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(54) **Display packaging**

(57) A method of manufacturing a display package (4) involving attaching thermoplastically coated cardboard sheets (5,6) together by fusing regions of the thermoplastic coating (8,9) together by high frequency welding. A container incorporating a mounting flange is also fused to the thermoplastic layers (8,9) by high frequency welding. There is no distinct adhesive between the polyethylene coated cardboard backing sheets.

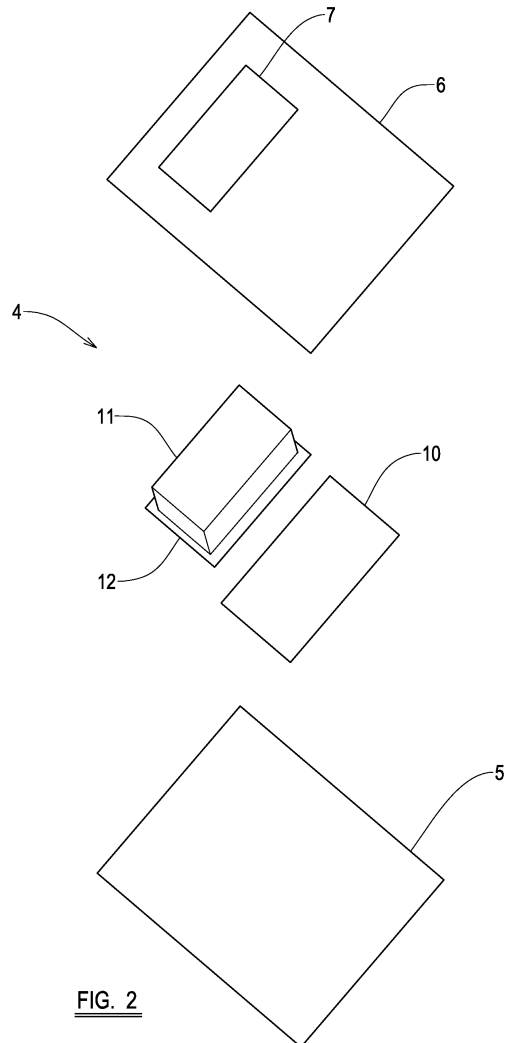


FIG. 2

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Description

[0001] THE PRESENT INVENTION relates to display packaging, and more particularly relates to a method of manufacturing a display package, and a display package product.

BACKGROUND

[0002] Small, high value products, such as razor blades or memory cards, are often held securely in a display package which allows the product to be displayed in a shop. The display package is usually substantially larger than the product. This is for two reasons: (1) to provide space on the package to display information about the product, and (2) so that the size of the packaged product is large enough to make it difficult for a thief to steal and hide the packaged product without being noticed by shop security.

[0003] Display packaging is usually designed to be difficult to open to minimise the possibility of a thief opening a display package discretely and stealing the contents.

[0004] One type of display package, commonly known as a "blister pack", is formed from two shells of transparent plastic which are sealed together. The shells are sealed together in such a way that it is difficult for a thief to pull the shells apart to gain access to a product retained within the blister pack. Whilst blister packs can retain a product securely, there are problems with this type of packaging: (1) the packaging is unattractive, and (2) the plastic material which forms the blister pack is not environmentally friendly to produce or dispose of.

[0005] Figure 1 shows another type of prior proposed display package which incorporates a backing sheet 1 and a display clam 2. The clam 2 is of a transparent plastics material and is shaped to receive a product. The clam 2 defines an open end which is surrounded by a perpendicularly extending mounting flange 3. The mounting flange 3 is mounted to the backing sheet 1 with an adhesive to attach the clam 2 to the backing sheet 1. The backing sheet 1 thus seals the open end of the clam 2 to retain a product within the clam 2.

[0006] This other type of display package uses less plastic than a blister pack and is thus more environmentally friendly than a blister pack. However, this type of display package is not secure because the adhesive does not attach the clam 2 to the backing sheet 1 securely. A thief can detach the clam 2 from the backing sheet 1 easily to steal the product.

[0007] The pervasive practice when attaching two cardboard elements together to form a blister pack, clam pack or similar is to apply an adhesive between the two cardboard elements, apply pressure and heat the adhesive to cure the adhesive and create a solid bond. This practice is fully accepted in the packaging world and the shortfalls in tidiness of join, waste materials generated, energy used to bring the join up to temperature are accepted by the industry. Temperatures of up to 400 de-

grees Celsius are necessary to establish an acceptable bond. This high temperature can cause problems if the article being packaged is affected by heat. One cannot establish whether the packaged product has been affected by the heat application.

[0008] Embodiments of the present invention seek to provide a method of manufacturing a display package and a display package which is both environmentally friendly and secure.

[0009] According to one aspect of the present invention, there is provided a method of manufacturing a display package comprising: providing a first cardboard element which has a region that is coated with a layer of polyethylene; providing a second cardboard element which has a region that is coated with a layer of polyethylene; positioning the first and second cardboard elements such that the coated regions at least partly overlap; and attaching the first cardboard element to the second cardboard element by radio frequency (RF) welding at least part of the overlapping coated regions such that the coated regions at least partly fuse together.

