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(54) Packaging

(57) The present invention relates to a packaging element (1) which may be arranged into a first configuration to accommodate a product and into a second configuration in which it is adapted to be nested with other packaging elements (1) of the same type.

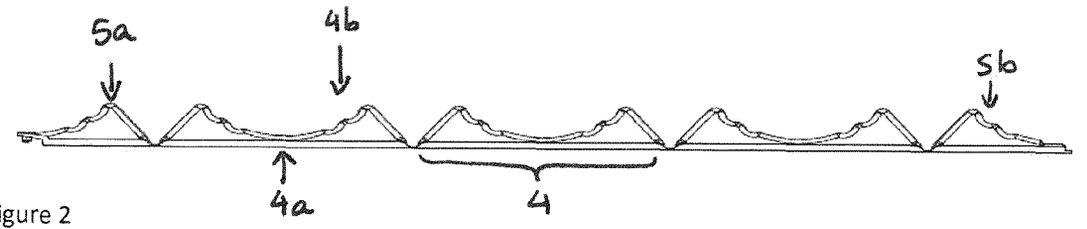

Figure 2

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Description

[0001] The present invention relates to packaging and more particularly to packaging elements and packaging systems suitable for accommodating food products, such as frozen cakes.

[0002] Food products require packaging systems made of food compatible material and adapted to protect the product(s). Soft products, such as cakes and pastries, are particularly susceptible to damage during transport. Furthermore, some products are destined to be frozen and packaging systems must be suitable for freezing temperatures.

[0003] Known packaging systems comprise molded elements made of polystyrene materials such as STYROPOR®, which is a well-known (usually white) beaded moulded polystyrene material. For example, such elements are prepared as a single solid brick-like structure with a recess to accommodate the product. Thus, the volume occupied by these systems is generally the same, whether they contain a product to be transported to the retail point or they are empty and are transported to the packaging point.

[0004] In order to prevent contamination of the cake by polystyrene beads coming off the STYROPOR® packaging, the cake is usually protected by a plastic film which partially or completely covers the surface of the cake. Cakes can also be provided with a plastic or paper band around the outer periphery to prevent the cake from contacting the STYROPOR® packaging.

[0005] It is an object of the invention to at least alleviate the above-mentioned disadvantages, or to provide an alternative to existing products.

[0006] According to a first aspect of the invention, there is provided a packaging element which may be arranged into a first configuration to accommodate a product and into a second configuration in which it is adapted to be nested with other packaging elements of the same type. In the first configuration, the packaging element helps protect the food product, which is preferably a cylindrical product, such as a cake, especially during transport where the product may be shaken and damaged. In the second configuration, the unfolded packaging elements may be nested on top of each other for ease of transport and storage, thereby reducing logistical costs. Therefore, the present packaging element provides both support and protection in the first configuration, and minimised logistical costs in the second configuration.

[0007] Preferably, the packaging element is a moulded strip, and more preferably the packaging element is a hollow moulded strip. The moulded strips are easy, and therefore cheaper, to produce. The hollow strips can be nested into one another to minimise the space occupied in transport and storage. The hollow strips use less material than solid structures such as the solid STYROPOR® structures described above and are therefore more environmentally friendly in terms of disposal. They will also be lighter and will therefore further minimise transport costs.

[0008] The packaging element may comprise means for securing the packaging element into the first configuration. Preferably the packaging element is releasably secured into the first configuration. Thus, in the packaging process, the packaging element may be secured into the first configuration, and the product or cake may be subsequently accommodated within the folded packaging element. Alternatively, the packaging element may be wrapped around the product or cake and secured.

[0009] The securing means may comprise complementary attaching means. Preferably, the complementary attaching means are located adjacent the free ends of the packaging element, when in the second configuration. The securing means may comprise a tab and a complementary slot for receiving said tad and/or at least two inter-locking tabs. Preferably, the securing means are integrally moulded with the packaging element. This decreases the manufacturing steps and costs and improves the robustness of the packaging.

[0010] Preferably, in the first configuration, the packaging element comprises a substantially square outer periphery. The square outer periphery so that the general outer shape of the packaging element is a box is preferred for transportation and storage purposes. Preferably, in the first configuration, the element comprises a substantially circular inner periphery. This is particularly advantageous when the product to be packaged is for example a cake, so that the shape of the product can be preserved in transport.

[0011] When the packaging element comprises a substantially square outer periphery in the first configuration, the securing means may be located at a corner of the packaging element. In other words, the attaching means located at each end of the moulded strips are brought together and secured at a corner (in the first configuration) of the packaging element. In this embodiment, the packaging element may comprise four sections which in the first configuration constitute the sidewalls of the packaging element and the attaching means are located adjacent the free ends, in the second configuration, of the packaging element.

[0012] Alternatively, the securing means is located in a sidewall (preferably towards the middle) of the packaging element when in the first configuration. This has been found to provide a more robust and secured structure (which is unlikely to become unintentionally undone). In this embodiment, the packaging element may comprise three sections which in the first configuration constitute three of the sidewalls of the packaging element, and two outer half sections which will constitute the fourth sidewall and the attaching means are located adjacent the free ends, in the second configuration, of the packaging element.

[0013] The packaging element may comprise polystyrene and preferably the packaging element comprises or consists of extruded polystyrene foam (XPS). This material is suitable for food packaging purposes, i.e. it is

food compatible. In addition, this material may be used at low temperatures and is therefore ideal when the products to be packaged are frozen products, such as frozen cakes.

[0014] According to a second aspect of the invention, there is provided packaging system comprising a packaging element as described above.

[0015] The invention will be further described with reference to the drawings and figures, in which

figure 1 is a schematic top view of a first packaging element according to the invention in the unfolded configuration;
figure 2 is a schematic side view of the packaging element of figure 1;
figures 3a and 3b are schematic front and back views of the packaging element of figure 1;
figures 4a and 4b are schematic perspective views of the packaging element of figure 1;
figure 5 is a schematic perspective view of the packaging element of figure 1 in a folded configuration;
figure 6 is a schematic top view of the packaging element of figure 5;
figure 7 is a schematic view of securing means for use with the packaging element of figures 1 to 6;
figure 8 is a schematic top view of a second packaging element according to the invention in the unfolded configuration;
figure 9 is a schematic side view of the packaging element of figure 8;
figures 10a and 10b are schematic front and back views of the packaging element of figure 8;
figures 11a and 11b are schematic perspective views of the packaging element of figure 8;
figure 12 is a schematic perspective view of the packaging element of figure 8 in a folded configuration;
figure 13 is a schematic top view of the packaging element of figure 5;
figure 14 is a schematic view of securing means for use with the packaging element of figures 8 to 13;
figures 15a to 15e are schematic views of another example of securing means for use with the packaging element according to the invention;
figures 16a to 16h are schematic views of a third packaging element according to the present invention;
figures 17a-17i are schematic views of a packaging system comprising a packaging element according to the invention.

