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(54) **A container for food**

(57) A container for food having sides (4) and a bottom (3) facing a space within which food is to be contained, the composite material having an inner and outer side, the inner side facing the space being lined with a susceptor film (36, 38), the susceptor film being formed

from a flexible base material having a metallised coating (36), in which the susceptor film is backed with a heat insulating material (24) having voids (32) therein, the susceptor film and insulating material forming the composite material being pressed together with a desired moulded form.

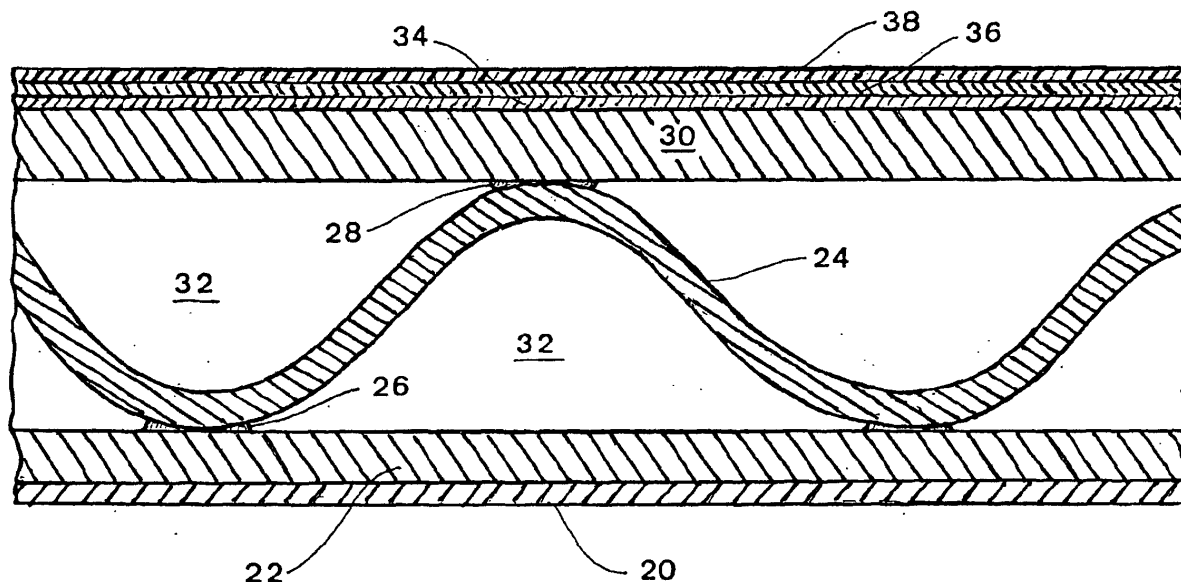


FIG. 5

Description

[0001] The present invention relates to a container for food such as may be heated or reheated in a microwave or conventional oven and a method of making such a container.

[0002] Food containers made of heat and pressure formed cardboard are commonly used as primary packaging by food manufacturers for various food products which may be frozen or chilled. For consumption, the food product is heated or reheated in a microwave or conventional oven. With products such as "French Bread Pizza", defrosting and/or reheating in a microwave oven is unsatisfactory if the product is wrapped in conventional packaging because insufficient local heat is generated to prevent the product sweating or becoming soggy.

[0003] It is an object of the invention to produce an improved food container, which will result in better treatment of the contained food when heated or reheated, and to reduce sogginess.

[0004] A container for food according to the present invention has sides and a bottom facing a space within which food is to be contained, the composite material having an inner and outer side, the inner side facing a space within which food is to be contained, the inner side facing the space being lined with a susceptor film, the susceptor film being formed from flexible base material having a metallised coating, wherein the susceptor film is backed with a heat-insulating material having air voids therein, the susceptor film and insulating material being pressed together into a desired moulded form.

[0005] When inserted in a microwave oven, the susceptor film applied to the shaped inner surface in or nearly in contact with the food concentrates the heat generated by the microwaves onto the food so that high local temperatures are generated. This evaporates surplus moisture to generate a crisp product. When removed from the oven, the insulating material enables the consumer to handle the container to eat the food from the container. Furthermore, especially where the container is shaped to the food product, the container assists in the product retaining its heat. The insulating material when moulded assists in keeping the shape of the container and hence mechanically protects the food product. Furthermore, the shaping of the container to the food product ensures the susceptor film is maintained in the correct proximity to the food product whilst being microwaved, thus ensuring the best microwave performance.