[0010] Conveniently information is printed on the first cardboard element.

[0011] Preferably information is printed on the second cardboard element.

[0012] Conveniently the method further comprises: providing a third element; and positioning the third element between the first and second cardboard elements such that the third element is at least partly trapped between the first and second cardboard elements when the first and second support elements are attached to one another.

[0013] Advantageously the third element is of cardboard.

[0014] Preferably the first and second cardboard elements are each generally planar sheets, with one side of each of the sheets being substantially entirely coated with the layer of polyethylene.

[0015] In one embodiment the method further comprises: providing an open ended thermoplastic container which incorporates a mounting flange; placing a product into the container; positioning the mounting flange at least partly between the overlapping coated regions of the first and second cardboard elements; and attaching the container to the cardboard elements by radio frequency (RF) welding at least part of the mounting flange to the coated regions such that the coated regions and the mounting flange at least partly fuse together.

[0016] Preferably the method further comprises: inserting part of the container through an aperture in the second cardboard element and positioning the mounting flange so as to overlap part of the coated region of the second cardboard element; and positioning the first cardboard element to close the open end of the container such that the container is sealed when first the cardboard element is attached to the second cardboard element.

[0017] According to a yet further aspect of the present invention, there is provided a display package compris-

ing: a first cardboard element which has a region that is coated with a layer of polyethylene; and a second cardboard element which has a region that is coated with a layer of polyethylene; the first and second cardboard elements being attached to one another by at least part of the coated region of the first cardboard element which is at least partly fused to at least part of the coated region of the second cardboard element.

[0018] Conveniently information is printed on the first cardboard element.

[0019] Preferably information is printed on the second cardboard element.

[0020] In one embodiment the display package incorporates a thermoplastic container which is at least partly fused to the coated layer of the first cardboard element and the coated layer of the second cardboard element.

[0021] In order that the invention may be more readily understood, and so that further features thereof may be appreciated, embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

FIGURE 1 is a diagrammatic perspective view of a prior proposed display package,

FIGURE 2 is a diagrammatic perspective view of parts of a display package in accordance with a preferred embodiment of the invention,

FIGURE 3 is a diagrammatic sectional view of part of the display package of figure 1, during an initial stage of manufacture,

FIGURE 4 is a view corresponding to figure 3, but at a later stage of manufacture,

FIGURE 5 is a diagrammatic sectional view of another part of the display package of figure 2, during an initial stage of manufacture,

FIGURE 6 is a view corresponding to figure 5, but at a later stage of manufacture,

FIGURE 7 is a diagrammatic perspective view of the display package of figure 2 in a fully assembled form,

FIGURE 8 is a diagrammatic perspective view of parts of a display package in accordance with a further embodiment of the invention, and

FIGURE 9 is a diagrammatic perspective view of the display package of figure 8 in a fully assembled condition.

[0022] Referring now to figure 2 of the accompanying drawings, a display package 4 in accordance with a preferred embodiment of the invention incorporates a first support element in the form of a generally planar card-

board backing sheet 5. The display package 4 also incorporates a second support element which is in the form of a generally planar cardboard front sheet 6. The front sheet 6 is provided with an aperture 7.

[0023] A region of each of the front and backing sheets 5,6 is coated with a respective layer of thermoplastic 8,9, as shown in figure 3. In this preferred embodiment the thermoplastic is polyethylene. The entirety of one side of each of the sheets 5,6 is coated with the respective layer of thermoplastic 8,9. Each polyethylene coated cardboard backing sheet is an integral item. The polyethylene coating 8,9 is integral with the cardboard backing sheet 5,6 as part of the coating is diffused within or penetrates into the cardboard backing sheet. It is important to note that there is no adhesive between the coated backing sheets. There is no distinct adhesive bead or layer between the coated backing sheets.

[0024] The sheets 5,6 are each decorated with printed information which can provide information about a product held within the packaging and/or to make the packaging aesthetically appealing.

[0025] The display package 4 further incorporates a third support layer in the form of a reinforcing sheet 10. The reinforcing sheet 10 is of a cardboard which is stiffer than the cardboard of the front and backing sheets 5,6. In this preferred embodiment the reinforcing sheet 10 is of cardboard which is thicker than the cardboard of the front and backing sheets 5,6. The purpose of the reinforcing sheet 10 will become clear from the description below.

[0026] The display package 4 further incorporates a clam in the form of an open ended thermoplastic container 11. The container 11 is shaped to receive a product (not shown) which is to be retained within the display package 4. The container 11 defines a mounting flange 12 which extends generally perpendicularly outwardly around the side of the container 11, adjacent the open end of the container 11.

[0027] A method of manufacturing the display package 4 will now be described.

[0028] Initially, the front and backing sheets 5,6 are coated with a layer of thermoplastic and cut into an appropriate shape for packaging a product. If necessary, information and/or decoration is now printed onto the front and backing sheets 5,6.

