References Cited

U.S. Patent Documents

Patent Number	Date Filed	Author
US5712012A	1993	David S. Forman Lisa R. Forman
20050120457	2003	Admir Mesalic
EP0745343A1	1989	Katherine C. Horton Mark C. Rogers
WO2007030688A2	2005	Lindy L. Bartell Christopher Bartell
20200397169	2019	Busy Baby LLC

Description

Background

The placemat is a type of mat that is used during times where food consumption occurs. Placemats prevent dishes, pots, and pans from causing damage to the tables that they are placed on. The material that makes up the placemat is typically one of light and durable sheets of mesh that come in different thicknesses, shapes, and sizes.

Placemats are made up of heat-resistant fabric aimed to prevent damage to tabletops and other eating surfaces. Without the use of placemats, the use of crockery could potentially result in chips, scratches, burn marks, and other kinds of damage.

Other types of placemats exist such as heated placemats, which prevent damage to surfaces, all while keeping the dish and food warm. Typically heated placemats don't fall into the category of a sheet, but instead are a bulky industrial kind of placemat that uses electricity to conduct heat which is transferred through a metal plate into a dish.

Devices such as heating lamps are also used in the food industry, these lamps however tend to dry the surface of the food and fail to heat the food thoroughly. These heating lamps also consume large amounts of electricity to function and require that the plates remain close to the lamp for the food to be heated.

What does not already exist in the placemat industry is a placemat that protects tabletops, heats food, and does not conduct heat electrically. A placemat that can be used in restaurants both in the kitchen and on the tables of those eating at the restaurant. This would mean that what lacks in a pre-existing heating placemat is a portable and movable one with no cord attached.

The solution for a placemat that all together can protect tabletops, keep food warm, and remain easily transportable is a slim rigid placemat that utilizes a copper plate to transfer heat created from a chemical reaction formed in a packet. This forms the herein summary of the disclosed embodiment.

The herein disclosed information is that, in accordance with a placemat having both a major and minor dimension, addressed the summary of the disclosure portion of the issued statements. The disclosed embodiment consists of a contraption capable of heating chemically a top-layer material in which transfers internal heat to the user. The specifics of the disclosed embodiment are addressed further below.

Summary of the Disclosure

According to an aspect of the disclosure, there is provided a placemat having a major dimension, a minor dimension consisting of multiple layers within two outer layers of plastic material to complete the disclosed design.

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. The additional use of the placemat is shown through its many uses and functions as a placemat and heat source. The heated placemat is placed on tables or other flat surfaces. The heated placemat is used to hold dishware for dining to keep food warm. The heated placemat has two different version

The heated placemat has 4 layers for version 1: a wood veneer, a plastic layer combined with a copper layer, and a final plastic bottom layer with a wood veneer layer. The layer can change with different variants of the placemat. Version 2 has 4 layers, a top copper layer, then a layer entirely for the pouches. then a bottom plastic layer followed by a wood veneer layer.

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. The placemat heats to let food remain warm throughout dining. The placemat can remain hot for many hours. Further embodiments allow the entire placemat

to be heated. The heating capabilities were originally thought up to be used at buffets instead of heat lamps to keep food warm.

To start the heat is produced through a chemical reaction then to disperse the heat throughout the embodiment a copper sheet was added. The chemical will be distributed and used in pouches and then placed into the placemat through a gap between the plastic layers and copper layers. In addition, the placemat can be used without the pouch in replace of a normal placemat as the pouches produce heat. Following the copper layers, metal strips will be used to mix the substances. The embodiment as well as usable to perform the uses of a normal placemat with the added specialty to heat.

For version 2 there is an entire layer dedicated for heating pouches and the entire heat source is spread throughout the heated placemat.

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. A pouch of chemicals is used to produce the heat for the heated placemat. The pouch of chemicals is composed of two bags. The outer bag is filled with a chemical which is a chloride compound that produces heat when it comes in contact with water. Therefore, a second bag is added which contains water. The pouch field with water is vacuum-sealed.

