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(54) FOOD PACKAGING FOR MICROWAVE COOKING

(57) The invention is a package for foodstuff which is for cooking by means of microwaves. The package is constructed to serve as the means in which the foodstuff is contained as microwave cooking takes place. To this end the package has microwave active material to focus heat onto the foodstuff in the package. Typically, the microwave reactive material is receptor material in sheet form.

The invention provides that the package is adapted to be reconfigured usually by tearing it, and enabling the foodstuff to get closer to the receptor, or into contact with it.

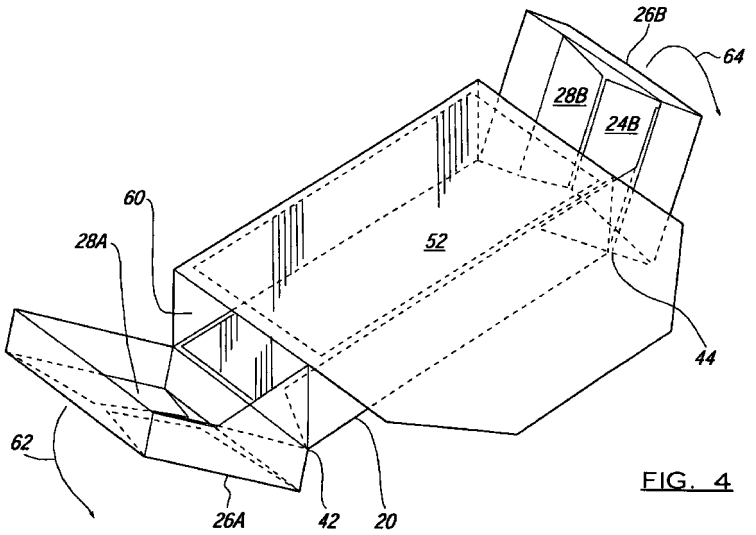

FIG. 4

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Description

[0001] This invention relates to an improved package, and more specifically to a package made of sheet material and including microwave active material, which package is adapted to contain foodstuff which requires cooking with the assistance of the microwave active material while in situ within the said package.

[0002] Granted UK Patent Number 2046060 discloses a receptor material which can be applied to the internal surfaces of packages, said receptor material being in sheet form and being activated by microwave radiation such that it generates heat and is thus ideally suited for heating foodstuff, for example for browning the surface of the foodstuff. Those skilled in the art will be well aware of this and other materials which are microwave active materials and are provided inside many food containing packages sold today, for the heating of the contained foodstuff. The microwave active material, depending upon its form (e.g. sheet, coating applied in liquid form, impregnation and so on) can be disposed on the inner surfaces of packages by appropriate means.

[0003] This invention can be applied to most formats of packages (produced from or including sheet material) inside which active microwave materials are disposed. Typical styles of packages include sleeves, "end-load" cartons, "top-load" cartons and lid/tray combinations.

[0004] End-load packages, an example of which is shown in Figures 1-4 herein are typically glued along a side seam and flattened before being delivered to the premises where the foodstuff is packed into the carton. After erecting a blank, from which the package is constructed, to form a hollow tube, the foodstuff is loaded into the package through one of the open ends thereof before being adhered in a closed condition. Sleeves are similar except they do not have end flaps which can be adhered together to form a closed box package construction.

[0005] Alternately, top load type packages, of which an example is shown in Figures 5-8 herein, which are also provided in blank form are erected to form a base tray into which the foodstuff is loaded through the open top before the lid is folded down and adhered against the side walls of the package.

[0006] The primary objective of using a microwave active material within cartons is to effect the heating, for example crisping/browning of the surface or to a desired internal temperature profile of the food product in close proximity therewith. Specifically, with microwave receptors the radiation heat transmission factor is known to be comparatively low. The radiation heat transmission factor of microwave active materials is known to be comparatively low and indeed ineffective if the food product is displaced from the surface of the microwave active material sheet more than approximately 2-4mm. Thus it is important that the food product within the packages contacts or is in very close proximity with any microwave receptor material disposed therein, because insufficient heating of the surface of the food product may result in insufficient browning/crisping and may give the food product an unsavoury appearance. Likewise, the performance of microwave field modification materials is also affected by their position relative to the food product, close proximity to the food product often being an important factor in achieving the optimum and safest performance.

[0007] The primary difficulty associated with ensuring contact between or sufficient closeness of the product surface with the microwave active material within the package arises from the requirement for clearance between the food product and the package interior, during loading the foodstuff into the package, to facilitate loading and closing of the package. When it is considered that the packages to which this invention is ideally suited are commonly used for packing such items as folded pizzas, pies, pasties, filled rolls, and other baked items, the fact that no single food product will be of identical shape necessitates the use of a package of certain minimum dimensions which is capable of easily packing and containing food products produced.

[0008] In general therefore, it is unlikely that a food product deposited in a package which is subsequently adhered in a closed condition will substantially contact the surface of a microwave active sheet material on the underside of the top of the package.

[0009] It is known to put a loose microwave active material sheet in a package for foodstuff, so that it will contact the foodstuff during microwave heating, but the problem with this arrangement is that the loose sheet can move during transit and during filling, so much so that the sheet ends up in the wrong place and does not perform its function. Additionally, placing a loose sheet in the correct position during packing is inconvenient.

[0010] It is an object of this invention therefore to provide a package capable of receiving food products without difficulty during the packing thereof, but which overcomes, at least in preferred embodiments, the disadvantages of the known packages.

[0011] According to the invention there is provided a sheet material package containing or adapted to contain a foodstuff to be cooked by microwaves whilst in the package, wherein the package includes a portion of microwave active material connected to or forming part of the sheet material of the package, and which is for creating localised heat and/or to distribute the microwave energy in the foodstuff, with the objective of optimising the foodstuff's eating qualities and/or reducing the time during which the foodstuff needs to be heated, said package being adapted so that when the package holds the foodstuff the microwave active material is spaced relative to the foodstuff, and the package includes means rendering the package capable of change of configuration by the user whereby the microwave active material moves into contact with or closer proximity to the foodstuff, for the more effective heating

of either one or more portions/areas of the foodstuff or of the foodstuff as a whole when the package with the foodstuff therein is subjected to microwave energy.

[0012] The microwave active material preferably is spaced from the top or the side of the foodstuff, prior to the change in configuration of the package, but in another embodiment the food stuff may sit on the microwave active material, and the user inverts the package so that the microwave active material is spaced above the foodstuff, and then the package is reconfigured to bring the microwave active material into contact or closer proximity with the foodstuff.

[0013] By the invention, the microwave active material is more effectively used. Thus, the package can be designed so that when the foodstuff is placed therein, there will be a space between the top of the foodstuff and the top of the package, where the microwave active material will be located. In this way the foodstuff can be loaded into the package quite easily, without any interference between the package and the foodstuff, which is the case when the foodstuff is a close fit in the package.

[0014] Also, as the microwave active material is attached to or forms part of the package sheet material, it will remain in place during production, transport and filling of the package, and it will be ensured that the microwave active material remains in the correct place in the finished package.

[0015] Another advantage is that the bringing together into contact or closer proximity of the microwave active sheet material and the foodstuff is that the foodstuff will be properly heated during microwave cooking. Typical of products which can be cooked in such a package are pies of all types, pizzas, cakes, potato, and indeed the list is infinite.

[0016] There are many embodiments of the means enabling the package configuration to be changed within the present invention, including the following.

[0017] Where the microwave active material is part of the sheet material of the package, there may be lines of weakening around the microwave active portion so that it can be pushed from the remainder by breaking the package along the lines of weakening, whereby the said portion becomes detached from the remainder and is repositioned in a controlled manner so that it drops onto the top of the foodstuff.

[0018] In another arrangement, the base of the package may be capable of being inwardly pressed, by tear and tuck flaps or the like, whereby the foodstuff is pressed upwards against the microwave active portion prior to cooking.

[0019] In other arrangements, sections of the package may be torn along tear lines or folded back permitting the microwave active portion to be tucked towards the foodstuff and into contact or closer proximity thereto.

[0020] In other arrangements, the microwave active portion is attached to the sheet material of the package, but can be released therefrom by the changing of the configuration of the package. There may be a tear strip which the user tears, and the effect of this is to detach the microwave active portion from the sheet material of the packaging, so that it drops onto the top of the foodstuff or into closer proximity thereto.

[0021] Even more elaborate arrangements may be provided. The package may be in two slidably fitted sections, which can be moved closer together by pressing the top towards the bottom. There may be a tear strip around the package which when torn away allows the said sliding, or alternatively, after the tearing away of the strip, one of the sections of the package may have its edges folded back to allow the other section to be fitted thereto so that the sections end up closer together than initially. All of these actions bring the microwave active material into contact with or closer to the foodstuff.

[0022] In yet another arrangement, the package may have fold lines around it, whereby the package is adapted to be compressed concertina fashion to reduce its height, for the achieving the same effect as mentioned above.

