Apparatus for transporting a substantially planar object comprises a pair of nestable plate-like members (1), each member having a raised flange (3) at its peripheral edge. The plate-like members are positionable such that the flanges of two adjacent plates inter-engage to thereby form an enclosure between the plate-like members.

**Title:** FOOD PACKAGING APPARATUS

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(54) Title: FOOD PACKAGING APPARATUS
FOOD PACKAGING APPARATUS

[001] The present invention relates to packaging and/or transportation apparatus.

[002] Particularly, but not exclusively, the present invention relates to a food packaging apparatus for use in the take-away food industry, for example to be assembled as a pizza box for containing a pizza while the pizza is delivered from a pizza shop to a customer's home or other intended destination.

[003] Containers for housing take-away food for transportation away from food establishments are well known.

[004] Pizza boxes, for example, are typically of cardboard material and initially flat-packed as a single unit "blank", having a shape that can be assembled to form a square box having a height of approximately twice the height of a pizza. Due to the assembly requirements, food establishments that specialise in take-away food generally assemble a large amount of boxes ready for an entire evening's trade. Disadvantages associated with this type of pizza box include the time and effort expended in assembling each flat-packed pizza box, the hygiene problems when so many bulky boxes have been assembled and are stacked up in the kitchen of a food establishment awaiting use, and also the amount of space required to store the assembled boxes.

[005] Various pizza boxes have been disclosed aiming to improve upon standard cardboard pizza boxes. US 2005/0087591 describes a collapsible pizza box formed from a blank where the surfaces of the box include additional perforations around the box to assist in disposal of the box. US7,051,919
discloses a convertible pizza box formed of a one-piece blank having a first portion and a second portion with score lines such that it is formable into a full sized pizza box. The blank is structured such that when the first portion and the second portion are separated, the first portion is formable into a smaller box. US-2006/0131369 describes a serving box fitted with a serving tray having handles, the tray being located inside the box and the handles providing additional support to the structure of the serving box such that the serving box may be constructed of lighter material. JP2000-191058 describes a box type container in which the lid has perforations and a cutting string such that the lid can be converted into four makeshift plates.

[006] However, these containers generally relate to improvements in the function of the container for the consumer. There has not yet been disclosed a pizza box which solves the abovementioned problems for the retailer of assembly time, hygiene problems and space requirements.

[007] It is an object of the present invention to provide an improved food packaging, and in particular to overcome or mitigate the above-mentioned problems.

[008] According to one aspect of the invention there is provided packaging apparatus for transporting a substantially planar object, the apparatus comprising a pair of nestable plate-like members, each member having a raised flange at its peripheral edge, the plate-like members being positionable such that the flanges of respective adjacent plates interengage to thereby form an enclosure between the plate-like members.

[009] Provision of the plate-like members as two separate units enables the members to be stacked like plates prior to
use, thus much reducing the space required for storage. For assembly, a first plate-like member can be disposed to hold the food contents as a regular plate would, and a second plate-like member simply needs overturning and coupling to the other plate-like member to form the lid.

[0010] Preferably, the plate-like members have fastening means for fastening them together on forming the enclosure. This is a convenient way of securing the pair of plate-like members together. More preferably, the fastening means comprises tabs formed by cuts or lines of weakness in each flange. This provides a simple and cost-effective way to fasten the plate-like members. Preferably, the tabs are substantially semicircular. Alternatively, the tabs may be mushroom shaped. Alternatively to tabs, the fastening means may comprise clips which are detachable from the plate-like members.

[0011] Preferably, the plate-like members are circular. This reduces the amount of wasted space when used for containing a pizza as well as reducing the amount of packaging required. Further, when used for containing a pizza, the shape will approximately equal the shape of the pizza and as such the pizza will not be able to move within the container and therefore will have a lower chance of becoming damaged.

[0012] Preferably, the plate-like members are formed of a biodegradable material. This is more environmentally-friendly than cardboard. More preferably, the plate-like members are formed of palm-fibre material. This material can be easily moulded into many different shapes.

[0013] Preferably, a surface of at least one of the plate-like members has ridges provided thereon. These ridges define open or closed channels in the packaging apparatus.
That is, when a plate-like member is acting as a base of the packaging apparatus, a pizza will substantially cover the base, excluding the flange, and closed channels will be formed between the ridges and the pizza base. When a plate-like member is acting as a top of the packaging apparatus, a pizza will not touch the surface of the plate-like member, but the ridges still form open channels which aid in dispersing condensation. The channels allow steam to escape with minimal heat loss from the pizza.

[0014] Preferably, the ridges are arranged for providing a non-direct path for steam to move away from an object in the apparatus. Preferably the non-direct path is a serpentine path, and it may be a spiral path. In this way, the non-direct path allows the slow release of steam from the pizza, which is transmitted along the path from a central area of the plate-like members to an outer area of the plate-like members in a controlled manner. Thus, the heat of the steam is retained around the pizza while moisture of the steam is allowed to be drawn away.

