US 20060278556A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2006/0278556 A1**

Niranjan et al. (43) **Pub. Date: Dec. 14, 2006**

(54) **FOOD PACKAGING**

(76) Inventors: **Keshavan Niranjan**, Reading (GB); **Eric Duncan**, Worcester (GB); **Jonathan Staley**, Hampshire (GB)

Correspondence Address:
ERNEST D. BUFF
ERNEST D. BUFF AND ASSOCIATES, LLC.
231 SOMERVILLE ROAD
BEDMINSTER, NJ 07921 (US)

(21) Appl. No.: **11/446,739**

(22) Filed: **Jun. 5, 2006**

(30) **Foreign Application Priority Data**

Dec. 3, 2004 (WO) PCT/GB04/05107
Dec. 6, 2003 (GB) ..... GB 0328332.2

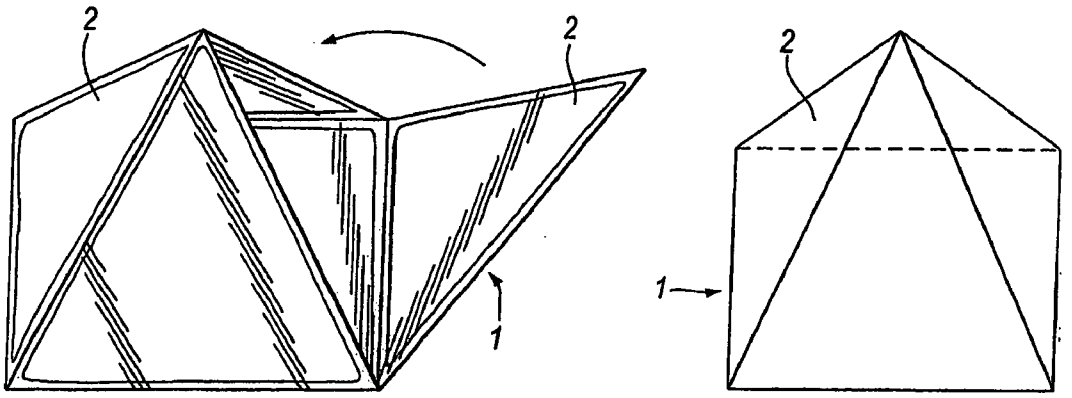
Publication Classification

(51) **Int. Cl.**
B65D 85/00 (2006.01)
B65D 65/00 (2006.01)

(52) **U.S. Cl.** **206/525**; 206/531; 206/497

(57) **ABSTRACT**

A multi-compartment unitary packaging is used for a variety of foodstuffs. The packaging includes two or more conjoined compartments. Each of the compartments is provided with or constituted by a containment having a gas permeability matching the individual respiration rate of the foodstuff(s) to be held within that compartment.