[0023] As the packages to which the invention relates will be for holding foodstuff which is to be cooked in a microwave oven, it is preferred that the packages, after being filled with the foodstuff, are of the type which have to be broken open to be used, so that the breaking open will provide evidence of tampering. The said breaking open may comprise the change of configuration of the package.

[0024] Summarising again, the advantages of the invention include that the packages can be filled easier as the microwave active material portion is attached to or forms part of the sheet material of the package, the microwave active material portion will remain in place more reliably, and the erecting and filling of the packages with the predetermined foodstuff will be simpler and faster, in that the foodstuff will be filled into the packages with a "clearance" in that the microwave active material portion is initially spaced from the top and/or the sides of the foodstuff.

[0025] An advantage of the arrangements in which the microwave active material "rests" on the top of the foodstuff is that if the foodstuff is of a type which rises as it is heated, such as puff pastry, then the microwave active material will rise along with the foodstuff, ensuring effective cooking thereof.

[0026] Any conventional type of microwave active material may be used, and of particular advantage is the use of a paper sheet with a receptor layer thereon, as described in UK Patent No. 2046060.

[0027] According to a specific arrangement according to the invention the package is provided with frangible means which in unbroken state maintains a first disposition between the microwave active sheet and the foodstuff, characterised in that after fracture of the frangible means, which gives rise to frangible portion edges, said frangible portion edges are brought to engage with other edge portions of the package such that the particular surface is maintained in a second, closer disposi-

tion with respect to the foodstuff for the reasons as aforesaid.

[0028] Preferably the fracture of the frangible means in the formation of at least one tongue portion with frangible portion edges separated from the body of the package as a result of the fracture, said body accordingly having corresponding frangible portion edges.

[0029] Further preferably the other edge portions are provided in the body of the package and are separated by a distance less than that of the width of the tongue portion, the frangible portion edges of which can thus be brought to engage therewith.

[0030] Preferably the engagement of the frangible portion edges of the tongue portion with the other edge portions is frictional.

[0031] In an alternative embodiment of the invention, the other edge portions of the package are frangible portion edges with which the tongue frangible portion edges are brought to engage, the frangible portion edges of the package having a shape which maintains the frangible portion edges of the tongue portion in the said second disposition.

[0032] Preferably the package is provided with two microwave active material sheet portions internally thereof, one of which is provided underneath the food product, and the second being provided substantially above the food product and on the particular surface which is brought into contact with the food product as a result of the fracture of the frangible portions.

[0033] It is most preferable that after the frangible portions have been brought to engage with the other portions of the package, the food product is trapped between and in contact with microwave active material portions of the package above and below the said product.

[0034] It is also preferable that further frangible portions are provided on the package which on fracture permit access to the product as trapped between the two microwave active material portions and allow same to slide therefrom onto, for example, a plate.

[0035] Preferably the further frangible portions are provided proximate one end of the package which on fracture preferably effected by rotation of the said end of the package relative to the remainder thereof permit access to the contents of the package at the said end.

[0036] Preferably the frangible portions are lines of perforations which may be dog-toothed or of "concora" profile. The particular choice of frangible portions depends on the style of package and the firmness with which the tongue portion is required to be held.

[0037] The reference to closer proximity is meant that the food product is spaced in the order of 2mm or less distant from the microwave active material over a reasonable portion of its area.

[0038] Embodiments of the invention will now be described, by way of example, with reference to the accompanying diagrams, wherein:

Figure 1 shows a plan view of a sheet material blank from which a package according to a first embodiment of the invention is manufactured;

Figure 2 shows a perspective view of the package erected from the blank of Figure 1;

Figure 3 shows the package of Figure 2 as configured in its second disposition and ready for cooking of the food product contained therein;

Figure 4 shows the package of Figure 3 with the additional frangible portions fractured allowing access to the cooked product at one end of the carton;

Figures 5-8 show the views corresponding to Figures 1-4 of a package according to a second aspect of the invention;

Figures 9, 10 and 11 show respectively in perspective, sectional elevation and perspective package according to another embodiment of the invention, and in different operational positions;

Figures 12 and 13 show in sectional elevation another embodiment of the invention in different operational positions; and

Figures 14 and 15, 16 and 17, 18 and 19 show respectively three further embodiments of the invention in a manner similar to Figures 12 and 13.

[0039] Referring firstly to Figure 1, there is shown a sheet material (such as cardboard) blank 2 provided with a number of fold lines and lines of perforations which are denoted in this figure and subsequent figures by long dash/dot lines and dashed lines respectively. A central body portion 4 of the blank 2 is provided with a plurality of fold lines 6, 8, 10, 12, which ultimately define side wall portions 14, 16, 18, a base portion 20, and a lid portion 22 once the blank has been erected to form the package. The ends of the erected carton are provided with a plurality of different flap portions 24, 26, 28, 30 which extend from the side wall portions 14, 16, and the base and lid portions 20, 22. Dog tooth perforation lines 32, 34 extend from a lip 36 of the side wall portion 18 and on either side thereof into the body 4 of the blank and terminate at their intersection with the fold line 8. Further perforation lines 38, 40 extend from the intersection between fold lines 42, 44 which continue within the body 4 of the blank after the perforation lines 32, 34 have ceased and terminate at the lateral fold line 6. Said perforation lines 38, 40 terminate at the free edge of the side wall section 14.

[0040] A pair of receptor material sheets 46, 48 are adhered to the surface of the body portion 4 of the carton blank which ultimately forms the interior of the car-

ton when erected. It will be seen from the figure that receptor material sheet 46 is adhered both to the lid portion 22 and the side wall portion 16 across the fold line 10, whereas receptor material sheet 48 is adhered substantially centrally within the base portion 20. The reason for this will become apparent with reference to Figures 2 and 3, and the description provided hereinafter with reference to these figures.

[0041] Figure 2 shows a package 50 erected from the carton blank of Figure 1, and it should be pointed out that in all the figures, hatching indicates a surface of one or other of the receptor material sheets 46, 48. It can be seen from Figure 2 that once erected, the package defines a cavity between the side wall portion 16, 18, and the base and lid portions 20, 22, within which a food product (not shown) may be deposited. Although the package is shown in its fully erected condition, it is to be appreciated that the formation of the ends from flap portions 26A, 26B may be the final step in the erection of the package, prior to which the said food products may be "end loaded" into the partially formed package, which at that stage would resemble a tube of substantially rectangular cross-section.

[0042] After the complete erection of the package, which will involve the folding of the various flap portions 24, 26, 28, 30 and ultimately the gluing of said flap portions against the outermost flap portions 26A, 26B, the package and food product contained therein is transported to its point of sale, possibly in a refrigerated or frozen condition.

[0043] It is to be mentioned that the particular size of the blank and package resulting therefrom is only important as regards the maximum size of the food product which the package is to contain. In particular, it is the case that partially erected packages which receive food products must be of a size greater than the product itself to allow for variances in the size and shape of the product being deposited therein, and the greater the size difference, the easier it is to load the food product. Furthermore, where the product is required to be heated and specifically both cooked and browned on at least one surface thereof, the packages of the prior art have been inadequate as regards the browning operation because the microwave active material has been spaced too far from the food product. The object of the invention is achieved by the package of Figure 2 in that a user wishing to cook the food product contained within the package firstly lifts the lip 36 away from the side wall portion 18 thus tearing the carton material along the lines of perforation 32, 34. This tearing action is continued across the lid portion 22, and the side wall portion 16 until a flap of package material 52 can be folded about the corner of the package defined by the fold line 8. The said flap 52 is subsequently folded back towards the remaining side wall portions 18 about an intermediary fold line 54 such that the receptor material sheet 46 previously deformed around the corner of the carton defined by the fold line 10, is rendered substantially planar and furthermore displaced inwardly of the remaining lid portions 22. This reconfiguration of the carton is shown in Figure 3.

[0044] It can also be seen from Figure 3 that the edges of the flat portion 52 frictionally engage edges of the flap portions 24A, 24B which stand proud of, but inside the remaining side wall portions 18. Such frictional engagement between the toothed edges of the flap 52 resulting from the perforation of lines 32, 34 in a dog tooth manner allows said flap 52 to be maintained in close proximity to the upper surface of a food product trapped between said flap 52 and the base portion 20 of the carton. It will be noted that although the food product may be trapped between the said flap portion 52 and the base portion 20, and the respective receptor material sheet 46, 48 provided thereon, the ends of the cavity so defined are open to the atmosphere, and thus air can escape from the said cavity in the manner shown by arrows 56, 58. This represents a further advantage of the package according to this embodiment of the invention, because it is generally appreciated that reasonable air flow around a food product being cooked is advantageous to the cooking thereof. The cavity defined by the said flap portion 52 and the base portion 20 of the package is clearly demonstrated in Figure 4, which also demonstrates a further novel and inventive feature of the package herein described.

[0045] In Figure 4, the said cavity is indicated generally by reference numeral 60. It can be seen from the figure that convenient access to said cavity is provided by means of the additional perforation lines 38, 40 which, after the separation of the flap portion 52 from the carcass of the package by tearing along perforation lines 32, 34, prevent the remaining end portion from rotating about the fold lines 42, 44 and hold said end portion in perpendicular relationship to the base portion 20.