[0015] Preferably, the ridges are substantially semicircular. More preferably, each ridge is provided to be substantially 90° to the ridge provided immediately radially inwardly or outwardly from it.

[0016] Preferably, the apparatus has vents. Preferably, the vents are circular. Alternatively, the vents may be slot shaped. This enables excess steam to escape from the apparatus in a controlled manner.

[0017] The present invention further encompasses a cassette for holding a plurality of plate-like members as defined above. A cassette may function as packaging to transport a plurality of plate-like members to a retail establishment and
According to another aspect of the present invention there is provided packaging apparatus for transporting a vapour emitting object, the apparatus comprising a pair of plate-like members which together form an enclosure, an inwardly directed surface of at least one of the plate-like members being arranged for providing a non-direct path for vapour to move away from the object in the apparatus.

An example of the present invention will now be described with reference to the accompanying drawings, in which:

Figure 1 shows a plan view of a plate-like member according to the present invention;

Figure 2 shows a side view of the plate-like member of Figure 1; and

Figure 3 shows a pair of plate-like members after assembly.

Figure 1 shows a plate-like member 1 of the present invention. The plate-like member is circular and has a base 2 and a flange or lip 3 extending around the periphery of the base 2. The outer edge of the base 2 is raised to meet the lip 3, as can be seen in Figure 2. Two plate-like members 1 are required to form a container or packaging for a food product, in this example a pizza. These two plate-like members are used in place of the single-unit blank that is well known in the art. For cost and storage reasons, it is preferable that the two plate like members are identical, because the plate-like members can be manufactured from the same mould, and transported and stored in large batches. Due to the shape of the plate-like members, they can be provided
in a batch very much like a stack of plates.

[0021] The lip 3 of the plate-like member 1 has tabs 4 as means for fastening two plate-like members together. In practice, assembly of a pizza box according to the present invention will occur at the time a pizza is ready to go out. This would be achieved by placing a first plate-like member on a surface with the base 2 adjacent to the surface, depositing a pizza on the first plate-like member, placing a second plate-like member over the first plate-like member in an orientation opposite to that of the first plate-like member, i.e., such that respective top surfaces of the lips of the two plate-like members meet, and then fastening the two plate-like members together using the tabs provided in the lips. In this example the tabs 4 are shaped as shown in Figure 1 which are cut into the lip 3. This enables a user to simply push the tabs from above whereby each tab will fold downwards, taking the tab below with it, and the wider section of the tab being held in place below the narrower opening.

[0022] The plate-like member 1 of the present example has further features which improve the functionality of the final pizza box. Ridges 5 in the base of the plate-like member 1 are provided such that when a hot pizza is placed on the plate-like member 1, only a small proportion of the base of the pizza sits on the plate-like member 1. This aids in letting steam move around below the pizza, which would otherwise over-hydrate the pizza if the pizza were on a completely flat base. Air flow channels 6 are provided to enable the steam to escape from the box in a controlled manner, so as to retain heat therein, again avoiding the over-hydrated pizza effect. In this regard the channels present a non-direct path for steam, which traps heat whilst removing moisture.
[0023] In this connection the channels are formed from a series of concentric ridges having offset or misaligned apertures 7.

[0024] The plate-like members of the present invention are not formed from cardboard., as is presently known and used.

[0025] Rather, they are formed from palm fibre material which is a waste product from the palm oil production process. This material is completely biodegradable and compostible because it is a natural material. Although this material is known for the production of fruit trays for supermarkets, etc, it has never been used in the field of pizza boxes. Due to use of the palm fibre material, the plate-like members can be formed by an injection moulding process as a single unit. This reduces production time and allows the features of the ridges and air flow channel to be encompassed at the same time as forming the plate-like member. Some prior art pizza boxes have an insert which forms ridges but clearly this causes additional materials, cost and effort to put in place.

[0026] Since a batch of plate-like members can be manufactured to be much like a stack of plates, it is envisioned that a stack of plate-like members be manufactured and delivered to food establishments in a hygienically sealed drum or cassette, also made of palm fibre material. The cassette could be mounted to a bracket or fixture on the wall of the food establishment allowing easy dispensing of plate-like members as and when required. The fixture would include a spring-loaded push plate acting on the rearmost plate-like member so that the stack has a constant spring bias applied from the rear causing the stack to always be flush with the front of the cassette. Thus the plate-like
members are always easily accessible from the cassette.

[0027] It will be understood that the embodiment shows one application of the invention only for the purposes of illustration. In practice the invention may be applied to many different configurations, the detailed embodiments being straightforward for those skilled in the art to implement. For example the plate-like members of the present invention can be other shapes and designs depending on the food to be carried and other requirements. The plate-like members of the present invention can also be square, oval or octagonal and the fastening means need not necessarily be tabs. A zip fastener or additional clamp could be used to secure the two plate-like members together. Alternatively the tabs could be of square or triangular shape.
Claims

1. Packaging apparatus for transporting a substantially planar object, the apparatus comprising a pair of nestable plate-like members, each member having a raised flange at its peripheral edge, the plate-like members being positionable such that the flanges of respective adjacent plates inter-engage to thereby form an enclosure between the plate-like members.

