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(54) **SELF-CONTAINED HOT MEAL ASSEMBLY WITH STEAM VENT**

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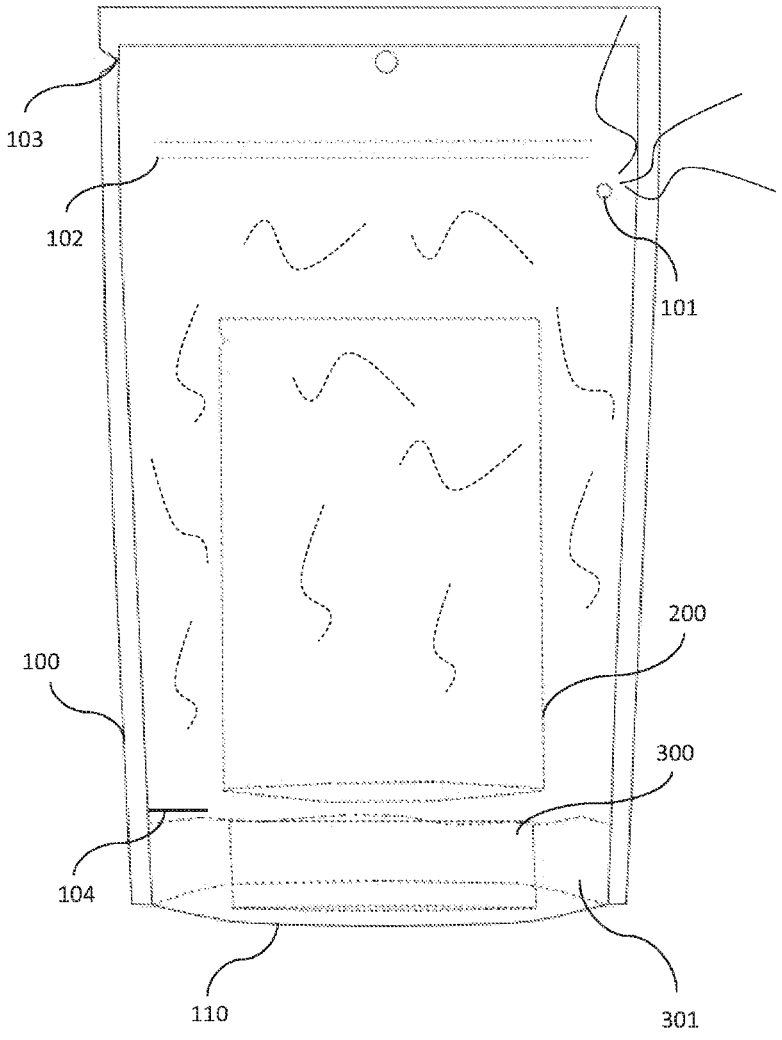
(57) **ABSTRACT**

A self-contained meal assembly comprises a heating bag, a food pouch, and a heating element. In operation, a heating element is placed along a bottom portion of a heating bag, a food pouch is placed inside proximate the heating element, a predetermined amount of water or other nonflammable aqueous liquid is added, and the heating bag is resealed thereby allowing an exothermic reaction to occur within the heating bag. One or more steam vents may be formed through a heating bag allow steam to discharge from the interior of the heating bag during operation. The configuration of the steam vent(s) allows a controlled release of high temperature steam from the heating bag as it circulates within the heating bag to the steam vent(s) at a safe discharge angle relative to the sides of the heating bag.



