



(19) **United States**

(12) **Patent Application Publication**
Sendel

(10) **Pub. No.: US 2011/0123684 A1**

(43) **Pub. Date: May 26, 2011**

(54) **SELF-CONTAINED AND SELF-HEATING
FOOD, MEAL AND DRINK PACKAGE**

(52) **U.S. Cl. 426/114; 426/113; 426/394**

(57) **ABSTRACT**

(75) **Inventor: Barry R. Sendel, Richmond Hill
(CA)**

A self-contained and self-heating food, meal and/or drink package, comprising a heat-resistant carton, a heat-resistant tray, a heating element, a container having a food, meal and/or drink sealed therein, and a pouch containing an activator solution for reacting with the heating element to generate sufficient heat to heat the food, meal and/or drink in the container. To heat the contents of the container, the heating element is positioned within the tray and the activator solution is applied to the heating element. The container then is positioned over the heating element in the tray, and the tray with the heating element and container therein is positioned within the carton which serves as an oven for heating the food, meal and/or drink in the container.

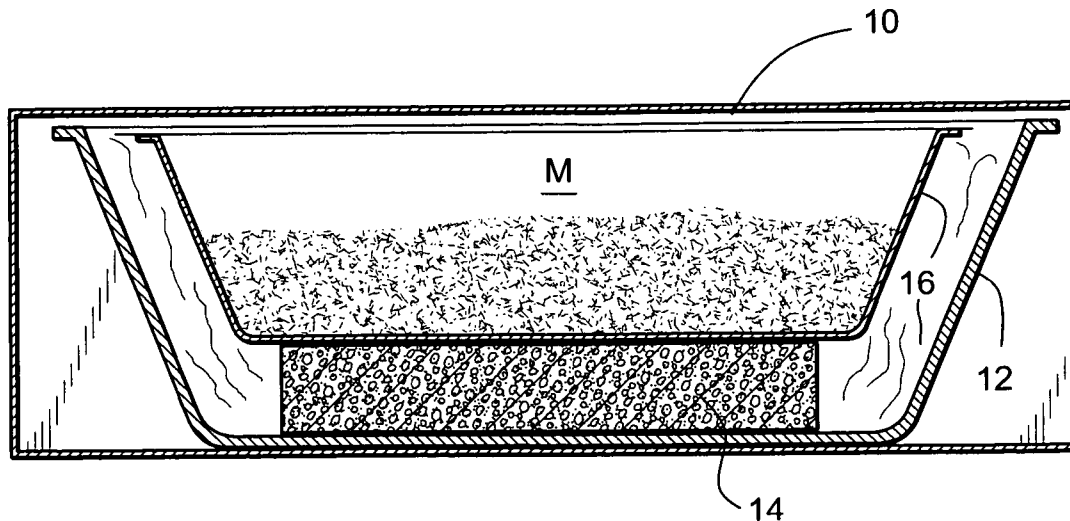
(73) **Assignee: Trillium Worldwide Group Inc.**