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. To use the heated placemat consumers will have to prepare the chemical pouch. To prepare the pouch consumers will have to hit the bag to break the water-filled bag to start the reaction. From there for version one, the chemical pouch will be placed in the center area designed for the chemical pouch. In version two the chemical pouch will be placed in the layer designed for the chemical pouch,

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. The placemat can come in all shapes and sizes and be used in all dining settings whether at restaurants or home. Differing sizes can be used to accommodate different portions of food and dishware.

The embodiment discussed per the heated placemat will be shown through differing forms of the placemat which can be customized. Furthermore, examples of such differences include circle placemats, differing plastic, and other such features for appeal. While other differences can change the application, size, color, and texture.

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. Differing arraignment as described will be listed to show how the heated placement can vary for different situations.

In some Agreements, the plastic layers can be changed for visual appeal as well as matching with other devices. In some Agreements, the dimensions of the placemat can change to be held to buffet trays or be a small personal placemat. In some Agreements The color of the plastic layers can be changed for visual appeal as well as matching with surroundings. In some Agreements, the texture can change to better suit the user.

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. Further customization can be done to the workings of the heated placemat including the space between layers.

The space introduced earlier was created for the pouch of chemicals which are used to create heat then dispersed through copper sheets can also be customized to change the application and heating capabilities of the embodiment. Under changes, the temperature of the placemat can raise or lower as well as the amount of time the placemat will remain heated. These differences can be ideal for situations presented in different workplaces and circumstances while dining.

The information further presented pertains to a heated placemat which is used in all dining settings to keep food warm. The heated placemat can be used in multiple situations to hold both the role of a placemat where it would be used as a place to set dishware down and keep surfaces clean from food. In addition to the Embodiment of the heated capabilities of the heated placemat, it can also be used instead of lamps which are commonly used to keep food warm at buffets. The added benefits are the cost benefits as well as the visual bonus.

It will be apparent that the placemats as described herein may be used in a variety and several different ways. Further, the placemats are of relatively basic construction and are capable of withstanding normal usage and laundering demands.

It also will be apparent that the placemats described and illustrated are merely exemplary of the present invention and that possible various modifications and adjustments may be made thereto without departing or leaving the spirit and scope of this disclosure.

The description of the present disclosure has been presented for illustration and description purposes, but it is not intended to be exhaustive or limited to the disclosure in the form

disclosed. Many and several modifications and variations will be apparent and or obvious to those of ordinary skill in the art without departing from the spirit and scope of the disclosure. The embodiments were chosen and described to give the best explanation of the principles of the disclosure and the practical usage and application and to enable others of ordinary and natural skill in the art to understand the disclosure for various embodiments with various modifications and changes as are suited to the particular use contemplated.

While several and many aspects of the present invention have been depicted and listed and described herein, alternative aspects may be affected or impacted by those who are skilled in the art to accomplish the same objectives. It will be understood by those skilled in the art that various changes and modifications, omissions, and additions may be made to that which is specifically disclosed herein without departing from the spirit and the scope of the present invention and disclosure.

Brief Description of the Drawings

To illustrate the invention, the drawings show aspects of one or more embodiments of the invention. The foregoing and other objects, features, and advantages of the invention will be readily understood from the following detailed description of aspects of the invention taken in conjugation with the accompanying drawings. However, it should be understood that the present invention is not limited to the precise arrangements and instrumentalities shown in the drawings, wherein:

FIGS. 1, 2, 3 are views of the present disclosure;

FIG. 1 illustrates the placement in both configurations I and configurations II;

FIG. 2 illustrates the build of the present disclosure as in configurations I and configurations II;

FIG. 3 Illustrates the user experience of the present disclosure as in configurations I and configurations II;

FIG. 4 illustrates the present configuration embodied in FIG 1 and FIG 2 and FIG 3;

Detailed Description

The presented disclosure pertains to the design of a thermochemically heated placemat which can be used in all settings that apply to culinary arts; namely settings such as private residences, business edifices (i.e. restaurants, cafes, privately owned eateries, etc.), and a variety of food stores (i.e. supermarket, grocery store, butchery, convenience store, etc.).

