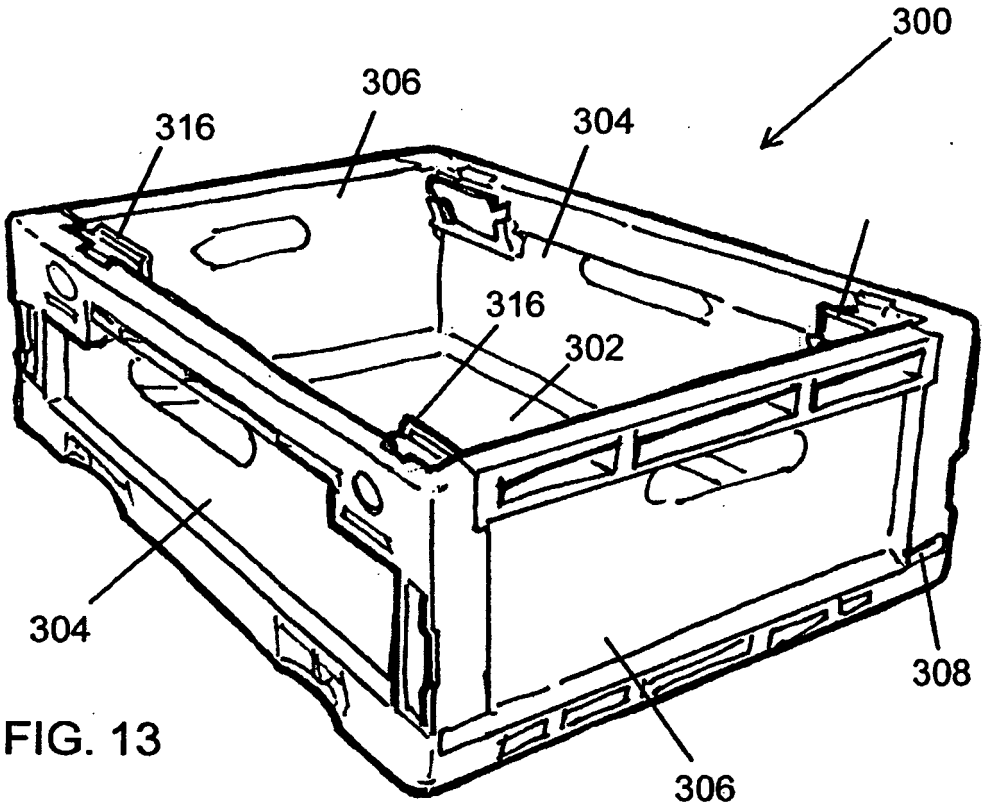


FIG. 13

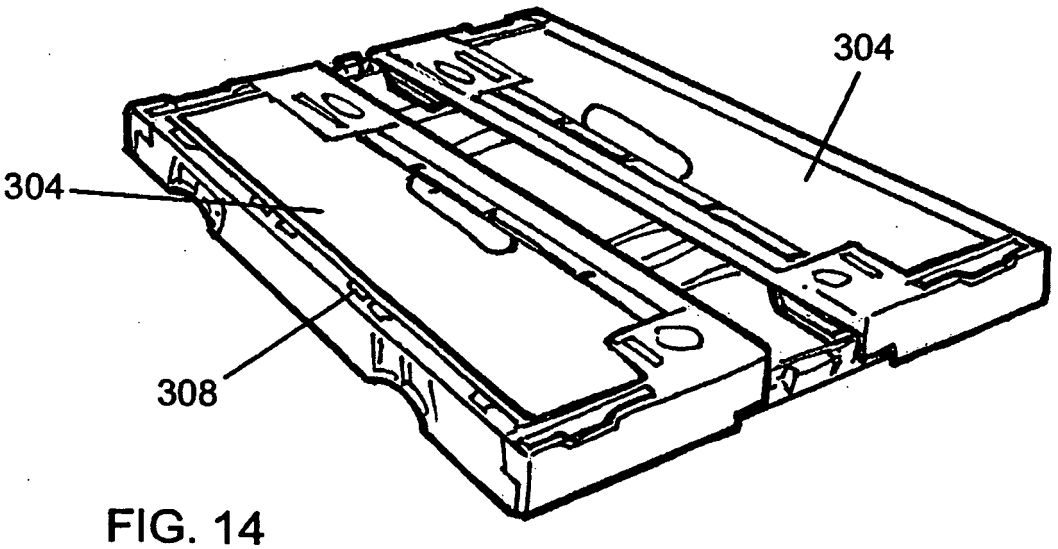


FIG. 14

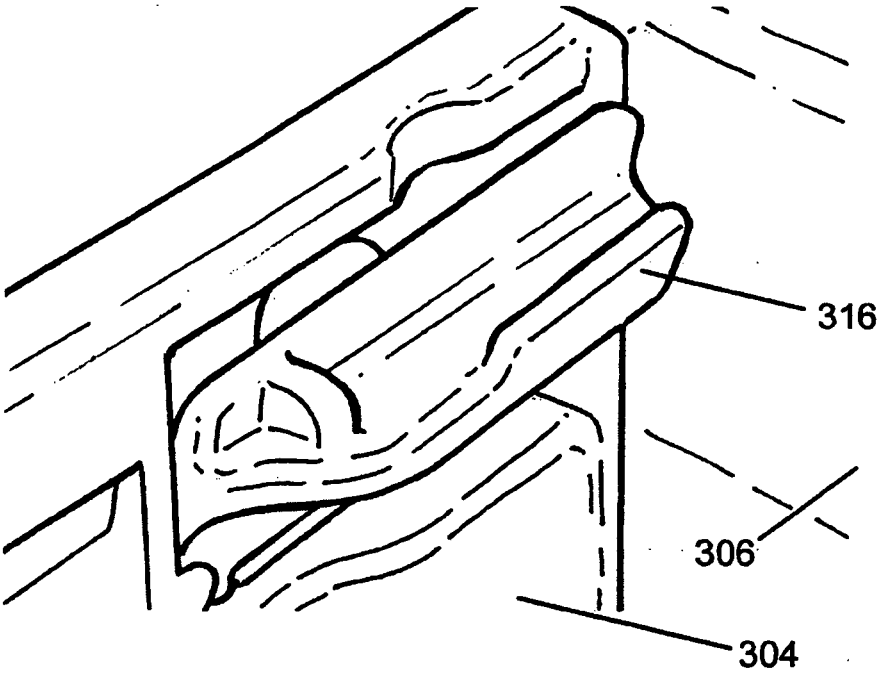


FIG. 15

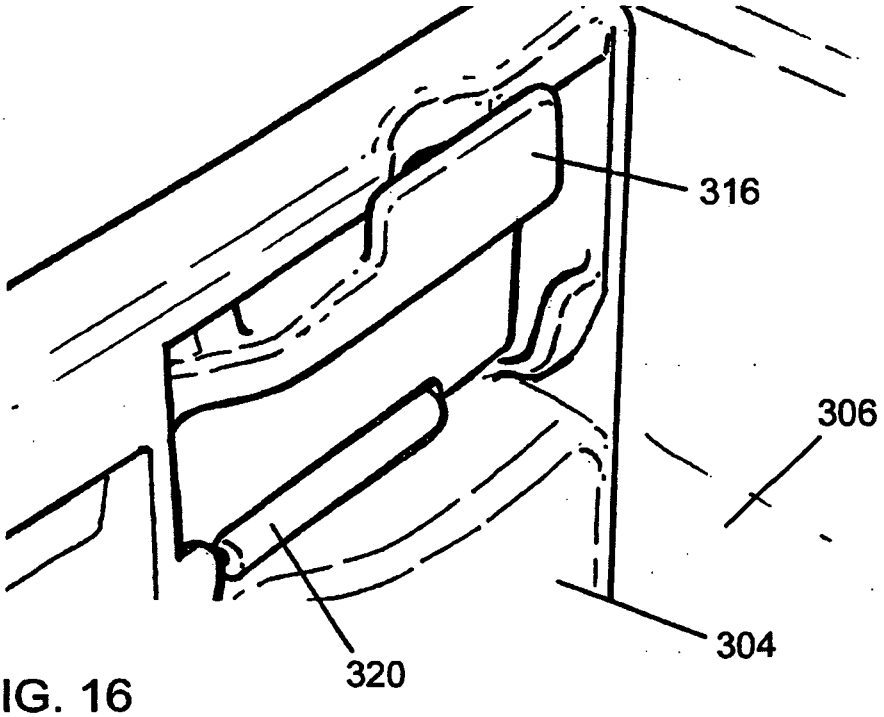


FIG. 16

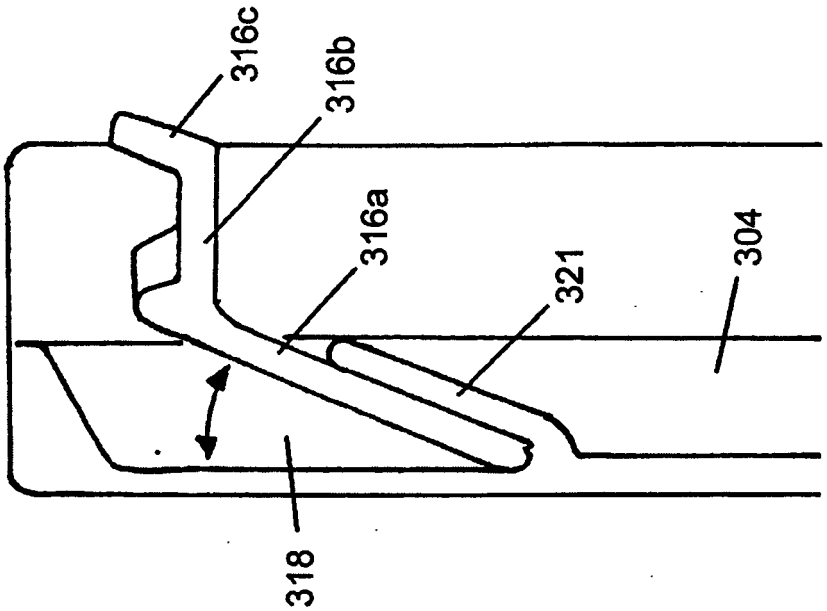