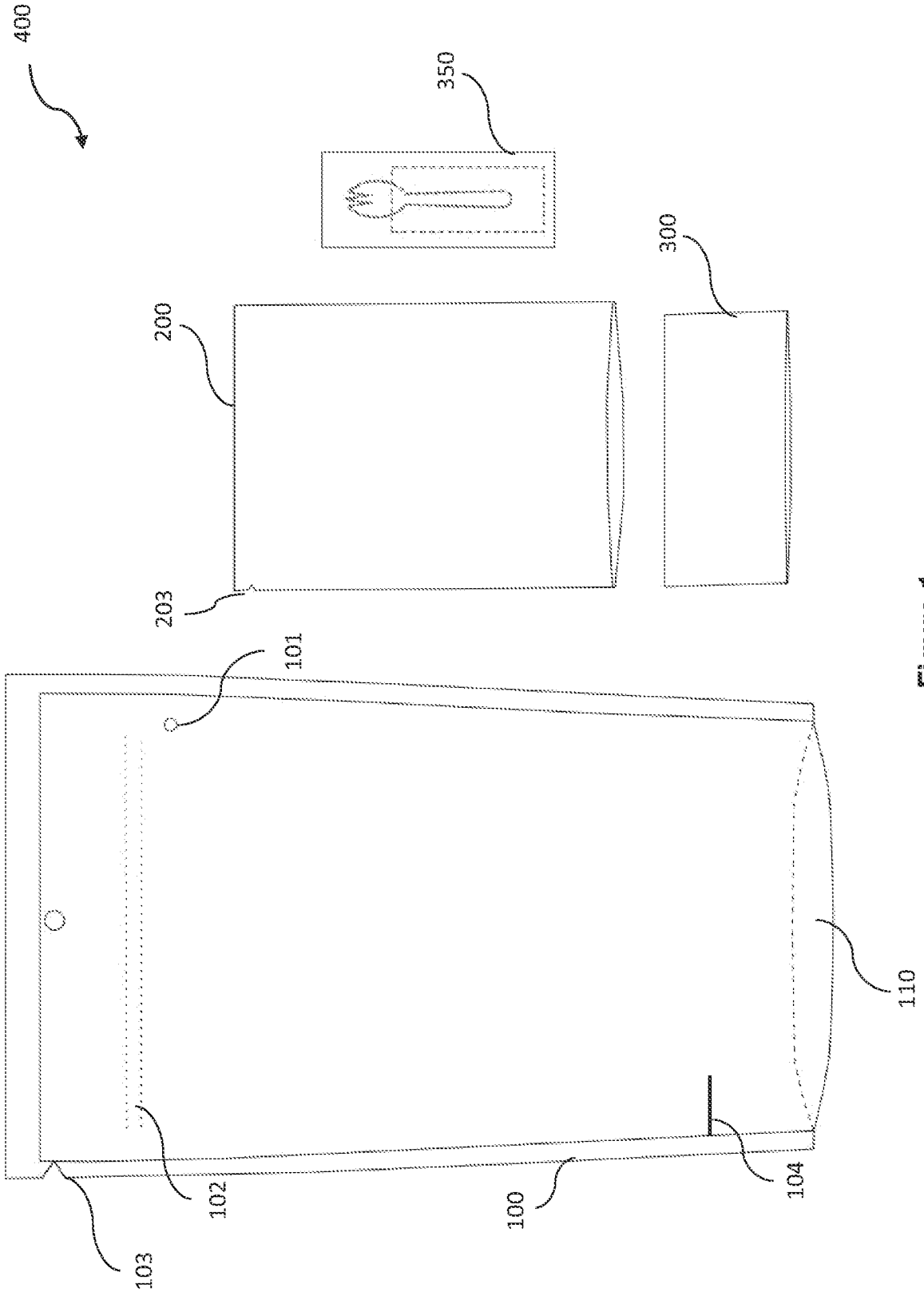


Figure 1

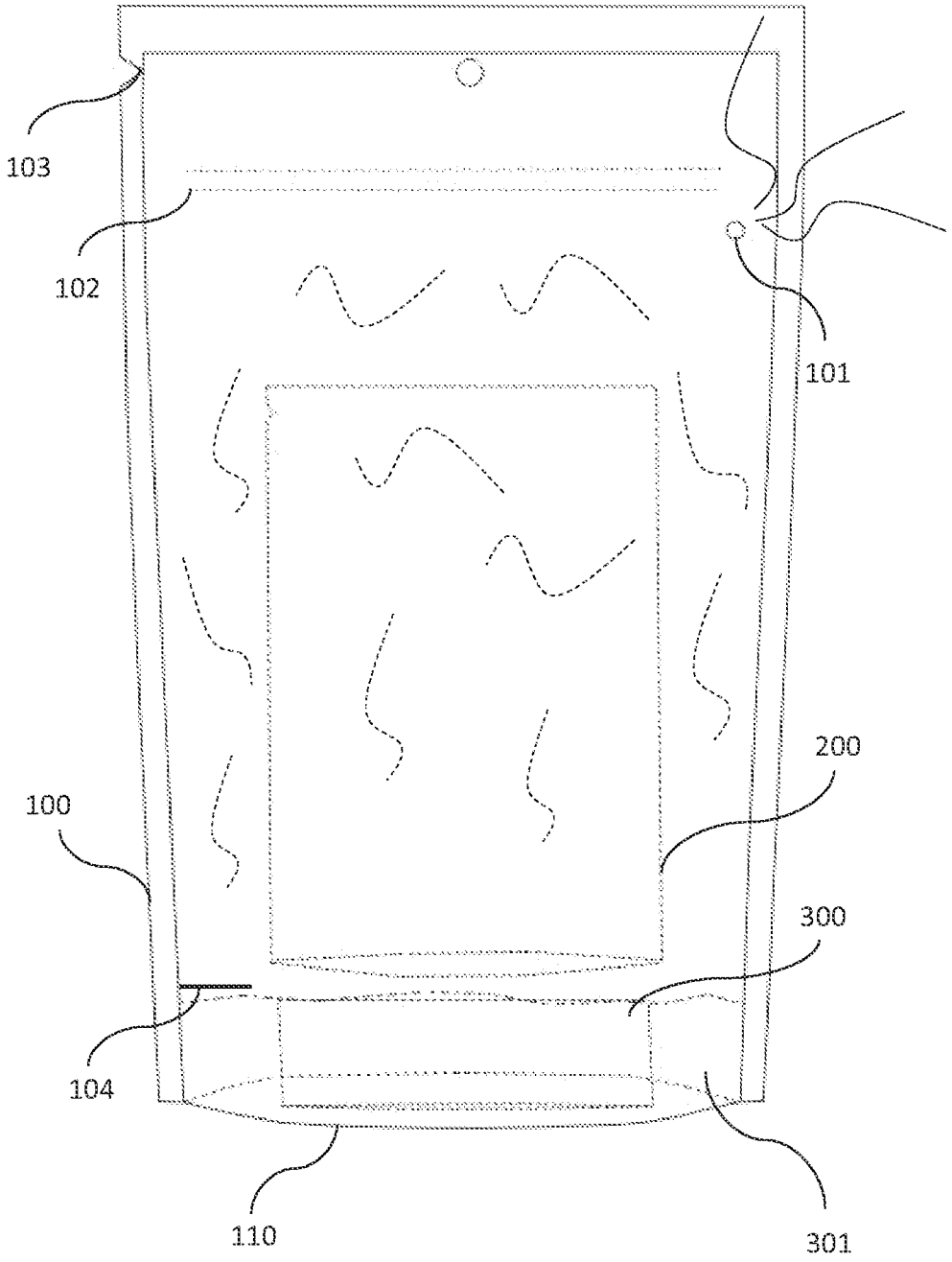


Figure 2

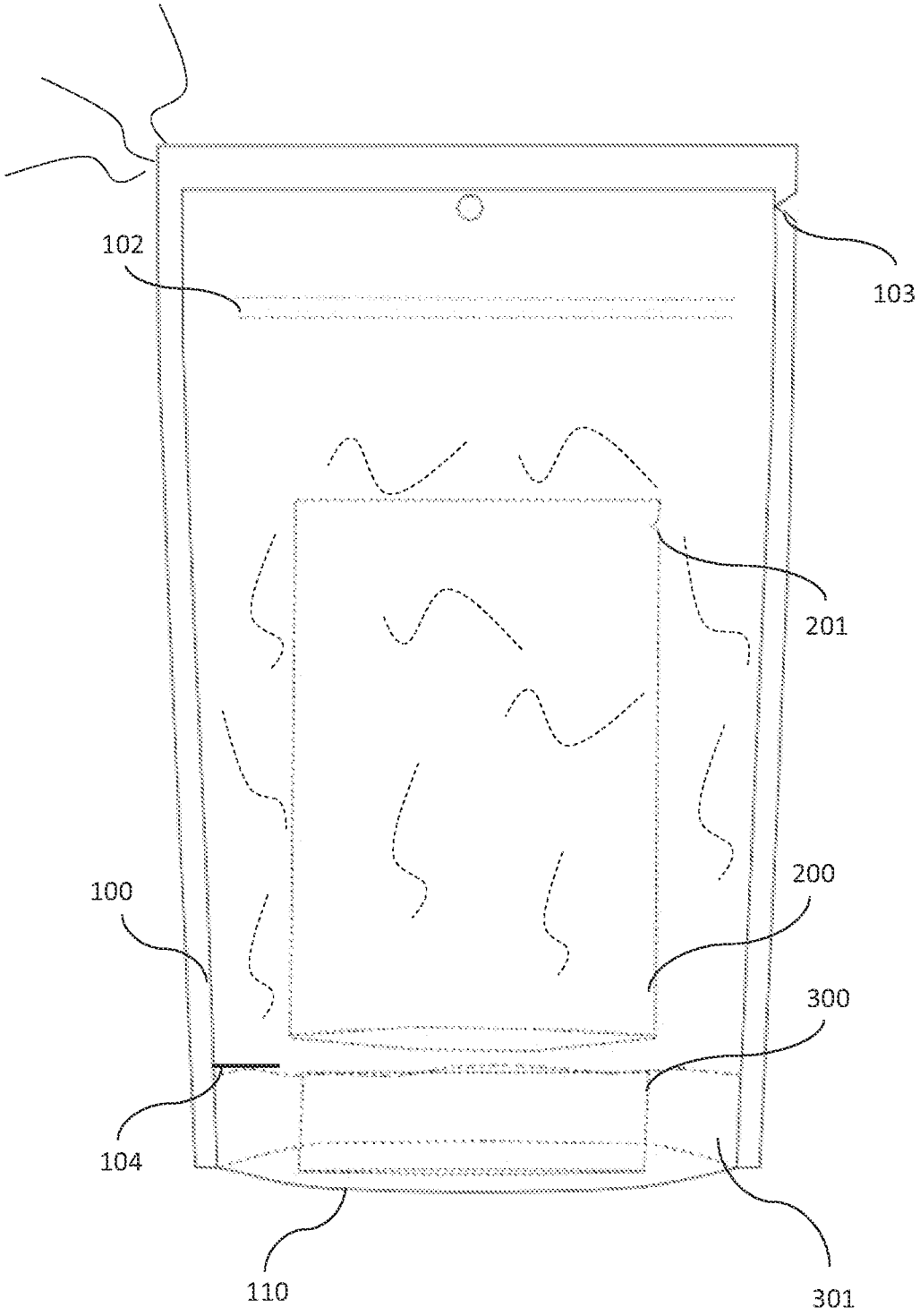


Figure 3

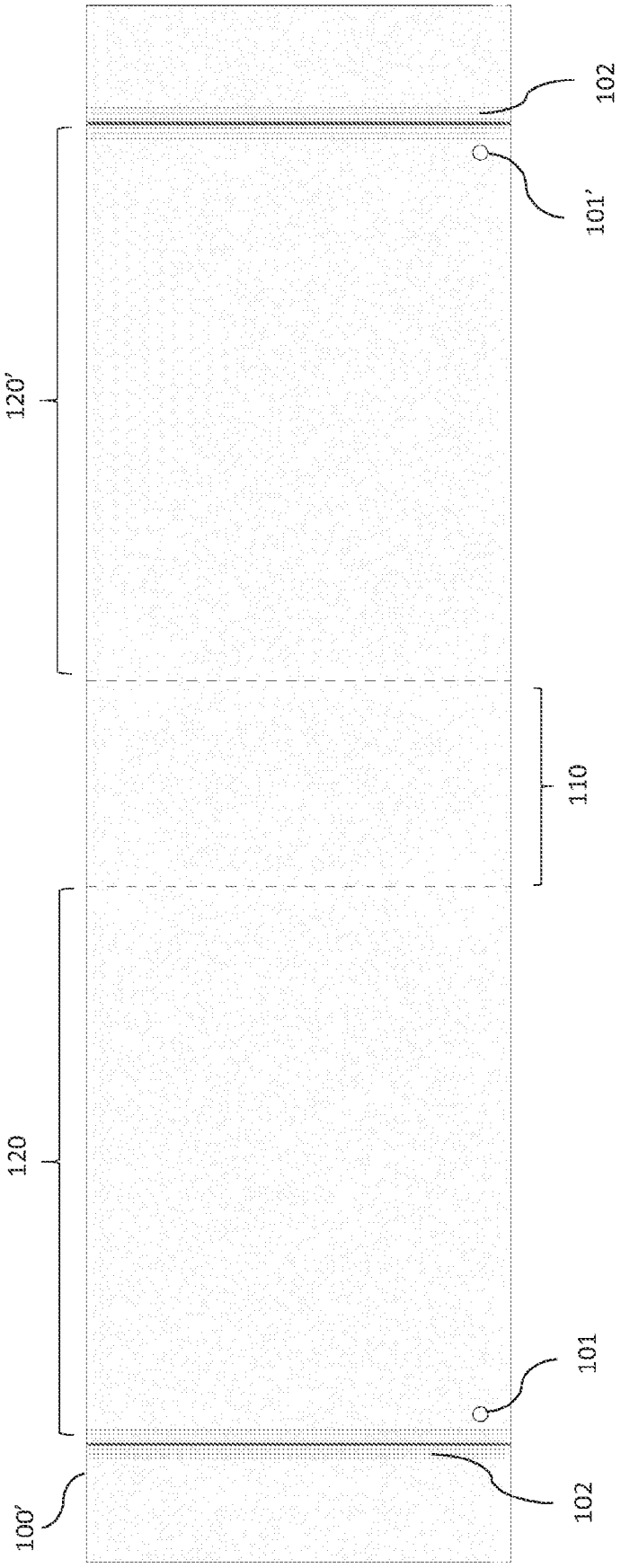


Figure 4

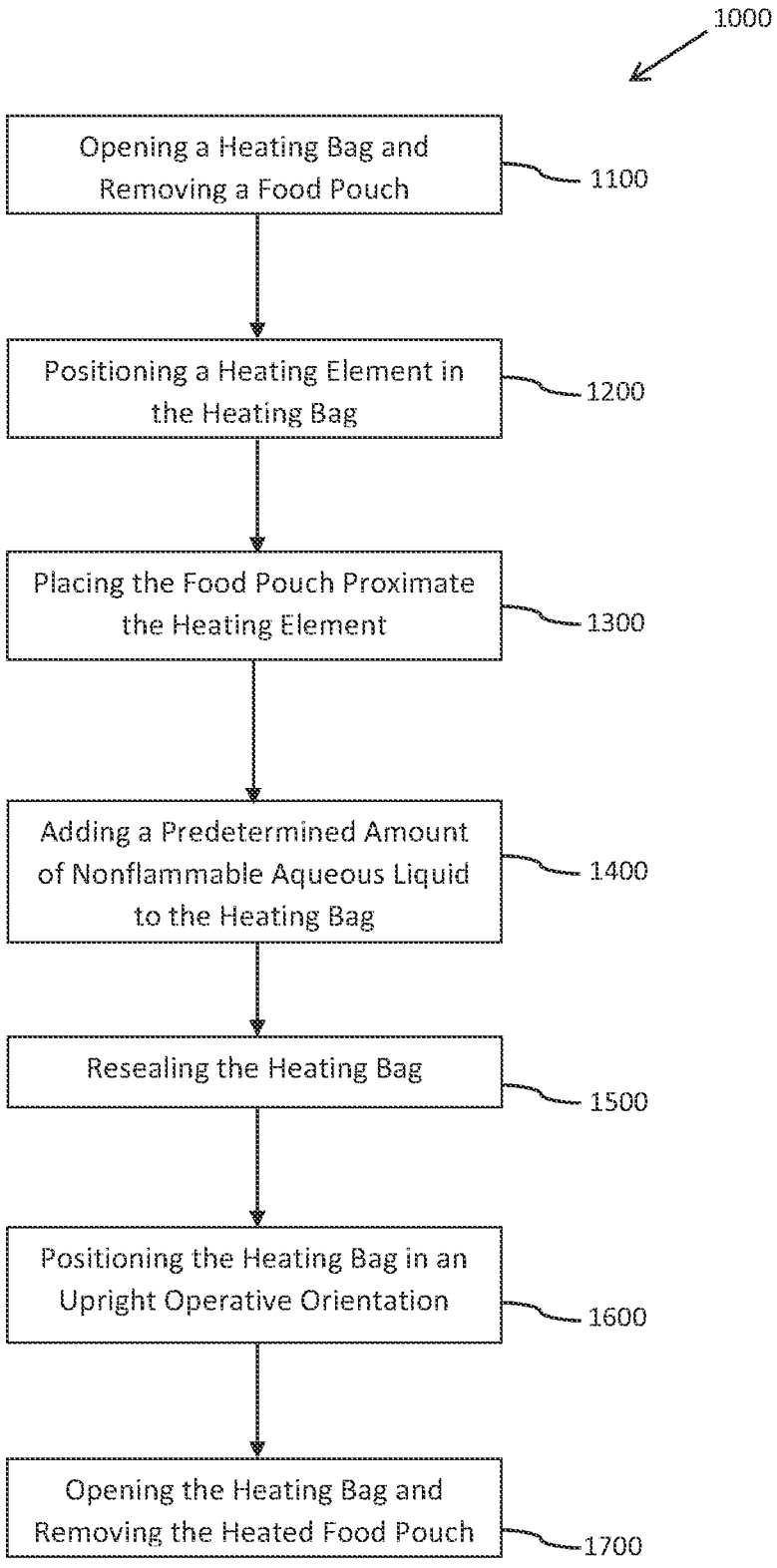

1000
Opening a Heating Bag and Removing a Food Pouch
1100
Positioning a Heating Element in the Heating Bag
1200
Placing the Food Pouch Proximate the Heating Element
1300
Adding a Predetermined Amount of Nonflammable Aqueous Liquid to the Heating Bag
1400
Resealing the Heating Bag
1500
Positioning the Heating Bag in an Upright Operative Orientation
1600
Opening the Heating Bag and Removing the Heated Food Pouch
1700

Figure 5

SELF-CONTAINED HOT MEAL ASSEMBLY WITH STEAM VENT

BACKGROUND OF THE INVENTION

Claim of Priority

[0001] The present application is a Continuation-In-Part (CIP) patent application of and claims priority to a previously filed, U.S. Non-Provisional patent application, namely, that having Serial No. 15/188,053 and a filing date of Jun. 21, 2016, and further, claims priority to a previously filed, U.S. Provisional patent application, namely, that having Serial No. 62/296,815 and a filing date of Feb. 18, 2016, with the contents of both prior applications being incorporated herein by reference in their entireties.

FIELD OF THE INVENTION

[0002] This invention is directed to a self-contained hot meal assembly including a heating bag having a steam vent and an exothermic efficient configuration. Specifically, the combination and configuration of the present invention provides for a heating bag having at least one steam vent that allows for optimal exposure of an internal food pouch to steam generated by a water-activated heating element, which altogether allows for effective storage, transit, heating, and disposal of a portable meal.

DESCRIPTION OF THE RELATED ART