Figures 1-7 are different schematic views a first packaging element 1 according to the invention. The element 1 may be arranged into a first configuration (see figures 5 and 6) to accommodate a product and into a second configuration (see figures 1, 2, 4a and 4b) in which it is adapted to be nested with other packaging elements.

Figures 8-14 are different schematic views a second packaging element 100 according to the invention. The element 100 may be arranged into a first configuration (see figures 12 and 13) to accommodate a product and into a second configuration (see figures 8, 9, 11a and 11b) in which it is adapted to be nested with other packaging elements.

[0016] The packaging element 1, 100 is an elongate member or a moulded strip, preferably a hollow moulded strip. In a preferred embodiment, the packaging element 1, 100 has a substantially square outer periphery for ease of packaging and transport and a substantially cylindrical recess 3, 103 for receiving a cake. The preferred diameters for the recess 3 are about 17cm, 20cm, 22cm, 24cm or 26cm. The elongate member may be divided into sections which will constitute the sidewalls 4, 104 of the packaging element 1, 100 in the first configuration. The sections are pivotally joined to each other so that the packaging element may be folded into the first configuration. Each sidewall comprises a substantially flat side 4a, 104a which will constitute a side of the substantially square outer periphery and a curved side 4b, 104b which will constitute part of the substantially cylindrical inner periphery.

[0017] The packaging element 1, 100 is constructed in such a way that the moulded sections will support and protect the product during transport (by forming the recess 3, 103 in the first configuration) and will also enable the nesting of the packing element 1, 100 with other packing elements of the same type (because of its hollow shape, which is complementary with the same section of other packing elements of the same type).

[0018] The securing means 2 (see figures 7, 14, 15a-15e) comprises complementary attaching means 2a, 2b, 102a, 102b at each end of said member. The attaching means 2a, 2b, 102a, 102b may comprise a tab and a complementary recess, complementary clip elements and/or two complementary tabs or hooks.

[0019] In the packaging elements of figures 1-14, the securing means 2, 102 is located substantially at the centre of a sidewall 4, 104 of the packaging element 1, 100 when in the first configuration. In this case, as can be seen best in the second configuration, the packaging element 1, 100 comprises three sections 4, 104, which each constitutes a sidewall, and two half-sections 5a, 5b, 105a, 105b which together constitute the fourth sidewall of the packaging element 1, 100. The three sections 4, 104 are located in an inner position relative to the two outer half sections 5a, 5b, 105a, 105b. The attaching means 2a, 2b, 102a, 102b of the securing means 2, 102 are located at the free end portion of the half-sections 5a, 5b, 105a, 105b.

[0020] In the packaging elements of figures 17a-17i, the securing means 202 is located substantially at a corner of the packaging element 200 in the first configuration. In this case, as can be seen best in the second configuration, the packaging element 200 comprises four sections 204 which each constitutes a sidewall. The attaching means 202a, 202b of the securing means 202

are located at the free end portion of the two outermost sections.

[0021] Preferably, the sections 204 of the packaging element 200 are hollow so that each section 204 of a top element 200 may be nested onto the same section 204 of a bottom element 200. Similarly, the half-sections 5, 105 in the packaging elements 1, 100 of figures 1-14 may be hollow. Thus, a large number of empty packaging elements may be transported or stored with minimal transport and storage costs.

[0022] The packaging element 300 of figures 16a to 16h differs from packaging elements 1, 100 and 200 only in its securing means. The securing means comprises one T-shaped tab 302a located at one end of the unfolded element, and a corresponding receiving recess 302b at the other end of the unfolded element. This configuration enables a more secured attachment of the two ends to form the folded packaging element 300. The securing means are located substantially at a corner of the packaging element 300.

[0023] The preferred material comprises an extruded polystyrene foam (XPS), also known as direct gas expanded polystyrene, which is a closed cell, thermal plastic material. This material has a reduced thermal conductivity and therefore helps maintaining the cake at a cool temperature when it is taken out of the refrigerator or the freezer. Therefore, the packaging element comprising or consisting of XPS serves not only as a protector for the food product but also as an insulator.

[0024] A preferred method for preparing the extruded polystyrene foam involves melting polystyrene resin in an extruder with a heated barrel, followed by an injection of a volatile gas such as a hydrocarbon (for example butane or pentane) alone or in combination with Nitrogen and/or carbon dioxide. Historically, CFCs were use but this ceased in the 1980s when the effect of CFC s on the ozone layer was discovered.

[0025] A preferred method for manufacturing packaging elements according to the present invention typically comprises three steps: extrusion, aging and moulding. For example, a sheet is extruded and then reeled up. It is already expanded to for example 2-4 mm thickness. Subsequently this sheet is aged to allow the gas (e.g. butane, pentane, nitrogen, carbon dioxide as mentioned above) to leave the cells of the foam. The aging process may take 1-5 days. After aging, the foam reels are passed through a thermo-former where the foam is re-heated; some further expansion can occur, depending on the open-cell content of the foam. The re-heated foam is passed into cooled match-mould tooling, where the foam takes up the form of the mould. After moulding, the sheet passes into a trimming station where the formed parts are cut out of the residual skeleton, and nested and packed for dispatch.

[0026] Figures 17a-17i are different schematic views a packaging system according to the invention. In use, the packaging element 200 may be arranged into an unfolded nesting position as shown for example in figure 17a. The packaging element 200 is in the form of an elongated hollow strip which can be nested on top of a similar packaging element. The strip 200 comprises a plurality of sections 204 which are pivotally joined to each other (see figure 17b) so that the strip 200 may be arranged in a second configuration (see figure 17c). In this second configuration, each sections 204 constitutes a sidewall of the folded strip, which has a substantially square outer periphery and a substantially cylindrical recess 203. The strip 200 is releasably secured into the second configuration by means of securing means 202, which in this specific embodiment is located at a corner of the folded element 200, but which may alternatively be located in the sidewall 204.

[0027] The cake can be placed into the recess of a folded element 200 or the packaging element 200 may be folded around the cake. A first mat 206 made of food compatible material may be placed under the cake. This first mat 206 is preferably shaped so that the cake may be placed on top of the first mat 206 and pushed through the recess 203 by lifting the first mat 206. Therefore, if the recess 203 is cylindrical, the first mat 206 may be circular with a diameter smaller than that of the recess 203. A second mat 207 may be placed under the first mat 206 to carry the cake and the packaging element 200. Therefore the second mat 207 has dimensions such that it cannot pass through the recess 203. Preferably, the second mat 207 has dimensions matching the outer periphery of the folded packaging element 200.