[0029] The front and backing sheets 5,6 and the reinforcing sheet 10 are cut to the required size and shape using, for instance, a die cutting machine or a guillotine. The coated backing sheets 5,6 are therefore pre-formed elements.

[0030] A product is loaded into the container 11. Part of the container 11 is pushed through the aperture 7 in the front sheet 6 so that the mounting flange 12 is positioned against the coated region of thermoplastic 9 on the front sheet 6 which surrounds the aperture 7.

[0031] The reinforcing sheet 10 is placed against one side of the front sheet 6 adjacent, but spaced apart from, the aperture 7. The backing sheet is then placed against

the front sheet 6 so that the coated thermoplastic region 8 of the backing sheet 5 is against and overlaps the coated thermoplastic region 9 of the front sheet 6. The pre-formed coated backing sheets 5,6 are registered with one another. The mounting flange 12 and the reinforcing sheet 10 are each sandwiched between the front and backing sheets 5,6, as shown in figures 3 and 5. It is important to note that there is no adhesive between the coated backing sheets. There is no distinct adhesive bead or layer between the coated backing sheets.

[0032] The partially assembled display package 4 is loaded into a high frequency welding machine. The high frequency welding machine operates, for example, at a radio frequency (RF). In this preferred embodiment, the high frequency welding machine is provided with a custom made jig which is shaped to receive the display package 4.

[0033] Referring now to figure 3 of the accompanying drawings, the high frequency welding machine incorporates a first welding element 13 which is positioned adjacent one side of the backing sheet 5 and a second welding element 14 which is positioned adjacent one side of the front sheet 6. The first and second welding elements 13,14 are positioned so as to be opposite one another, with the pre-formed coated backing sheets 5,6 sandwiched between the elements 13,14. Once the welding elements 13,14 are in position, the high frequency welding machine is activated so that high frequency radio waves are transmitted between the welding elements 13,14. The high frequency radio waves pass through the sheets 5,6 and layers of thermoplastic 8,9 which are positioned between the welding elements 13,14. The high frequency radio waves interact only with the regions of the thermoplastic layers 8,9 between the welding elements 13,14, causing the thermoplastic layers 8,9 to fuse together to form a fused region 15, as shown in figure 4. The fused region 15 defines a secure connection between the front and backing sheets 5,6 which attaches the sheets 5,6 together securely.

[0034] The high frequency welding machine is used to fuse together regions of the thermoplastic layers 8,9 around the entire periphery of the sheets 5,6 so that the fused region 15 seals the front and backing sheets 5,6 together, as shown by the outer dotted line 16 in figure 7.

[0035] The high frequency welding machine incorporates third and fourth welding elements 17,18. The third and fourth welding elements 17,18 are positioned respectively on each side of the first and second backing sheets 5,6, and on each side of the mounting flange 12 of the container 11 which is sandwiched between the sheets 5,6, as shown in figure 5. When the high frequency welding machine is activated, high frequency radio waves pass between the third and fourth welding elements 17,18 to fuse regions of the layers of thermoplastic 8,9 and a region of the mounting flange 12 together to form a further fused region 19, as shown in figure 6. The third and fourth welding elements 17,18 fuse regions of the thermoplastic layers 8,9 with regions of the mounting

flange 12 around the entire periphery of the mounting flange 12 to form a fused region as shown by the inner dotted line 19 in figure 7.

[0036] The fusing of the pre-formed polyethylene coated cardboard backing sheets 5,6 to one another is effected by RF welding the polyethylene coatings together. If only one backing sheet was coated with polyethylene, then the resultant bond is significantly less effective than when using two coated backing sheets. There is no adhesive between the coated backing sheets. There is no distinct adhesive bead or layer between the coated backing sheets.

[0037] It is to be appreciated that, whilst the description above describes first and second and third and fourth welding elements, the high frequency welding machine may incorporate a larger number of welding elements which weld various regions of the thermoplastic layers 8,9 and the mounting flange 12 together simultaneously. The high frequency welding machine can thus attach the front and backing cards and the container 11 together in one high frequency welding step. Using the RF welding technique on polyethylene pre-coated and pre-formed cardboard backing sheets is tremendously advantageous as there is no danger of the product being packaged being subjected to the high temperatures which are necessary to provide an effective bond when a distinct adhesive is used between backing sheets. Prior art techniques consistently use temperatures in excess of 400 degrees Celsius to cure a distinct adhesive bead or layer sandwiched between backing sheets. The heat must pass through the backing sheets to reach and cure the sandwiched adhesive and this same heat may be damaging the packaged contents. Prior techniques also use more energy than the present invention to secure like bonds.

[0038] Referring now to figure 8 of the accompanying drawings, a further embodiment of the invention is in the form of a display card 20. The display card 20 is a simplified version of the display package 4 of the preferred embodiment described above and common features between the display card 20 and the display package 4 have been given the same reference numerals for ease of reference. The display card 20 incorporates front and backing sheets 5,6 and a reinforcing sheet 10, but the display card 20 does not incorporate a container for containing a product. Each of the front and backing cards 5,6 of the display card 20 is provided with an identically shaped hanging aperture 21,22.