[0006] Preferably, the heat insulating material is formed from a fine corrugated board such as microflute cardboard material where the flute height is no greater than 1.3mm and preferably about 0.65mm and before moulding is a total thickness of no greater than 1.5mm and preferably approximately 1.15mm. After moulding to the desired form, the thickness is reduced to about 1mm. The microwave performance using microflute

backed with susceptor film moulded to shape results in a cooking time from frozen of 3 minutes as distinct from a cooking time from frozen in a conventional preheated oven of 15 minutes.

[0007] According to another aspect of the invention, there is provided a method of forming a container for food comprising applying a susceptor film formed from flexible base material having a metallised coating to a heat insulating material having air spaces therein and moulding the film and insulating material together into a desired form.

[0008] An embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1 is a plan view of a pre-creased blank for a container of combined susceptor film and insulant before moulding according to the invention,

Figures 2 to 4 are respectively a plan, side elevation and end elevation of a container according to the invention formed from the pre-creased blank of Figure 1, and

Figure 5 is an enlarged cross-sectional view of the combined material used for the blank of Figure 1.

[0009] A container for "French Bread Pizzas" is shown generally in Figures 2 to 4 at 1. The container is boat shaped to conform closely to the traditionally shaped "French Bread Pizza" shown in broken lines in Figure 3 at 2. The container has a flat bottom 3 extending to curved upwardly extending sides 4 which terminate in a flange 5 onto which is stuck or otherwise secured a closure element such as a flat printed heat seal board lid (not shown, for clarity's sake). One end 6 is bluntly pointed and this end may if required be separable from the rest of the container by tearing end 6 away along perforated tear line 7. This makes eating the food product 2 easier and cleaner, particularly when the product, as is intended, is heated.

[0010] The container is first formed from a plain sheet of a composite material, which will be described with reference to Figure 5. The blank is subjected to heavy creases 10 and lighter creases 12 as it is cut out of the sheet to produce blank 9 as shown in Figure 1.

[0011] The composite material for blank 9 is shown in Figure 5. This is formed from 180gm/m² "chip" (paper) 22 with white clay coating 20 suitably printed and varnished. Stuck to the white lined chip by means of starch based adhesive 26 is corrugated 105gm/m² waste based (i.e. recycled paper) microfluting 24 of a 560 flutes/metre grade. Stuck to the microfluting at 28 using a starch based adhesive is a further paper layer 30 somewhat thicker than layer 22 to which is bonded by adhesive 34 a polyester film 38 having a vacuum metallised aluminium coating 36. Voids 32 are left between layers 22 and 30 between the fluting. Film 38 is on the

inside of the container whilst layer 20 is on the outside. Film 38 with its coating 36 is herein referred to as "susceptor film". The composite material (20-38) used in this embodiment is about 1.15 to 1.35mm thick and after moulding about 1mm thick. The fluting should not be less than about 280 flutes/metre. In particular, the flanged area 5, the voids 32 must be able to vent outwardly through layers 24, 22 and 20. This is achieved by perforating the external surface of the container either locally on flange 5 or randomly throughout the blank. The perforations should not extend through the inner layers 30 to 38.

[0012] To form the container, the composite material blank 9 is placed in a suitably shaped mould at a temperature of 100-180°C and preferably 120-140°C and a pressure of 4-6 tonnes applied.

[0013] As the pressure applies, the creases on the pre-creased corners collapse on each other and with local collapsing of the corrugated material, the material binds together and the material then sets to provide a rigid tray "shell".

[0014] Although microflute material is known per se, it is not believed to have been used with susceptor film in a moulded form. The moulding technique when applied to the composite material is unexpectedly strong and when the container so formed is used for a product like a French Bread Pizza having hot cheese and so on, it is easy to remove from an oven due to the rigidity of the corrugated construction. Furthermore, before heating, the composite material, because it is a good insulant, enables frozen products to keep cool between shop and home.

[0015] Whilst the insulating material is formed from microfluting 24, it is probable that pulped fibre could be used or alternatively an expanded plastics material.