[0028] The cake accommodated in the recess 203 of the packaging element, and placed on top of first mat 206 and second mat 207, may be further packaged into a first sleeve 208 made of food compatible material and a second sleeve 209. The second sleeve 209 may be used for commercial markings and is preferably made of cardboard or plastic.

[0029] Thus, from the above description, it can be seen that the present invention provides a packaging element which suitable for food products, such as cakes and pastries. The element may be arranged into a first configuration to accommodate a product and into a second configuration in which it is adapted to be nested with other packaging elements. Therefore, several elements may be nested on top of each other for ease of transport and the transport costs can be substantially decreased. The packaging element is substantially hollow and therefore relatively light and environmentally friendly.

Claims

1. A packaging element which may be arranged into a first configuration to accommodate a product and into a second configuration in which it is adapted to be nested with other packaging elements of the same type.

2. The packaging element according to claim 1, where-

in the food product is a generally cylindrical product.

3. The packaging element according to claim 1 or 2, wherein the packaging element is a moulded strip.

4. The packaging element according to any one of claims 1 to 3, wherein the packaging element comprises means for securing the packaging element into the first configuration.

5. The packaging element according to claim 4, wherein the securing means comprises complementary attaching means

6. The packaging element according to claim 5, wherein the securing means comprises a tab and a complementary slot for receiving said tab.

7. The packaging element according to claim 5, wherein the securing means comprises at least two interlocking tabs.

8. The packaging element according to any preceding claim, wherein, in the first configuration, the packaging element comprises a substantially square outer periphery.

9. The packaging element according to claim 8, wherein, in the first configuration, the element comprises a substantially circular inner periphery.

10. The packaging element according to claim 8 or 9, wherein the securing means is located at a corner of the packaging element when in the first configuration.

11. The packaging element according to claim 8 or 9, wherein the securing means is located in a sidewall of the packaging element when in the first configuration.

12. The packaging element according to any preceding claim, wherein the packaging element comprises polystyrene

13. The packaging element according to claim 12, wherein the packaging element comprises or consists of extruded polystyrene foam (XPS).