[0039] The display card 20 of this further embodiment is manufactured by placing thermoplastically coated regions of the front and backing cards 5,6 together, with the reinforcing card 10 sandwiched between the sheets 5,6. Regions of the thermoplastically coated layers of the sheets 5,6 are then fused together by a high frequency welding machine. The fused regions extend around the periphery of the sheets 5,6, as shown by the dotted line 23 in figure 9. The front and backing sheets 5,6 of the display card 20 are thus attached securely to one another.

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[0040] Whilst the embodiments described above each incorporate a reinforcing sheet 10, it is to be appreciated that the reinforcing sheet is optional and other embodiments of the invention do not incorporate a reinforcing sheet. The inclusion of the reinforcing sheet is, however, preferred in situations when the container 11 contains larger items.

[0041] Embodiments of the present invention seek to provide the following advantages over prior proposed display packages.

[0042] The regions of the thermoplastic layers 8,9 and the regions of the mounting flange 12 of the container 11 which are fused together by high frequency welding are attached to one another very securely. The fused connection is difficult to break apart and hence display packages manufactured using the methods described above are very tamper resistant. The tamper resistance of display packages of preferred embodiments of the invention minimises the possibility of the packages being opened discretely by a thief and hence minimises the possibility of a packaged product being stolen by a thief.

[0043] The use of cardboard to form the front and backing sheets 5,6 is environmentally friendly since cardboard can be produced and disposed of ecologically. When coated with polyethylene the cardboard backing sheets are used to create a package according to the invention. The resultant package is recyclable. If a distinct adhesive is used between backing sheets, then the resultant package is less susceptible to recycling.

[0044] The high frequency welding which is used in the manufacture of display packages 4,20 as described above does not generate heat. The manufacturing process is thus suitable for packaging products, such as perfumes, which could otherwise be damaged by heat generated during most prior proposed packaging methods.

[0045] The display packages and display card in accordance with embodiments of the invention have a neat appearance which is more aesthetically appealing than most prior proposed packages.

[0046] The use of cardboard for both the front and backing sheets of packages in accordance with embodiments of the invention maximises the area on which information about the product can be displayed because information can be printed anywhere on the cardboard.

[0047] The method of manufacturing the display package in accordance with embodiments of the invention does not require the use of an adhesive. The components of the display package are fused to one another by high frequency welding to produce a fused bond which is stronger than a bond formed using adhesive.

[0048] When used in this specification and claims, the terms "comprises" and "comprising" and variations thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.

Claims

1. A method of manufacturing a display package comprising:

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providing a first cardboard element which has a first region that is coated with a first layer of polyethylene;

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providing a second cardboard element which has a second region that is coated with a second layer of polyethylene;

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positioning the first and second cardboard elements such that the first and second coated regions at least partly overlap; and

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attaching the first cardboard element to the second cardboard element by radio frequency (RF) welding at least part of the first and second overlapping coated regions such that the first and second coated regions at least partly fuse together.

2. A method according to claim 1, wherein information is printed on the first cardboard element.

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3. A method according to claim 1 or 2, wherein information is printed on the second cardboard element.

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4. A method according to any preceding claim, wherein the method further comprises:

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providing a third element; and
positioning the third element between the first and second cardboard elements such that the third element is at least partly trapped between the first and second cardboard elements when the first and second cardboard elements are attached to one another.

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5. A method according to claim 4, wherein the third element is of cardboard.

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6. A method according to any preceding claim, wherein the first and second cardboard elements are each generally planar sheets, with one side of each of the sheets being substantially entirely coated with the layer of polyethylene.

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7. A method according to any preceding claim, wherein the method further comprises:

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providing an open ended thermoplastic container which incorporates a mounting flange;
placing a product into the container;
positioning the mounting flange at least partly between the overlapping coated regions of the first and second cardboard elements; and
attaching the container to the cardboard elements by radio frequency (RF) welding at least

- part of the mounting flange to the coated regions such that the coated regions and the mounting flange at least partly fuse together.
8. A method according to claim 7, wherein the method further comprises:
- inserting part of the container through an aperture in the second cardboard element and positioning the mounting flange so as to overlap part of the coated region of the second cardboard element; and
- positioning the first cardboard element to close the open end of the container such that the container is sealed when the first cardboard element is attached to the second cardboard element.
9. A method according to any preceding claim, wherein the first and second cardboard elements are each coated on one side by a layer of polyethylene and the first and second cardboard elements are pre-formed for registration with one another to provide an effective bond between the first and second cardboard elements.
10. A display package comprising:
- a first cardboard element which has a region that is coated with a layer of polyethylene to form a first integral backing sheet; and
- a second cardboard element which has a region that is coated with a layer of polyethylene to form a second integral backing sheet;
- the first and second cardboard backing sheets being attached to one another by at least part of the coated region of the first cardboard element which is at least partly fused to at least part of the coated region of the second cardboard element, wherein no adhesive is present in any bond between the backing sheets.
11. A display package according to claim 10, wherein information is printed on the first cardboard element.
12. A display package according to claim 10 or 11, wherein information is printed on the second cardboard element.
13. A display package according to any one of claims 10 to 12, wherein the display package incorporates a thermoplastic container which is at least partly fused to the coated layer of the first cardboard element and the coated layer of the second cardboard element.
14. A display package according to any one of claims 10 to 13, wherein the first and second cardboard elements each have a polyethylene coating on one side to provide an effective bond between the first and second cardboard elements.
15. A display package according to any one of claims 10 to 14, wherein the first and second cardboard elements are pre-formed for registration with one another.

