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Kuchenbecker

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[54] **MULTI-COMPARTMENT TRAY**

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[52] **U.S. Cl.** ..... **229/27;** 229/30; 229/31 R

[51] **Int. Cl.** **B65d 85/36**

[58] **Field of Search** 229/27, 30, 31

[56] **References Cited**

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Attorney, Agent, or Firm—Robert P. Auer; Frank S. Charlton; George P. Ziehmer

[57] **ABSTRACT**

A multi-compartment, web-cornered tray formed of a single blank of coated paperboard and having no raw paperboard edges on any interior surface susceptible to wicking. The compartments have double thickness end walls for rigidity and the integral partition is also of double thickness.

8 Claims, 9 Drawing Figures

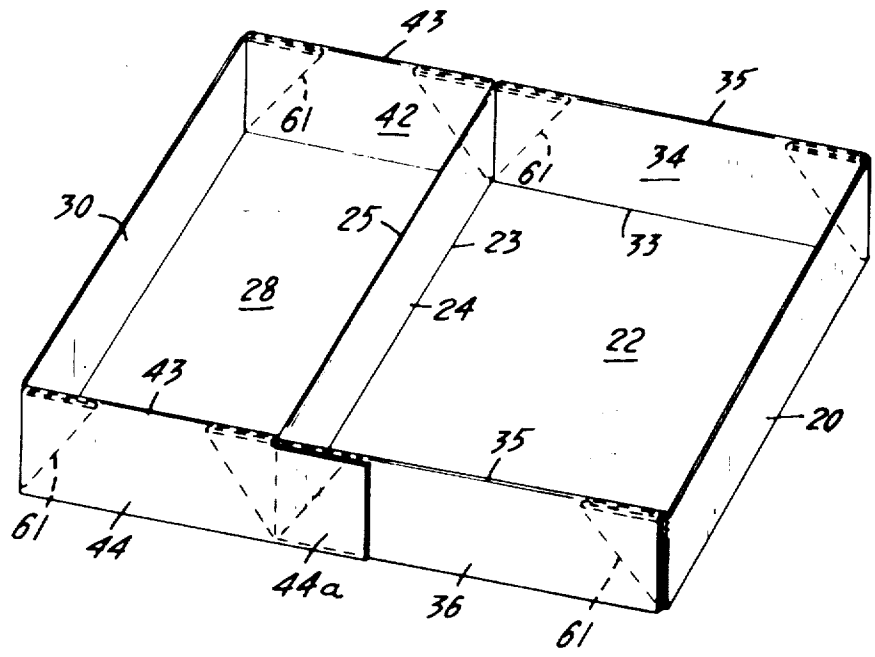

FIG. 1

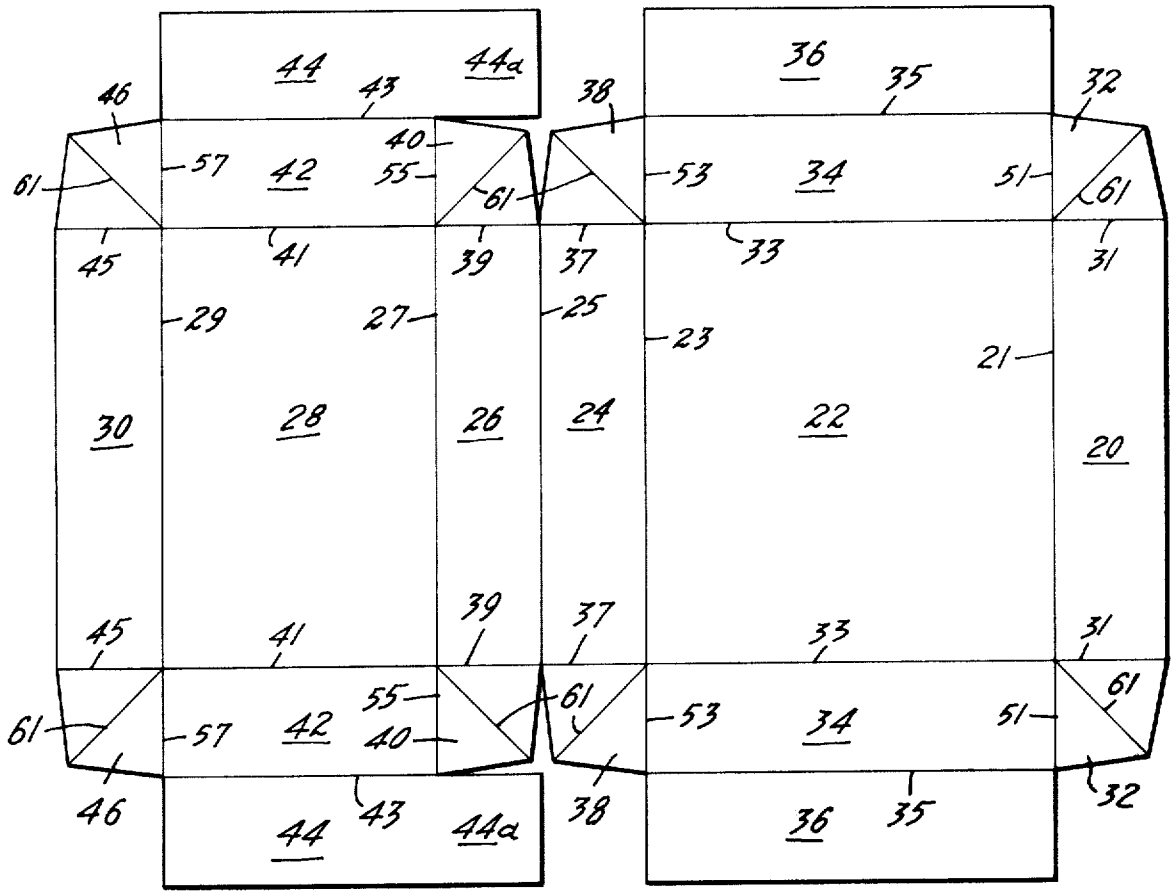
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FIG. 2

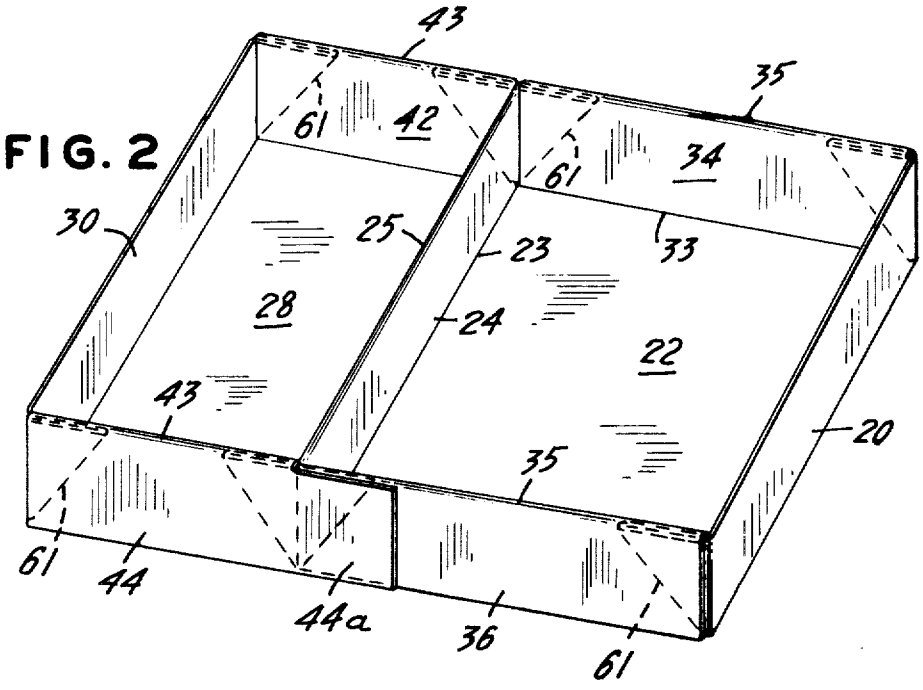
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FIG. 3