[0046] Henceforth, it is very easy for a user of the carton to fracture said perforation lines 38, 40, and rotate said end portion outwardly as shown by the arrows 62, 64, and once one or other of said end portions has been rotated to a sufficient degree, the package as a whole may be tilted to allow the food product contained within the cavity 60 to slide therefrom, for example onto a plate (not shown).

[0047] It will be appreciated by those skilled in the art that those portions of the package to which the receptor material sheets 46, 48 are adhered become exceedingly hot during cooking, and it is therefore desirable that end portions such as 26A, 26B by which a user can manipulate the package after it has been subjected to microwave radiation to effect cooking of the food product contained therein.

[0048] In this regard, it will be instantly appreciated that the configuration of the package according to this embodiment of the invention is advantageous because the means by which the package would be conventionally manipulated after cooking do not become exceed-

ingly hot, and therefore there is only minimal risk of burning of the user's fingers or the like during such manipulation.

[0049] A second embodiment of the invention is now described with reference to Figures 5 to 8. In Figure 5, there is shown a package blank 100 comprising a body portion 104 comprising a plurality of lateral fold lines 106, 108, 110, 112, which define side wall portions 114, 116, 118, a base portion 120, and a lid portion 122. A similar convention as regards fold lines and lines of perforation is adopted to that of Figures 1 to 4, but in the case of Figures 5 to 8, the important lines of perforation are restricted to the side wall portions 116, 118, and the lid portion 122.

[0050] In particular, the lid portion 122 is provided with a pair of curved perforation lines 124, 126 which define tab portions 128, 130 with the fold lines 112, 110 respectively.

[0051] A receptor material sheet 132 is adhered substantially centrally of the base portion 120, and a further receptor material sheet 134 is positioned substantially centrally of the lid portion 122, but adhered only to one side of the tab portions 128, 130.

[0052] The said curved perforation lines 124, 126 extend into the side wall portions 116, 118 at sinusoidal perforation lines 136, 138, 140, 142 until intersecting with intermediate fold lines 144, 146. The said perforation lines 136, 138, 140, 142 extend linearly from their intersection with intermediate fold lines 144, 146 until they intersect with secondary intermediate fold lines 148, 150. Thereafter, the perforation lines continue only on one side of the tab portions 128, 130, on the one hand terminating at the fold line 108, and on the other hand terminating at the edge of the side wall portion 118. These final perforation lines are identified by reference numerals 152, 154.

[0053] The package blank of Figure 5 is shown in its erected condition in Figure 6 in which the two receptor material sheets 132, 134 are shown by hatching on the base portion 120 and the lid portion 122 of the package. Further perforation lines 156, 158 extend from one corner of the tab portions 128, 130 to the end of the lid portion 122 defined by a fold line 160, and these further perforation lines can be seen clearly in Figures 5 to 8, as can the various perforation line described with reference to Figure 5.

[0054] The mode of operation of the package can be best understood with reference to Figure 7, in which it can be seen that perforation lines 124, 126, 136, 138, 140, 142 have been fractured, and this is most expediently achieved by a user forcing his thumbs downwards as shown by the arrows 162, 164, on the upper surfaces of the tab portions 128, 130. As such fracture is effected, the receptor material sheet 134, being only adhered to the lower surfaces of the tab portions 128, 130 moves downwards within the carton and into contact with or in close proximity to a food product contained thereby and between said receptor material sheet 134 and the alternate receptor material sheet 132. All the advantages achieved by the package shown in Figures 1 to 4 are achieved by the package shown in Figures 5 to 8 and are therefore not repeated. However, it should be pointed out that the receptor material sheet 134 is maintained in contact with or in close proximity to with the food product contained within the package by means of the interaction between the edges of the tab portions 128, 130 and the remaining sinusoidal perforation lines 136, 138, 140, 142. The frictional interengagement of the respective edges prevents the said receptor material sheet 134 from springing upwardly against the resiliency of the board from which the package is manufactured, as would normally be the case after the folding the material along lines 146, 150, and 144, 148 which results from the downward pressure applied to the tab portions 128, 130.

[0055] The package of Figures 5 to 8 is additionally provided with an access feature in similar manner to the package of Figures 1 to 4 in that an end 166 may be rotated about a longitudinal fold line 168 thus fracturing perforation lines 152, 154, and also perforation line 170 and allowing access to the food product trapped between receptor material sheets 132 and 134 within the package.

[0056] In similar manner to the package of Figures 1 to 4, a user can simply tilt the open ended package upwardly to allow the food product to slide from between the two receptor material sheets and onto a plate.

[0057] Referring now to Figures 9, 10 and 11, a package 200 according to the embodiment shown is of generally rectangular configuration, and is constructed of cut and creased sheet material such as cardboard. The top of the package is provided with a tear strip 202 which can be removed as shown in Figure 11 to detach a central portion 204 of the top of the package from the remainder.

[0058] To the underside of the portion 204 is connected a sheet of microwave active material 206, and the arrangement is that when the strip 202 is torn away as shown in Figure 11, the portion 204 which is detached, and the sheet 206 drops within the package and onto the top of the food product 208 so that the microwave active material 206 comes to rest on top of the food product and therefore during microwave cooking will effectively heat the top of the product 208. If the product 208 is of the type which rises when being heated, the assembly comprising the portion 204 and the microwave active material 206 will be able to rise to accommodate the rising of the food product.

[0059] To facilitate the tearing away of the strip 202, the front 210 of the package is a cut-out 212 into which the leading end 214 of the strip 202 extends so that it can be engaged easily by the finger and thumb and the strip torn away. The tear strip 202 is of conventional type, and in tearing it away, the board of the top of the package fractures to separate the portion 204.

[0060] In an alternative arrangement, the strip 202

may extend straight across the top of the package, and its underside would be attached to the microwave active sheet 206 so that when the strip is torn away, the remaining portions of the top of the package serve to restrain the sheet 206 which becomes detached from the strip (which may be connected thereto by a spot of glue or the like), and falls onto the food product in the manner shown in Figure 10. Figure 11 also shows the detached portion 204 and the microwave active sheet 206 in the dropped position.

[0061] The package shown in Figures 9 to 11 may be constructed in any suitable manner, such as from a blank of cut and crease material, and normally the package will be sealed as it contains a food product 208, but the package is reconfigured from the initial condition shown in Figure 9 in which it is sold, and the position shown in Figure 11 in which it is used.

[0062] In the arrangement of Figures 12 and 13, which illustrate the package of the same geometric shape as that shown in Figures 9 to 11, but in sectional elevation, the top 220 of the package is provided with fold lines 222 and 224 where indicated, and between the fold lines the microwave active material 226 extends. It will be seen that the top 220 includes a top flap 228 which extends into the package to the inside of the front wall. To use the package, the lid 220 is opened, and this may require the tearing away of a portion of the package or otherwise fracturing it and the lid can then be raised by pivoting about the corner 230. After it has been so pivoted, it is refolded about fold lines 222 and 224 and tucked inwardly as shown in Figure 13, so that the microwave active sheet 226 comes into contact with the top of the food product 232, and cooking can be commenced.

[0063] In the arrangement shown in Figures 14 and 15, the package 240 has fold lines 242 and 244 extending horizontally around the sides or at least the two sides, and to reconfigure the package the top 246 is pushed downwardly as shown by arrow 248 so that the microwave active material 250 on the underside of the top 246 is forced down onto the top of the food product 252 as shown in Figure 15, the sides buckling about the fold lines 242 and 244. Again, there may be a tear away portion to this package which has to be removed before the package can be compressed as shown in Figures 14 and 15, although in other designs the tear away portion may not be necessary.

[0064] In the arrangement of Figures 16 and 17 the package 260 has a tear away strip 262 extending around the package, and when that strip is torn away, the effective height of the package is reduced, and the two portions of the package which are separated by the removal of the strip 262 can come closer together or the top portion 264 can fall so that the microwave active material 266 on the underside of the portion 264 can fall into contact with the food product 268.

[0065] In the arrangement of Figures 18 and 19, the package 270 has tuck panels 272 and 274 at opposite sides, and in order to use the package the tuck panels 272 and 274 are tucked inwardly to force the base 276 (for example by tearing same or breaking same away from the remainder of the package) to force the food product 278 upwardly and into contact with the microwave active material 280 as shown in Figure 19.

[0066] It will be understood that Figures 12 to 19 are diagrammatic and show the principle of constructing the package to enable it to operate in accordance with the general principles of the invention. It can be understood therefore that there are many manifestations of a package according to the invention, and it will normally be desired that these packages are of a sealed nature and require to be broken or torn open or otherwise manipulated to enable the movement of the product and the microwave active material together to bring them into contact or into closer proximity.

[0067] Many embodiments of the invention are indicated herein, and it is to be mentioned also that any feature of any embodiment, if appropriate, can be used in any other embodiment, within the general scope of the invention. For example the embodiments of Figs. 9 to 19 could and probably will also have microwave active material on the inside of the base of the package to heat the underside of the foodstuff.