PRIOR ART

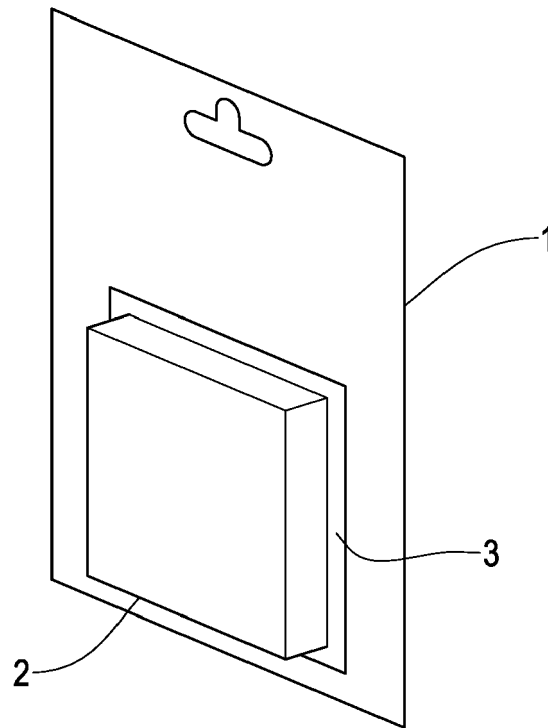
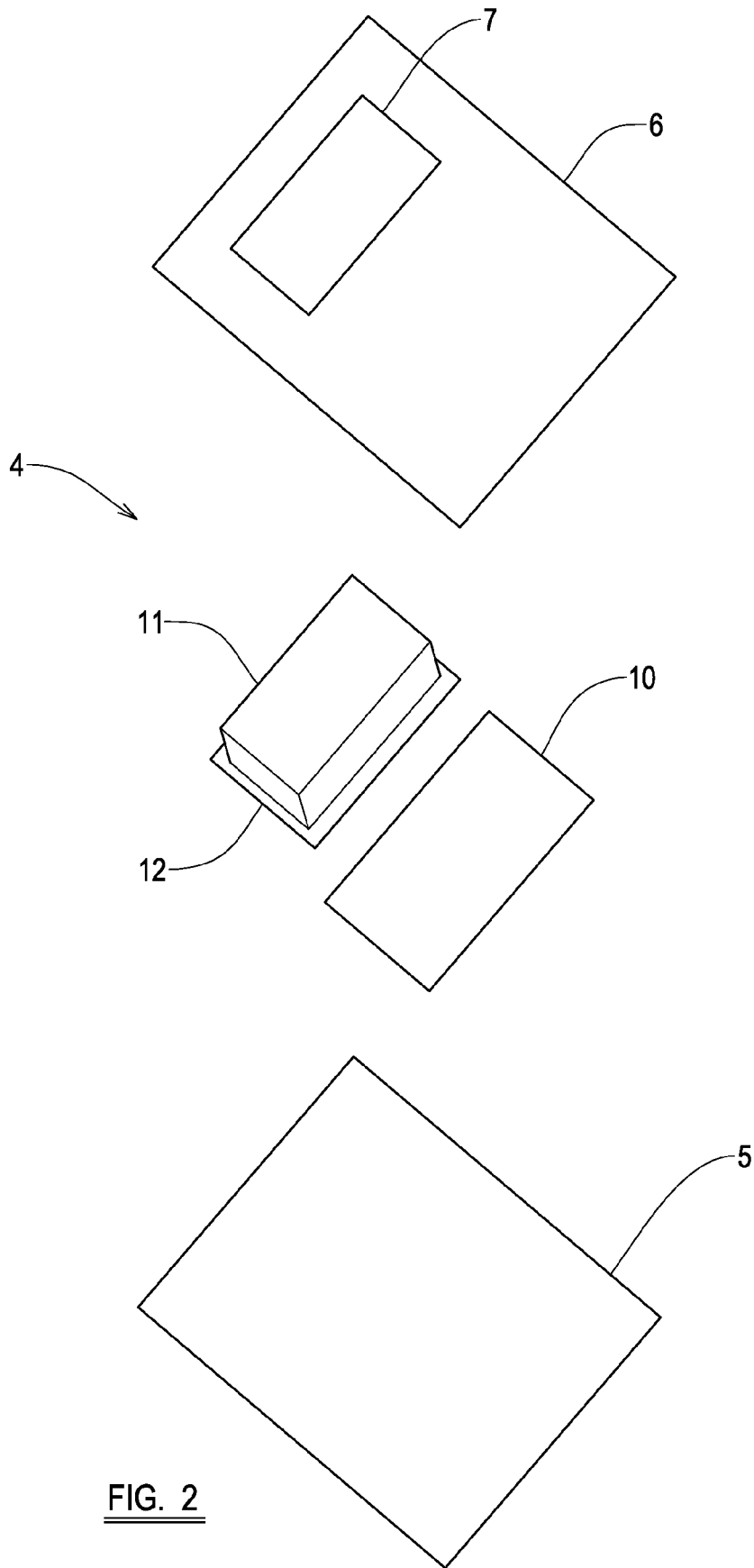