[0003] A "Meal, Ready-to-Eat", more commonly known as an MRE, is a self-contained, individual field ration originally created by the United States military for its service members engaged in combat or other field operations, where food preparation facilities were not readily available. Being lightweight and self-contained, MREs allow for more food rations to be carried on extended trips. MREs have evolved and improved since their original conception years ago and today have been increasingly adapted for use by people while hiking, camping, or engaging in other outdoor activities, where it may be beneficial or perhaps even necessary to have portable and self-contained food rations.

[0004] One notable improvement in the history of MREs was the addition of a flameless ration heater (FRH) in 1990, which involved the use of a water-activated exothermic reaction product that emits heat. This product allowed a service member or a backpacker to enjoy a hot meal in the field or on the trek, by placing the food in proximity to the heating element.

[0005] As such, MREs provide significant advantages when compared to freeze dried food alternatives, which still require carrying a supply of potable water and a pot to heat the water in, over using either a portable stove, which then must also be carried, or building a campfire onsite, which may not always be convenient or safe.

[0006] However, the current design of this heating element in combination with traditional MRE packaging is less than ideal, as the current solution requires the placement of a heating pack on one side of the MRE meal pouch, enclosed by an external paper-based carton. The result of this approach is an unevenly heated meal, and an inefficient exothermic reaction due to the inability of the external carton to preserve and circulate heat or steam. As