[0068] It will be appreciated that the packages described herein represent a significant advance over existing packages which are provided with microwave active material and are adapted for cooking food products contained within the package because the package according to the invention allows for both error free packing, and effective heating (e.g. in some cases browning) of the food product during cooking.

[0069] The embodiments of the invention herein comprise packages which suitably are made of cardboard, and so the packages could be considered to be cartons, but it is to be mentioned that other sheet materials could be used, such as plastic sheeting. The packages could be composites of different sheet materials, and the sheet material need not be cut and creased. The sheets could be moulded from paper and plastics, and the packages could be of part cut and creased material and part moulded material.

Claims

1. A sheet material package containing or adapted to contain a foodstuff to be cooked by microwaves whilst in the package, wherein the package includes a portion of microwave active material connected to or forming part of the sheet material of the package, and which is for creating localised heat and/or to distribute the microwave energy in the foodstuff, with the objective of optimising the foodstuff's eating qualities and/or reducing the time during which the foodstuff needs to be heated, said package being adapted so that when the package holds the foodstuff the microwave active material is

spaced relative to the foodstuff, and the package includes means rendering the package capable of change of configuration by the user whereby the microwave active material moves into contact with or closer proximity to the foodstuff, for the more effective heating of either one or more portions/areas of the foodstuff or of the foodstuff as a whole when the package with the foodstuff therein is subjected to microwave energy.

2. A package according to claim 1, wherein, the microwave active material is spaced from the top or the side of the foodstuff, prior to the change in configuration of the package.

3. A package according to claim 1 or 2, wherein the food stuff sit on the microwave active material, and the user inverts the package so that the microwave active material is spaced above the foodstuff, and then the package is reconfigured to bring the microwave active material into contact or closer proximity with the foodstuff.

4. A package according to claim 1, 2 or 3, wherein the package is designed so that when the foodstuff is placed therein, there will be a space between the top of the foodstuff and the top of the package, where the microwave active material is located.

5. A package according to any preceding claim, wherein, when the microwave active material is part of the sheet material of the package, there are lines of weakening around the microwave active portion so that it can be pushed from the remainder by breaking the package along the lines of weakening, whereby the said portion becomes detached from the remainder and is repositioned in a controlled manner so that it drops onto the top of the foodstuff.

6. A package according to any of claims 1 to 4, wherein the base of the package is capable of being inwardly pressed, by tear and tuck flaps or the like, whereby the foodstuff is pressed upwards against the microwave active portion prior to cooking.

7. A package according to any preceding claim, wherein sections of the package can be torn along tear lines or folded back permitting the microwave active portion to be tucked towards the foodstuff and into contact or closer proximity thereto.

8. A package according to any of claims 1 to 6, wherein the microwave active portion is attached to the sheet material of the package, but can be released therefrom by the changing of the configuration of the package.

9. A package according to claim 8, wherein there is a tear strip which the user tears, and the effect of this is to detach the microwave active portion from the sheet material of the packaging, so that it drops onto the top of the foodstuff or into closer proximity thereto.

10. A package according to any of claims 1 to 6 wherein the package is in two slidably fitted sections, which can be moved closer together by pressing the top towards the bottom.

11. A package according to claim 10, wherein there is a tear strip around the package which when torn away allows the said sliding.

12. A package according to any of claims 1 to 6, wherein the package has a tear away strip, and after the tearing away of the strip, one of the sections of the package may have its edges folded back to allow the other section to be fitted thereto so that the sections end up closer together than initially.

13. A package according to any one of claims 1 to 6, wherein the package may has fold lines around it, whereby the package is adapted to be compressed concertina fashion to reduce its height, to provide said reconfiguring..

14. A package according to any one of the preceding claims, wherein the package is of the type which has to be broken open to be used, so that the breaking open will provide evidence of tampering.

15. A package according to claim 14, wherein the said breaking open also provides the change of configuration of the package.

16. A package according to any preceding claim, wherein the microwave active material is a paper sheet with a receptor layer thereon, as described in UK Patent No. 2046060.

17. A sheet material package containing or adapted to contain a foodstuff to be cooked by microwaves whilst in the package, wherein the package is provided with frangible means which in unbroken state maintains a first disposition between the microwave active sheet and the foodstuff, characterised in that after fracture of the frangible means, which gives rise to frangible portion edges, said frangible portion edges are brought to engage with other edge portions of the package such that the particular surface is maintained in a second, closer disposition with respect to the foodstuff.

18. A package according to claim 17, wherein the frac-

ture of the frangible means results in the formation of at least one tongue portion with frangible portion edges separated from the body of the package as a result of the fracture, said body accordingly having corresponding frangible portion edges.

19. A package according to claim 18, wherein, the other edge portions are provided in the body of the package and are separated by a distance less than that of the width of the tongue portion, the frangible portion edges of which can thus be brought to engage therewith.

20. A package according to claim 19, wherein the engagement of the frangible portion edges of the tongue portion with the other edge portions is frictional.

21. A package according to claim 18, wherein the other edge portions of the package are frangible portion edges with which the tongue frangible portion edges are brought to engage, the frangible portion edges of the package having a shape which maintains the frangible portion edges of the tongue portion in the said second disposition.

22. A package according to claim 21, wherein the package is provided with two microwave active material sheet portions internally thereof, one of which is provided underneath the food product, and the second being provided substantially above the food product and on the particular surface which is brought into contact with the food product as a result of the fracture of the frangible portions.

23. A package according to any of claims 17 to 22, wherein the package is such that after the frangible portions have been brought to engage with the other portions of the package, the food product is trapped between and in contact with microwave active material portions of the package above and below the said product.

24. A package according to claim 23, wherein further frangible portions are provided on the package which on fracture permit access to the product as trapped between the two microwave active material portions and allow same to slide therefrom onto, for example, a plate.

25. A package according to claim 24, wherein the further frangible portions are provided proximate one end of the package and which, on fracture preferably effected by rotation of the said end of the package relative to the remainder thereof, permit access to the contents of the package at the said end.

26. A package according to any of claims 17 to 25, wherein the frangible portions are lines of perforations which are dog-toothed or of "concora" profile.

27. A sheet material package containing or adapted to contain a foodstuff to be cooked by microwaves whilst in the package, substantially as any of the embodiments hereinbefore described by way of example with reference to the accompanying drawings.

28. A one piece blank of cut and creased sheet material erectable into a package according to at least one of the preceding claims.

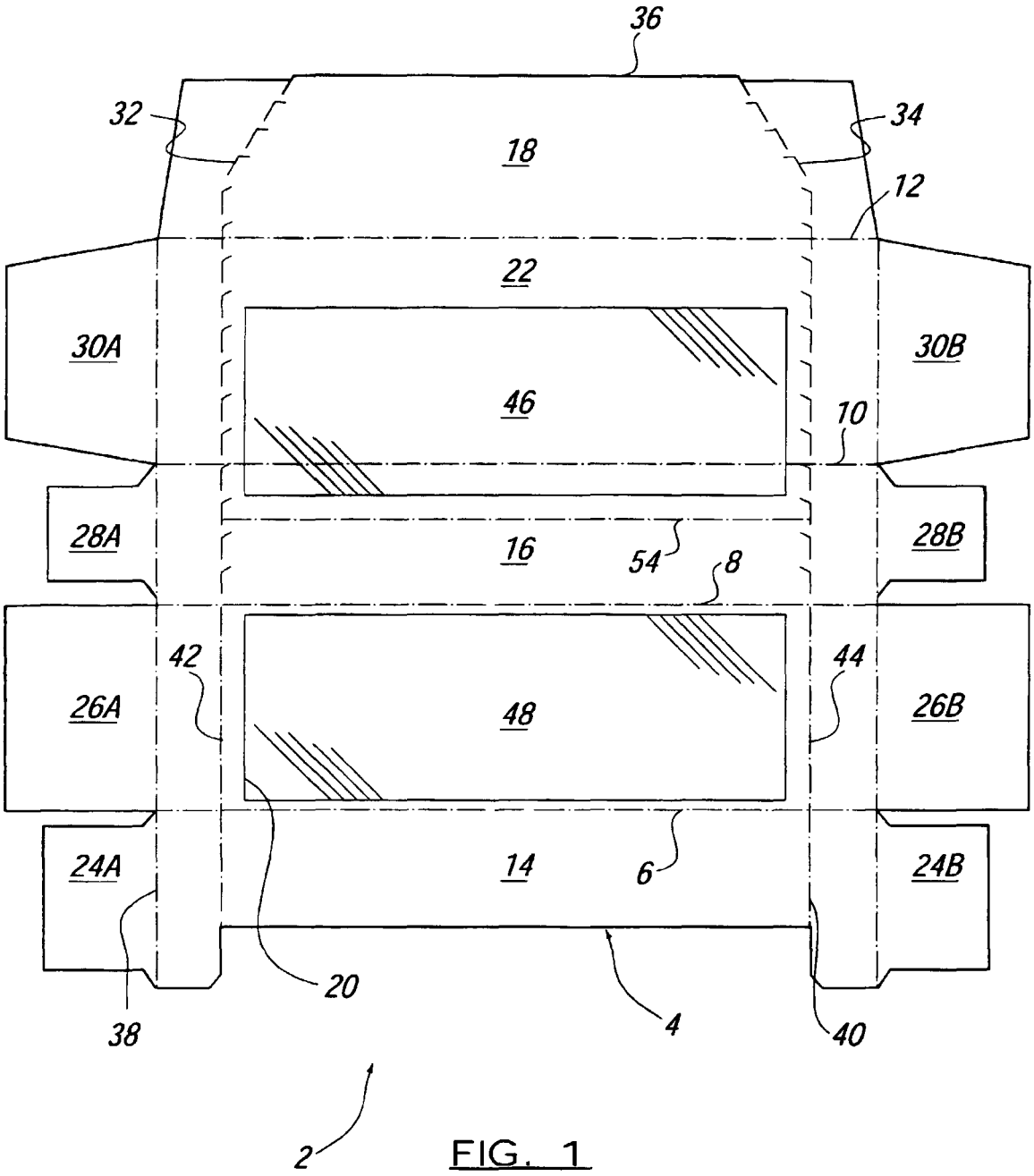
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FIG. 1