FIG. 1



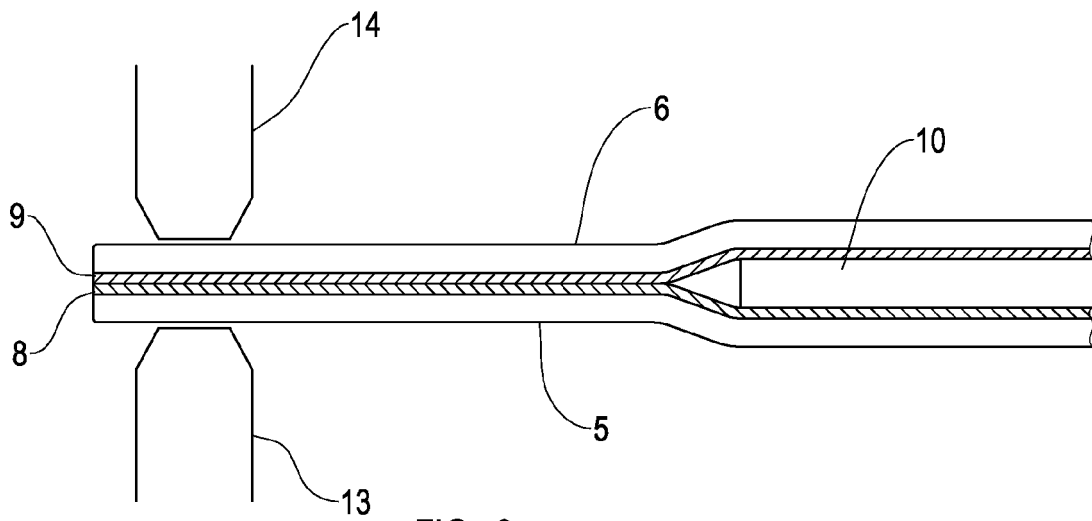


FIG. 3

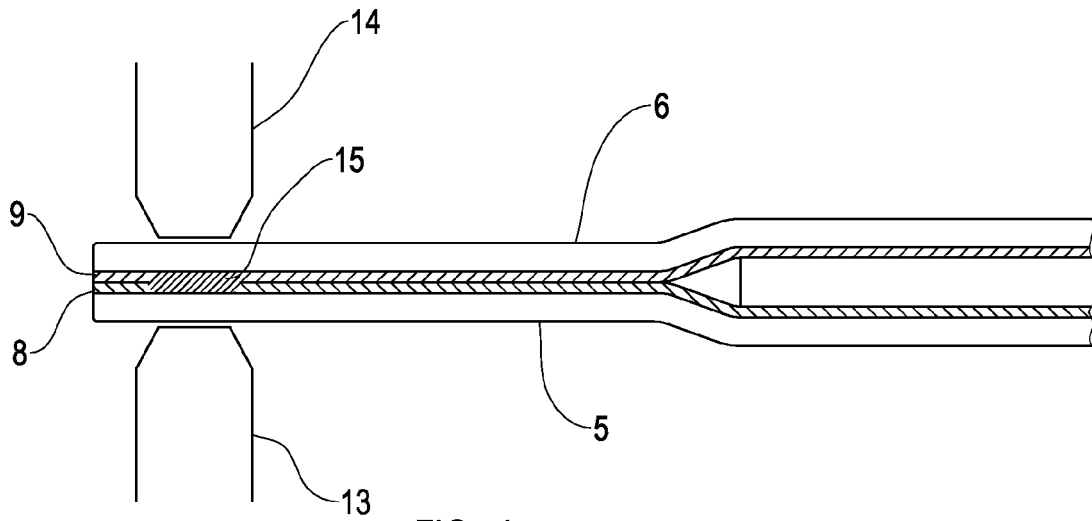
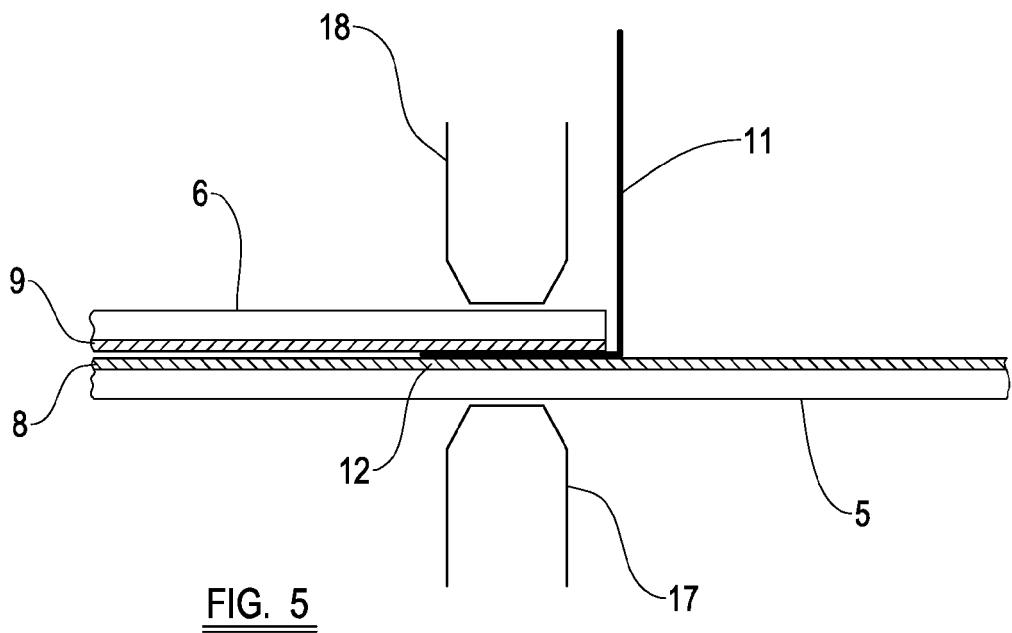