The purpose of the presented disclosure is to maintain the heat within a food or drink (i.e. an item that is edible/that can be ingested) through the use of an exergonic thermochemical reaction which provides the heat used to keep the ingestible item of choice warm/hot, all of which being contained in the form of a placemat. The use of the disclosure can be presented in both private and professional settings; it can be used within peoples' homes and or in professional settings, such as restaurants.

The disclosure, for all configurations, has absolute dimensions of 13.5 inches in length, 9.25 inches in width, and 0.25 inches in height (13.5 in. x 9.25 in. x 0.25 in.).

The presented disclosure is concocted of two major pieces. The first of which has two formulations; the first version is concocted of a major dimension of a layer of Polyethylene HDPE plastic material (a high-density plastic which is resistant up to roughly 227.89 kJ of heat), and a minor dimension of circular copper insertion in the center of the rectangular dimension. The second version of the first of two major pieces represents the entirety of the major dimension as a rectangular copper insertion, with all other aspects remaining constant with the first version. The use of a copper inlay allows the excellent transfer of heat to the item being used as copper is an exceptional heat conductor.

In the first configuration of the major dimension of the first major piece of the presented disclosure, the copper inlay occupies a specific portion of the major dimension; a circular face-centered copper insertion (Fig. 112) 7 inches in diameter will be 1.125 inches away from both the edges depicted in (Fig. 66) and (Fig. 64), and 3.25 inches away from the edges depicted in (Fig. 62) and (Fig. 60); this hereby states that configuration 1 of the major dimension is centered among the Polyethylene HDPE plastic within the rectangular shape of the disclosure. The intention of the copper and plastic materials residing in the same dimension is to concentrate the heat transfer to a specific area which will heat up to a high degree, allowing for efficient use of the disclosure.

In the second configuration of the presented disclosure, the copper inlay will be the only material in the major dimension of the first major piece of the disclosure, as presented in (Fig. 114 V2). This configuration will not house Polyethylene HDPE plastic in the major dimension, allowing for a larger area in which heat can transfer.

The second of two major pieces are similarly constructed of two dimensions, but only with a single formulation. The outer dimension is a layer of Polyethylene HDPE plastic and the inner dimension is an empty compartment under the copper inlay in which the pouches–made out of polyethylene plastic (a low-density plastic which makes it easy to puncture and therefore fits its use within the regards of the use of the disclosure) – containing the solution used to generate heat is stored.

The second major piece of the presented disclosure resides in the interior of the disclosure. It is concocted of two Polyethylene HDPE plastic space fillers, as seen in (Fig. 72) and (Fig. 74), and an empty compartment, as seen in (Fig. 76), which will encase the polyethylene pouches(carrying the solutions required for exergonic chemical reaction). The empty compartment is 8 inches in length and 6 inches in width.

There will be two different polyethylene pouches inserted in the compartment depicted in (Fig. 76). One of which will contain the chemical solution and the other will contain water. The combination of the contents of these two pouches is what will initiate the thermochemical reaction. The full representation of the pouches within the empty compartment is depicted in (Fig. 98), where the chemical solution is represented by (Fig. 224) and the water-containing pouch is depicted by (Fig. 222).

Each individual pouch aids the purpose of the presented disclosure by holding the water and chloride compound (separately), which ultimately produce the heat needed to heat/warm up the item of choice at hand. One polyethylene pouch, 7 inches in length and 5 inches in width (7in. x 5 in.), will bear the chloride compound chemicals. Within the same polyethylene pouch, the polyethylene pouch contains water–which is 3 inches in length and 2 inches in width (3in. x 2in. [Fig. IV VALUE 222])–will reside in the larger chloride compound chemical-filled polyethylene pouch.

The chemical solution represented in (Fig. 224) is a chloride compound. The specific contents within the compound include Calcium Chloride ($CaCl_2$), Potassium Chloride (KCl), and Magnesium Chloride ($MgCl_2$). In the presented disclosure, 75.0 grams of reactant compound and 3 ounces of water will be used; the reaction between this chloride compound and water produces 173.35 kJ of heat, which can be translated to around 196.3º Fahrenheit (91.278º Celsius), and lasts for roughly 2 hours. However, these are averaged estimates, meaning that any amount of reactant and solution will result in varying capacities of heat that can be used in the product.