(21) **Appl. No.: 12/591,580**

(22) **Filed: Nov. 24, 2009**

Publication Classification

(51) **Int. Cl. B65D 81/34 (2006.01)**



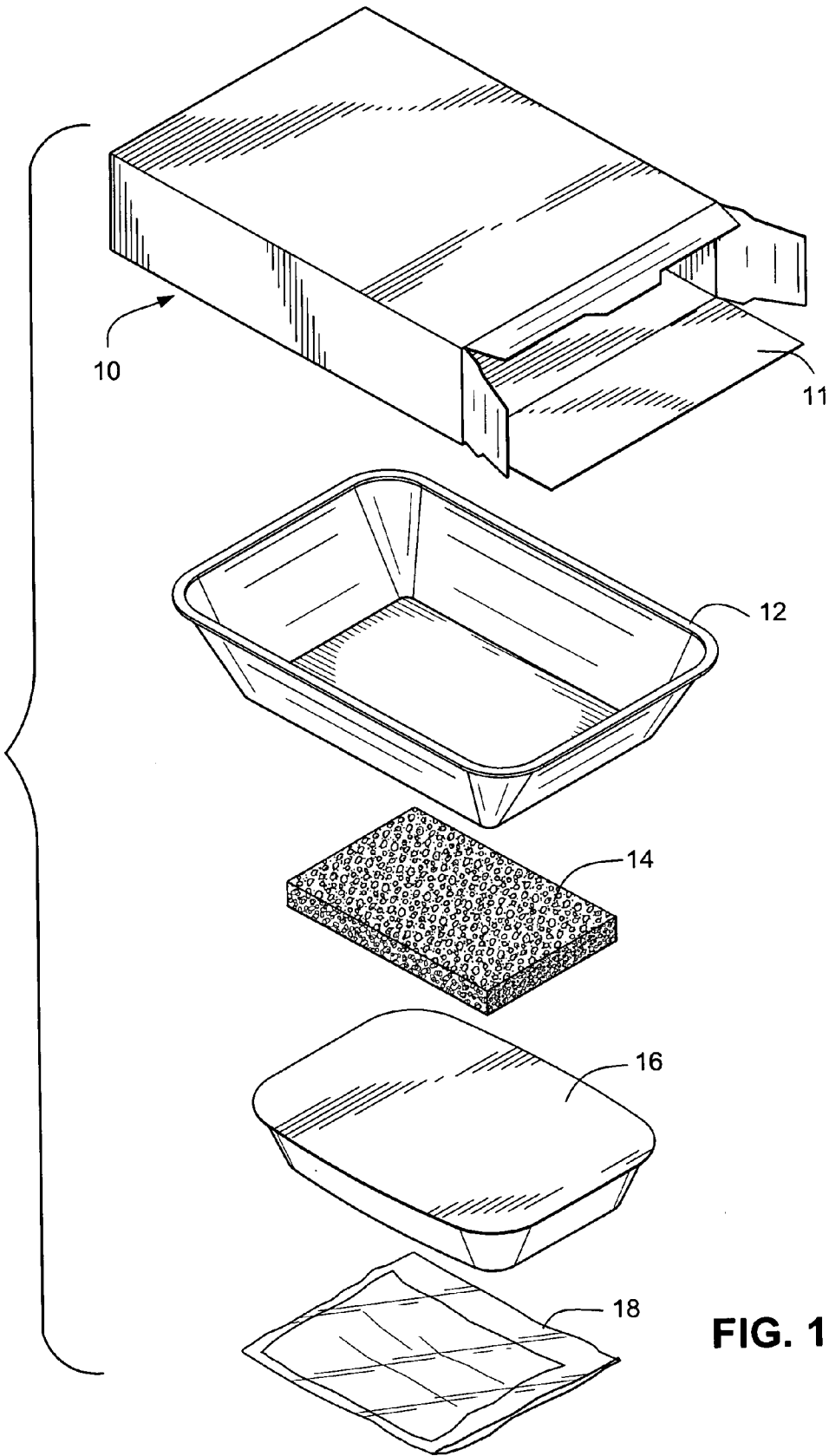


FIG. 1

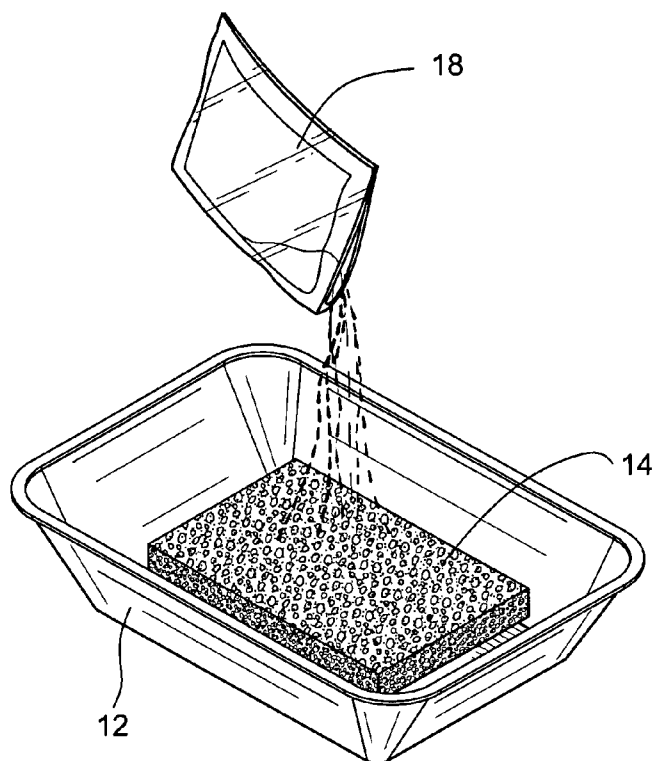


FIG. 2

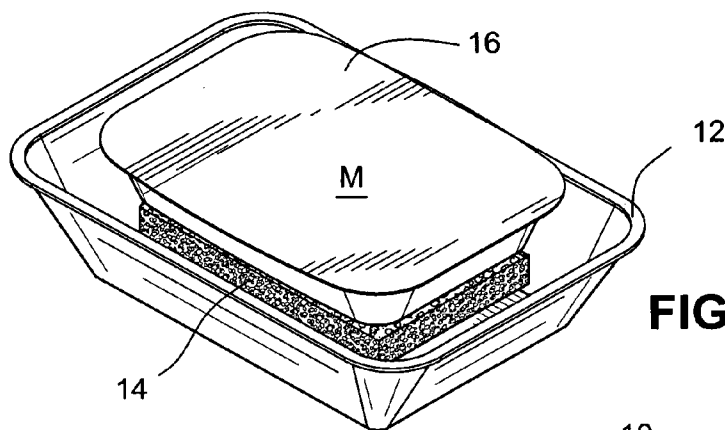


FIG. 3

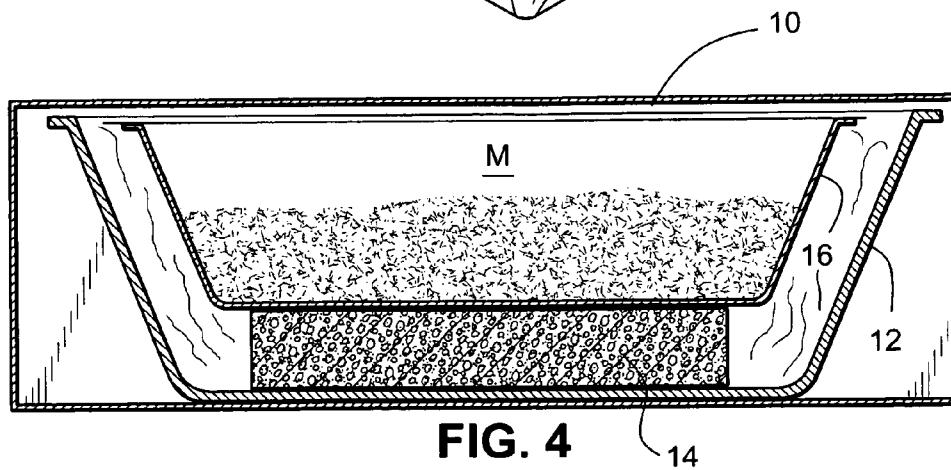


FIG. 4

SELF-CONTAINED AND SELF-HEATING FOOD, MEAL AND DRINK PACKAGE

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not applicable.

REFERENCE TO A MICROFICHE APPENDIX

[0003] Not applicable.

BACKGROUND OF THE INVENTION

[0004] 1. Field of the Invention

[0005] The present invention relates to a self-contained meal and a portable package for containing the meal and for heating the same.

[0006] 2. Description of the Background Art

[0007] There is a need for self-contained and self-heating food, meals and drinks in environments where there is no electricity or fire, such as in the military, natural disaster relief efforts and other emergency situations, camping, fishing, boating, travel, vending, school campuses and the like. While some self-contained and self-heating food, meal or drink packages have been developed for these purposes, they all have been subject to one or more of the following disadvantages:

[0008] 1. They have been expensive to manufacture; and/or

[0009] 2. They have been of poor quality and thus unreliable in operation with respect to temperature or the like; and/or

[0010] 3. They have taken too long to heat a meal to a required temperature or to maintain a desired temperature for an adequate time period; and/or

[0011] 4. They have been subject to breakage, deterioration or leakage; and/or

[0012] 5. They have had a short shelf life; and/or

[0013] 6. They have been difficult to use; and/or

[0014] 7. They can expose the hands of a user to residues or high heat; and/or

[0015] 8. They do not have quality temperature growth and stability.

[0016] Accordingly, a need has arisen for a new and improved self-contained and self-heating food, meal and/or drink package which is not subject to any of the above-listed disadvantages. The self-contained and self-heating package of the present invention meets this need and possesses significant advantages over previously used packages of this type.

BRIEF SUMMARY OF THE INVENTION

[0017] The new and improved self-contained and self-heating food, meal and/or drink package of the present invention meets or exceeds all current military and government performance specifications and regulations for such packages, and goes beyond meeting all civilian and institutional regulations by USDA and FDA.