FIG. 4



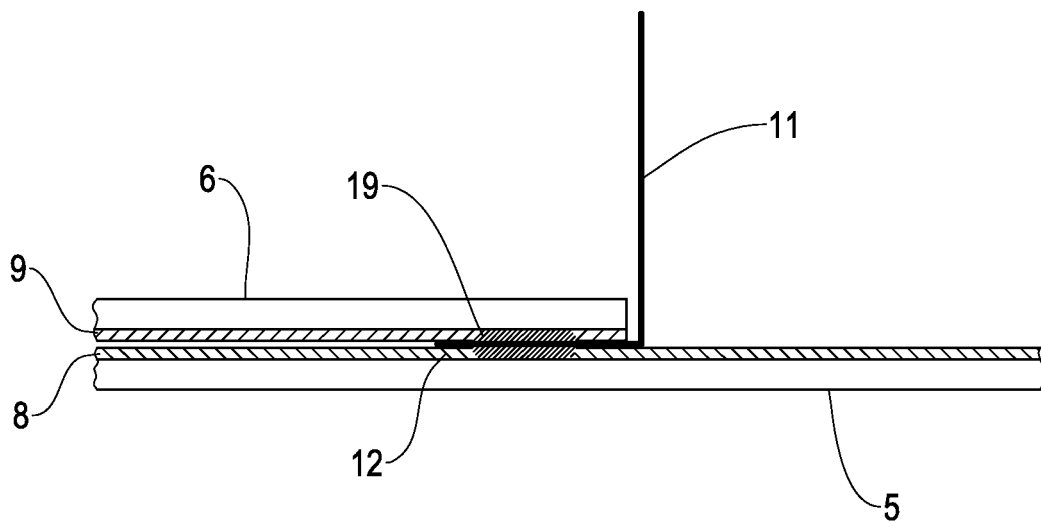


FIG. 6

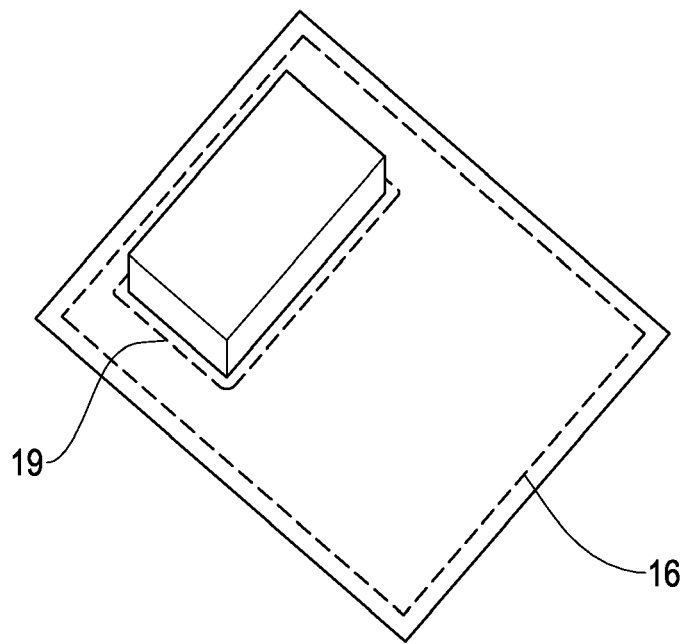


FIG. 7

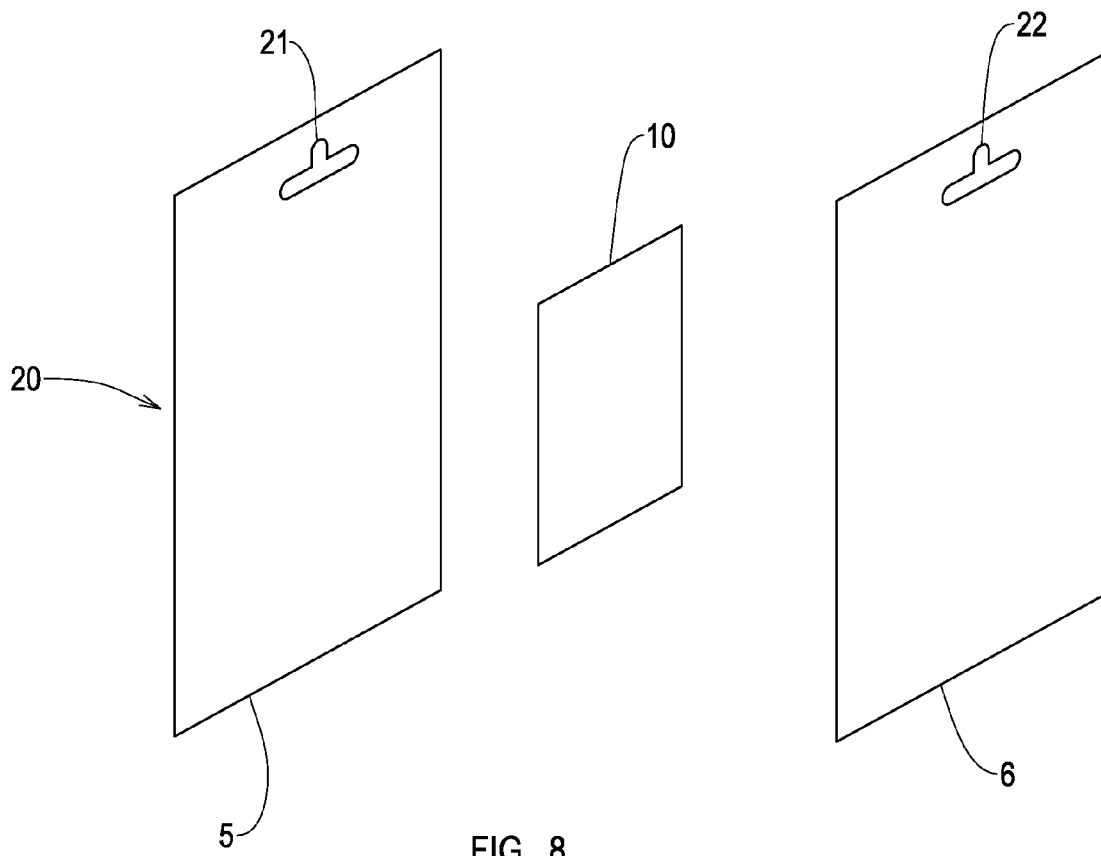


FIG. 8

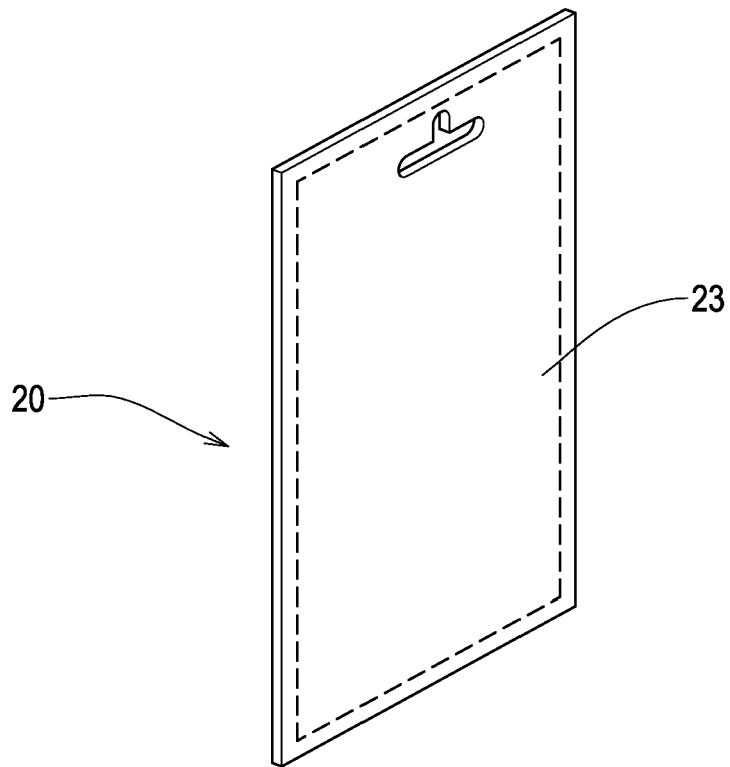


FIG. 9



EUROPEAN SEARCH REPORT

Application Number
EP 08 17 0870

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	US 2007/051652 A1 (TILTON CHRISTOPHER R [US]) 8 March 2007 (2007-03-08) * paragraph [0036] - paragraph [0037] * * paragraph [0045]; figure 4 * * paragraph [0064] * -----	1-15	INV. B65D73/00 B65D75/30
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Place of search		Date of completion of the search	Examiner
Munich		13 March 2009	Segerer, Heiko
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