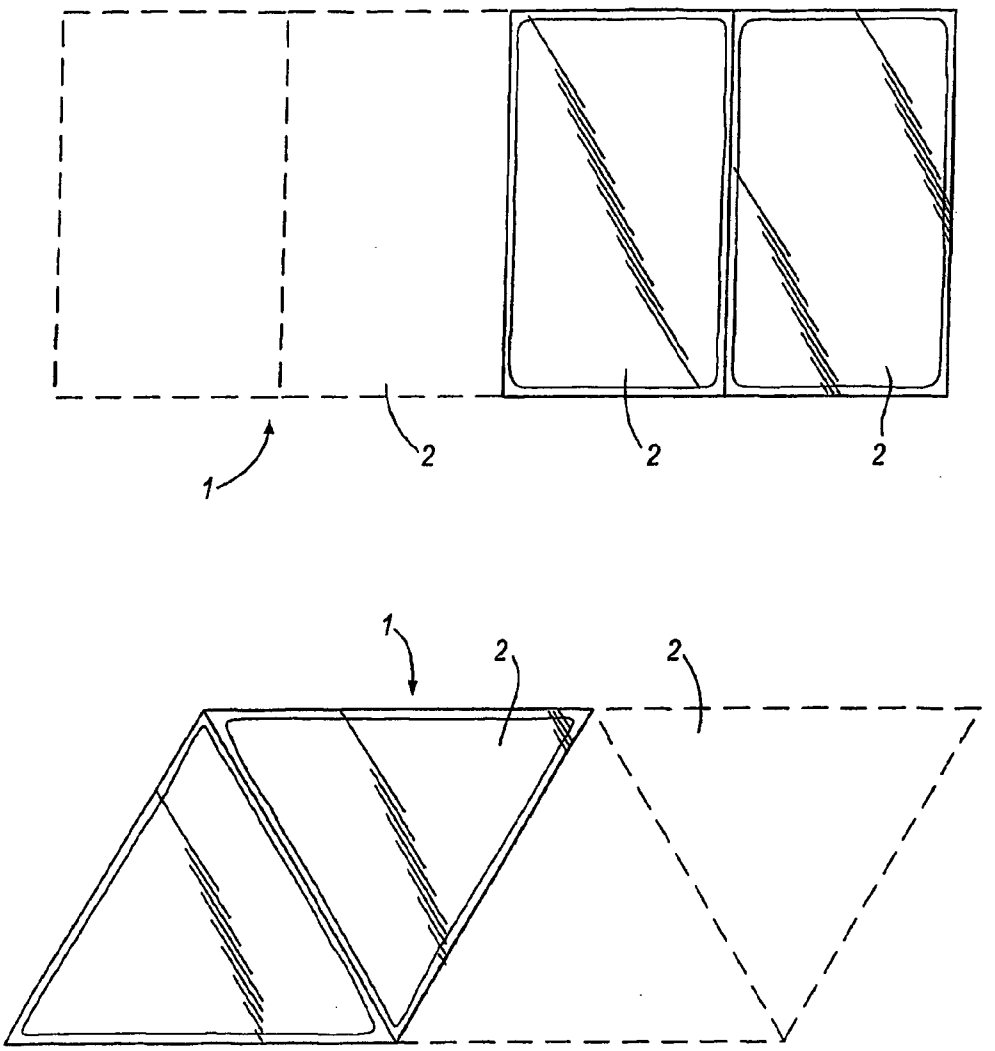


Fig.2

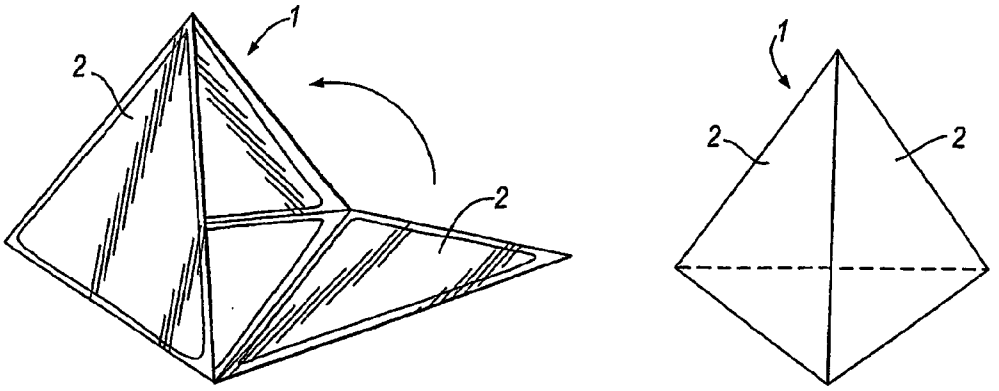


Fig.3

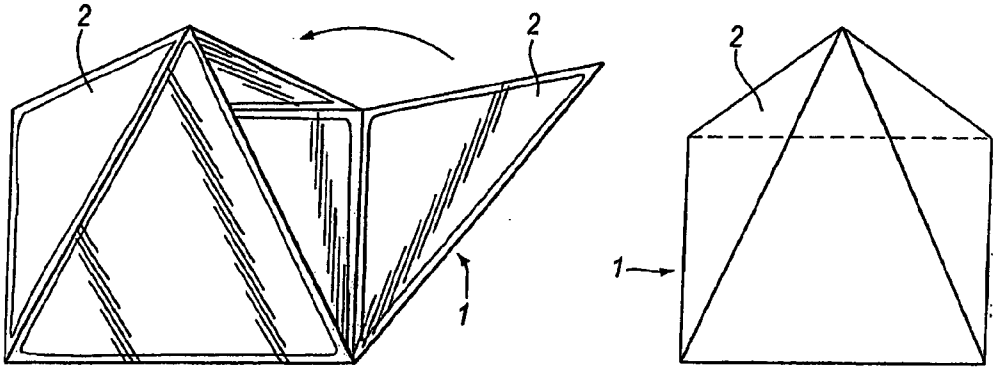


Fig.4

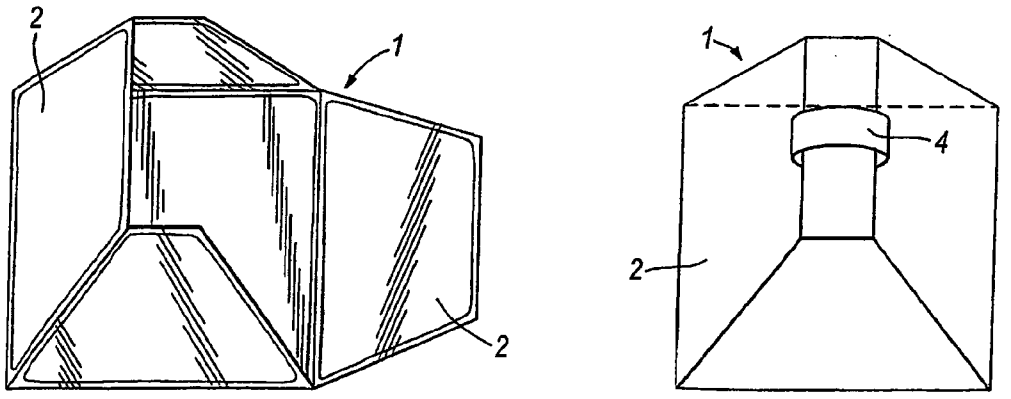


Fig.5

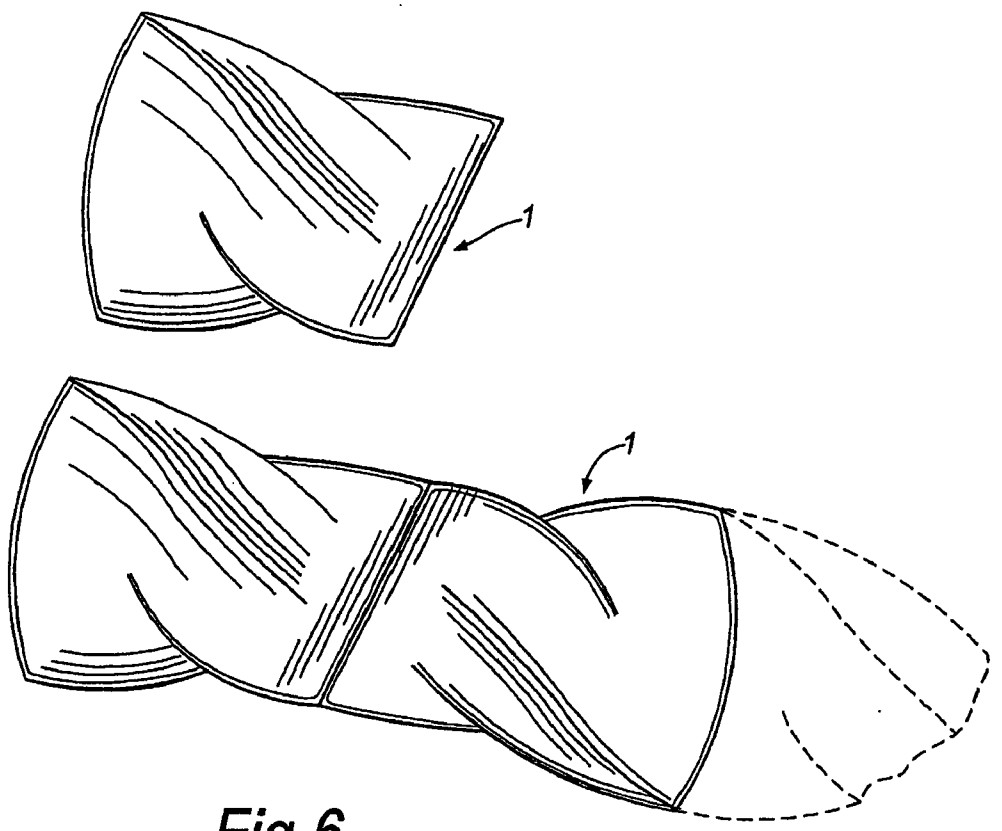


Fig.6

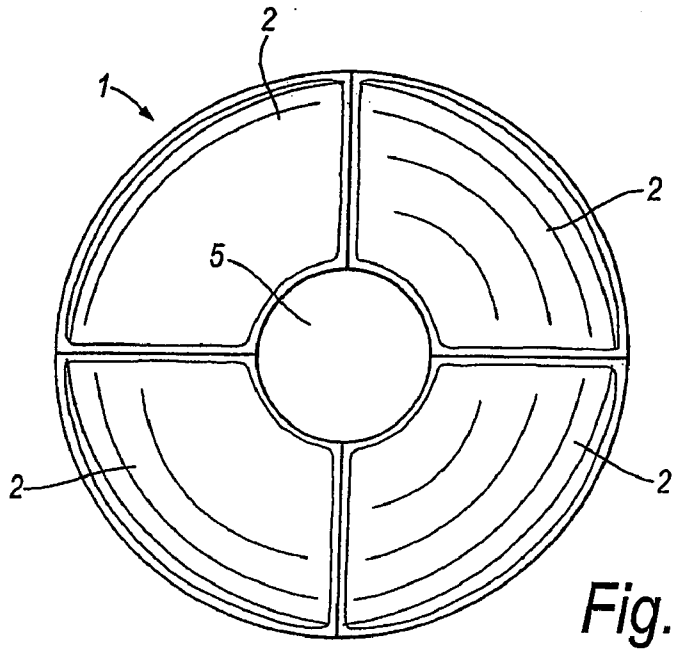


Fig.7

FOOD PACKAGING

RELATED APPLICATION DATA

[0001] This application corresponds to International (PCT) Patent Application No. PCT/GB2004/005107, filed Dec. 3, 2004, which published as WO 2005/056426 on Jun. 23, 2005; claims priority from GB Patent Application No. 0328332.2, filed Dec. 6, 2003, which is incorporated herein in its entirety by reference thereto.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention concerns improvements in or relating to food packaging and more particularly, but not exclusively, to packaging for foodstuffs with a defined but relatively short shelf life, for example perishable foods such as vegetables and fruit.

[0004] 2. Description of the Prior Art

[0005] It is common practice in the modern retailing of these types of foodstuffs to use packaging in order to preserve the freshness and quality of the produce and to impose a measure of