FIG. 18

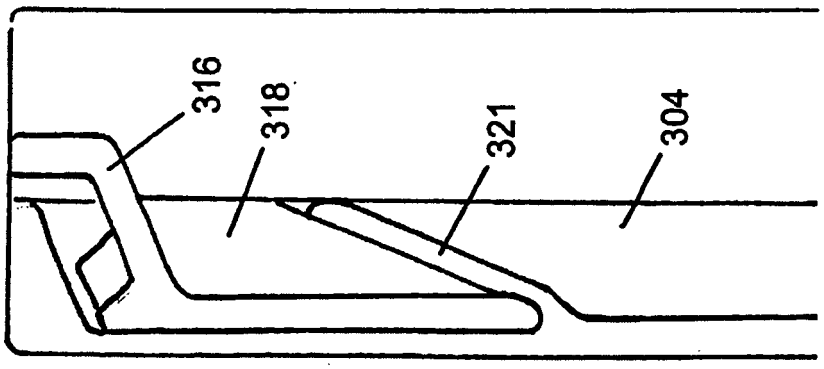


FIG. 17

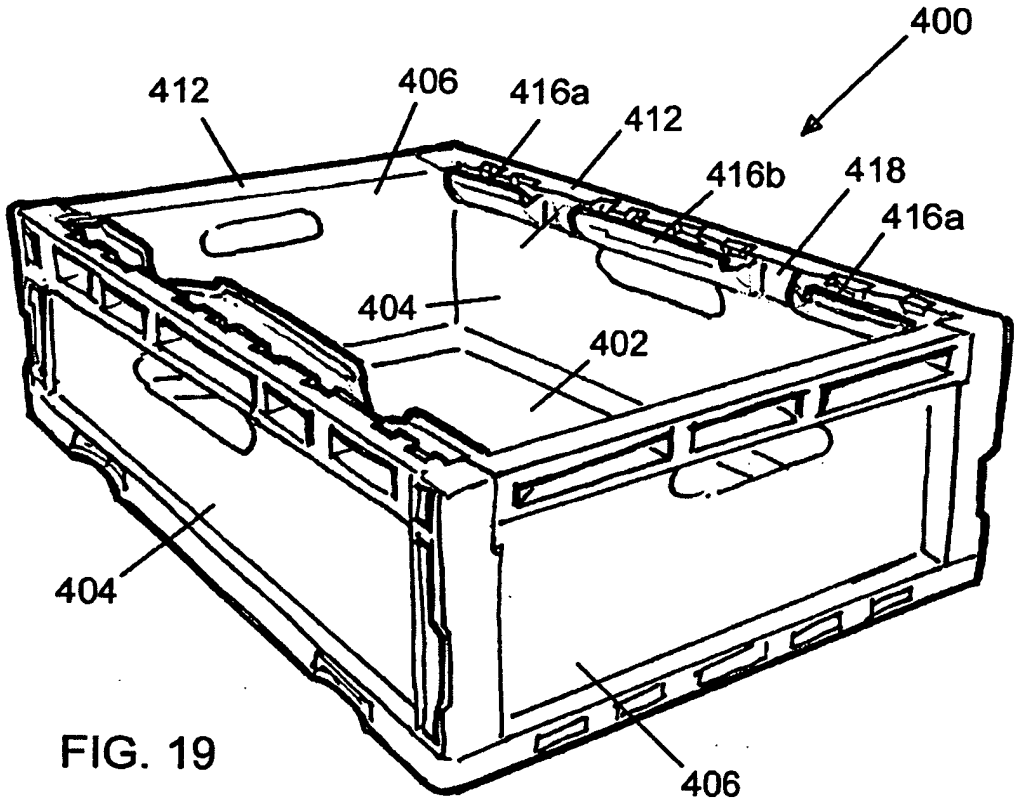


FIG. 19

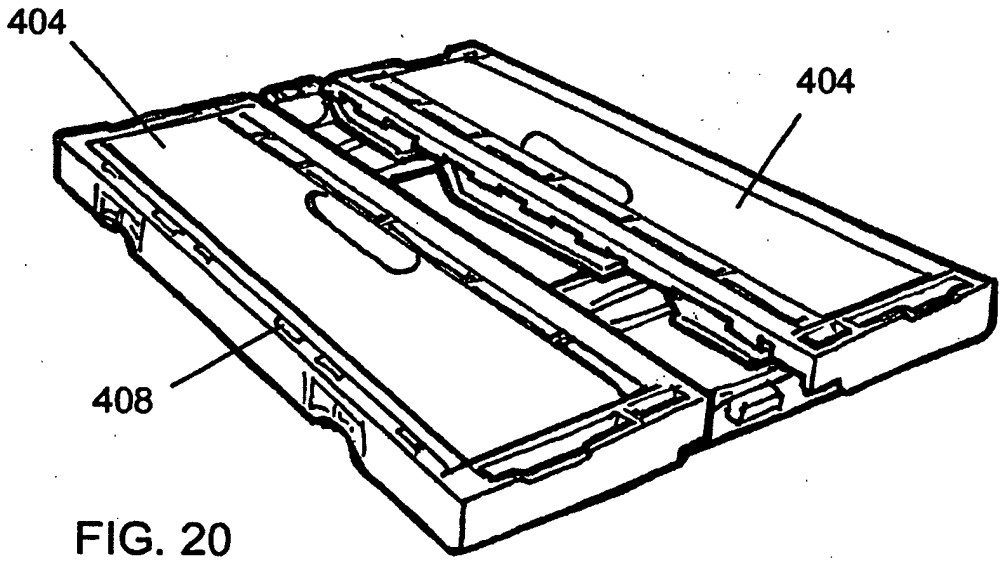


FIG. 20

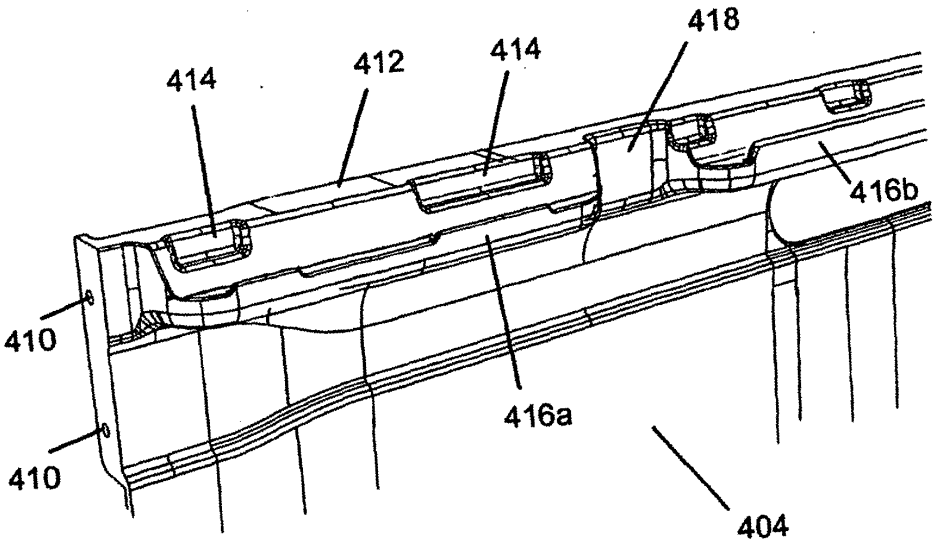


FIG. 21