2. Apparatus according to claim 1, wherein the plate-like members have fastening means for fastening them together on forming the enclosure.

3. Apparatus according to claim 2, wherein the fastening means comprises tabs formed by cuts or lines of weakness in each flange.

4. Apparatus according to claim 3, wherein the tabs are substantially semicircular.

5. Apparatus according to claim 3, wherein the tabs are mushroom shaped.

β. Apparatus according to claim 2, wherein the fastening means comprises clips which are detachable from the plate-like members.

7. Apparatus according to any preceding claim, wherein the plate-like members are circular.

8. Apparatus according to any preceding claim, wherein the plate-like members are formed of a biodegradable material.
9. Apparatus according to claim 8, wherein the plate-like members are formed of palm-fibre material.

10. Apparatus according to any preceding claim, wherein a surface of at least one of the plate-like members has ridges provided thereon.

11. Apparatus according to claim 10, wherein the ridges are arranged for providing a non-direct path for steam to move away from an object in the apparatus.

12. Apparatus according to claim 11, wherein the non-direct path is a serpentine path.

13. Apparatus according to claim 11 or 12, wherein the non-direct path is a spiral path.

14. Apparatus according to any of claims 10-12, wherein the ridges are substantially semicircular.

15. Apparatus according to claim 14, wherein each ridge is provided to be substantially 90° to the ridge provided immediately radially inwardly or outwardly from it.

16. Apparatus according to any preceding claim, wherein the apparatus has vents.

17. Apparatus according to claim 16, wherein the vents are circular.

18. Apparatus according to claim 16, wherein the vents are slot shaped.

19. A cassette for holding a plurality of plate-like members as claimed in any preceding claim.
20. Packaging apparatus for transporting a vapour emitting object, the apparatus comprising a pair of plate-like members which together form an enclosure, an inwardly directed surface of at least one of the plate-like members being arranged for providing a non-direct path for vapour to move away from the object in the apparatus.

21. Apparatus according to claim 20, wherein the plate-like members have fastening means for fastening them together on forming the enclosure.

22. Apparatus according to claim 21, wherein the fastening means comprises tabs formed by cuts or lines of weakness in each flange.

23. Apparatus according to claim 22, wherein the tabs are substantially semicircular.

24. Apparatus according to claim 22, wherein the tabs are mushroom shaped.

25. Apparatus according to any of claims 20-24, wherein the plate-like members are circular.

25 26. Apparatus according to any of claims 20-25, wherein the plate-like members are formed of a biodegradable material.

27. Apparatus according to claim 26, wherein the plate-like members are formed of palm-fibre material.

28. Apparatus according to any of claims 20-27, wherein a surface of at least one of the plate-like members has ridges provided thereon.
29. Apparatus according to any of claims 20-28, wherein the non-direct path is a serpentine path.

30. Apparatus according to claim 29, wherein the ridges are substantially semicircular.

31. Apparatus according to claim 30, wherein each ridge is provided to be substantially 90° to the ridge provided immediately radially inwardly or outwardly from it.

32. Apparatus according to any of claims 20-31, wherein the apparatus has vents.

33. Apparatus according to claim 32, wherein the vents are circular.

34. Apparatus according to claim 32, wherein the vents are slot shaped.

35. A cassette for holding a plurality of plate-like members as claimed in any of claims 20-34.

36. Apparatus substantially as herein described with reference to the accompanying drawings.

37. A cassette substantially as herein described with reference to the accompanying drawings.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

INV. B66D21/02

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

B66D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>US 3 938 726 A (HOLDEN JR MORELL J ET AL) 17 February 1976 (1976-02-17) abstract; figures 1,2,4,5,7,10 column 3, line 1 - column 5, paragraph 4</td>
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<td>X</td>
<td>US 5 273 174 A (FISHER RONALD F [CA]) 28 December 1993 (1993-12-28) abstract; figures 1,3,4 column 3, line 1 - column 4, line 52</td>
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Further documents are listed in the continuation of Box C See patent family annex

Special categories of cited documents

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Date of the actual completion of the international search 26 November 2007

Date of mailing of the international search report 04/12/2007

Name and mailing address of the ISA European Patent Office, P B 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel (+31-70) 340-2040, Tx 31 651 epo nl, Fax (+31-70) 340-3016

Authorized officer Segerer, Heiko
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**Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [ ] Claims Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. [x] Claims Nos. 36, 37
   because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
   
   see FURTHER INFORMATION sheet PCT/ISA/210

3. [ ] Claims Nos.:
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[ ] No protest accompanied the payment of additional search fees.
Continuation of Box II.2

Claims Nos.: 36,37

The present claims 36 and 37 relate to an extremely large number of possible apparatus/cassettes, since the said claims are only based on references to the drawings; i.e. the combinations of features comprised in claims 36 and 37 are unclear in the sense of Article 6 PCT to such an extent, that a meaningful search is not possible.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.
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