such, in lower temperature environments, the heating packet and the external carton utilized are insufficient for evenly or properly heating up a meal to the desired temperatures. Therefore, there is a need in this area for an improved MRE or self-contained hot meal assembly, which allows for more efficient and controlled heating of a portable meal, and which also provides the convenience of a single self-contained, low-profile, environmental-friendly, and cost-effective packaging.

SUMMARY OF THE INVENTION

[0007] The present invention is generally directed to a self-contained hot meal assembly. As such, initially and in broad terms, a self-contained hot meal assembly of the present invention generally comprises a heating bag having a steam vent, a food pouch, a heating element, and, optionally, a utensil packet or bag, and/or combinations thereof. Each of the included elements may be prepackaged in a heating bag which may also serve as an external packaging for the self-contained hot meal assembly.

[0008] In operation, a heating element is placed within an interior of a heating bag at a bottom or lower portion thereof. A food pouch is placed within the heating bag either above the heating element, beside the heating element, or otherwise proximal to the heating element. A predetermined amount of water or any other nonflammable aqueous liquid is added to the heating bag, and the heating bag is quickly resealed. An aqueous activated exothermic reaction is created by exposing the heating element to the predetermined amount of water or other nonflammable aqueous liquid, which causes the generation of steam and the generated steam to rise and circulate around the food pouch. The steam is evacuated from the heating bag at a slow and controlled rate via a steam vent disposed on a distal and/or upper portion of the heating bag.