The consumer will use the heated placemat in order to keep the food/drink item of their choice warm/hot. In order to perform the use of the presented disclosure, a select few steps must be taken to initiate the healing process. The polyethylene pouches must be punctured with a hole to allow the flow of the chemicals throughout the entirety of the inner compartment of the disclosure (Fig. 76). This process is shown in (Fig. IV) by both (Fig. 98) and (Fig. 100). Within the depiction of (Fig. 98), (Fig 222) represents the water pouch still intact and (Fig. 224) represents the chemical compound still undispersed, all contained within the area encapsulated by (Fig. II - PII).

To insert the polyethylene pouches into the entire presented disclosure, the consumer will use the opening in the side of the heated placemat represented by (Fig. 28). Once the polyethylene pouches are inserted into the presented disclosure and punctured in order to allow the ingredients of the pouches to escape, the chloride compound will disperse throughout the inner compartment of the disclosure (Fig. 76). Similarly, the water in the polyethylene water pouch will escape through the previously made hole and disperse throughout the inner compartment of the presented disclosure.

The dispersion of both the chemical compound and the water throughout the inner compartment presented in (Fig. 76) allows for the even distribution of heat, produced by the exothermic chemical reaction between the chloride compound and water, throughout the entirety of the presented disclosure; this is seen in (Fig. 192). The heat then transfers to the outside of the heated placemat through the use of the copper inlay in the top layer of the presented disclosure. This transferred heat, shown in (Fig. 142), is then used to heat the food/drink item being used by the consumer.

The presented disclosure will be very versatile in its ornamentations. Consumers can choose from multiple decorated finishes that feature different types of wood veneer. The placemat will offer different varieties of wood veneer; there is no one specific version that is made for the placemat. The wood veneer will be wrapped around every externally visible Polyethylene HDPE plastic piece; the veneers will not wrap around the copper inlay in either version of the presented heated placemat.

The entirety of (Fig. 1 V1) represents the presented disclosure as the first configuration of the heated placemat. The first configuration of the heated placemat at hand features a face-centered circular copper insertion (Fig. 112). The other faces and sides of the presented configuration will remain constant throughout both configurations (all Figures presented in [Fig.1] other than [Fig. 112] and [Fig. 114 V1] will remain constant). The second configuration pertaining to the presented disclosure differs from the first configuration in that the entire top

layer of the presented disclosure will be represented by a copper insertion. The area encompassed by the edges shown in (Fig. 60), (Fig. 62), (Fig. 64), and (Fig. 66) depict the area in which the copper insertion of the second configuration

The placemat 52 may be left undyed or may be coloured or patterned as desired. The cotton layer 16 and 23 may be printed with any desired pattern, for example, a pattern having water droplets or water-time theme, which may be boy, girl, or gender-neutral themed; a pattern or theme associated with a film, game, book, or TV, or colours or patterns associated with a brand or trademark, facilitating provision of promotional or “sponsored” placemats; or associated characters; colours or patterns associated with sports teams or events.

It will be apparent that the placemats as described herein may be used in a variety and a number of different ways. Further, the placemats are of relatively basic construction and are capable of withstanding normal usage and laundering demands.

It also will be apparent that the placemats described and illustrated are merely exemplary of the present invention and that possible various modifications and adjustments may be made thereto without departing or leaving the spirit and scope of this disclosure.

The description of the present disclosure has been presented for illustration and description purposes, but it is not intended to be exhaustive or limited to the disclosure in the form disclosed. Many and several modifications and variations will be apparent and or obvious to those of ordinary skill in the art without departing from the spirit and scope of the disclosure. The embodiments were chosen and described in order to give the best explanation of the principles of the disclosure and the practical usage and application and to enable others of ordinary and natural skill in the art to understand the disclosure for various embodiments with various modifications and changes as are suited to the particular use contemplated.

While several and many aspects of the present invention have been depicted and listed and described herein, alternative aspects may be affected or impacted by those who are skilled in the art to accomplish the same objectives. It will be understood by those skilled in the art that various changes and modifications, omissions, and additions may be made to that which is specifically disclosed herein without departing from the spirit and the scope of the present invention and disclosure.