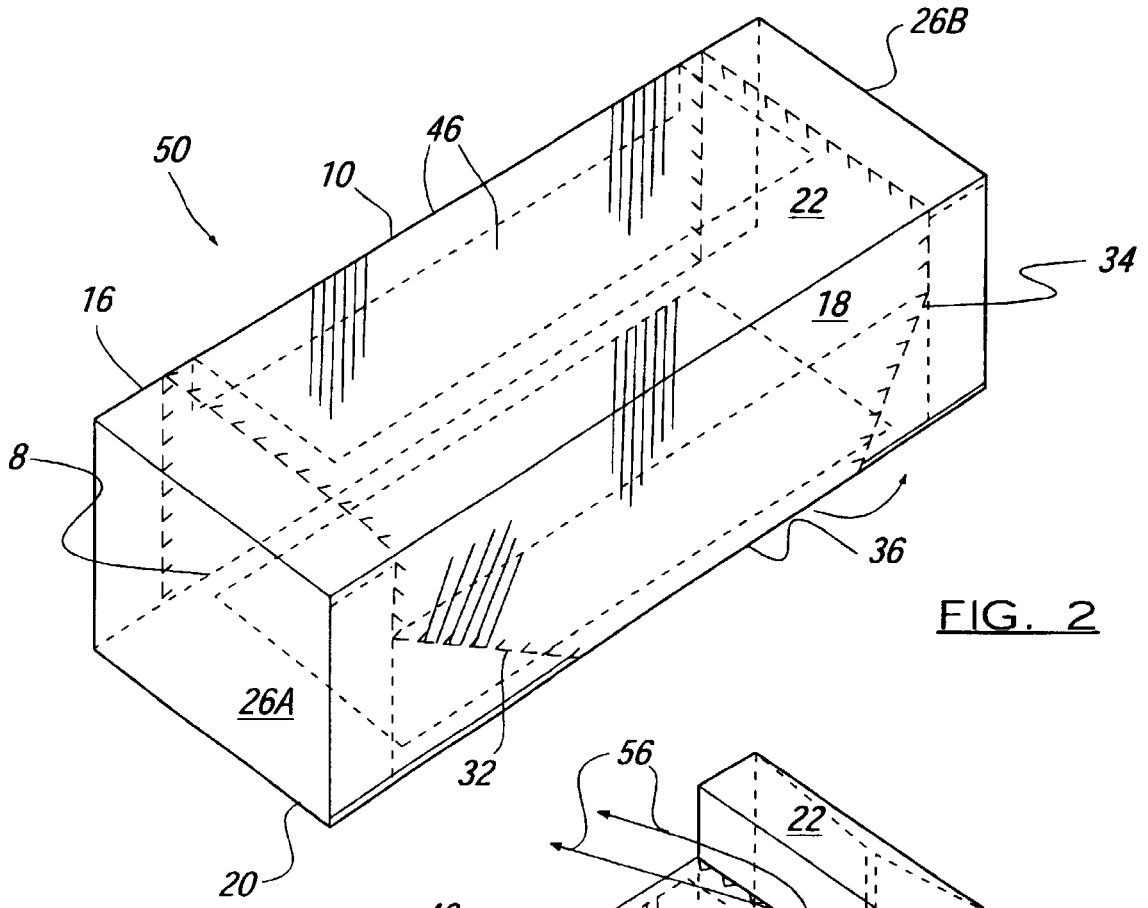
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FIG. 2

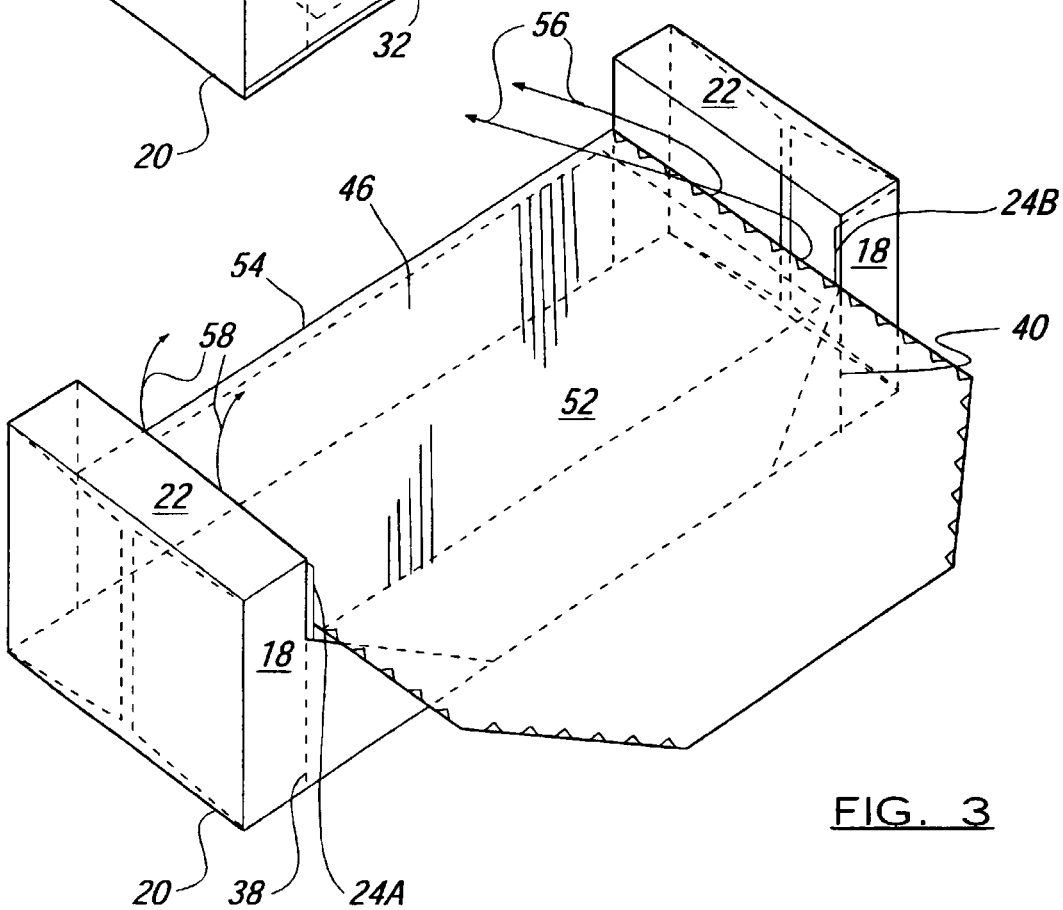
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FIG. 3