[0009] The heating bag may comprise a resealable access opening to allow removal of various components from the heating bag, and to allow closure of the heating bag during operation, i.e., while heating a food pouch therein. The resealable access opening may comprise one or more resealable strip(s) such as a press-and-seal zipper. At least one steam vent is formed along a portion of the heating bag, such as a distal and/or upper portion thereof, and/or at a distal and/or upper corner of the heating bag in order to facilitate the controlled and safe evacuation or release of the steam generated therein away from a user. As such, the steam vent may comprise a substantially circulator aperture imprinted or structured onto the heating bag during construction.

[0010] The heating bag may include a single or multilayer film composition designed to be flexible and lightweight, such as to include a base structured and dimensioned to allow the heating bag to stand in a substantially upright position and to provide stability when the product is in operation. An appropriate sealant may be used in its construction having a melting point greater than 120° C. and in at least one embodiment greater than 160° C., in order to accommodate for a high efficiency and highly reactive heating element. In at least one embodiment, a heating bag includes a multi-layer construction. In one further embodiment, a water line or visual indicator is printed onto the heating bag along a transparent or partially transparent portion thereof, so that a user can visually determine the predeter-

mined amount of water or other nonflammable aqueous liquid to be added.

[0011] A food pouch in accordance with the present invention may similarly comprise a single or multi-layer foil pouch including food-safe materials as approved by the Food and Drug Administration and is also designed to accommodate high temperatures greater than 120° C. and in at least one embodiment greater than 160° C. A food pouch in at least one embodiment comprises a 4-ply layer foil pouch. A food pouch may undergo retort processing to allow for sterile packaging of food handled by aseptic processing. A retort process is conducted at high temperatures and/or at high pressure for complete sterilization and for extending the shelf life of the food stored in the food pouch. Also, other food products may be processed that are not retorted such as, but not limited to, pizza, cookies, brownies that are shelf stable and packaged using modified atmosphere packaging (MAP). Moreover, it should be noted that the efficiency and operability of the self-contained hot meal assembly of the present invention is capable of heating food maintained within a container while being heated or the food itself absent any such container or containment structure.

[0012] A heating element may include any number of chemical composition(s) for generating heat in oxidation-reduction when exposed to water or any other nonflammable aqueous liquid. A heating element may comprise magnesium metal, and may further comprise a mixture of aluminum, calcium oxide, calcium carbonate, calcium di-hydroxide, sodium carbonate, and/or sodium hydroxide for catalyzing and/or accelerating the aqueous exothermic reaction. The heating element may be housed within a fabric pouch or container, which may be formed of a non-woven fabric material, that may or may not be biodegradable. In one further embodiment, a fabric pouch and/or an external surface of a heating element is structured to delay the oxidation reaction, in order to provide the user with sufficient time to reseal the heating bag.

[0013] These and other objects, features and advantages of the present invention will become clearer when the drawings as well as the detailed description are taken into consideration.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] For a fuller understanding of the nature of the present invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

[0015] FIG. **1** is a schematic representation of one illustrative embodiment of a self-contained hot meal assembly of the present invention, including a heating bag, a meal pouch, a heating element, and a utensil packet.

[0016] FIG. **2** is a front view of one illustrative embodiment of a self-contained hot meal assembly in accordance with the present invention in operation.

[0017] FIG. **3** is a rear view of the illustrative embodiment of a self-contained hot meal assembly of FIG. **2**.

[0018] FIG. **4** is a schematic representation of one illustrative embodiment of a heating bag in accordance with the present invention having a one-piece construction.

[0019] FIG. **5** is a diagrammatic representation of one illustrative embodiment of a method for preparing a hot meal for consumption by a user utilizing a self-contained hot meal assembly in accordance with the present invention.

[0020] Like reference numerals refer to like parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] As schematically represented in the accompanying drawings, the present invention is generally directed to a self-contained hot meal assembly **400** as generally illustrated at FIG. **1**. Accordingly, the self-contained hot meal assembly **400** comprises a heating bag **100**, a food pouch **200**, a heating element **300**, a utensil packet **350**, and/or combinations thereof. In one embodiment, each of a food pouch **200**, a heating element **300**, and a utensil packet **350** are prepackaged in a heating bag **100**. In at least one further embodiment, a heating bag **100** serves as an outer package for enclosing the various components of a self-contained hot meal assembly **400** in accordance with the present invention. Further, the heating element **300** may be in the form of a heating pad or other structure wherein a reactive composition may be at least partially retained or contained in a manner which facilitates exposure of the reactive composition to water or a nonflammable aqueous liquid, as set forth hereinafter in more detail.

[0022] In operation, each of a food pouch **200**, a heating element **300**, and a utensil packet **350** are removed from an outer package which, as noted above, in at least one embodiment comprises a heating bag **100**. Turning to the illustrative embodiment of FIG. **2**, a heating element **300** is placed in a lower portion of a heating bag **100**. As before, the heating bag **100** includes a base **110** structured and dimensioned to allow the heating bag **100** to stand in a substantially upright position and to provide stability when it is in operation. A food pouch **200** including an amount of food to be heated is placed within the heating bag **100**, once again, either above the heating element **300**, beside the heating element **300**, or otherwise proximal to the heating element **300**. A predetermined amount of water or other nonflammable aqueous liquid is added to the heating bag **100**, and the heating bag **100** is quickly resealed. In one embodiment, a predetermined amount of water or other nonflammable aqueous liquid is about three fluid ounces. However, in one or more embodiments the fluid amount added to the heating bag **100** may be between about 2 fluid ounces to 8 fluid ounces. In at least one further embodiment, a water line or visual indicator **104** is printed onto the heating bag **100** along a transparent or partially transparent portion thereof, so that a user can visually determine the predetermined amount of water or other nonflammable aqueous liquid to be added to the heating bag **100**. In order to accommodate the above possible variable amount of non-flammable aqueous liquid added to the heating bag **100**, the location of the indicator line **104** may vary, dependent on and in cooperation with the location and the size of the heating bag **100**, in order to accommodate the addition of between about 2 fluid ounces and about 8 fluid ounces.

[0023] An aqueous activated exothermic reaction is initiated by exposing the heating element **300** to the predetermined amount of water or other nonflammable aqueous liquid. The reaction heats the water or nonflammable aqueous liquid, which causes steam to rise and circulate around the food pouch **200**. The steam is evacuated from the heat-

ing bag **100** at a slow and predetermined controlled rate safely away from the user via at least one steam vent **101** disposed on a distal and/or upper portion of the heating bag **100**.