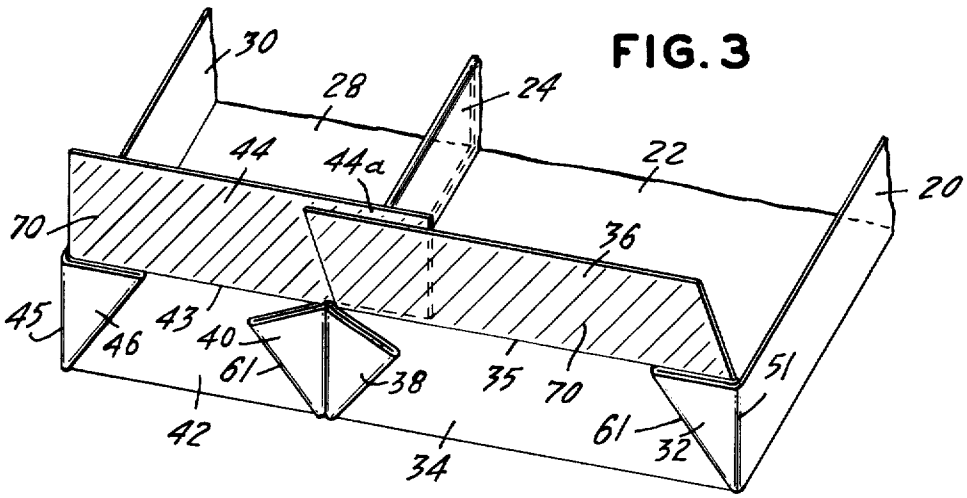


FIG. 4

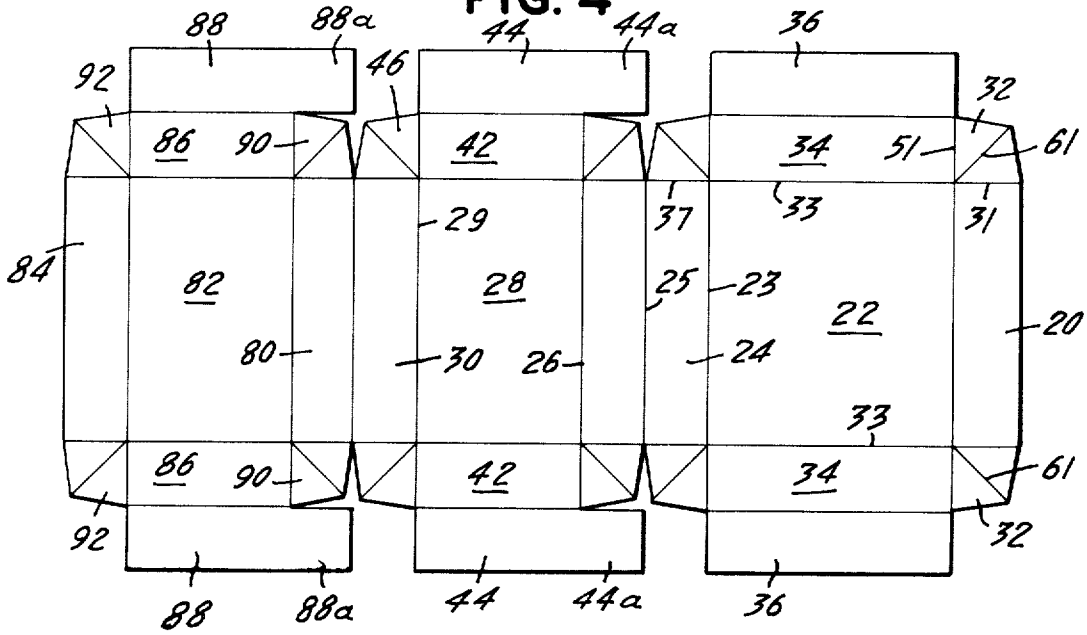


FIG. 5

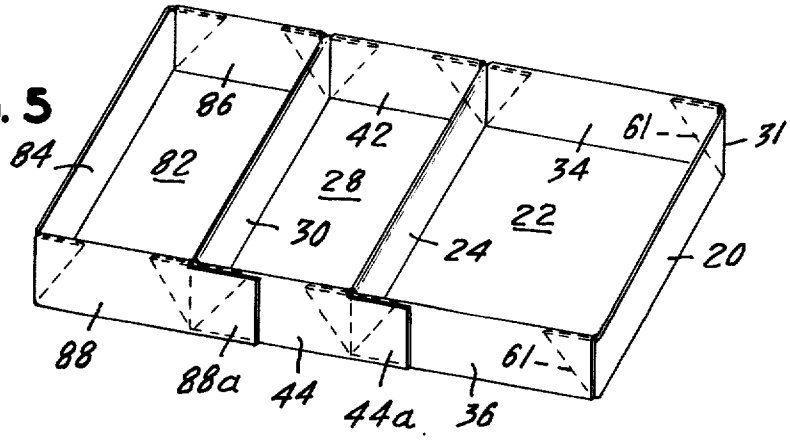


FIG. 6

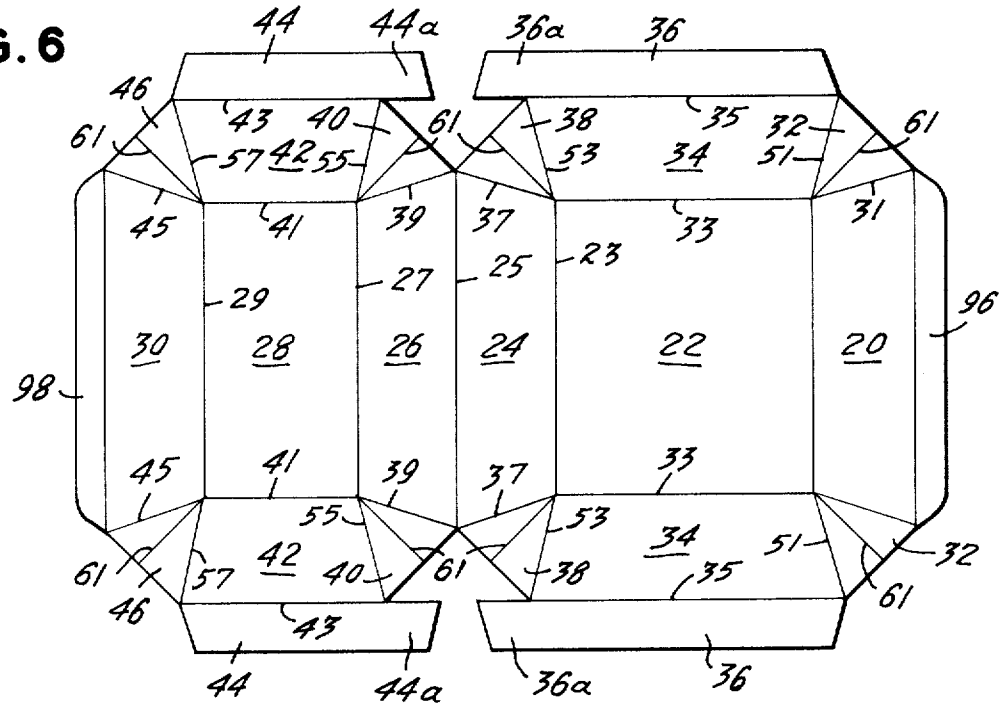


FIG. 7

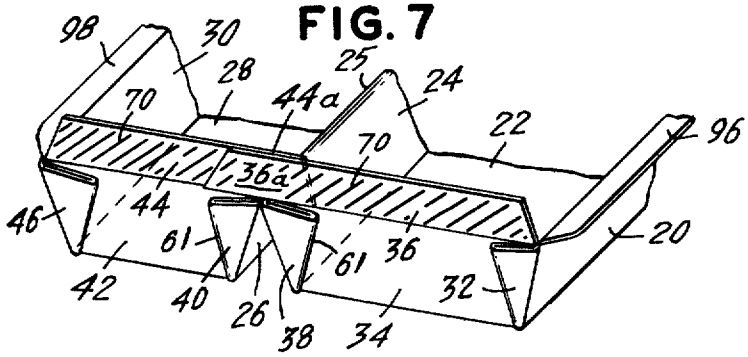
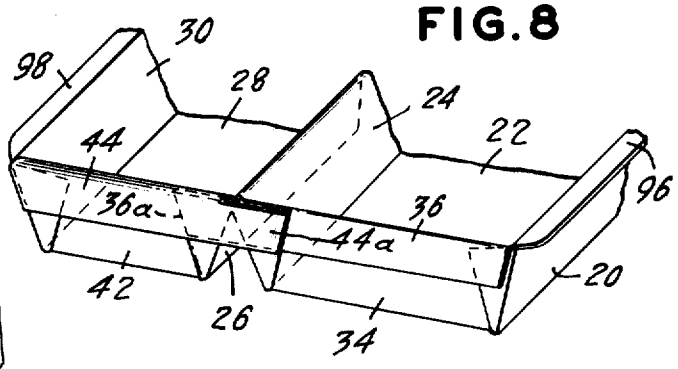


FIG. 8



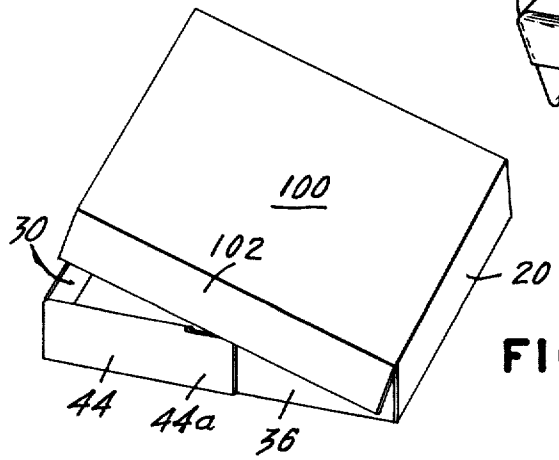


FIG. 9

MULTI-COMPARTMENT TRAY

BACKGROUND OF THE INVENTION

This invention relates to a disposable tray formed from a single blank, suitably of paperboard, and having an integral divider or partition separating the tray into two compartments. The tray is leakproof in construction and is suitable for serving foods in situations where separation is desired between two different components of a meal served together on the same tray. The tray of this invention is of particular utility in the hot lunch program for school children in which an entire luncheon is pre-packaged on a tray which may be heated rapidly in a microwave oven and served in the disposable packaging tray. In