14. A packaging system comprising a packaging element according to any one of claims 1 to 13.

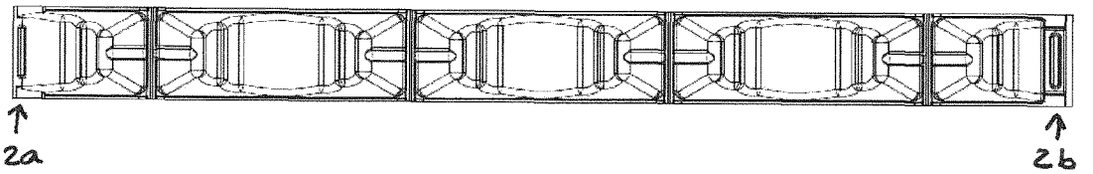


Figure 1

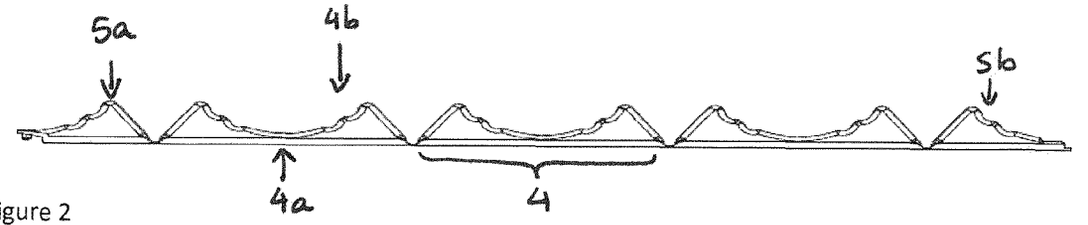


Figure 2

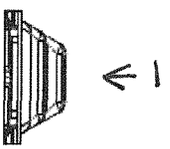


Figure 3a

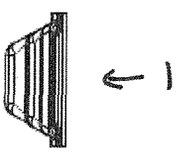


Figure 3b

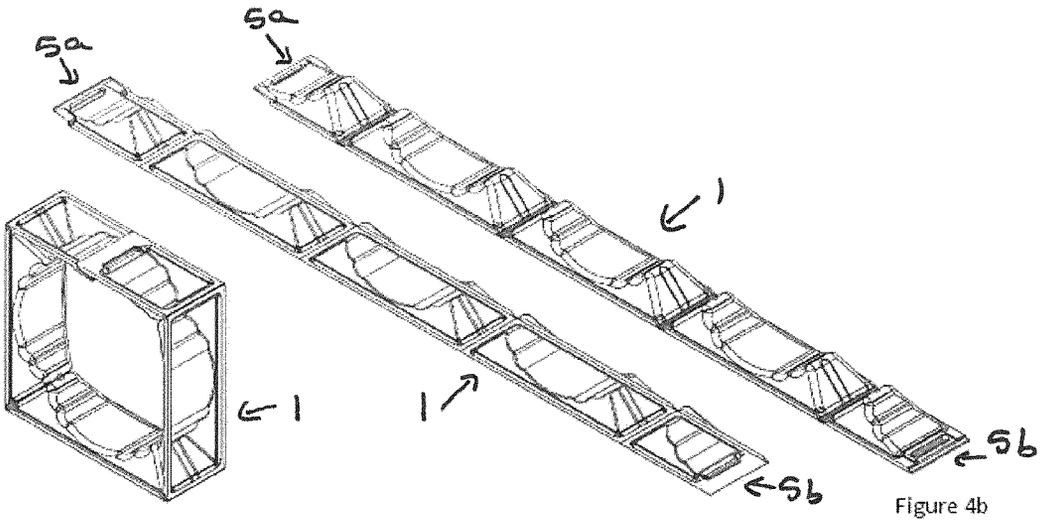


Figure 5

Figure 4a

Figure 4b

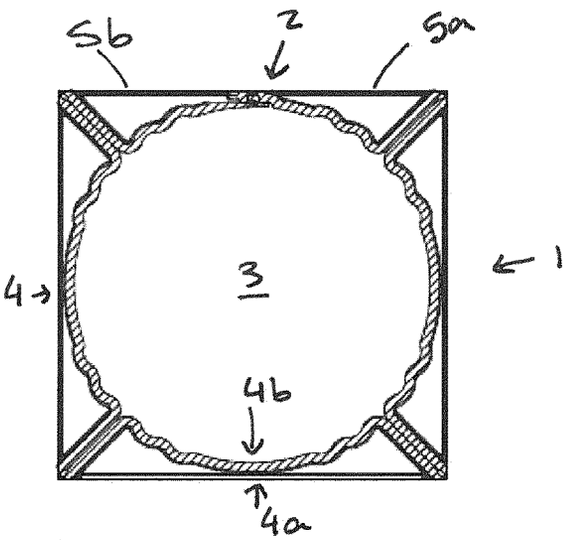


Figure 6

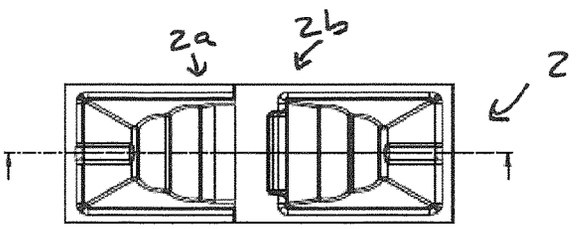


Figure 7