hygiene in an environment in which handling of the produce is customary. It is well known that differing vegetables and fruits possess different respiration rates and accordingly their rate of deterioration or preservability differs to the extent that their enclosure in a unitary pack fails to accommodate their inherent attributes. The consequence is that one type of packaging is not universally acceptable for the maintenance of quality and the enhancement of shelf life. Much attention has been paid to the creation of packaging materials that address the need for providing films or other enclosures which afford flexibility in terms of catering for the different respiration rates mentioned above. For example U.S. Pat. No. 4,996,071 to Bell is concerned with the ascertainment of the respiration rates of various vegetables and the matching of those rates with an appropriate packaging to achieve the desired effect for the preservation of quality, appearance and marketability of the produce. U.S. Pat. No. 6,013,293 to De Moor discloses a packaging member including a gas permeable membrane having a defined oxygen respirability and a container enclosing the member within which in practice fruit or other respiring biological materials are packed.

[0006] The globalization of supply sources demands a new approach to packaging for the transportation and distribution of perishable foodstuffs in a way that preserves quality and freshness with a reasonable shelf life span. There is a veritable plethora of patents directed to all manner of controlled atmosphere packaging and the materials used therefor but none of them relates to the solution of the problem of accommodating the varying respiration rates of perishable foodstuffs whilst offering to the customer the versatility of produce normally on sale and to be used together when consumed.

[0007] It is also known to provide multi-compartment packaging in the presentation of ready to eat meals, for example in aircraft catering, but such packaging usually has common headspace. Furthermore there is also known the "eat-me/keep me" multi-packs but they are focused on providing the same produce but in separate compartments so that they can be used sequentially. It is an object of the present invention to provide a packaging for foodstuffs that provides a solution to the problem outlined above.