a preferred version thereof, the tray of this invention is formed with tapered side walls in both the main tray body and in the partition, so that the tray may be shipped and stored in semi-nested condition in order to conserve space.

SUMMARY OF THE INVENTION

More specifically, the paperboard multi-compartment tray of this invention is formed with an integral, double thickness partition separating the tray into two compartments, each of which is of leakproof, webbed corner construction. In a preferred version, the side walls normal to the partition are of double thickness and tabs extending from the side wall of one receptacle portion overlap and are adhered to the outer surface of the other receptacle portion, thus serving to unify and rigidify the overall tray construction.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention may be best understood by reference to the following detailed description together with the accompanying drawings in which:

FIG. 1 is a plan view of the inside surface of a blank for a tray embodying the construction features of the present invention,

FIG. 2 is a perspective view of a completed two-compartment tray,

FIG. 3 is a perspective view of an end wall portion of a tray in one stage of its construction and showing the arrangement of webbed corner portions which, in the finished tray, underlie outer end wall panels of the tray,

FIG. 4 is a plan view of a blank for a three-compartment tray in accordance with the invention,

FIG. 5 is a perspective view of a completed three-compartment tray as constructed from the blank of FIG. 4,

FIG. 6 is a plan view of a modified blank for forming a two-compartment tray having tapered side walls,

FIG. 7 is a perspective view partially cut away of the tapered wall tray in one stage of construction,

FIG. 8 is a partial, cut away perspective view of a completed, tapered wall tray, and

FIG. 9 is a perspective view of a tray according to this invention modified by the addition of a cover element of conventional construction.