[0018] The package of the present invention generally comprises a carton formed of a suitable material such as cardboard or the like, as more specifically described hereinafter; a meal

sealed in a container; a heating element; a pouch of activator solution for the heating element; a tray to hold the heating element and the meal; eating utensils and written instructions. The heating element is porous and has a composition that is electrochemically heated when exposed to the activator solution to heat the self-contained food, meal and/or drink in a required period of time.

[0019] To heat the contents, the package is opened and components are removed therefrom leaving the heating element in the tray. The activator solution in the pouch is poured onto the heating element. The self-contained food, meal or drink container is then placed on top of the heating element and the tray is slid back into the carton which serves as an oven for the heating process in a pre-determined period of time.

[0020] The self-contained and self-heating food, meal and/or drink package of the present invention is simple in construction, easy to use and reliable in operation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] FIG. 1 is an exploded perspective view of the components of the self-contained and self-heating meal package of the present invention showing the carton opened and the components removed therefrom, with the exception of eating utensils and written instructions;

[0022] FIG. 2 is a perspective view of the heating element positioned in the tray of the package and the activator solution from the opened pouch being poured onto the heating element;

[0023] FIG. 3 is a perspective view of the self-contained meal container being positioned on the heating element in the tray after the activator solution has been poured onto the heating element; and

[0024] FIG. 4 is an enlarged side elevational view in section of the components shown in FIG. 3 being positioned in the carton for the heating of the self-contained meal.

DETAILED DESCRIPTION OF THE INVENTION

[0025] FIG. 1 illustrates the components of the self-contained and self-heating meal package of the present invention, namely, a heat-resistant carton 10 shown open at one end 11, a heat-resistant deep tray 12, a heating element 14, a meal M sealed in a suitable container 16, e.g., a high density polymer, and a pouch 18 containing an activator solution for the heating element 14. Prior to use, the components 12, 14, 16 and 18 are enclosed in the carton 10 in a suitable manner along with eating utensils (not shown) and written instructions (not shown). The components 10-18 of the meal package of the present invention may be of any suitable size and shape, and are constructed in accordance with the description set forth hereinafter.

[0026] The carton 10 may be formed of any suitable material and, preferably, is formed of cardboard having an aluminum foil lining on the inner surface thereof, with the shiny side of the aluminum foil facing inwardly and being of food grade quality. In one embodiment, a layer of food grade polyethylene may be laminated over the shiny side of the aluminum foil. The use of the aluminum foil lining with the shiny side facing inwardly serves to retain heat in the carton 10 when the meal container 16 is positioned therein for heating, as will be more fully explained hereinafter. As an illustrative example, the above-described carton construction has been able to sustain a peak temperature of 190° F. for a period

of at least three minutes, and to maintain a temperature of 140° F. for at least 20 minutes.

[0027] The tray **12** is formed of a suitable heat-resistant material such as Styrofoam or a suitable plastic or plastic coated cardboard. The tray **12** may be of any suitable size and shape that would fit within the carton **10** as described hereinafter.

[0028] The heating element **14** may be in the form of a porous brick and is of suitable size and shape so as to fit within the tray **12** and allow the meal container **16** to be placed thereon in the tray **12** such that all three components can be positioned within the carton **10** for heating as described hereinafter.

[0029] Preferably, the composition of the porous brick heating element **14** is such that it will generate sufficient heat to heat the meal container **16** in the carton **10** to a sufficient temperature in a required period of time when the activator solution in the pouch **18** is poured thereon. In one embodiment, the porous brick heating element **14** is formed of white metallic corrodalloy element, UHMWPE (ultra high molecular weight polyethylene), LDPE (low density polyethylene), and tartaric acid.

[0030] The pouch **18** may be formed of any suitable material for retaining the activator solution therein, such as a high density polyethylene white/polyester, combination. The pouch is formed of an opaque film to reduce algae growth in the solution therein.

[0031] The activator solution is of a suitable composition that will react electrochemically with the porous brick heating element **14** to generate sufficient heat to heat the meal container **16** sufficiently when positioned in the carton **10**. As an illustrative example, when the porous brick heating element **14** is formed of white metallic corrodalloy element, UHMWPE, LDPE and tartaric acid, the activator solution is formed of water with salt at about 5.5%, surfactant at about 5% and algacide at about 5% by weight. For a porous brick heating element with a mass of 40 g, it has been found that the corresponding optimal mass of activator solution is 80 g.