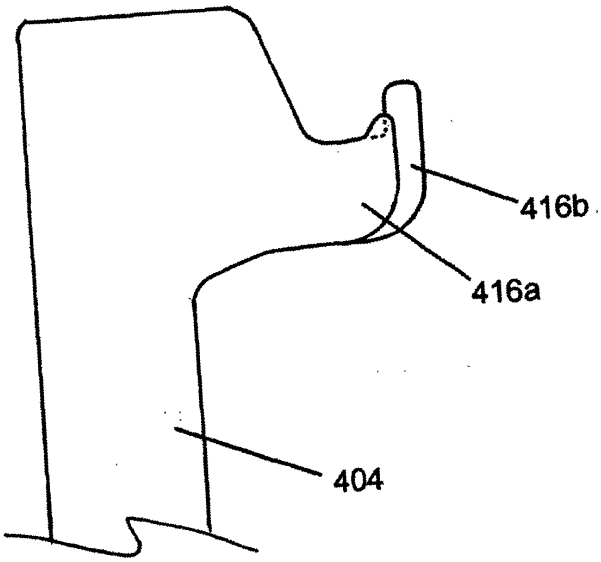


FIG. 22

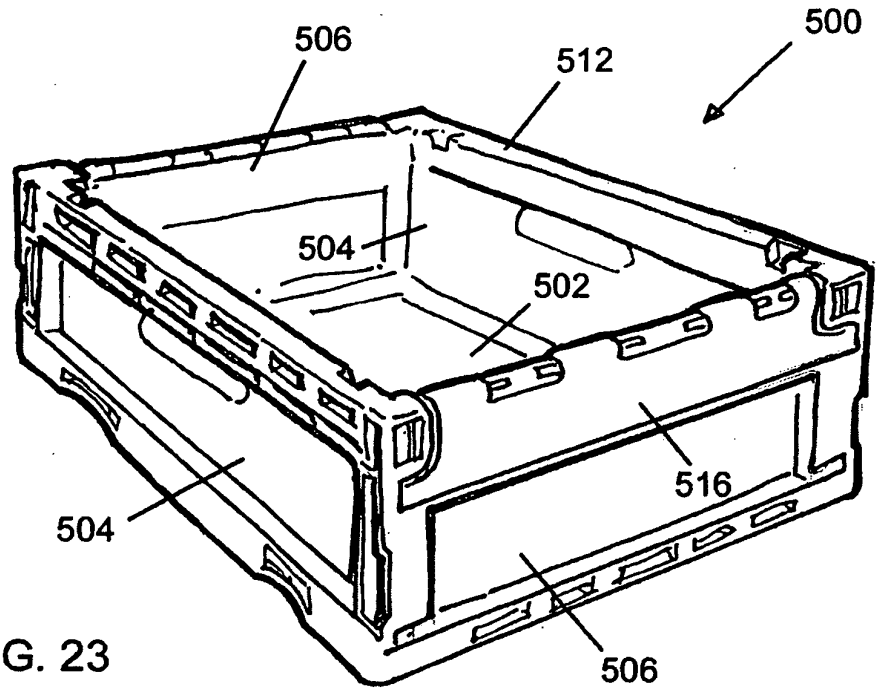


FIG. 23

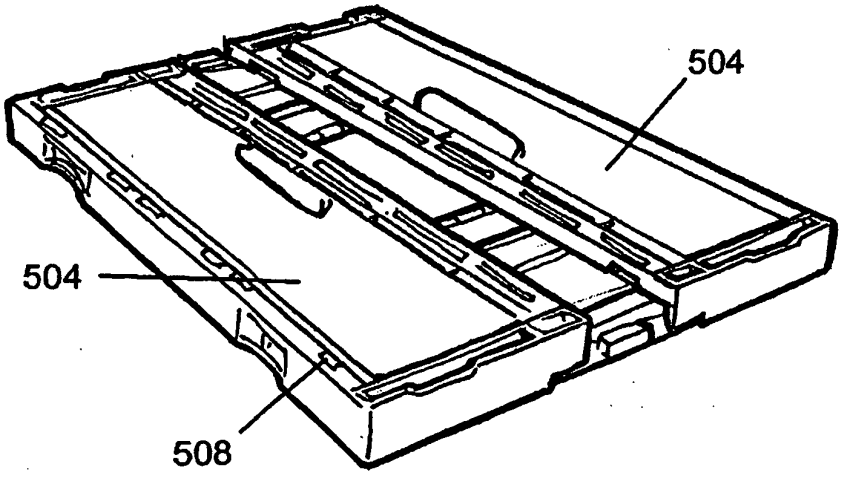


FIG. 24

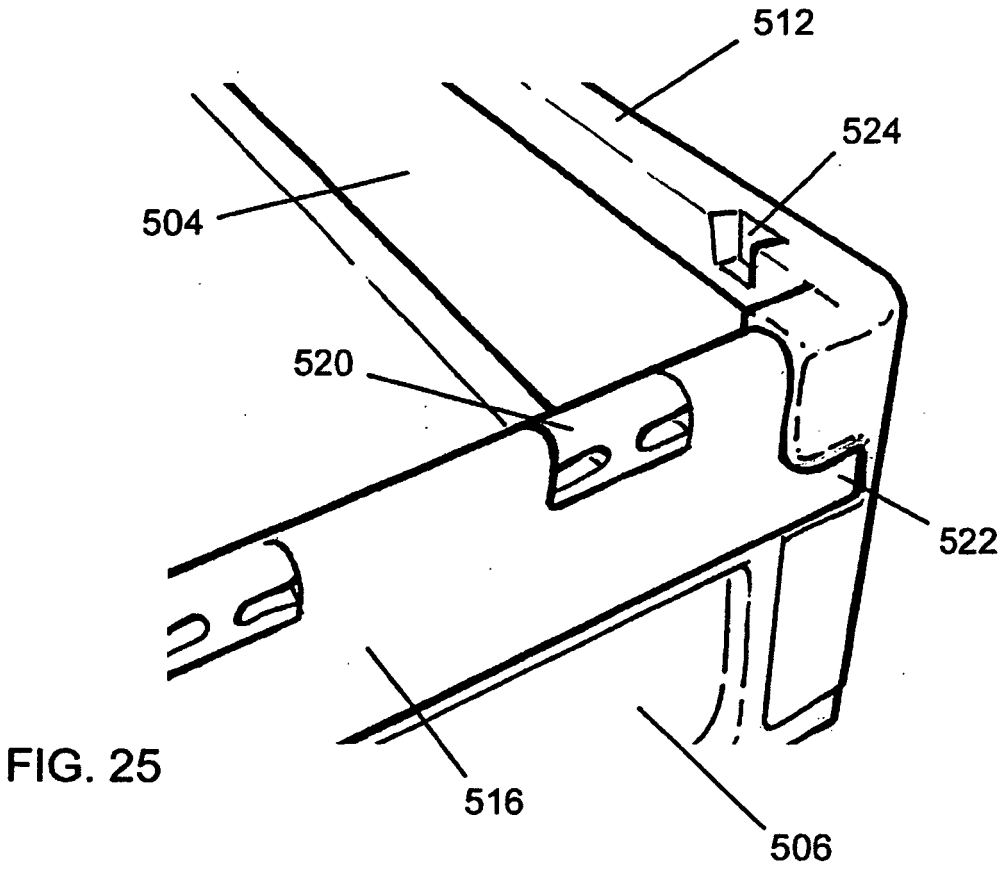


FIG. 25

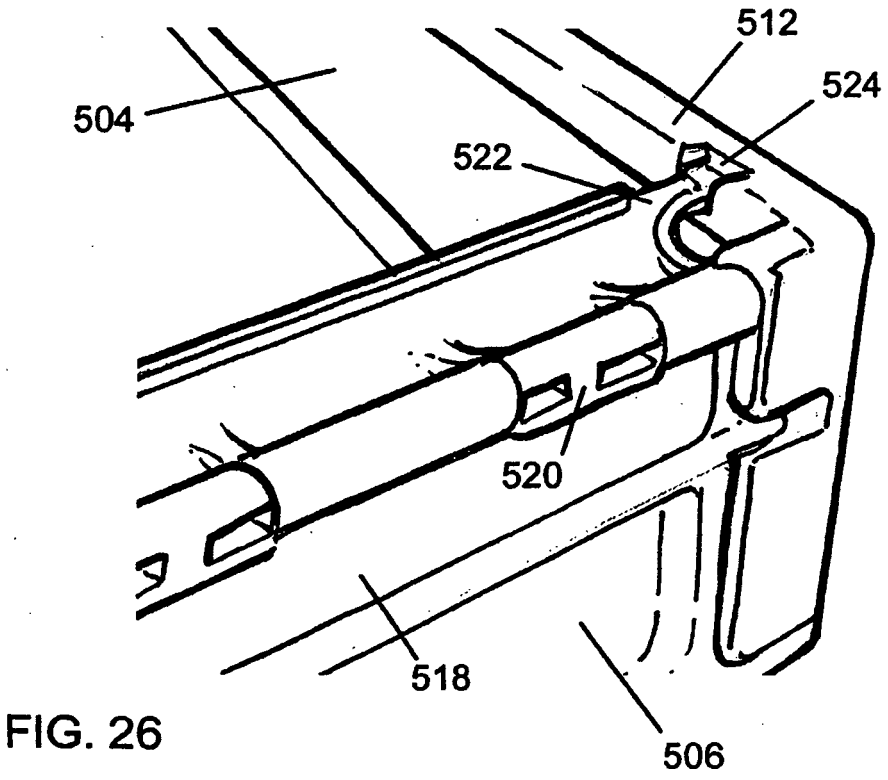