SUMMARY OF THE INVENTION

[0008] According to the invention there is provided a multi-compartment unitary packaging for a variety of foodstuffs, including two or more conjoined compartments, each compartment being provided with or constituted by a containment having a gas permeability matching the individual respiration rate of the foodstuff(s) to be held within that compartment. Each compartment when constituted by the containment may comprise a film in the form of a bag which conveniently is integral with the other compartments of the packaging. Each compartment may in practice be formed separately from the other compartment or compartments and then conjoined therewith to provide the multi-compartment packaging of the invention. In the alternative, the multi-compartment packaging may be produced unitarily with each compartment being separate but conjoined. In some embodiments of the invention the compartments are communicable one with the other through the agency of a common barrier whereby the permeation of gases from one compartment to another assists in the preservation of the foodstuffs in the recipient compartment.

[0009] The compartments may be separable one from the other and it is to be understood that the term "multi-compartment" as used herein embraces packaging with two or more compartments. The packaging may be manufactured from currently available conventional materials used for the packaging of perishable foodstuffs and these materials may be gas and/or vapor-permeable as required according to the specific foodstuffs in question.

[0010] The present invention also provides for the formation of the packaging into differing geometric shapes and accordingly the structure thereof is governed thereby. For example, the multi-compartment packaging may be made in such form as in the finished article to present a pyramidal shape with each triangular face and the base thereof providing a compartment for a foodstuff or a variety of foodstuffs. Alternative geometric shapes could be adopted, for example a circular form providing a multiplicity of compartments in sectoral fashion. Further alternative shapes may be rectilinear or curvilinear. In all cases the functional aspect of providing a plurality of compartments for differing foodstuffs is achieved together with the aestheticizing of the packaging to make it more attractive to the consumer rather than just a plain bag.

[0011] As indicated supra the compartments may be sealed one from the other or may be in communication through a common harrier therebetween under controlled conditions dependent upon the foodstuffs to be packaged. Accordingly the shape and therefore the appearance of the packaging will depend in some measure upon the desired functionality.

[0012] The packaging of the present invention may include rigid or semi-rigid elements and thus for example each compartment may comprise a base formed of such an element or elements amid may be of unitary construction or may be formed of two or more elements conjoined in suitable manner one to the other or others. The containment may be in the form of at least one film covering or closure. In the case of a single containment the film would seal all the compartments one from the other or others along common

boundaries. In the alternative a number of containments would be provided separately to cover the individual compartments sealing the same. This seal not only prevents mixing of the foodstuffs as between one compartment and another but also isolates the headspaces one from the other. The base may be formed of a material that allows permeation of gases or vapors from one compartment to an adjacent compartment, or it may be non-permeable. In a further alternative a combination of non-permeable and permeable materials may be employed as dictated by the foodstuffs to be included therein.

[0013] The term foodstuffs is intended to embrace all edible produce such as for example vegetables, including salad components, and fruit together with suitable dressings therefor. In this latter respect it is expected that for some applications of the present invention it will be necessary or desirable to provide in at least one of the compartments of the packaging a dressing or other condiment or sweetener or the like to embellish the flavor of the produce concerned, it is also to be understood that the term 'edible produce' will encompass foodstuffs other that of the green-grocery kind: for example it is envisaged that meat may he included as a foodstuff for which the packaging of the present invention may he suitable. In this instance, the packaging of the invention comprising a multiplicity of compartments may be used for the presentation of complete meals of differing courses, each one requiring different preservation conditions and thus differing containments. For example, cooked meats or boiled eggs are non-respiring and accordingly may be suitably gas-flushed within their respective compartments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] By way of example only, seven embodiments of multi-compartment packaging according to the invention are described below with reference to the accompanying schematic drawings in which:

[0015] **FIG. 1** shows a first embodiment;

[0016] **FIG. 2** shows a second embodiment;

[0017] **FIG. 3** shows a third embodiment;

[0018] **FIG. 4** shows a fourth embodiment;

[0019] **FIG. 5** shows a fifth embodiment;

[0020] **FIG. 6** shows a sixth embodiment; and

[0021] **FIG. 7** shows a seventh embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[0022] In the drawings like parts have been accorded like numerals of reference throughout the description of the embodiments.