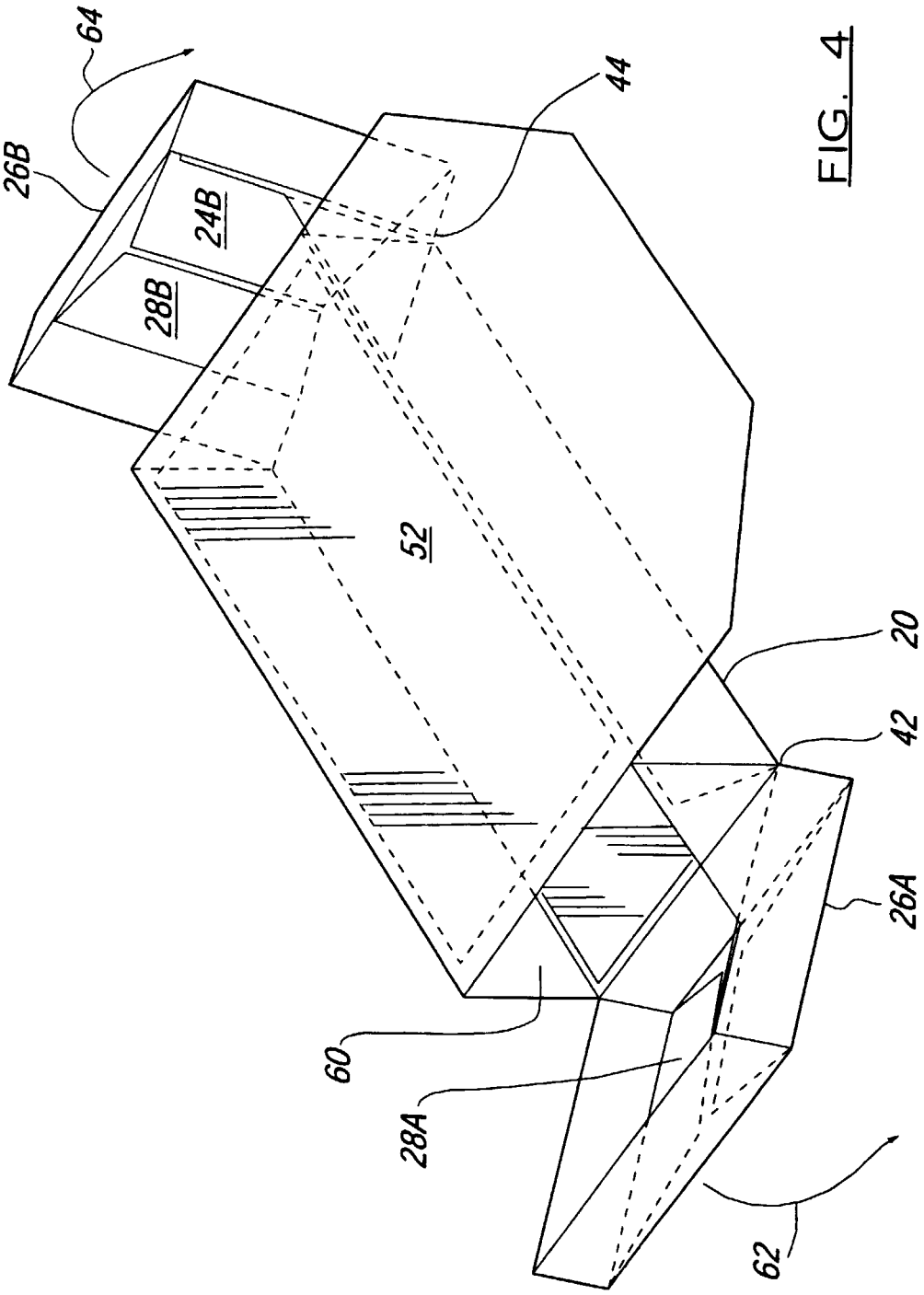

FIG. 4

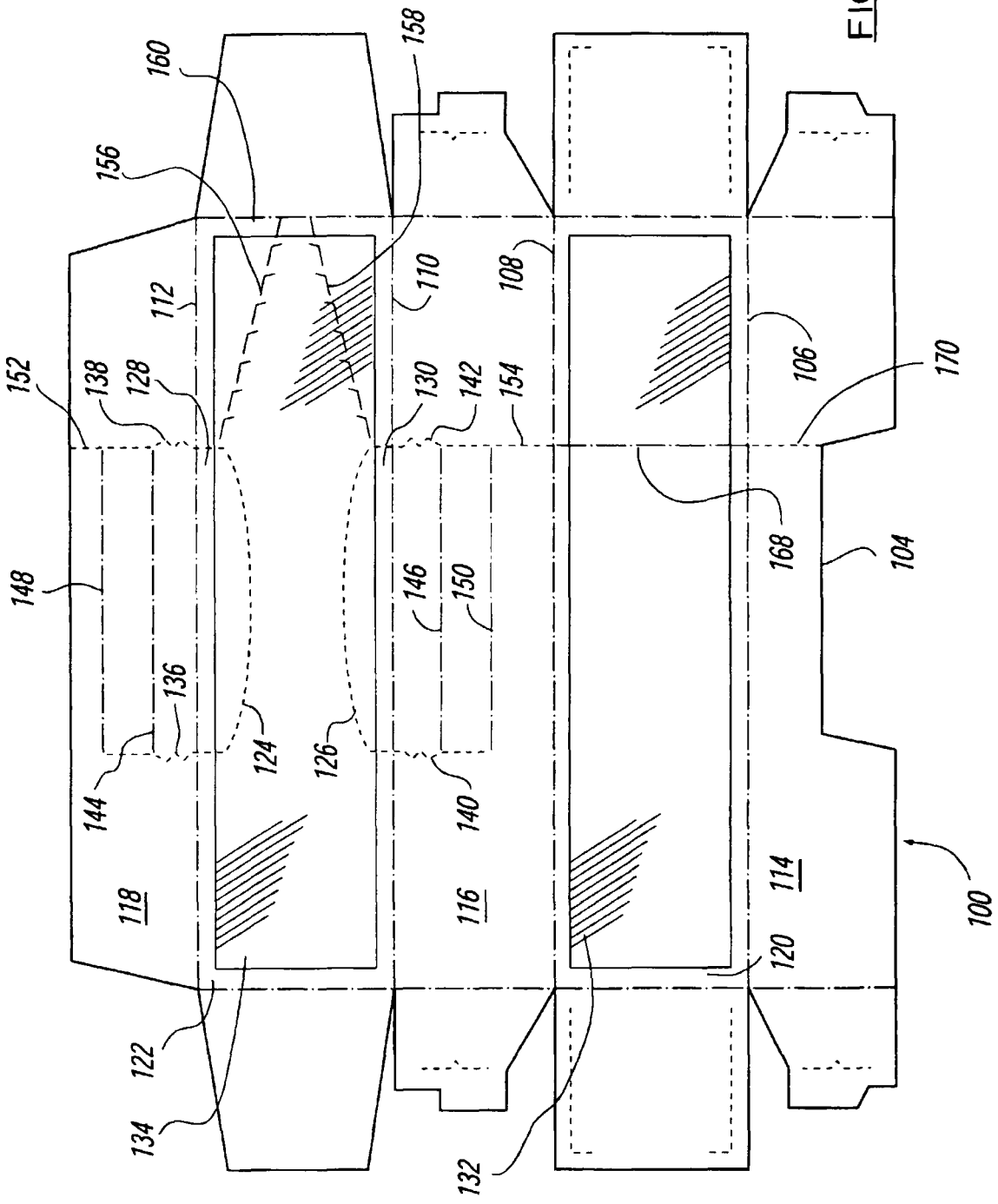
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FIG. 5

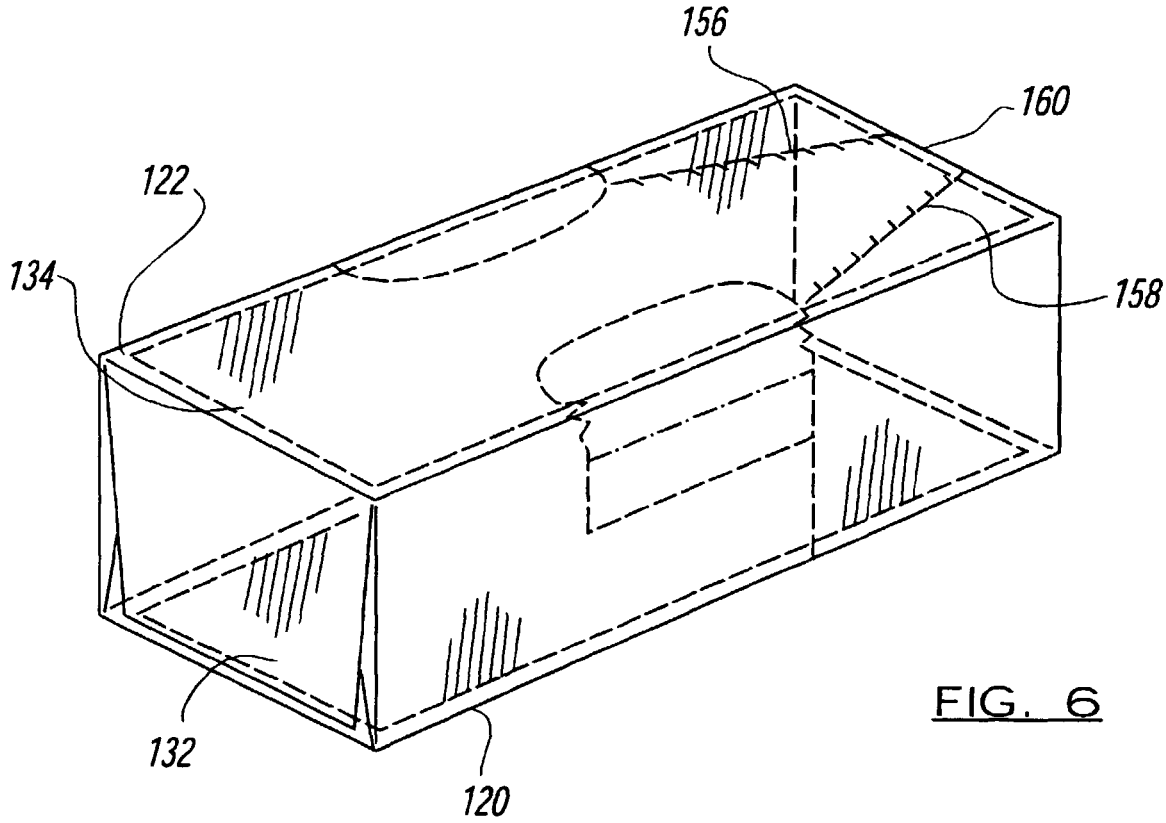
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FIG. 6