FIG. 26

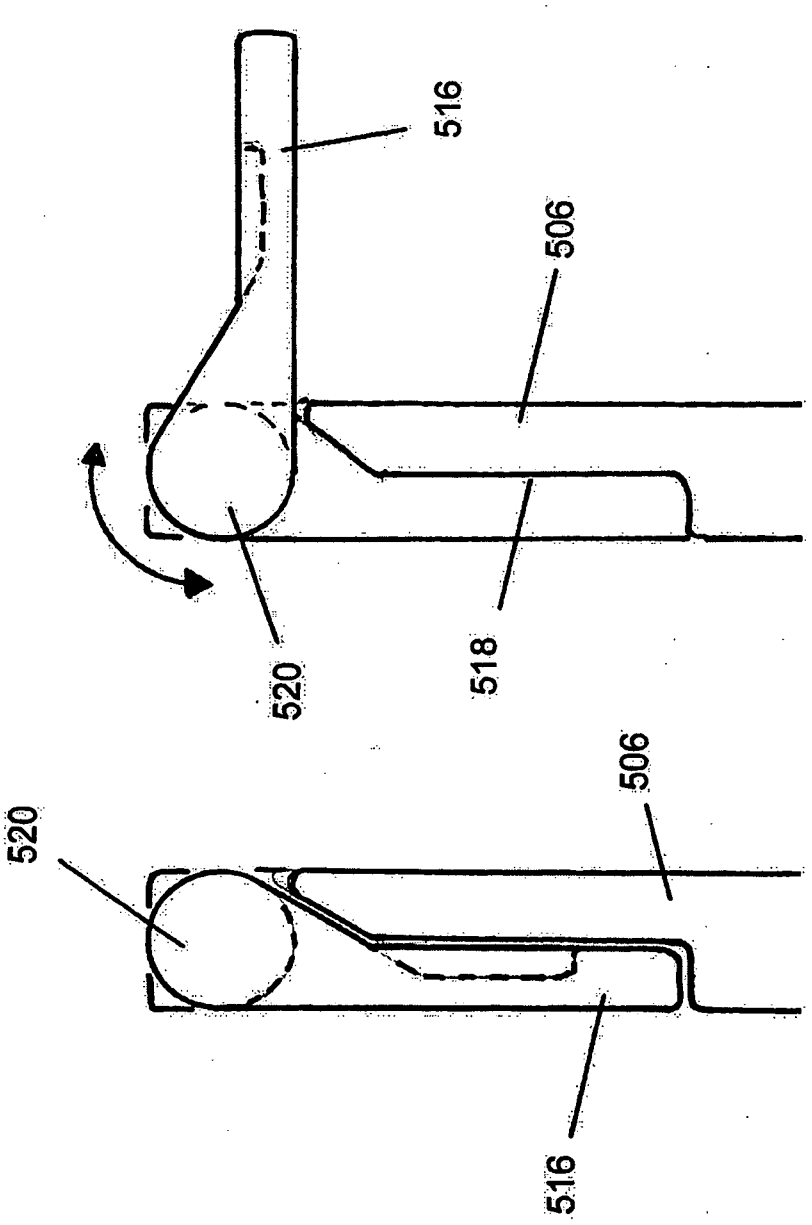


FIG. 28




FIG. 27

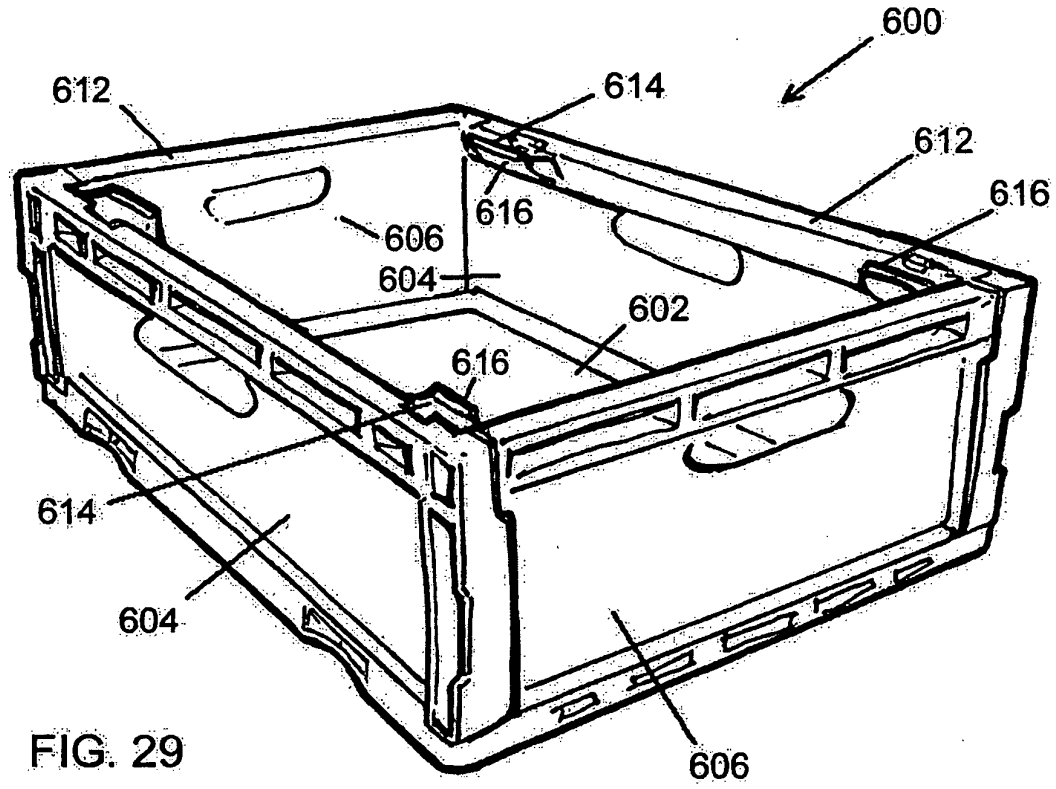


FIG. 29

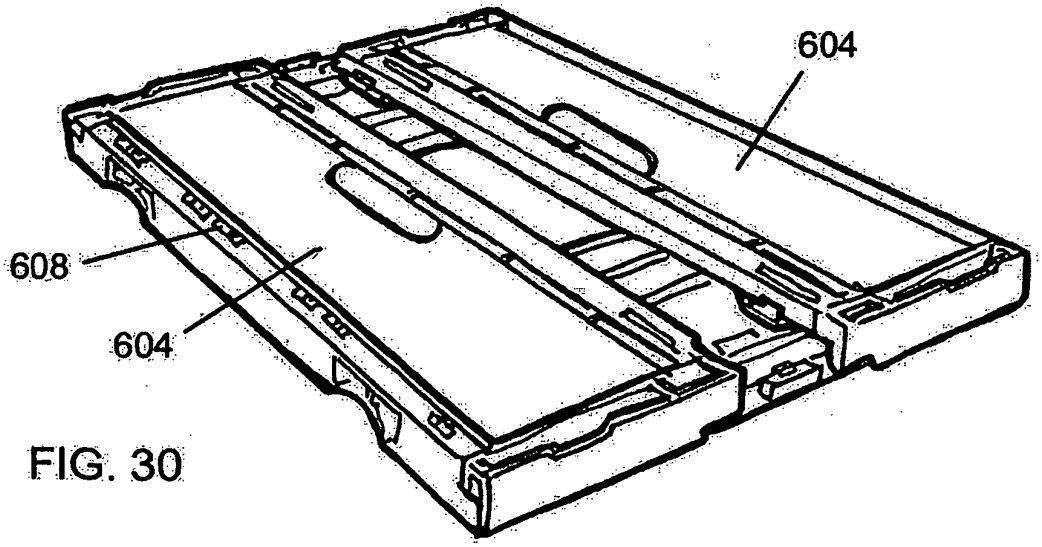


FIG. 30

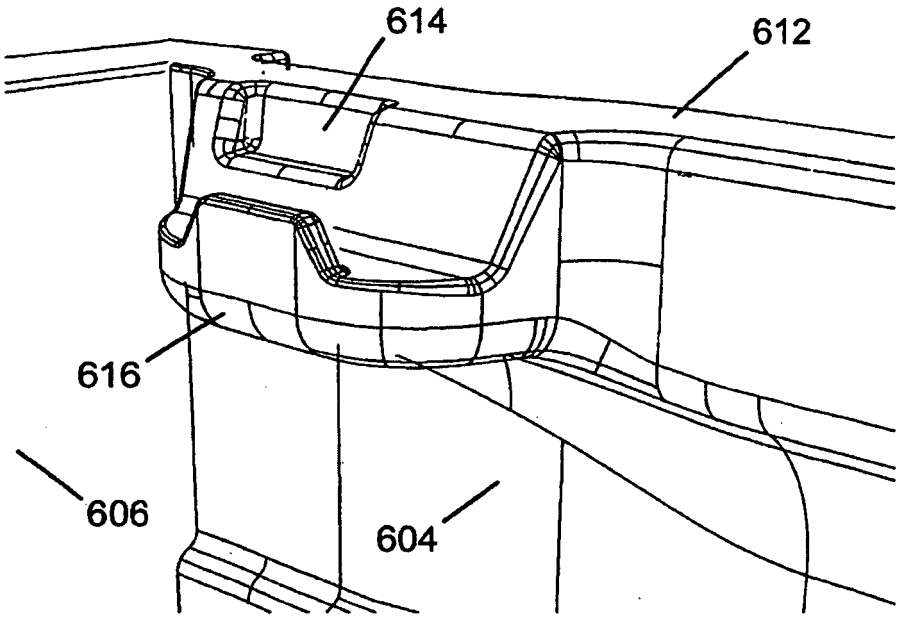


FIG. 31