DESCRIPTION OF A PREFERRED EMBODIMENT

In a preferred embodiment, the tray of this invention is formed of a single blank of paperboard or similar material, as shown in FIG. 1, suitably cut and scored to provide a first compartment side wall 20, a first compartment bottom panel 22, a first partition panel 24, a second partition panel 26, a second compartment bottom panel 28 and a second compartment side wall 30, hingedly connected in sequence along parallel score lines 21, 23, 25, 27 and 29, respectively. Hingedly attached to each end edge of side wall 20 along score line 31 is a web corner panel 32. Hingedly attached to each end of first bottom panel 22 along score line 33 is a first compartment inner end wall panel 34 and extending from the remote edge thereof along score line 35, which parallels score 33, is a first compartment outer end wall panel 36. A web corner panel 38 is hingedly attached to each end edge of first partition panel 24 along hinge score line 37. The above-indicated panels cooperate to form the first of two similar compartments of the overall two-compartment tray of this embodiment of the invention.

Hingedly attached to each end edge of second partition panel 26 along a score line 39 is a web corner panel 40. Hingedly attached to each end edge of second compartment bottom panel 28 along score line 41 is second compartment inner end wall panel 42 and extending from the remote edge of panel 42 along score line 43, which parallels score 41, is a second compartment outer end wall panel 44. Outer end wall panel 44 has a connecting tab portion 44*a* extending toward first compartment outer end wall portion 36. Second compartment side wall 30 has a web corner panel 46 hingedly connected to each end thereof along a score line 45.

In addition to the hinge score connections previously mentioned, each of the web corner panels is hingedly attached along an adjacent edge as hereinafter noted. Web corner panels 32 and 38 are hingedly connected to opposite side edges of first compartment inner end wall panel 34 along score lines 51 and 53, respectively, and web corner panels 40 and 46 are hingedly connected to opposite side edges of second compartment inner end wall panel 42 along score lines 55 and 57, respectively. Each of the web corner panels 32, 38, 40 and 46 is divided into two approximately equal triangular portions by a score line 61 running diagonally across the panel from the free corner thereof to the point of junction of the two respective hinge score lines connecting the respective web corner panel to adjacent panels.

In forming a finished, partitioned tray from the blank of FIG. 1, panels 32, 34, 38, 40, 42 and 46 are swung 90° into a vertical plane normal to the remainder of the blank about hinge score lines 31, 33, 37, 39, 41 and 45, respectively. The main partition member, consisting of panels 24 and 26, is then erected by folding the blank outward along score line 25 and simultaneously inward along score lines 23 and 27. As these folding steps are being carried out, web corner panels 38 and 40 will fold along their diagonal score lines 61 so that the two triangular half sections of each of the web panels lie superposed on each other in face-to-face relationship. The resulting double thickness triangular corner webs are then swung about score lines 53 and 55, respectively, to lie snugly superposed on the exterior surface of the first and second compartment inner end wall panels 34 and 42, respectively, as shown in FIG. 3.

Compartment side wall panels 20 and 32 may then be swung into vertical position, with simultaneous folding of web corner panels 32 and 46 along their respective diagonal score lines 61. The resulting double thickness triangular corner webs are then swung about score lines 51 and 57, respectively, to lie superposed on the re-

spective exterior surfaces of first and second compartment inner end wall panels **34** and **42**, respectively, as shown in FIG. **3**.