[0032] The meal container **16** preferably is formed of a heat-resistant plastic material, such as a polypropylene/polyester film filled with cut glass in the center thereof, or aluminum foil with food grade polyethylene laminated on the inside surface thereof, having the meal sealed therein. Such films are able to withstand high temperatures, do not produce any negative smells or tastes in the meal when heated, and provide a shelf life for the food, meal or drink of up to five years.

[0033] In the use of the self-contained and self-heating meal package of the present invention, the carton **10** is opened at one end and the tray **12**, heating element **14**, meal container **16** and activator solution pouch **18** are removed therefrom as shown in FIG. 1. Thereafter, the heating element **14** may be left in the tray **12** or thereafter positioned within the tray **12**, and the activator solution in the pouch **18** is poured thereon, as shown in FIG. 2.

[0034] The container **16** is then placed on the heating element **14** in the tray **12**, as shown in FIG. 3 and the tray **12** with the heating element **14** and meal container **16** therein is positioned within the carton **10**, as shown in FIG. 4 for the heating of the contents of the container **16**. The electrochemical reaction of the activator solution and the heating element generates sufficient heat in the carton **10** which acts as an oven to heat the contents of the container **16** sufficiently in a required period of time. It is important that the tray **12** be deep enough

to prevent burning of the hands of the user when the heated meal **16** and tray **12** are removed from the carton **10**. With the use of the self-contained and self-heating package and method of the present invention, it is possible to generate food, meal or drink temperatures in the carton **10** above 190° F. only one minute after activation for at least three minutes. In this manner, it has been possible to heat the container contents adequately for consumption within approximately seven minutes after starting the heating process which is a significant improvement over previously used self-contained and self-heating meal packages which can take considerably longer to heat. Also, the temperature of the heated food, meal or drink can be maintained at an even temperature of 140° F. for at least twenty minutes in the carton **10**.

[0035] As an additional feature, the carton **10** may be provided with a temperature indicator (not shown) on the outer surface thereof that indicates the temperature of the food, meal or drink in the container **16** when heated.

[0036] While the invention has been described in connection with what are presently considered to be the most practical and preferred embodiments, it is to be understood that the invention is not to be limited to the disclosed embodiments, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

What is claimed is:

1. A self-contained and self-heating food, meal and/or drink package, comprising:

- a heat-resistant carton;
- a heat-resistant tray of a size and shape to be received within said carton;
- a heating element of a size and shape to be received within said tray;
- a container having a food, meal and/or drink sealed therein, said container being of a size and shape to be received within said tray on top of said heating element such that said tray with said heating element and said container therein is receivable within said carton for the heating of the food, meal and/or drink; and
- a pouch containing an activator solution for reacting with said heating element to generate sufficient heat to heat the food, meal and/or drink in said container when it is positioned within said carton on top of said heating element in said tray after the activator solution is applied to said heating element.

2. The package of claim **1** wherein said carton is formed of cardboard having an aluminum foil layer on the inner surface thereof with a shiny side of the aluminum foil facing inwardly.

3. The package of claim **2** wherein a layer of food grade polyethylene is laminated over the shiny side of the aluminum foil.

4. The package of claim **1** wherein said tray is formed of Styrofoam, plastic or plastic coated cardboard.

5. The package of claim **1** wherein said heating element is a porous brick heating element.

6. The package of claim **5** wherein said porous brick heating element is composed of white metallic corrodalloy element, UHMWPE, LDPE and tartaric acid.

7. The package of claim **1** wherein said container is formed of polypropylene/polyester film.

8. The package of claim **7** wherein said polypropylene/polyester film is filled with cut glass in a center portion thereof.

9. The package of claim **1** wherein said container is formed of aluminum foil with food grade polyethylene on an inner surface thereof.

10. The package of claim **1** wherein said pouch is formed of a high density polyethylene opaque white/polyester combination.

11. The package of claim **6** wherein the activator solution in said pouch is composed of water, salt, surfactant and algicide.

12. The package of claim **11** wherein said porous brick heating element has a mass of approximately 40 g, and the activator solution has a mass of approximately 80 g.

13. A method of heating the food, meal and/or drink in the self-contained and self-heating meal package of claim **1**, comprising:

positioning said heating element within said tray;
applying the activator solution from said pouch onto said heating element;

positioning said container on top of said heating element in said tray; and

positioning said tray with said activated heating element and container therein within said carton so that said carton acts as an oven for heating the food, meal and/or drink within said container.

* * * * *