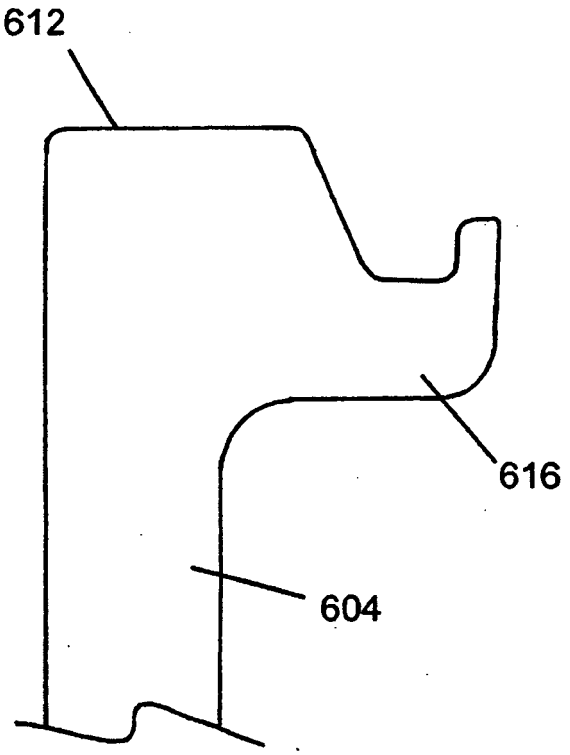


FIG. 32

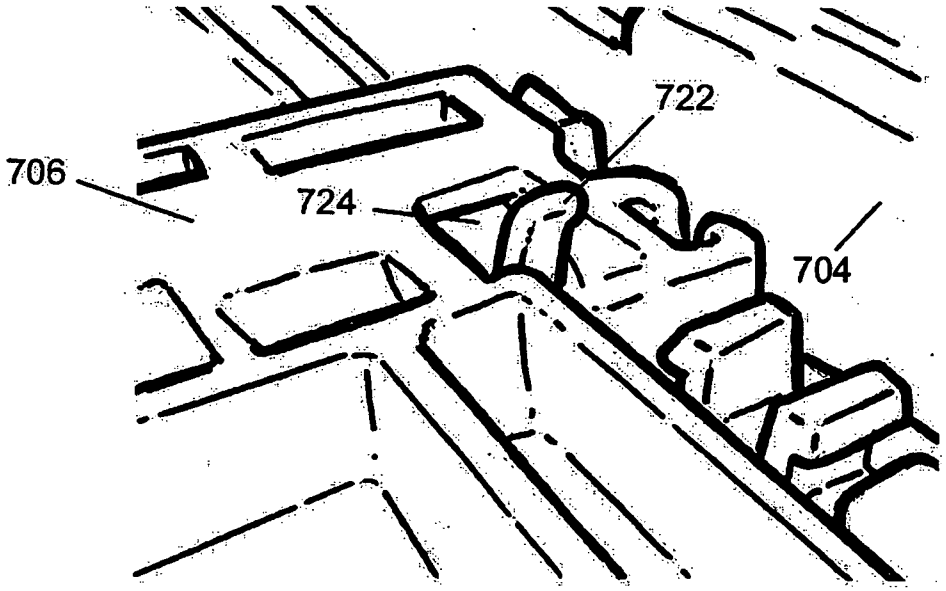


FIG. 34

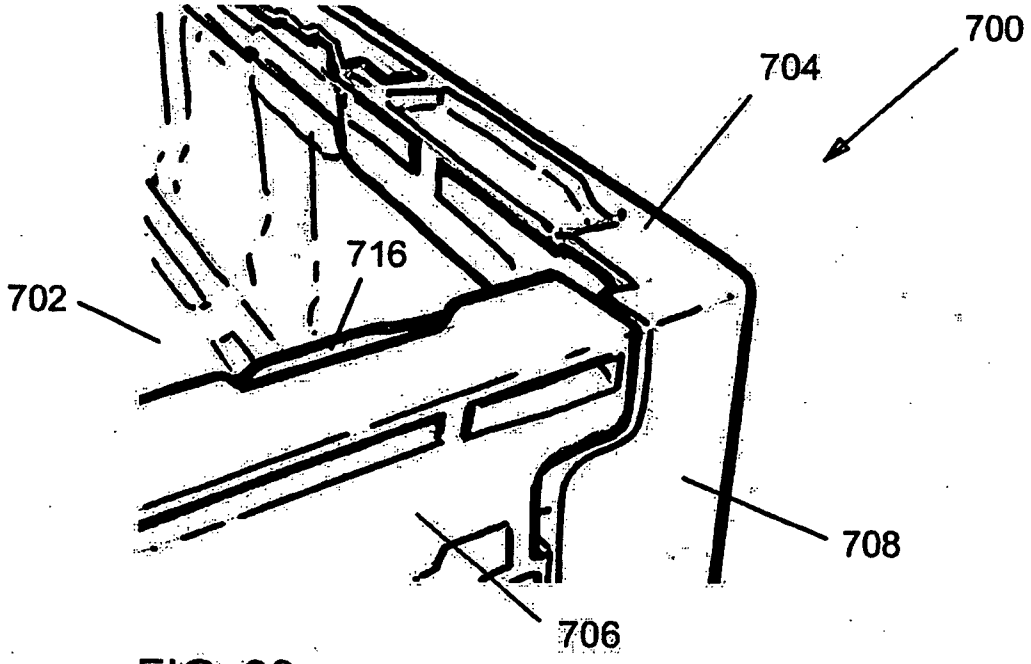


FIG. 33

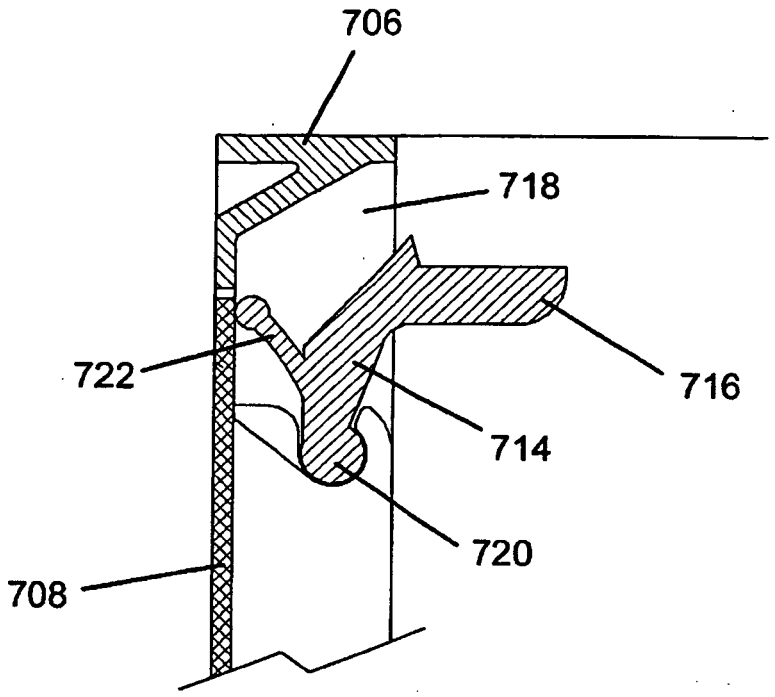


FIG. 36

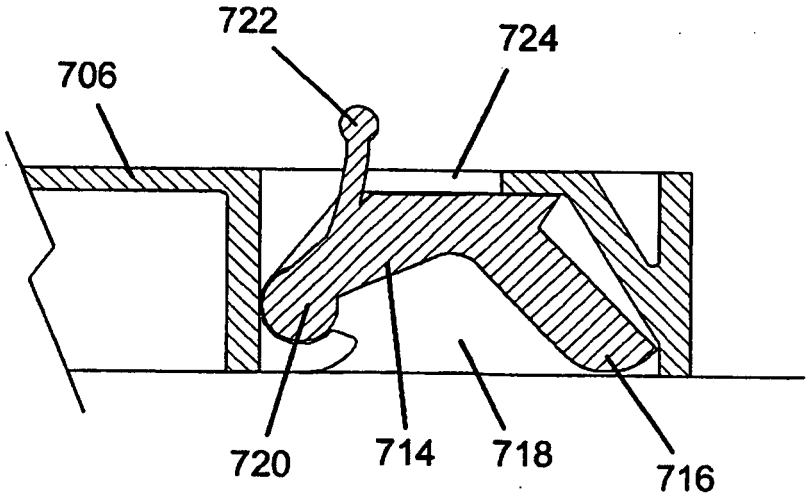