[0024] A heating bag **100** in accordance with one embodiment of the present invention comprises a resealable access opening **102**, which may include one or more resealable strips for closing the bag to substantially enclose the exothermic steam therein upon operation. In one embodiment, the resealable access opening **102** comprises a plastic zipper as known in the art, such as a press-and-seal zipper. In one other embodiment, the resealable access opening **102** comprises two or more resealable strips. In at least one embodiment, a heating bag may or may not comprise a tear-away notch **103** disposed on an upper portion above a resealable opening **102**, such as is shown by way of example in the illustrative embodiment of FIG. **1**. A tear-away notch facilitates convenient opening of the heating bag **100** and access to the resealable opening **102**.

[0025] At least one steam vent **101** is formed along an upper portion of the heating bag **100** beneath the resealable access opening **102**. As shown in the illustrative embodiment of FIG. **1**, the heating vent **101** is disposed through an upper distal corner of the heating bag **100** in order to facilitate the controlled and safe evacuation of steam from therein. In one embodiment, such as is illustrated in FIGS. **2** and **3**, a single steam vent **101** is formed on only one side of the heating bag **100**, in this embodiment, through an upper distal corner on the front of the heating bag **100**. In another embodiment, such as in the illustrative embodiment of FIG. **4**, steam vents **101**, **101′** are formed through each of the front and back of the heating bag **100′**.

[0026] A steam vent **101** in accordance with the present invention may comprise a substantially circular aperture formed through a portion of the heating bag **100**. Of course, it will be appreciated by those of skill in the art that a steam vent **101** may comprise other geometric configurations which are encompassed within the scope and intent of the present invention. In at least one embodiment, a steam vent **101** is disposed through a distal upper corner of the heating bag **100** and therefore, steam is discharged outwardly from the steam vent at about a 90-degree angle relative to the sides of the heating bag **100**, in order to facilitate safe evacuation of the steam away from a user. In other words, the steam vent **101** facilitates the outward projection of steam in a relatively slow and controlled manner and at a predetermined controlled rate. Such a controlled rate or controlled manner of escape allows a sufficient temperature or "threshold temperature" to be maintained within the heating bag **100** by circulating steam evenly around the enclosed food pouch **200**, while the steam is being released and while eliminating the danger of over-pressurizing the heating bag **100**, causing it to explode or otherwise fail, and potentially harming a user or others proximate the assembly **400**, while in use.

[0027] In one embodiment, a steam vent comprises a ¼-inch diameter, to allow sufficient heat dissipation, through the escape of steam therethrough, from the heating bag **100** during use, so that the structural integrity of the heating bag **100** is not compromised, while maintaining a sufficient temperature or threshold temperature of the heating process therein to allow for efficient and even heating of an amount of food in a food pouch **200**. In one further embodiment, a steam vent **101** comprises a diameter of about ⅛ inch to about ½ inch. As noted above, a steam vent **101** can comprise any of a variety of geometric configurations to facilitate the evacuation of steam from a heating bag **100** at a discharge angle of about 30 degrees to about 90 degrees relative to the sides of the heating bag **100**, in order to facilitate safe evacuation of the steam away from a user.

[0028] In one embodiment, a visual indicator **104** is marked or otherwise disposed on a heating bag **100**, in order to assist a user in adding the predetermined amount of water or other nonflammable aqueous liquid into the heating bag **100** so as to substantially submerge the heating element **300** and initiate an efficient and effective aqueous exothermic reaction. A visual indicator **104** in one embodiment comprises a fill line, and in one further embodiment, a visual indicator **104** comprises an at least partially transparent portion formed on the heating bag **100** itself, such that a user can visualize the amount of water or other nonflammable aqueous liquid being added to the heating bag **100**.

[0029] In one embodiment, a fluid pouch, not shown, containing a predetermined amount of water or other nonflammable aqueous liquid is incorporated into the present self-contained hot meal assembly **400**. A fluid pouch may include a tear-away notch similar to tear-away notch **103** which may be included in the heating bag **100**. In another embodiment, a measuring cup, envelope, pouch or other appropriate container (not shown), may be used to allow a user to measure a predetermined amount of water or other nonflammable aqueous liquid, for example, in 3 fluid ounces, or between 2 fluid ounces and 8 fluid ounces, and is incorporated into the present self-contained hot meal assembly **400**. In yet one further embodiment, the predetermined amount of water or other nonflammable aqueous liquid to be added to the heating bag **100**, once again, by way of example, between 2 fluid ounces and 8 fluid ounces and in certain embodiments 3 fluid ounces, may be printed directly on the heating bag **100** itself.

[0030] It is to be noted that in at least one embodiment the amount or quantity of water or nonflammable aqueous liquid added to the heating bag is dependent on the dimensions of the heating element **300** and/or the quantity of reactive composition contained therein or otherwise directly associated therewith. In turn, the amount of reactive composition operatively associated with the heating element **300** may vary in quantity dependent, at least in part, on the dimensions and/or structural features of the heating bag and/or the quantity of food product to be heated. Further, in at least one embodiment, the quantity of reactive composition is about 25 g; at least 25 g or less than 25 g. Further, the adequate amount of water or other nonflammable aqueous liquid may be added to the interior of the heating bag **100** without the inclusion or use of a fluid pouch, measuring cup, etc., such as by adding sufficient amount of water or other non-flammable aqueous liquid to the interior of the heating bag **100** utilizing the indicator line **104**, as set forth in detail herein.

[0031] As before, a heating bag **100** may comprise a multilayer film composition designed to be flexible, lightweight, and compliant with Food and Drug Administration requirements. However, it is recognized that Food and Drug Administration requirements may not be necessary when the heating bag does not come in contact with the food being heated. An appropriate sealant may be used in the construction of a heating bag **100** having a melting point greater than 120° C., in order to ensure that the heating

bag **100** maintains structural integrity at the relatively elevated temperatures created by the heating element **300**. A heating bag **100** in accordance with the present invention may be constructed of a number of suitable materials including but not limited to polyethylene, polyethylene terephthalate (PET or PETE), high density polyethylene (HDPE), low density polyethylene (LDPE), polypropylene (PP), polystyrene (PS), polyvinyl chloride (PVC), polycarbonate, among other appropriate materials or combinations thereof for implementing the present invention.

[0032] A heating bag **100** in accordance with at least one embodiment of the present invention comprises a base **110** structured and dimensioned to allow the heating bag **100** to stand in a substantially upright position while in operation. With reference to FIG. **4**, one dimensional embodiment of the present invention is shown. Accordingly, in at least one embodiment, a height **120**, **120'** of a heating bag **100** is about 8 inches to about 10 inches, and a width of the base **110** is about 2 inches to about 5 inches. In at least one embodiment, a base **100** comprises a material of construction having sufficient elasticity such that the base **110** is expandable and collapsible. Providing an expandable base **110** allows a volume of a self-contained hot meal assembly **400** to be reduced for transit by user, such as, in a backpack. Different types of food products may require a heating bag **100** having different dimensions in order for the heating process to occur efficiently, However, because it is desirable for steam to travel and/or be disposed inside the heating bag **100**, upwards and along one or more external surfaces of a food pouch **200**, the height **120**, **120'** of a heating bag **100** will be about 1.1 to about 3 times the width of the base **110**.