[0016] The reason for perforating the container is that it has been found that the highly compressed flanges 5 of the container create a hermetic seal within the walls of the body corrugations. Any residual moisture within these corrugations may expand under heating and cause delamination of the material structure which in turn creates a 'ballooning' effect within the wall layers, deforming the tray. This can seriously affect product performance.

moulded form.

2. A method of forming a container for food comprising applying a susceptor film formed from flexible base material having a metallised coating to a heat insulating material having voids therein and moulding the film and insulating material together into a desired form.
3. A container or method according to claim 1 or 2 wherein the insulating material is formed from a fine corrugated board.
4. A container or method according to claim 3 wherein the corrugated board has a flute height of no greater than 1.3mm.
5. A container or method according to claim 3 or 4 wherein fluting of the corrugated board is not less than 280 flutes/metre and preferably about 560 flutes/metre.

Claims

1. A container for food having sides and a bottom facing a space within which food is to be contained, the composite material having an inner and outer side, the inner side facing the space being lined with a susceptor film, the susceptor film being formed from a flexible base material having a metallised coating, wherein the susceptor film is backed with a heat insulating material having voids therein, the susceptor film and insulating material forming the composite material being pressed together with a desired

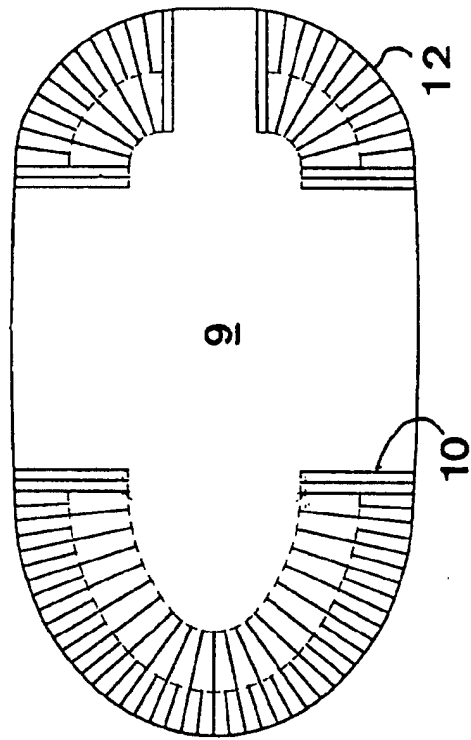


FIG. 1

FIG. 4

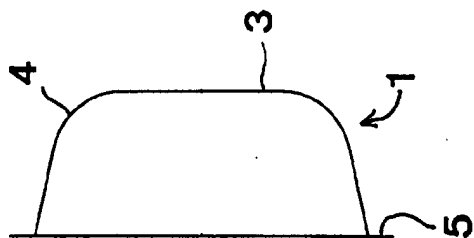


FIG. 2

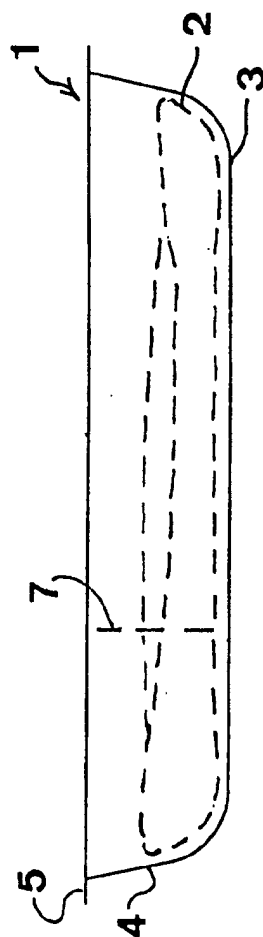
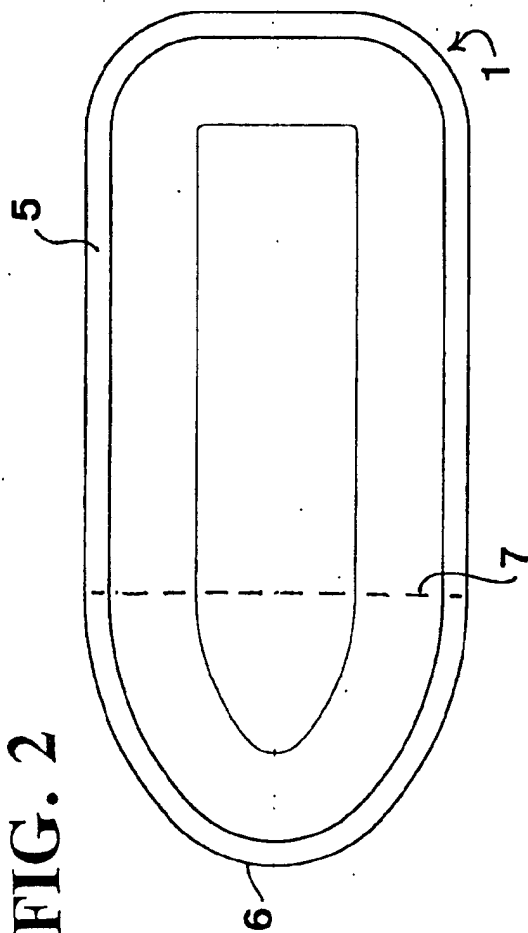