FIG. 35

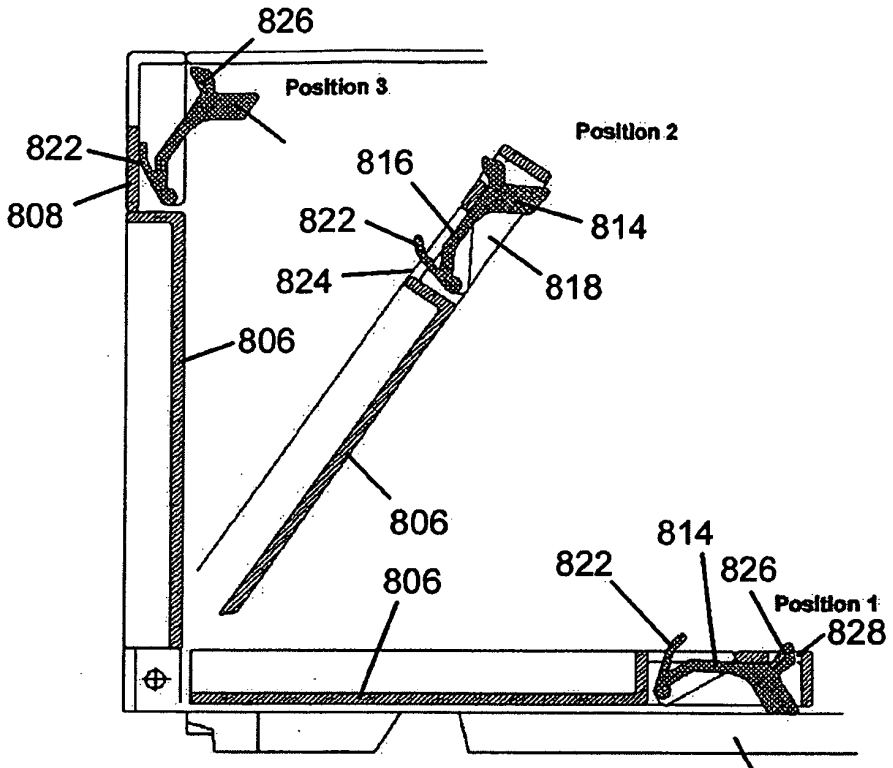
826
Position 3
Position 2
822
816
808
822
814
824
818
806
806
814
822
826
806
Position 1
828
802

FIG. 37

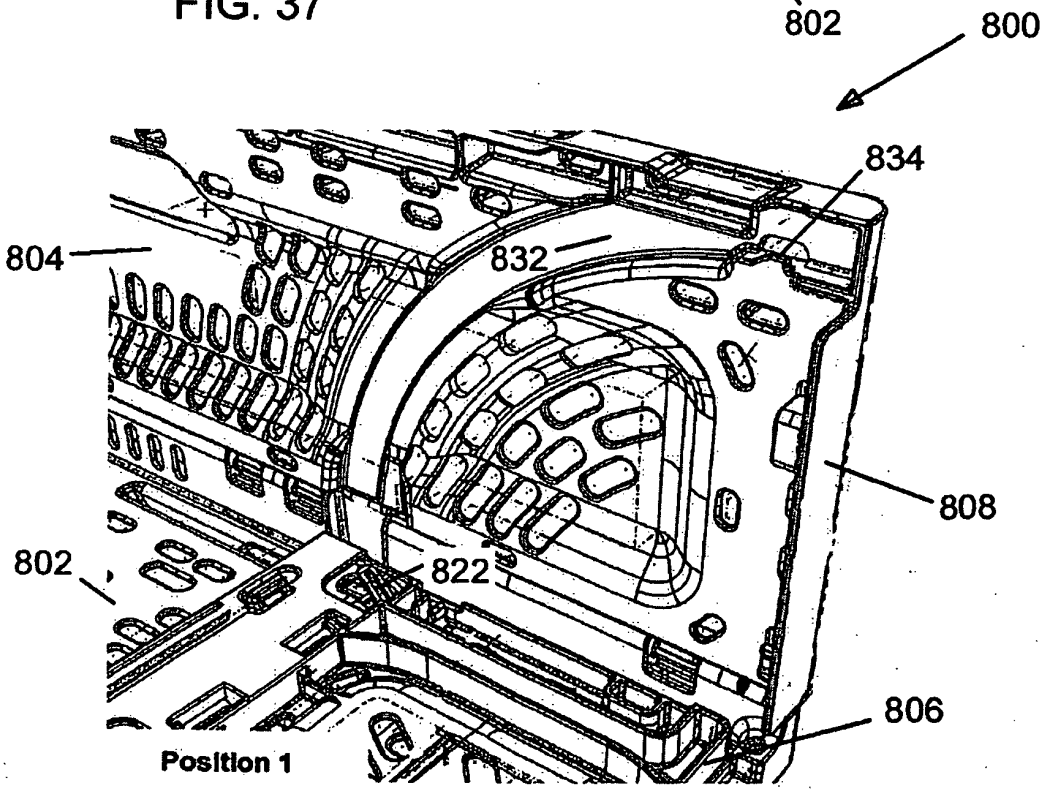
800
834
804
832
808
802
822
806
Position 1