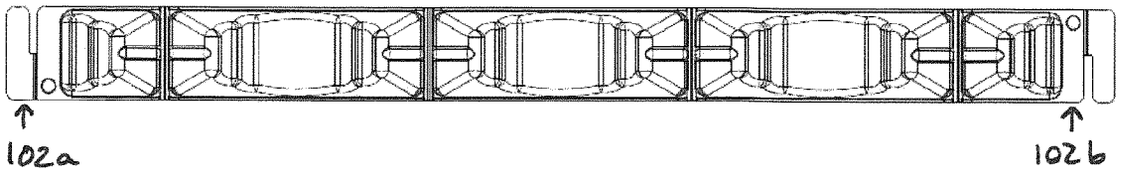


Figure 8

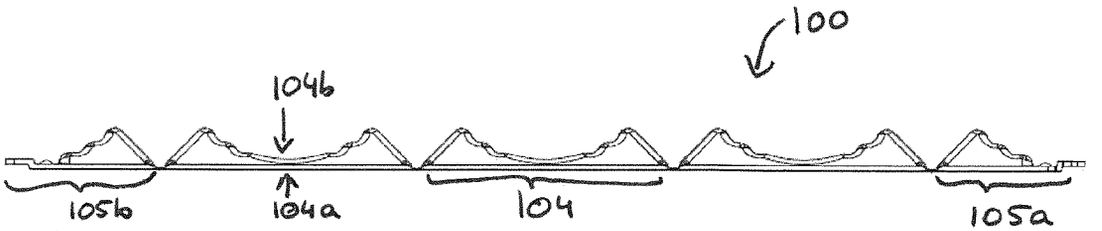


Figure 9

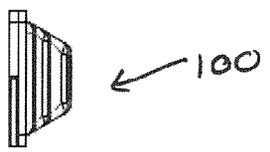


Figure 10a

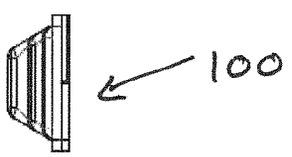


Figure 10b

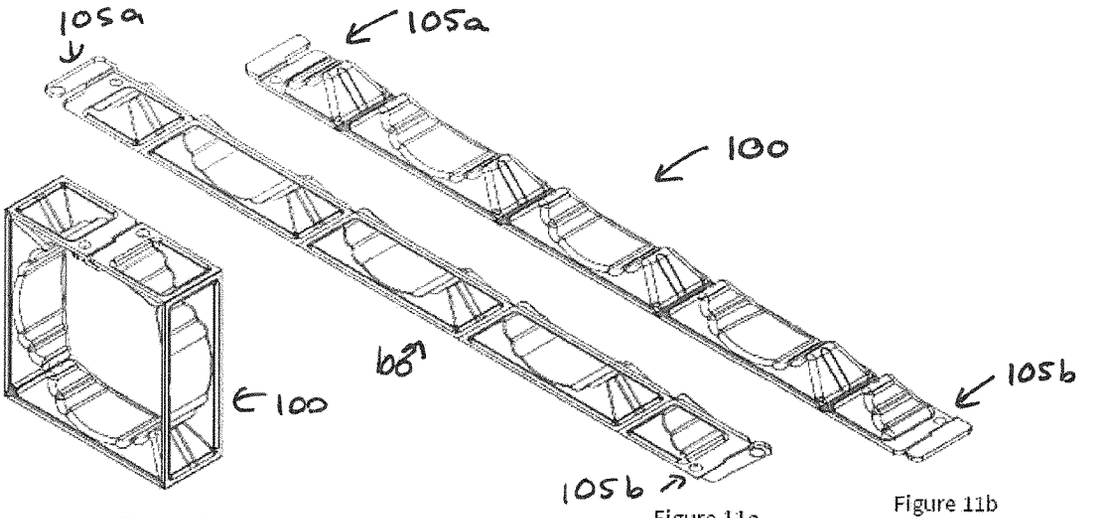


Figure 12

Figure 11a

Figure 11b

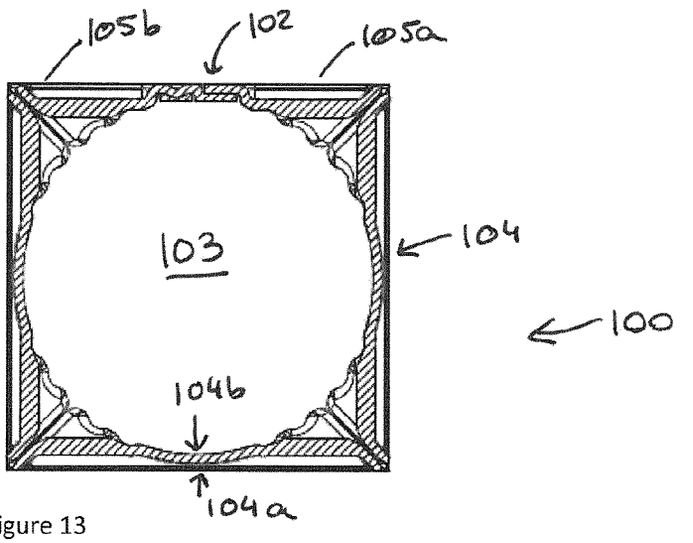


Figure 13

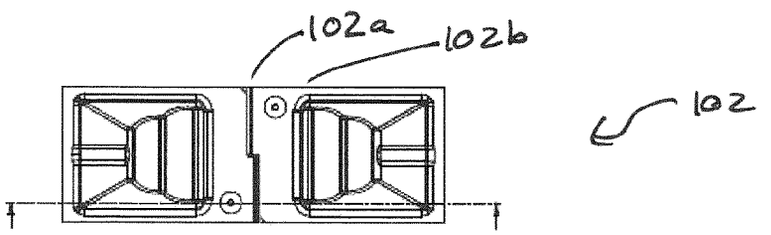


Figure 14

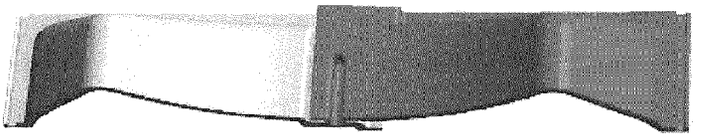


Figure 15a

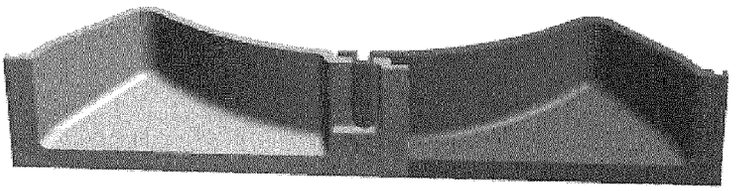


Figure 15b

Figure 15c