[0033] A food pouch **200** may also comprise a single or multi-layer foil pouch with an amount of food sealed therein. In one embodiment, a food pouch **200** comprises a 4-ply layer foil pouch that has undergone a retort process at high temperatures and high pressure for complete sterilization, in order to extend the shelf life of the food therein. In another embodiment, a food pouch comprises between 2 to 8 layers.

[0034] Accordingly, structural and/or dimensional modifications of the heating bag **100**, heating element **300** and reactive composition have been found to provide different results and operational characteristics. By way of nonlimiting example, a reduction in size of the heating element **300** as well as the size of the non--woven fabric that holds the reactive composition, such as up to 25 gr of mixed chemicals, and reducing the dimensions of the heating element **300** to up to 30% resulted in the ability to heat up to 8-10oz of food in 8-12 minutes reaching and maintaining temperatures above 80° C. for more than 10 minutes. In addition, the heating bag **100** and other types of heating bags constructed with paper and including a hard base can be utilized to contain baby bottles and other food type containers, including cans, etc. It is further contemplated that such structural and/or dimensional modifications of the various components of the self-contained hot meal assembly **400** of the present invention in accord with the inclusion of the basic components as set forth therein provides a versatility which allows for the heating of different types of products such as, but not limited to the hard boiling of eggs, cooking of fish, chicken and other food products. Further modifications as set forth herein as resulted in the processing of freeze-dried food products and reconstituted food and was successful.

[0035] A heating element **300** in accordance with the present invention includes a reactive composition which is reactive upon contact with water or any other nonflammable aqueous liquid for facilitating the generation of heat in an exothermic electron-transfer or oxidation-reduction reaction. In one embodiment, water or another nonflammable aqueous liquid is poured into the heating bag **100** and onto the heating element **300** which comprises a predetermined amount of a mixture of sodium hydroxide and aluminum.

[0036] In order to accelerate this reaction, mixed metallic iron particles and/or other particles may be added to the heating element **300**. In one embodiment of the present invention, a proprietary reactive composition comprises a mixture of aluminum powder, calcium oxide, calcium carbonate, accelerant aid, wetting agent, and/or sodium hydroxide is utilized in a heating element **300**. In more specific terms and by way of a nonlimiting example of at least one embodiment of the present invention, the reactive composition may comprise, aluminum at 20%-45% by weight; calcium oxides at 20%-40% by weight; calcium carbonate at 14%-30% by weight; accelerant at 5%-15% by weight; wetting agent at 9%-20% by weight. In at least one further embodiment of the present invention, a proprietary reactive composition comprises a mixture of aluminum powder and sodium hydroxide is utilized in the heating element **300**. The predetermined amount of aluminum powder and sodium hydroxide is disposed within a fabric pouch or container. In at least one embodiment, the pouch or container is a non-woven fabric, and in one further embodiment, the pouch or container may or may not be biodegradable. A heating element **300** in accordance with at least one embodiment of the present invention generates sufficient heat to maintain a temperature within a heating bag **100**, and thus, surrounding a food pouch **200**, at about 105° C. for about 3 to about 5 minutes. The proprietary mixture within a heating element **300** in accordance with the present invention may be required to pass the Substances of Very High Concern (SVHC) screening test. In at least one embodiment, a heating element **300** is dimensioned cooperatively with a base **110** of a heating bag **100**, in order to facilitate its expansion thereof and to provide stability of the heating bag **100** in a substantially upright position while in use, such as is shown in FIGS. **2** and **3**.

[0037] A utensils packet **350** in at least one embodiment includes utensils such as plastic or other disposable forks, sporks, knives, napkins, condiments, etc. A utensils packet **350** is removed from the heating bag **100** prior to adding water or another nonflammable aqueous liquid.

[0038] Accordingly, and in summary, one or more embodiments of the present invention comprises a reactive composition contained within and or operably associated with the heating element **300** being reactive with a nonflammable aqueous liquid to initiate an exothermic reaction. The exothermic reaction being sufficient to generate steam within heating bag **100**, upon interaction with the water or other nonflammable aqueous liquid. The heating element **300**, the food pouch **200**, and possibly but optionally the utensil pouch **350** and fluid pouch (not shown) initially prepackaged within said heating bag **100** to facilitate ease and efficient storage and transport thereof prior to use.

[0039] Further, the heating bag **100** is dimensioned and configured to allow the heating element **300** and said food pouch **200** to be operatively positioned therein for heating of said food product within the food pouch **200**, by the afore-

mentioned generation of steam. The predetermined amount of the reactive composition in the heating element **300** is reactive with the predetermined amount of said nonflammable aqueous liquid to generate sufficient heat to maintain a preferred threshold temperature of about 82° C. within the heating bag **100** for about 3 minutes to about 5 minutes, thereby heating the amount of food product in the food pouch **200** for consumption by a user. The establishment and/or maintenance of the preferred threshold temperature of about 82° C. is accomplished and/or facilitated by the at least one steam vent **101** structured and dimensioned to discharge steam from said heating bag **101** at a controlled rate. Such a controlled rate of dispensing the steam from within the interior of the heating bag **100** is sufficient to allow the threshold temperature to be maintained and the attendant heat being sufficient within said heating bag, at about the threshold temperature, by circulating, disposing and/or maintaining the generated steam evenly around the food pouch **200** to allow for efficient and even heating of said food product and provide a fully heated food product within said food pouch.

[0040] The present invention is further directed to a method **1000** for preparing a hot meal for consumption by a user utilizing a self-contained hot meal assembly **400**. In at least one embodiment, the present method for preparing a hot meal **1000** comprises opening the resealable opening **102** of a heating bag **100** and removing a food pouch **200** therefrom **1100**. In one further embodiment, the present method **1000** also comprises removing a utensils packet **350** from the heating bag **100**, when and if a utensil packet **350** is included. The present method for preparing a hot meal **1000** further comprises positioning **1200** a heating element **300**, for example, positioning a heating element in a lower portion of the heating bag **100**. In accordance with one embodiment, the present method for preparing a hot meal **1000** further comprises placing, as at **1300**, a food pouch **200** containing an amount of a food product at least temporarily sealed therein proximate the heating element **300** in the heating bag **100**.