FIG. 38

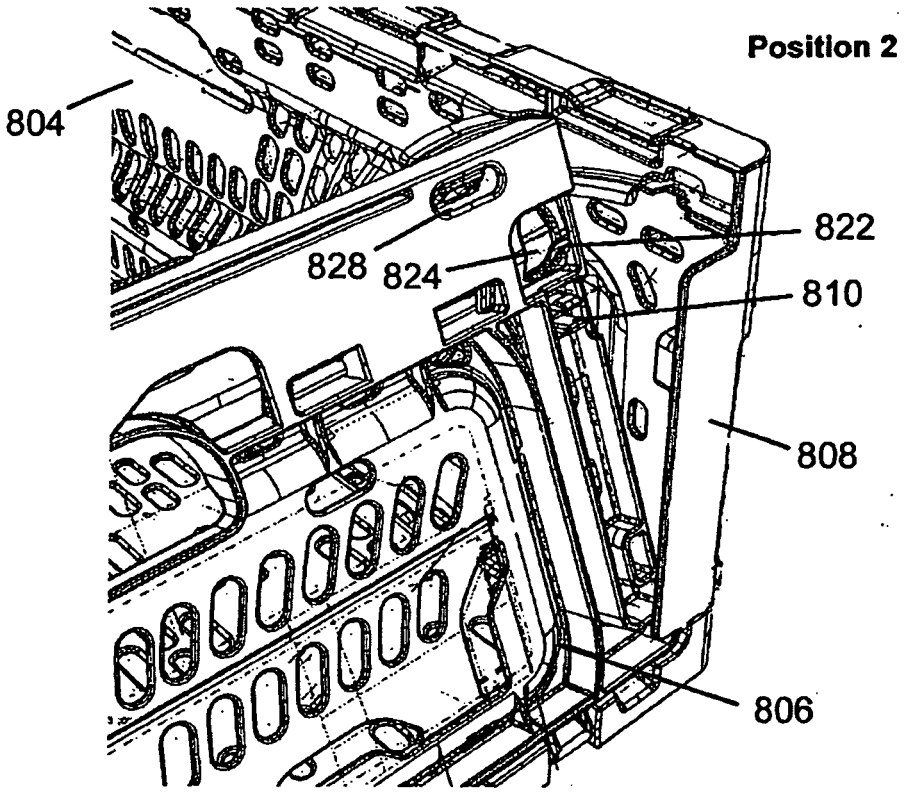
Position 2
804
822
828
824
810
808
806

FIG. 39

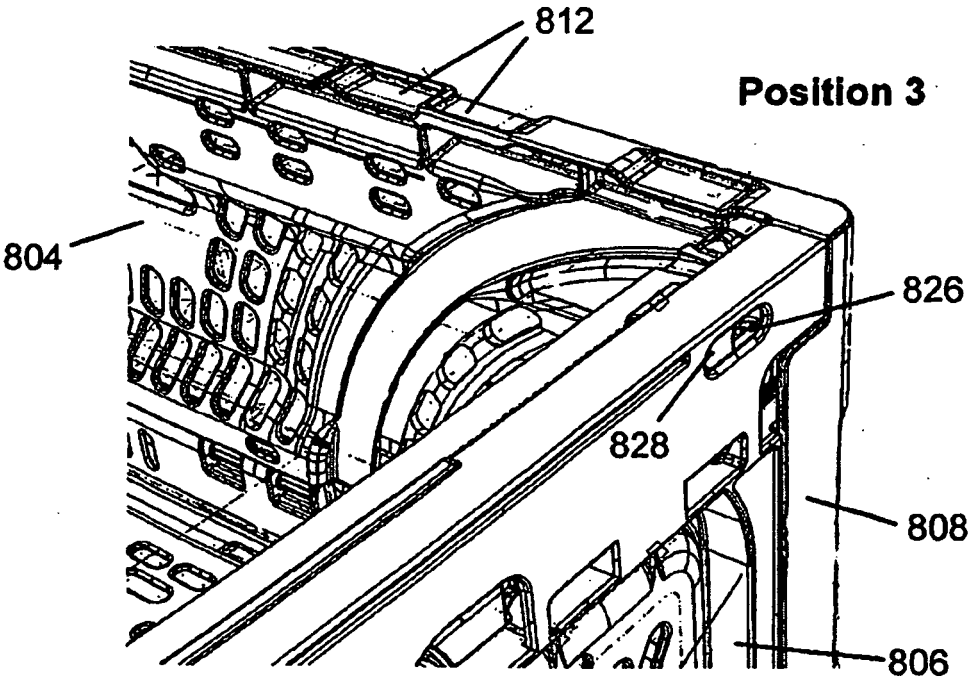
812
Position 3
804
826
828
808
806

FIG. 40

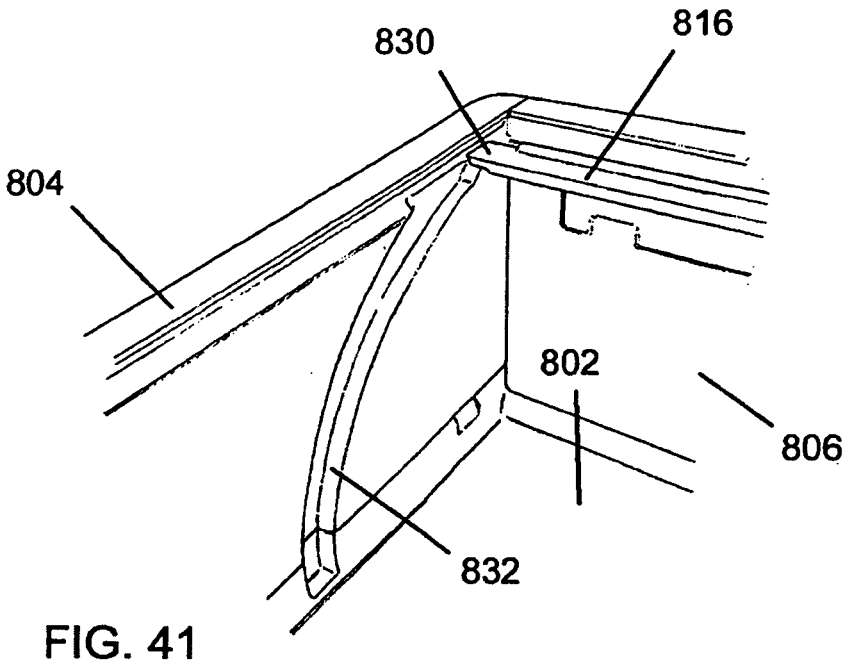


FIG. 41

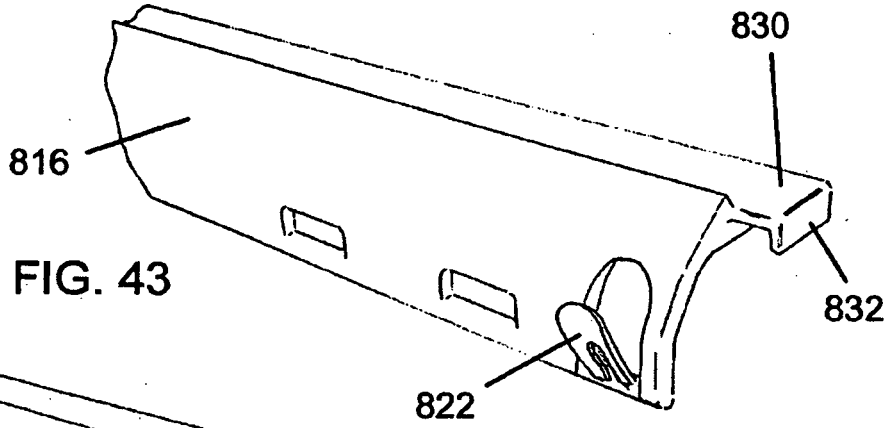


FIG. 43

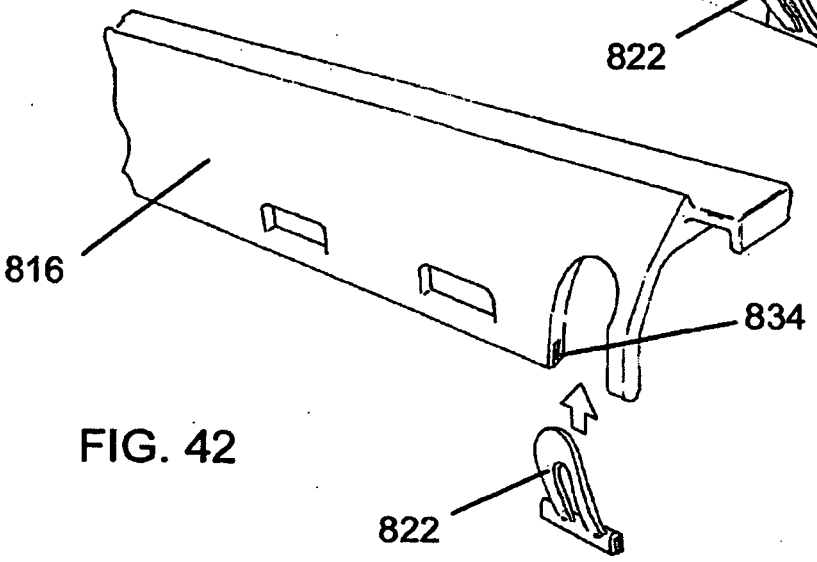


FIG. 42

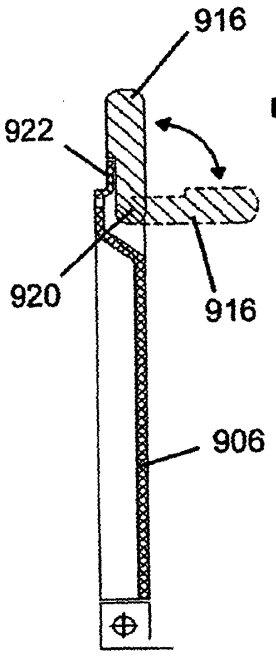


FIG. 45

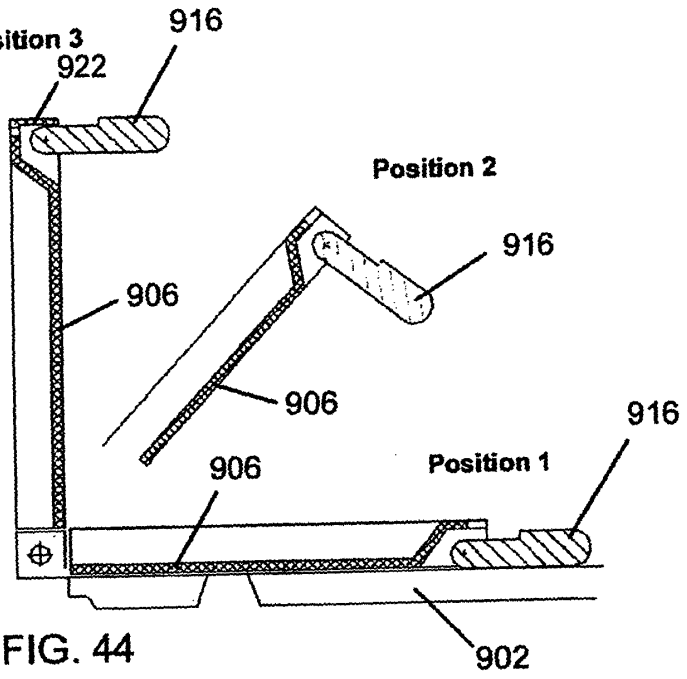


FIG. 44