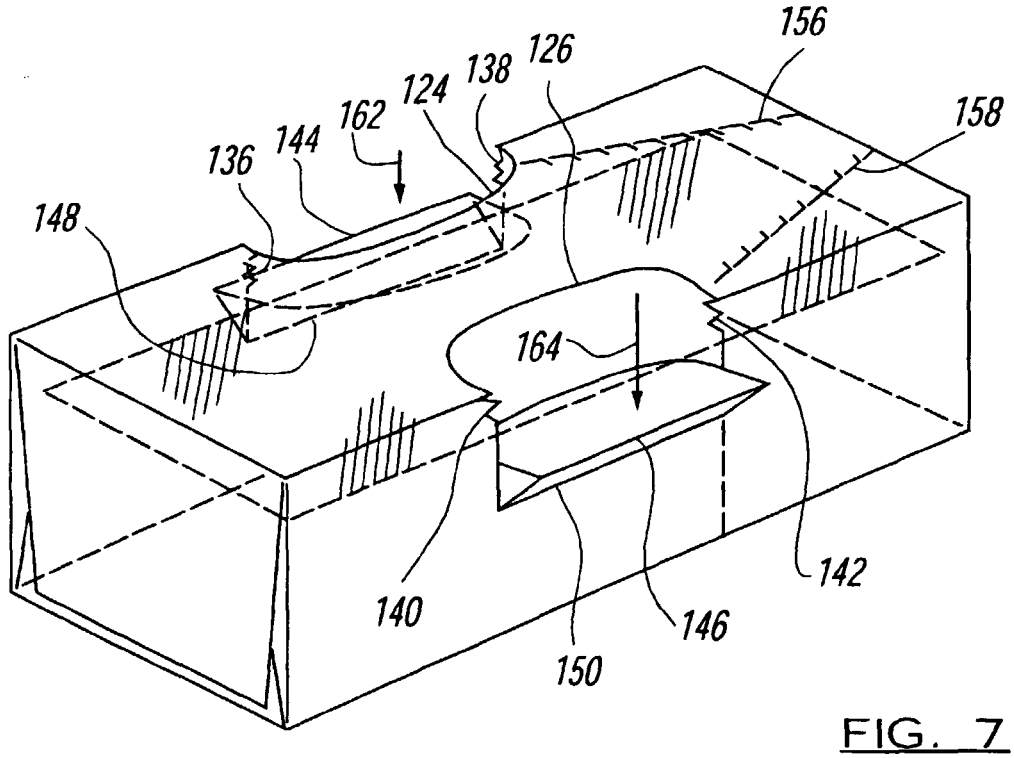
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FIG. 7