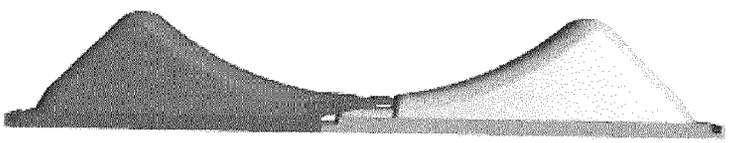


Figure 15d

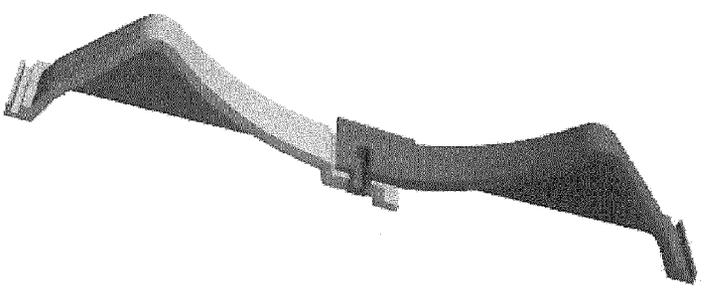


Figure 15e

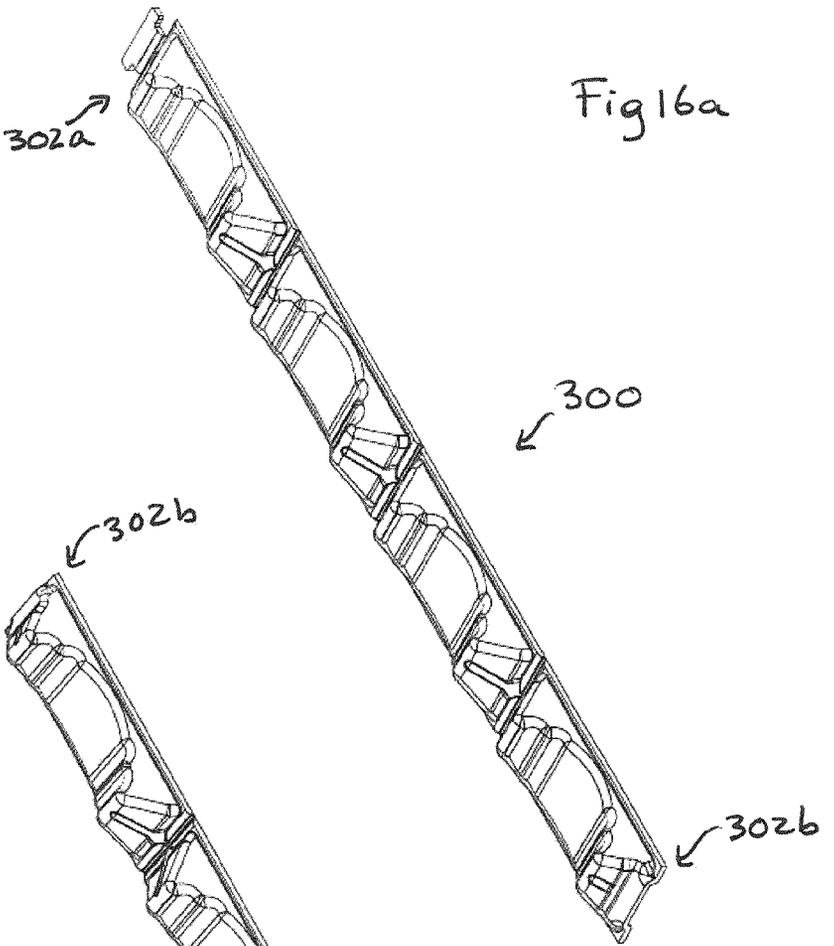


Fig16a

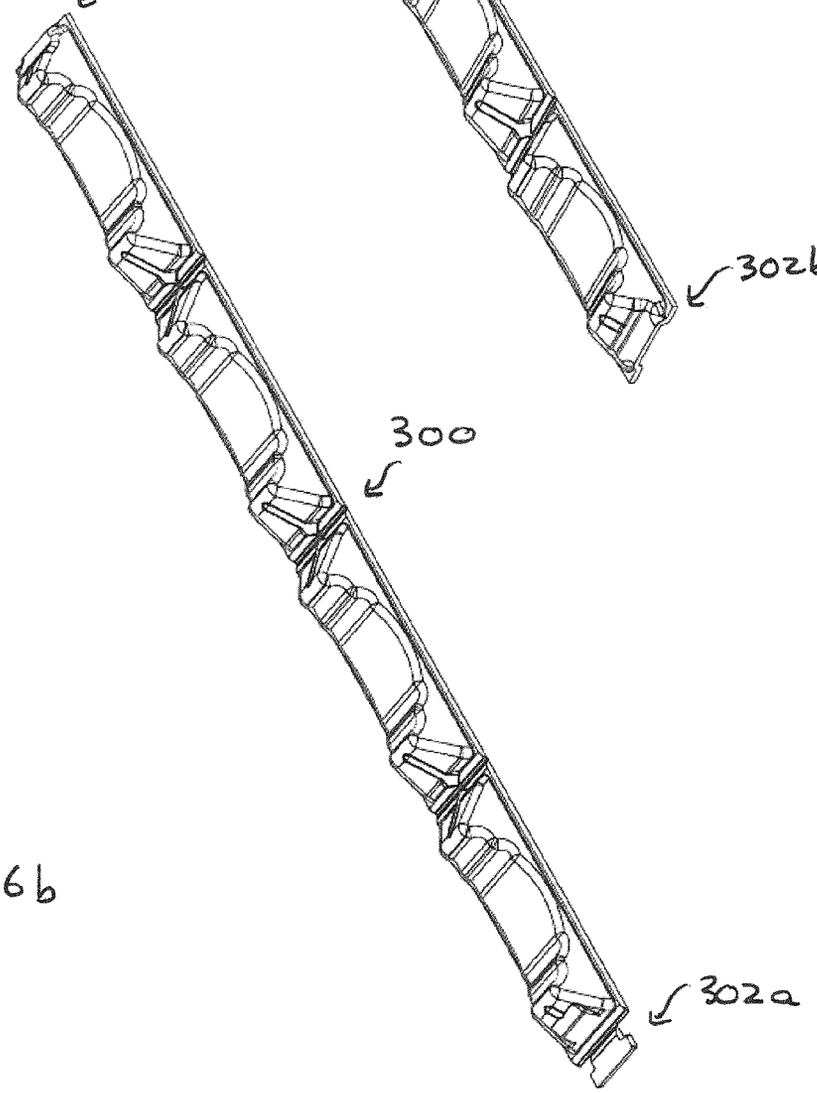


Fig16b

Fig16c

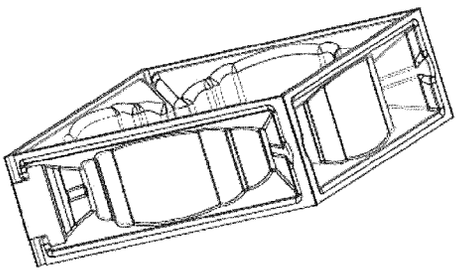
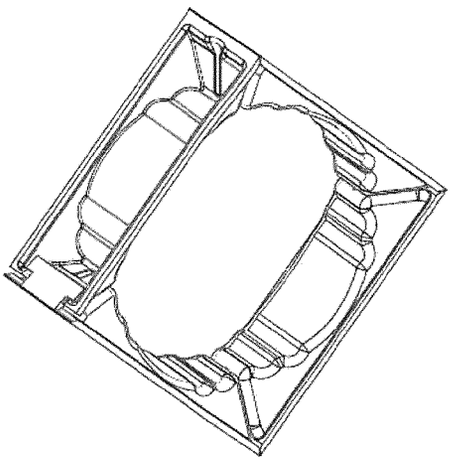


Fig16d



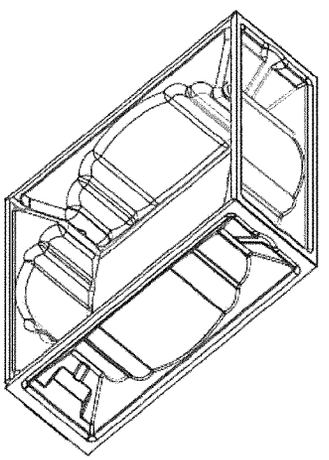


Fig16e

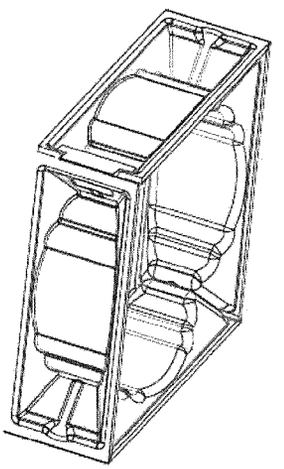


Fig16f

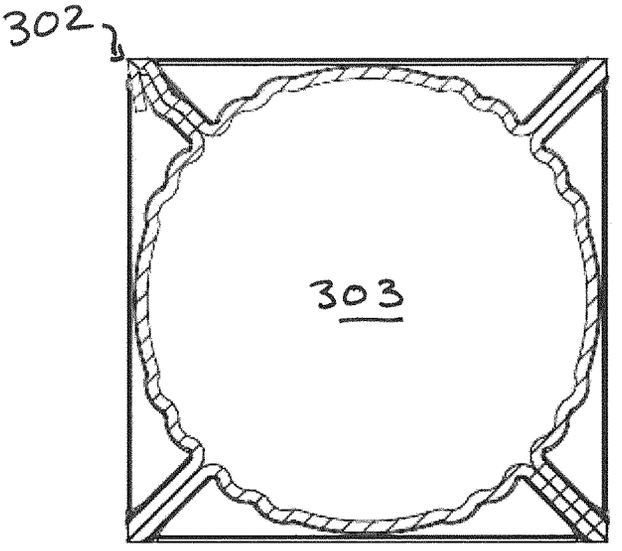


fig16g

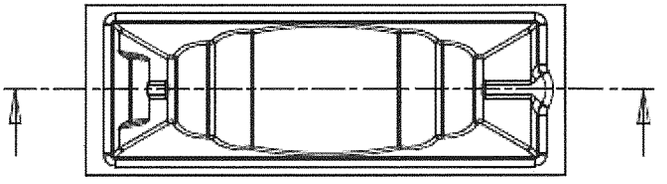


Fig16h.