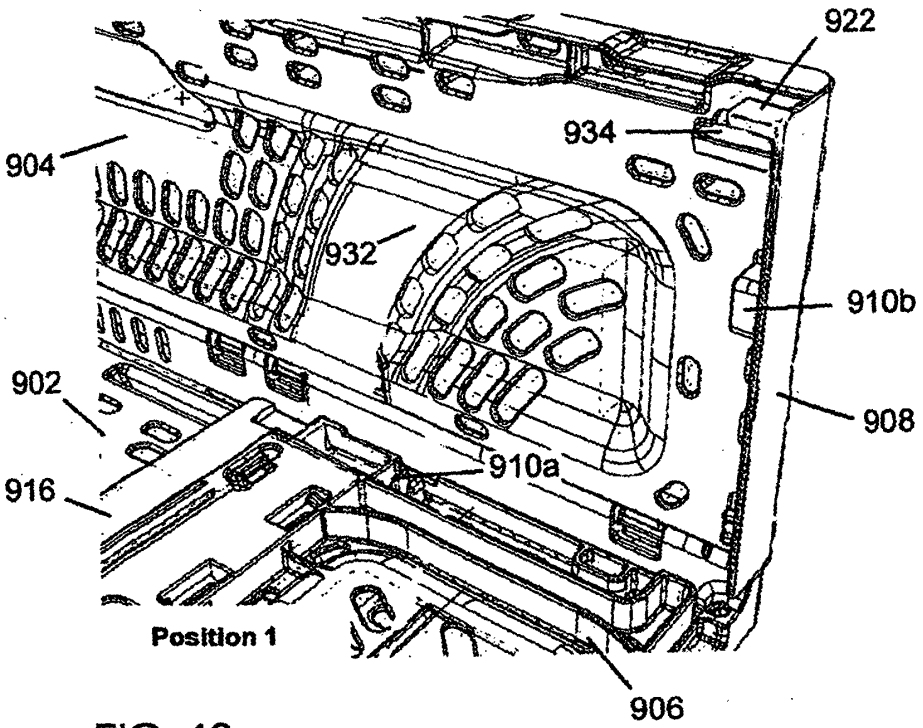


FIG. 46

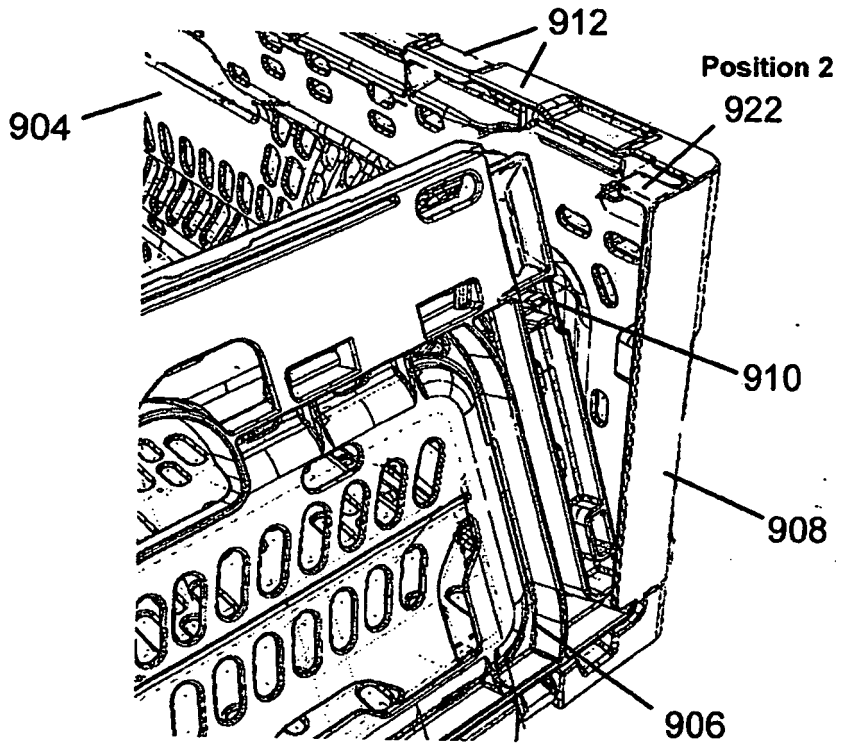
912
Position 2
904
922
910
908
906

FIG. 47

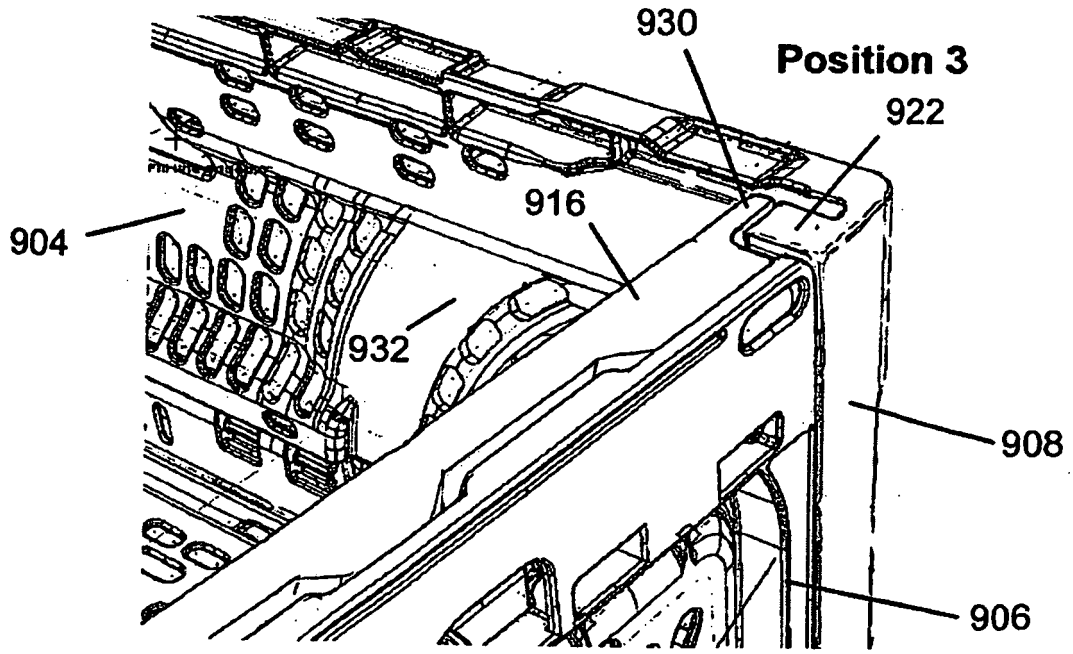
930
Position 3
922
916
904
932
908
906

FIG. 48

## REFERENCES CITED IN THE DESCRIPTION

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

### Patent documents cited in the description


- EP 0553540 A **[0004]**
- EP 0911268 A **[0006] [0007]**
- WO 0144060 A **[0007] [0008]**