[0023] Referring to **FIG. 1** there is shown the first embodiment of multi-compartment packaging **1** comprising two or more compartments **2**, with possibly two further compartments shown in dotted outline. Each compartment **2** is a film in the form of a bag conjoined to the next in a suitable manner, for example heat or pressure welding. Each compartment is unique in terms of having its own permeability characteristics to cater for and match the respiration rate of the produce it is in practice intended to contain. In this and indeed all examples of the invention the bag is the containment which constitutes the compartment. This form of packaging may be used to encapsulate differing leaf salads which in practice deteriorate at differing respiration rates. The packaging is thus able to preserve the freshness of all the salad components because the compartments are respiration specific. Conventional packaging is defective since it does not address the poor cohabitation of different foodstuffs.

[0024] In **FIG. 2** the multi-compartment packaging **1** is of parallelogram form composed of four equilateral triangular compartments **2** connected to one or more adjacent compartments, each compartment **2** again being so formed of appropriately gas and/or vapor permeable material to accommodate foodstuffs of varying respiration rates.

[0025] **FIGS. 3 and 4** illustrate multi-compartment packaging **1** of pyramidal shape with either four or five compartments respectively. Again each compartment complies with the principal feature of the invention in being made of a material giving the required preservative features for the produce contained within it. The packaging is so formed geometrically that it can be configured as a pyramid to provide the aesthetic appearance for customer appeal, but with the functionality as indicated.

[0026] **FIG. 5** provides a multi-compartment packaging **1** so formed as to provide a multitude of compartments **2** but with the facility of a carrying feature, namely a handle or loop **4**. **FIG. 6** shows a tetrahedrally-shaped multi-compartment packaging **1** in the form of a bag which may be conjoined to an adjacent element as shown in the lower representation.

[0027] **FIG. 7** depicts multi-compartment packaging **1** of generally circular form with four sectoral compartments **2** arranged symmetrically about a core **5**, the compartments being connected one to the other to provide a unitary package.

[0028] The present invention provides individual atmospheric **15** conditions to cater for the individual foodstuffs thereby affording enhanced cohabitation when compared with contemporary approaches to this kind of packaging. The customization of the packaging of the present invention allows a miscellany of foodstuffs to be accommodated in but one pack with each different product enjoying an optimized climate in which to survive satisfactorily for its expected shelf life. This advantageous attribute is in sharp contrast to the conventional packaging which essentially forces one product to endure what may well be a relatively hostile environment in terms of deterioration of freshness and quality.

[0029] The added virtue of the present invention is that it uses conventional materials which, as indicated above, have been investigated thoroughly in terms of content and performance. It is to be understood that the present invention allows, as foreshadowed supra, the adoption of diverse presentational packaging which not only provides improved protection for the produce concerned, but also makes it more visually attractive.

[0030] The merit of the invention is thus twofold in these respects.

What is claimed is:

1. Multi-compartment unitary packaging for a variety of foodstuffs, including two or more conjoined compartments, each compartment being provided with or constituted by a containment having a gas permeability matching the individual respiration rate of the foodstuff(s) to be held within that compartment.

2. Packaging according to claim 1 in which each compartment is constituted by the containment and comprises a film of plastics material, the characteristics of the film being dependent upon the individual parameters to be established in the relevant department.

3. Packaging according to claim 1 in which each compartment is integral with one or more adjacent compartments.

4. Packaging according to claim 1 in which the compartments are formed separately and conjoined to provide the multiplicity of compartments.

5. Packaging according to claim 1 in which some or all of the adjacent compartments are

provided with a common barrier.

6. Packaging according to claim 5 in which the common barrier is gas/vapor permeable.

7. Packaging according to claim 1 in which the compartments are separable one from the other or others of them.

8. Packaging according to claim 1 in which the compartments are formed into geometric shapes.

9. Packaging according to claim 8 in which the geometric shape is rectilinear.

10. Packaging according to claim 8 in which the geometric shape is curvilinear.

11. Packaging according to claim 8 in which the geometric shape is circular, each compartment being of sectoral form.

12. Packaging according to claim 8 in which the geometric shape is pyramidal amid each face

of the pyramid is formed as a compartment.

13. Packaging according to claim 1 in which the one or more compartments may be produced

from rigid or semi-rigid material and the containment for each compartment or all compartments is a plastics film.

14. Packaging according to claim 1 in which each compartment and/or the containment are gas/vapor permeable.

15. Packaging according to claim 1 in which a carrying handle is provided.

* * * * *