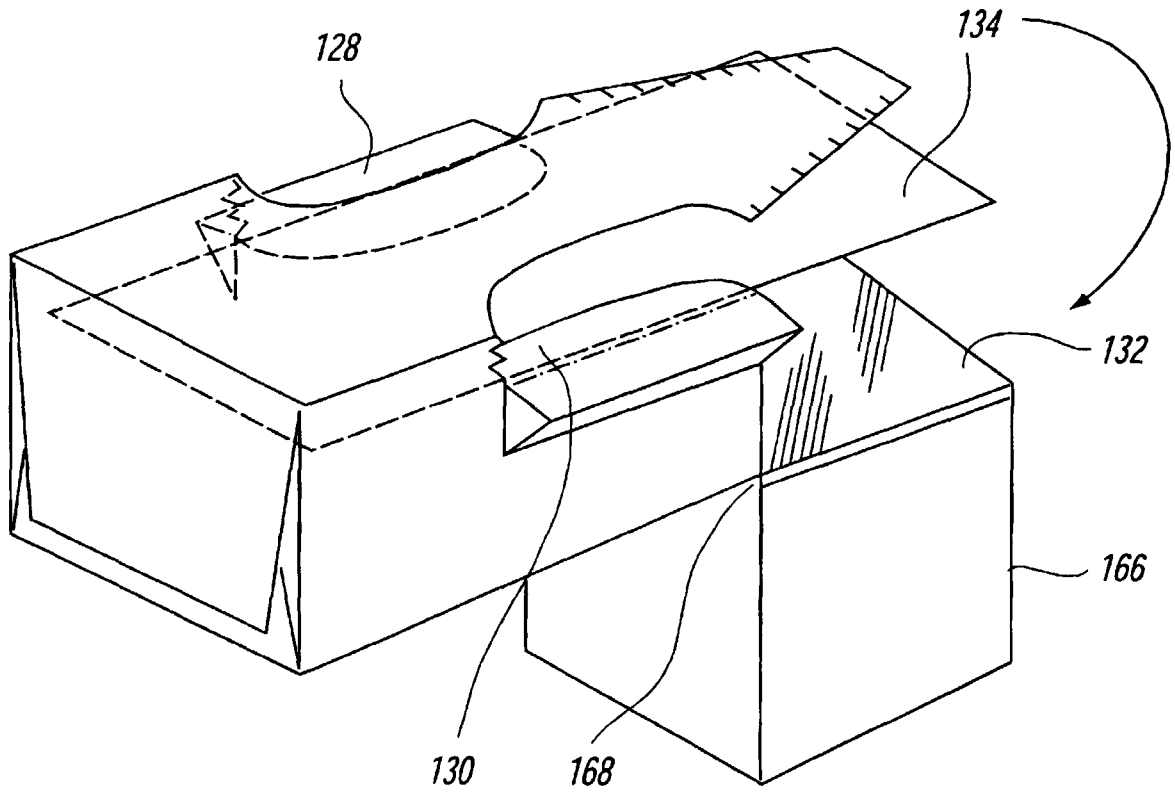

FIG. 8

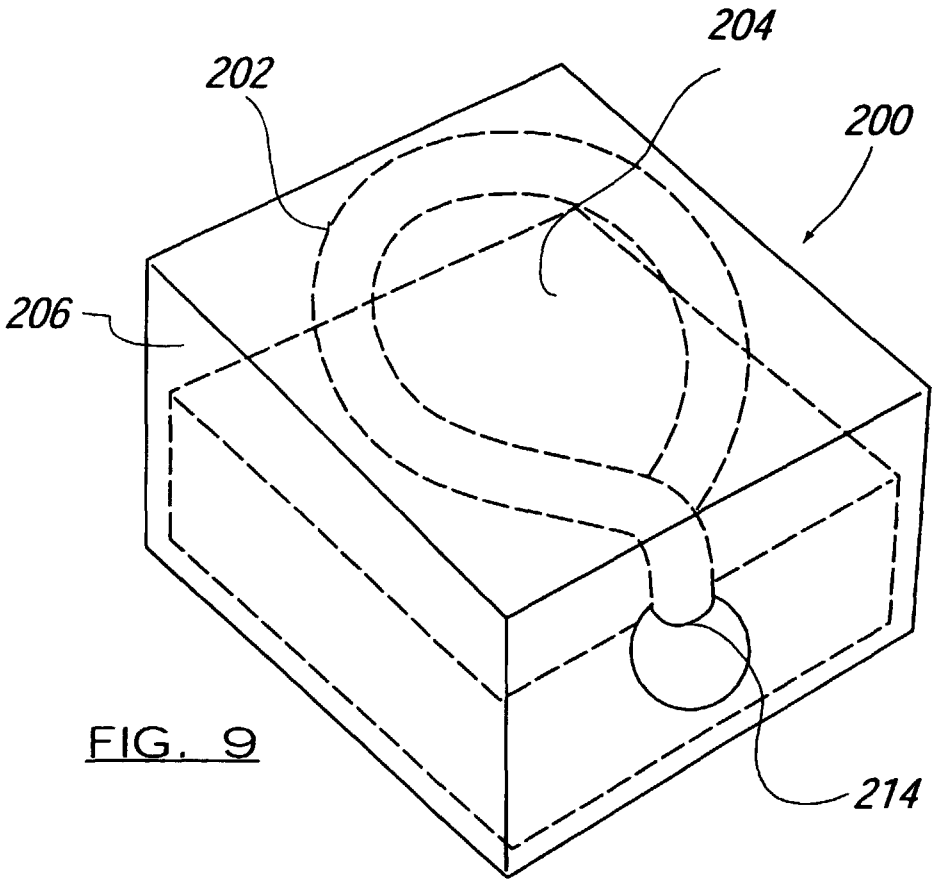

FIG. 9

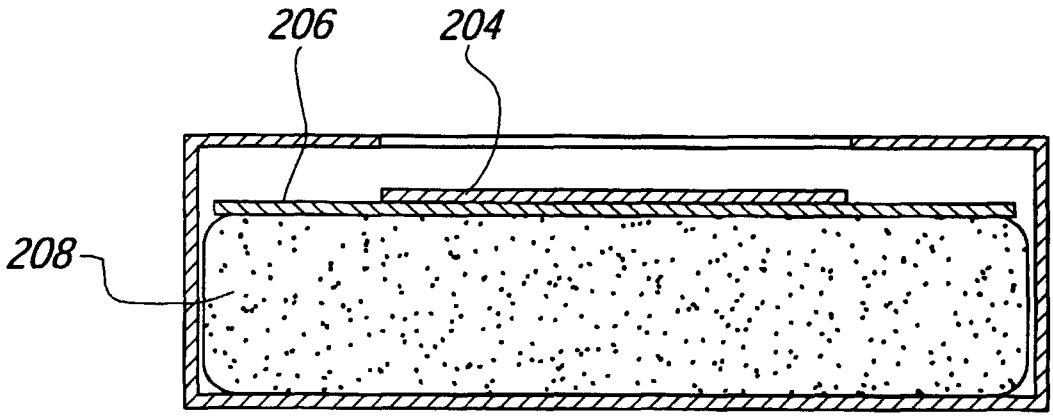

FIG. 10

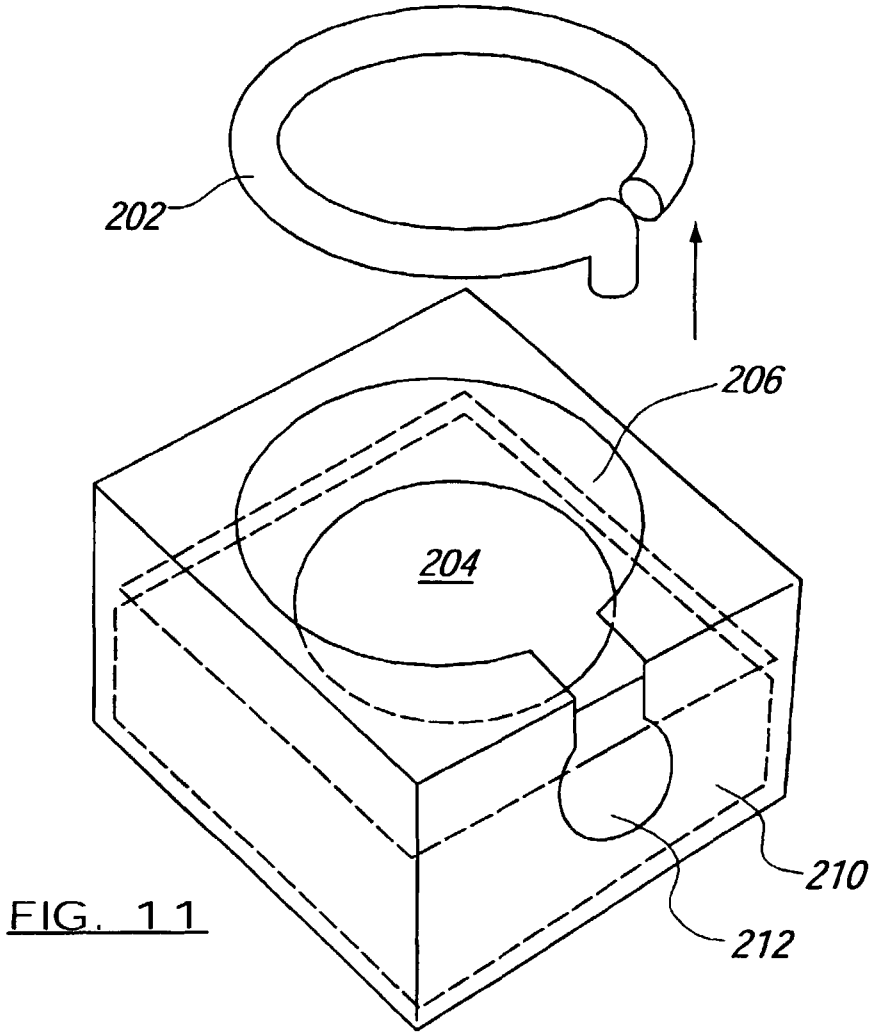

FIG. 11

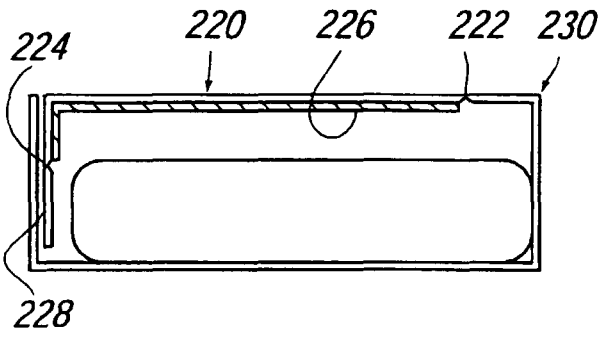

FIG. 12

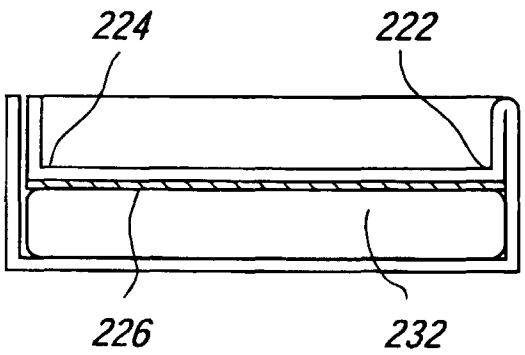

FIG. 13

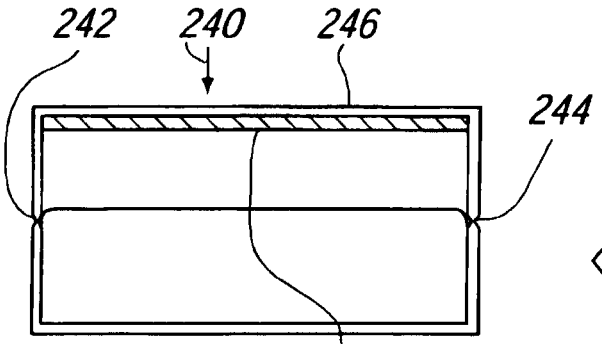

FIG. 14

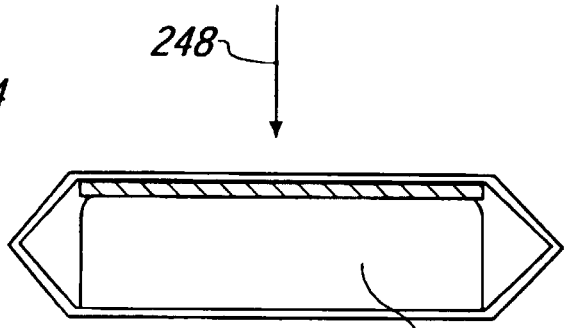

FIG. 15

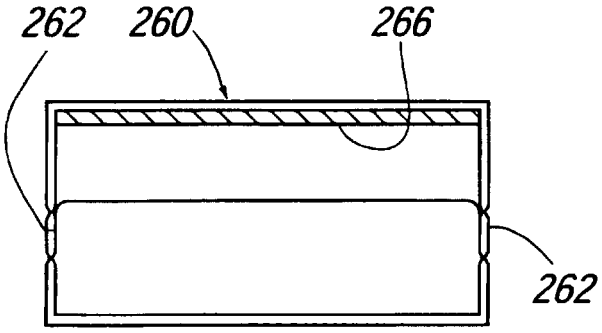

FIG. 16

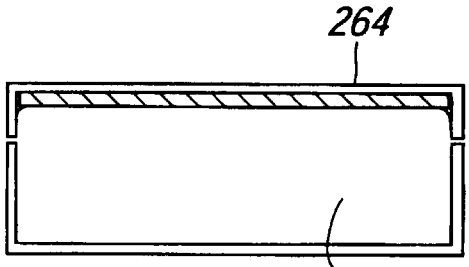

FIG. 17

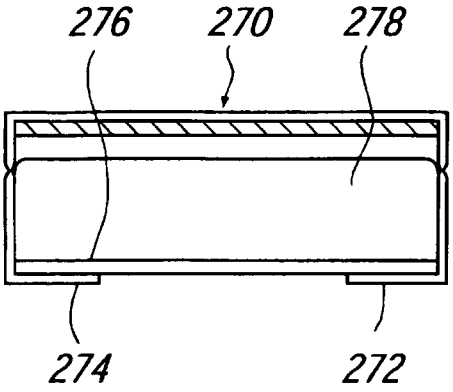

FIG. 18

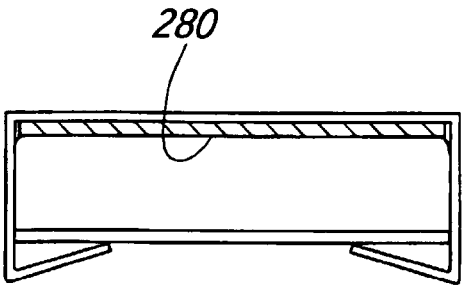

FIG. 19