FIG. 3

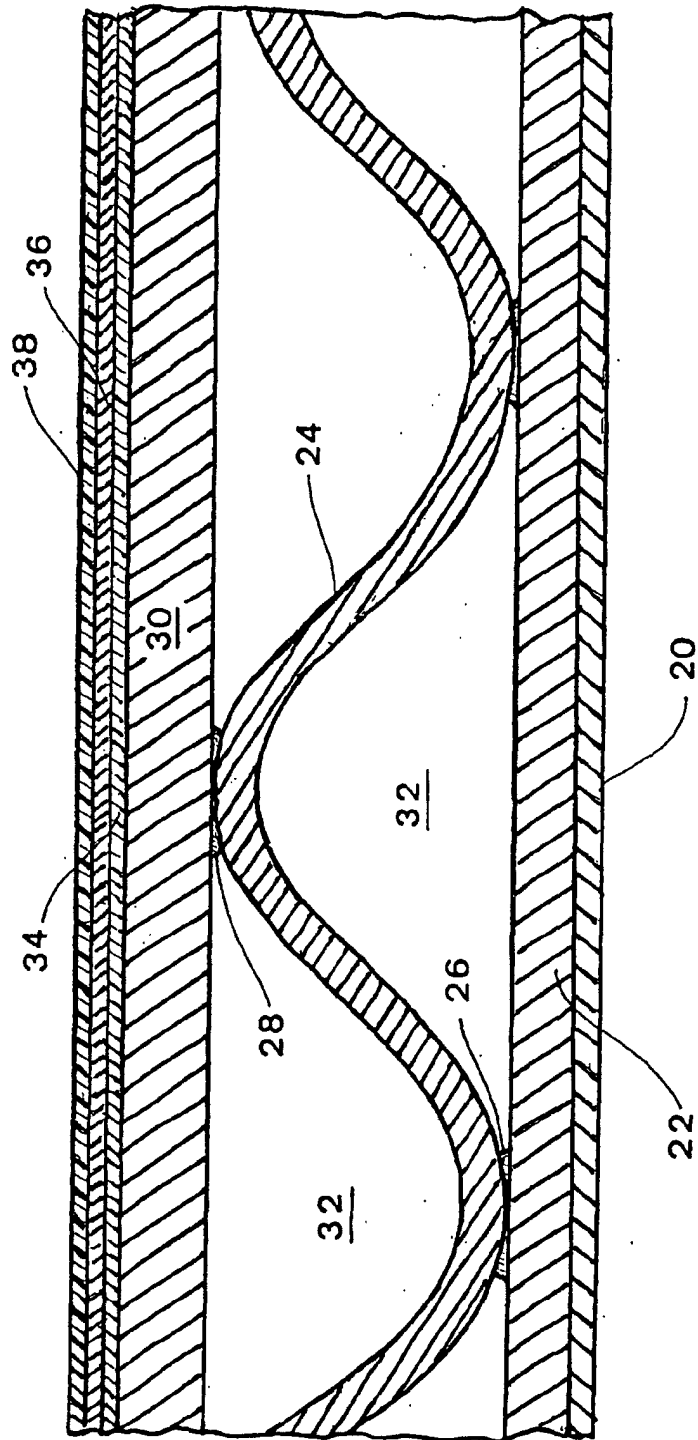


FIG. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 7904

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D
Place of search BERLIN		Date of completion of the search 8 January 2002	Examiner Spettel, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 01 30 7904

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