The tray is brought into its final state of assembly by application of a suitable adhesive to the under surfaces of the outer end wall panels **36** and **44** as shown as cross-hatched areas **70** in FIG. **3**, after which panels **36** and **44** are folded downward and outward to overlie the outer surfaces of panels **34** and **42** as well as the double thickness triangular web corner panels **32**, **38**, **40** and **46**, all of these panels being thereby adhered into a unified end wall construction. It is to be noted that the extended portion, **44***a*, forming a connecting tab portion of outer end wall panel **44**, overlies and is adhered to the outer surface of outer end wall panel **36**, as shown in FIG. **2**, thus maintaining the two compartments of the tray firmly unified into a single composite unit. If desired, outer end panel **36** may also be formed with an extending connecting tab which, in the finished tray, will underlie the main portion of panel **44**, thus further stiffening the overall tray end wall structure.

Each compartment of the overall tray is leakproof due to the webbed corner construction, and the entire tray is surprisingly firm and rigid due to the sandwiching of the triangular corner web portions between the inner and outer side wall panels and the stiffening and unifying influence of the connecting tabs **44***a* in tying the side wall areas of the two compartments together.

The tray of the present invention may be varied in the relative sizes of the compartments by varying the position of the score lines **23**, **25** and **27** with regard to the two-compartment bottom panel portions **22** and **28**. It is generally preferred that the dimensions of the partition panels **24** and **26** be substantially equivalent to those of the side wall panels **20** and **32** so that the partition is of the same height as the main receptacle walls although, if desired, the partition panel height may be somewhat foreshortened. If the partition panel height is reduced, the shape of the web corner panels **38** and **40** is altered from essentially square to rectangular and the diagonal scores **61** will terminate on a side edge of the respective corner panel rather than at the free corner.

The web stock from which the tray of this invention is constructed is preferably paperboard which is coated on its interior surface with a heat-resistant, moisture and greaseproof coating such as a polyamide. Polyamide-coated paperboard trays made in accordance with this invention are leakproof and greaseproof, and food may be heated in the tray either in a conventional oven or in a micro-wave oven, thus giving maximum flexibility in utilization of the tray in, for example, a hot lunch program for school children. If this degree of versatility is not required, however, the tray may be made of paperboard coated with a variety of water and greaseproof materials, including metallic foil, a polyolefin, polyvinylidine chloride resin or a grease-resistant varnish. In any case, an important advantage of the present construction over prior art trays lies in the fact that all interior surfaces of the tray are covered with the protective water and greaseproof coating. Since there is no uncoated or raw paperboard exposed on the interior of the tray either as a flat surface or as a cut edge of paperboard, there is no susceptibility to fluid absorption by the tray stock and no edge wicking which weakens the stock and is generally unsightly.

The principles of this invention may be applied to the construction of trays of more than two compartments and the invention is intended to include embodiments having any convenient and desired number of compartments formed of a single, unitary paperboard blank, the compartments being linearly attached to each other. A blank for a three-compartment tray in accord with this invention is illustrated in FIG. **4**, it being noted that the third compartment is provided by hingedly attaching to second side wall panel **30** the new third partition panel **80**, third compartment bottom panel **82** and third compartment side wall **84**, together with associated end wall panels **86** and **88** and web corner panels **90** and **92**, each of which elements finds its counterpart in the earlier described elements of the second compartment of the two-compartment tray. In extending the tray from two to three compartments, the original second side wall panel **30** becomes one thickness of the double thick partition panel between the second and third compartments. It will be obvious that four and five compartment trays may be constructed by a simple extension of the above principles.

If desired, a hood-like cover of conventional design comprising a cover panel **100** (FIG. **9**), opposed cover end panels **102** and a cover side panel with attached locking or glue tabs may be hingedly connected to the upper edge of one of the tray side walls, such as side wall **20** or **30** in FIG. **1**, or side wall **84** in FIG. **4**. The resultant covered tray (two-compartment version) is shown in FIG. **9**. The hinge line connecting the cover panel **100** to the tray side wall **20** may be a line of perforations or a cut score line so the cover may be readily torn off the tray for convenience at the time of use.

In a further embodiment of the tray of this invention, the side, end and partition walls are all tapered inwardly toward the bottom of the tray, and the connecting tab portion **44***a* of the second compartment outer end wall panel **44** is reduced in width to allow a substantial degree of nesting of the completed trays, thus reducing the space required for shipping.