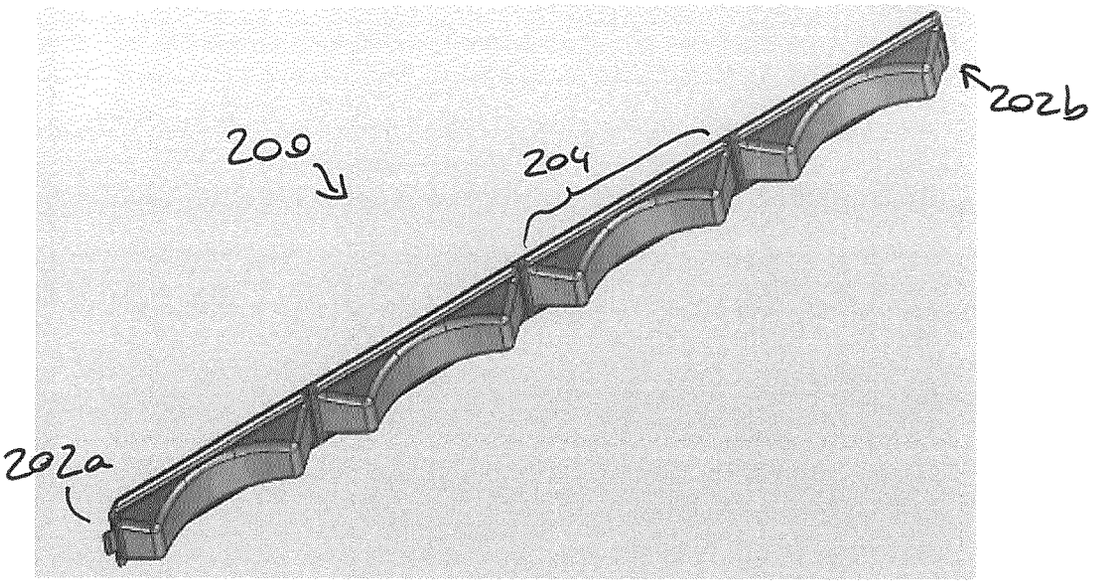


Figure 17a

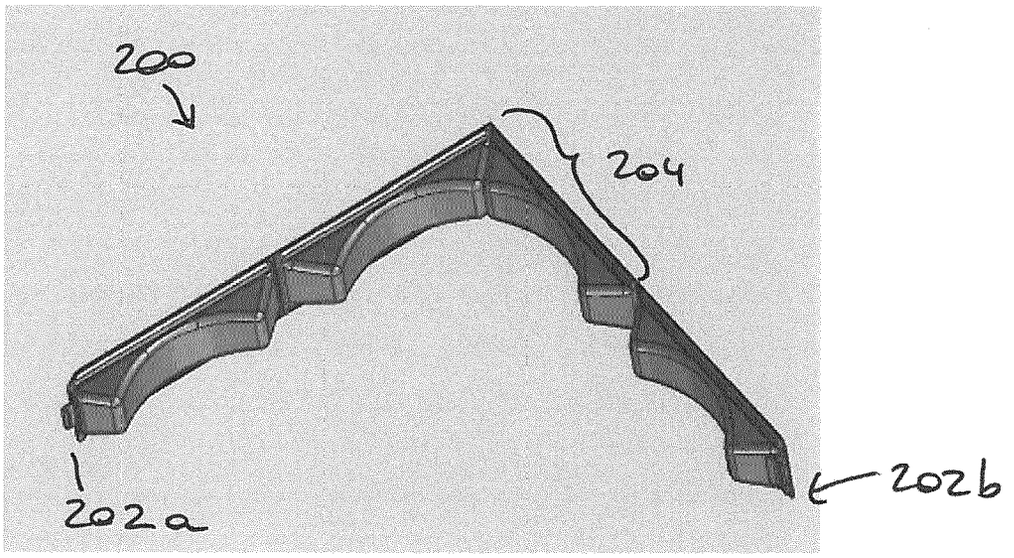


Figure 17b

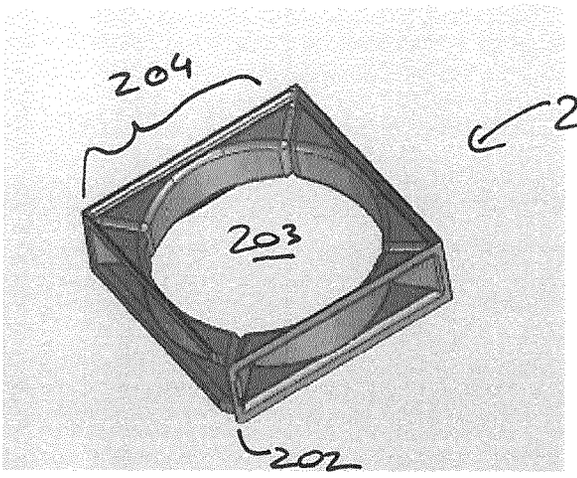


Figure 17c

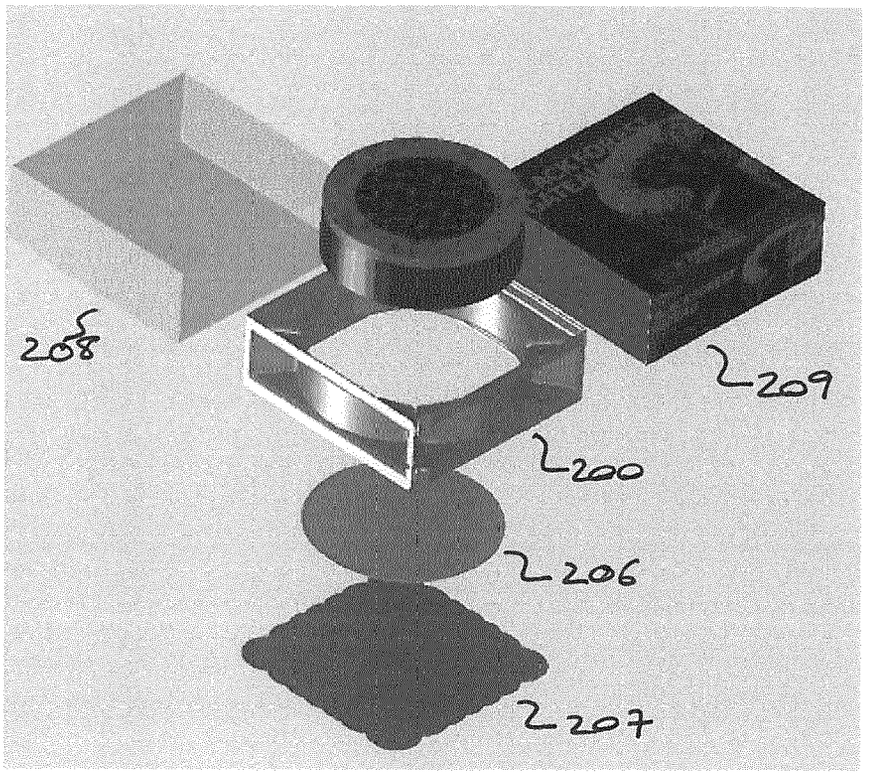


Figure 17d

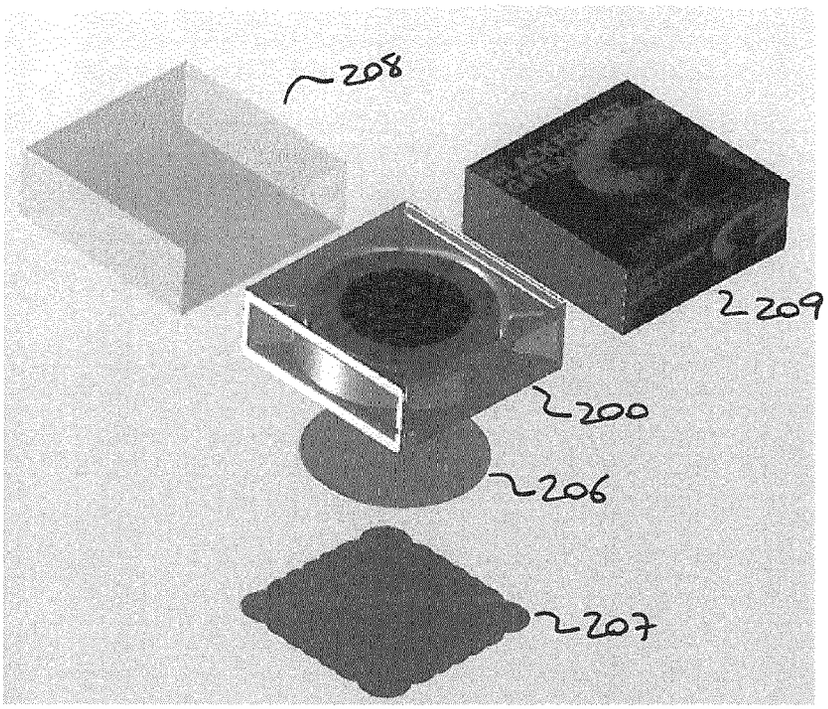


Figure 17e

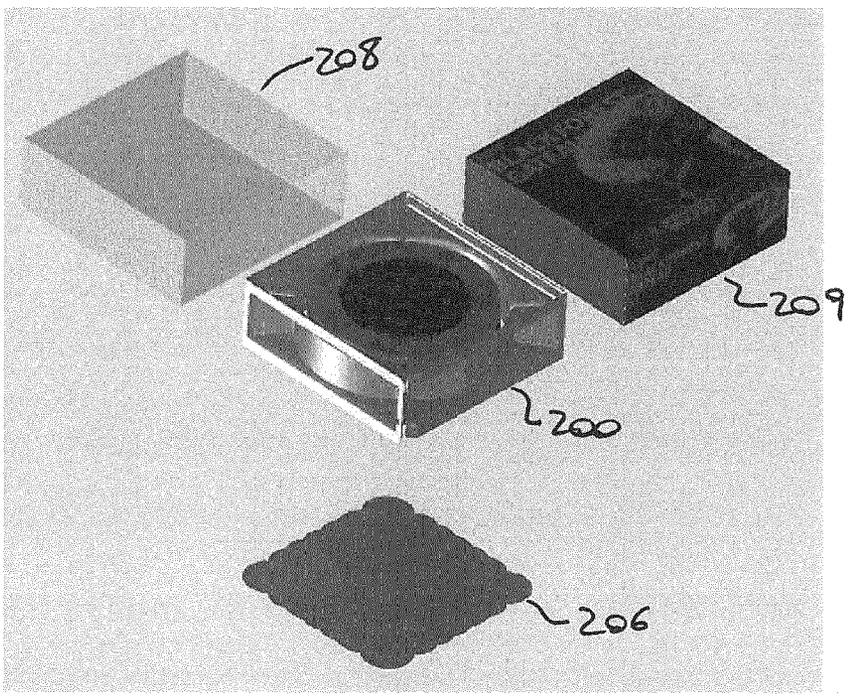


Figure 17f

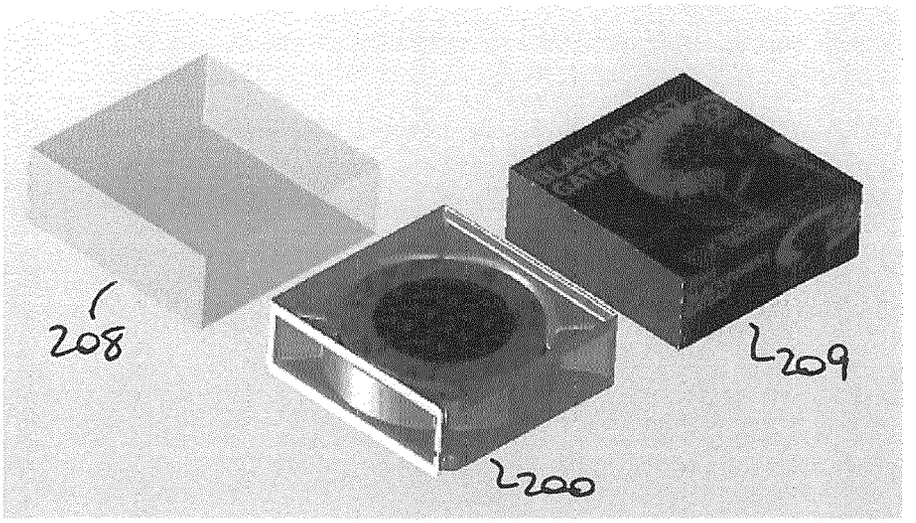


Figure 17g

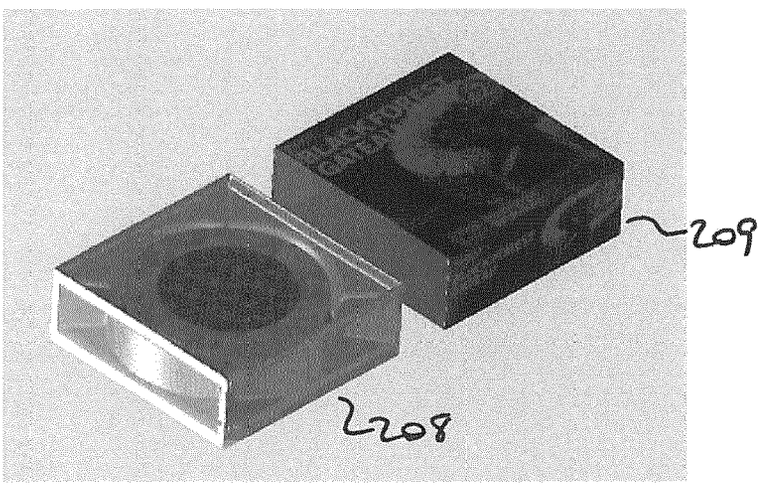


Figure 17h

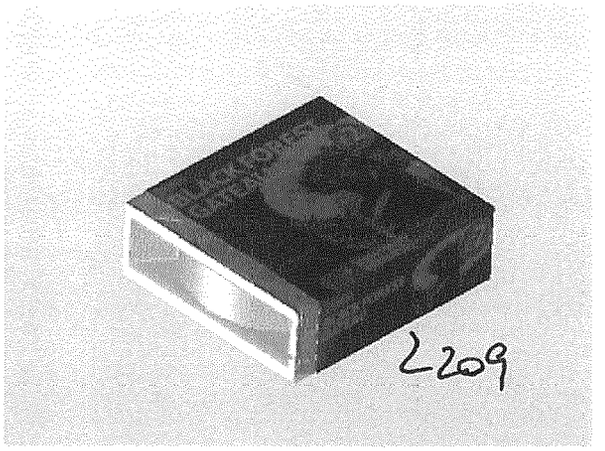


Figure 17i

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 6041

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 1 030 546 A (REED PAPER GROUP LTD) 25 May 1966 (1966-05-25) * page 1, line 83 - page 2, line 59; figures 1-3 *	1,3,8, 12,14	INV. B65D75/22 B65D85/36 B65D81/02 B65D81/133
X Y	GB 2 078 674 A (WILKIE & PAUL LTD) 13 January 1982 (1982-01-13) * abstract; figures 1-4 * * page 1, line 40 - line 94 *	1 1-14	
Y	DE 75 24 327 U (CONDITOREI COPPENRATH & WIESE [DE]) 20 November 1975 (1975-11-20) * page 3, last paragraph - page 6, paragraph 1; figure 1 *	1-14	
A	US 6 877 601 B1 (TRES FRESH L.L.C. [US]) 12 April 2005 (2005-04-12) * column 4 - paragraph 3 *	1,13,14	
			TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 August 2012	Segerer, Heiko

CATEGORY OF CITED DOCUMENTS

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03-08-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1030546 A	25-05-1966	NONE	
GB 2078674 A	13-01-1982	NONE	
DE 7524327 U	20-11-1975	NONE	
US 6877601 B1	12-04-2005	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82