[0041] The present method for preparing a hot meal **1000** further comprises adding, as at **1400**, a predetermined amount of a nonflammable aqueous liquid to the heating bag **100** thereby initiating an exothermic reaction, and the generation of steam, with a reactive composition in the heating element **300**. In at least one embodiment, the present method for preparing a hot meal **1000** includes resealing as at **1500** the resealable opening **102** of the heating bag **100**. In yet one further embodiment, the present method for preparing a hot meal **1000** further comprises positioning the heating bag **1600**, for example, positioning the heating bag **100** in a substantially upright operative orientation and allowing steam generated by the exothermic reaction to heat an amount of food product in the food pouch **200**.

[0042] The present method for preparing a hot meal **1000** further comprises, as at 1700, the opening the resealable opening **102** of the heating bag **100** and removing a food pouch **200** from the heating bag **100**, wherein the food pouch **200** now contains a fully heated food product which is ready to eat.

[0043] Since many modifications, variations and changes in detail can be made to the described preferred embodiment of the invention, it is intended that all matters in the foregoing description and shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense. Thus, the scope of the invention should be determined by the appended claims and their legal equivalents.

What is claimed is:

1. A self-contained hot meal assembly comprising:
- a heating bag including an access opening,
- said access opening disposed in communicating relation with an interior of said heating bag,
- a heating element disposed within said heating bag and comprising a predetermined amount of a reactive composition contained therein,
- a food pouch removably retained within said heating bag, said food pouch including a food product removably contained within said food pouch,
- said reactive composition reactive with nonflammable aqueous liquid, added to said heating bag, to initiate an exothermic reaction within said heating bag, said exothermic reaction sufficient to generate steam within said heating bag, upon interaction with said nonflammable aqueous liquid,
- said predetermined amount of said reactive composition being reactive with said predetermined amount of nonflammable aqueous liquid to generate sufficient heat, via said generated steam, to maintain a threshold temperature for a predetermined time sufficient to heat said food product for consumption by a user, and
- at least one steam vent disposed and structured to discharge steam from said heating bag at a controlled rate; said controlled rate sufficient to allow said threshold temperature to be maintained within said heating bag by circulating steam evenly around said food pouch to provide a fully heated food product.

2. The self-contained hot meal assembly as recited in claim **1** wherein at least said heating bag and said food pouch are prepackaged within said heating bag, to facilitate storage and transport thereof prior to use.

3. The self-contained hot meal assembly as recited in claim **1** wherein said heating bag comprises a base dimensioned and configured to maintain said heating bag in a substantially upright, operative orientation while in use.

4. The self-contained hot meal assembly as recited in claim **1** wherein said at least one steam vent is disposed and configured to discharge steam and an angle of approximately 90° relative to a side of said heating bag.

5. The self-contained hot meal assembly as recited in claim **1** wherein said threshold temperature is about 82° C.

6. The self-contained hot meal assembly as recited in claim **5** wherein said predetermined time sufficient to heat said food product for consumption by a user is about 3 minutes to about 5 minutes.

7. The self-contained hot meal assembly as recited in claim **1** wherein said predetermined time sufficient to heat said food product for consumption by user is at least about 3 minutes to about 5 minutes.

8. The self-contained hot meal assembly as recited in claim **1** wherein said nonflammable aqueous liquid added to said heating bag is between about 2 fluid ounces and about 8 fluid ounces.

9. The self-contained hot meal assembly as recited in claim **1** wherein said access opening comprises a resealable structural configuration.

10. The self-contained hot meal assembly as recited in claim **1** wherein said reactive composition comprises

predetermined percentages by weight of aluminum, calcium oxide, calcium carbonate, accelerant and wetting agent.

11. A self-contained hot meal assembly comprising:

a heating bag including an access opening disposed in communicating relation with an interior of said heating bag,

a food pouch removably retained within said heating bag, said food pouch including a food product removably contained within said food pouch,

a heating element disposed within said heating bag in the heat transferring relation to said food pouch, said heating element comprising a predetermined amount of a reactive composition contained therein,

said reactive composition reactive with nonflammable aqueous liquid, added to said heating element within said heating bag, to initiate an exothermic reaction within said heating bag,

said exothermic reaction sufficient to generate steam within said heating bag, upon interaction with said nonflammable aqueous liquid,

said predetermined amount of said reactive composition being reactive with said predetermined amount of nonflammable aqueous liquid to generate sufficient heat to maintain a threshold temperature of about 82° C. for at least about 3 minutes to about 5 minutes, sufficient to heat said food product for consumption by a user, and

at least one steam vent disposed and structured to discharge steam from said heating bag at a controlled rate; said controlled rate sufficient to allow said threshold temperature to be maintained within said heating bag by circulating steam around said food pouch to provide a fully heated food product.

12. The self-contained hot meal assembly as recited in claim **11** comprising a plurality of steam vents collectively dimensioned to discharge steam from said heating bag at said controlled rate.

13. The self-contained hot meal assembly as recited in claim **11** wherein said heating bag comprises a base dimensioned and configured to maintain said heating bag in a substantially upright, operative orientation while in use.

14. The self-contained hot meal assembly as recited in claim **11** wherein said nonflammable aqueous liquid added to said heating bag is between about 2 fluid ounces and about 8 fluid ounces.

15. The self-contained hot meal assembly as recited in claim **11** wherein at least said heating bag and said food pouch are prepackaged within said heating bag, to facilitate storage and transport thereof prior to use.

16. A method for preparing a hot meal for consumption by a user utilizing a self-contained hot meal assembly, the method comprising:

prepackaging a heating element and a food pouch, containing a food product, within a heating bag and including a reactive composition in the heating element

placing the heating element in heat transferring relation to the food pouch, within the heating bag,

adding a predetermined amount of a nonflammable aqueous liquid to the reactive composition in the heating bag to initiate an exothermic reaction resulting in the generation of steam;

concurrent to the generation of steam, maintaining the exothermic reaction sufficient to generate enough heat to maintain at least a predetermined threshold temperature within the heating bag for at least a predetermined period of time sufficient for heating the food product in the food pouch for consumption by the user,

sealing the heating bag, and

discharging an amount of steam via at least one steam vent at a controlled rate; establishing the controlled rate sufficient to maintain the threshold temperature within the heating bag, concurrent to circulating the steam around food pouch to provide a fully heated food product within said food pouch.

17. The method as recited in claim **16** wherein said threshold temperature is about 82° C.

18. The method as recited in claim **16** wherein said predetermined time sufficient to heat said food product for consumption by a user is about 3 minutes to about 5 minutes.

19. The method as recited in claim **16** wherein said nonflammable aqueous liquid added to said heating bag is between about 2 fluid ounces and about 8 fluid ounces.

20. The method as recited in claim **16** wherein said reactive composition comprises predetermined percentages by weight of aluminum, calcium oxide, calcium carbonate, accelerant and wetting agent.

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