FIGS. **6–8** illustrate the tapered-wall tray embodiment of the invention in various stages of its construction. In general, the elements shown in the earlier-described embodiment have counterparts similarly numbered in the tapered-wall embodiment shown in FIGS. **6–8**. It is to be noted, however, that, in the embodiment here shown, both first compartment outer end wall panels **36** and second compartment outer end wall panels **44** have extending connecting tab portions **36***a* and **44***a*, respectively, for greater wall strength. Furthermore, both compartment side wall **20** and compartment side wall **30** are illustrated as having a relatively narrow flange panel **96** and **98**, respectively, hinged to the upper edge thereof. Such flanges may be added if it is desired to seal a cover film over the contents of the tray, such film being peelably adhered to the flanges and the top edge of the double thickness end walls.

Due to the tapering of the side walls and partition wall in this embodiment of the invention, and the fact that outer end panels **36** and **44** are made substantially narrower than the respective underlying inner end wall panels, the finished trays may be partially nested for conservation of space in shipping.

I claim:

1. A multi-compartment tray made from a unitary blank of coated paperboard,

each compartment comprising a bottom panel having hingedly attached to each end thereof an end wall assembly including an inner end wall panel and an outer end wall panel hinged thereto and folded to lie substantially co-planar therewith,

each said bottom panel having a side wall panel hingedly attached to each side edge thereof, at least one of the side wall panels of each compartment being one of a pair of hingedly connected, like panels which together form a double-walled partition between two adjacent compartments,

substantially rectangular web corner panels respectively connecting each end edge of each of said partition-forming panels with the adjacent inner end wall panel of each respective compartment, said web corner panels being folded along diagonal hinge lines to form double thickness triangular corner webs which are outfolded to lie sandwiched in adhered, co-planar relationship between said inner and outer end wall panels of each respective compartment,

and, in the combined end wall assembly of each pair of adjacent compartments, a connecting tab extending from a side edge of an outer end wall panel of a first compartment of said pair of compartments and being in overlapping and adhered relationship to a portion of the outer end wall panel of the adjacent, second compartment of the said pair of compartments.

2. A multi-compartment tray according to claim **1**, wherein said side and end walls of each compartment are tapered inwardly toward said bottom panel.

3. A multi-compartment tray according to claim **2**, wherein said outer end wall panels are narrower than said inner end wall panels.

4. A multi-compartment tray according to claim **1**, wherein the upper edges of said side walls at each end of the tray have horizontally and outwardly directed flanges hingedly attached thereto.

5. A multi-compartment tray according to claim **1**, wherein a cover assembly is hingedly attached to the upper free edge of a side wall panel.

6. A coated paperboard blank for a multi-compartment tray suitably cut and scored to provide a plurality of individual compartment bottom panels in linear sequence, adjacent bottom panels being separated by a pair of like partition panels hinged together on one side edge thereof and each hingedly attached along its second, opposed side edge to an adjacent side edge of one of said adjacent bottom panels, the first and last bottom panels in said sequence having tray side panels hinged to the side edges thereof opposite the hinged attachment to a partition panel, each compartment bottom panel being hingedly connected at each end thereof to a tray end wall forming assembly including an inner end wall forming panel hinged along one edge to a respective bottom panel and along the opposite edge to an outer end wall forming panel, generally rectangular web corner forming panels respectively joining each partition panel to a respective adjacent inner end wall forming panel, said web corner forming panels being diagonally scored along a line running from a free corner thereof to the diagonally opposite corner thereof, and a connecting tab at each end of the blank extending from an outer end wall panel toward the outer end wall panel of the tray end wall forming assembly hinged to the adjacent compartment bottom panel, said connecting tabs being adapted for superposition on, and adhesion to, said adjacent outer end wall panel.

7. A blank according to claim **6** wherein said paperboard is coated with a greaseproof coating.

8. A blank according to claim **7** wherein said coating is a polyamide.

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