US 20060091133A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2006/0091133 A1**

DiPucchio et al. (43) **Pub. Date: May 4, 2006**

(54) **MULTI-LAYERED CARRIER**

(76) Inventors: **Jay DiPucchio**, Turners Falls, MA (US); **Thomas J. Luck**, Leyden, MA (US)

Correspondence Address:
DOHERTY, WALLACE, PILLSBURY & MURPHY, P.C.
ONE MONARCH PLACE, SUITE 1900
1414 MAIN STREET
SPRINGFIELD, MA 01144-1900 (US)

(21) Appl. No.: **11/163,919**

(22) Filed: **Nov. 3, 2005**

Related U.S. Application Data

(60) Provisional application No. 60/624,766, filed on Nov. 4, 2004.

Publication Classification

(51) **Int. Cl.**
H05B 3/34 (2006.01)
H05B 3/54 (2006.01)

(52) **U.S. Cl.** **219/545**

(57) **ABSTRACT**

A multi-layered carrier comprising: a first layer; a jacket; a laminated fabric heater disposed between the first layer and the jacket, wherein the heater comprises a consolidated electrically conductive fabric layer, a plurality of bus bars, a first thermoplastic layer, and a second thermoplastic layer, wherein the first and second thermoplastic layers sandwich the consolidated electrically conductive fabric layer and the plurality of bus bars to form a fused single sheet; and a cavity formed from the assembly of the first layer, the jacket, and the heater; wherein the multi-layer carrier provides for the even distribution of heat throughout the cavity.

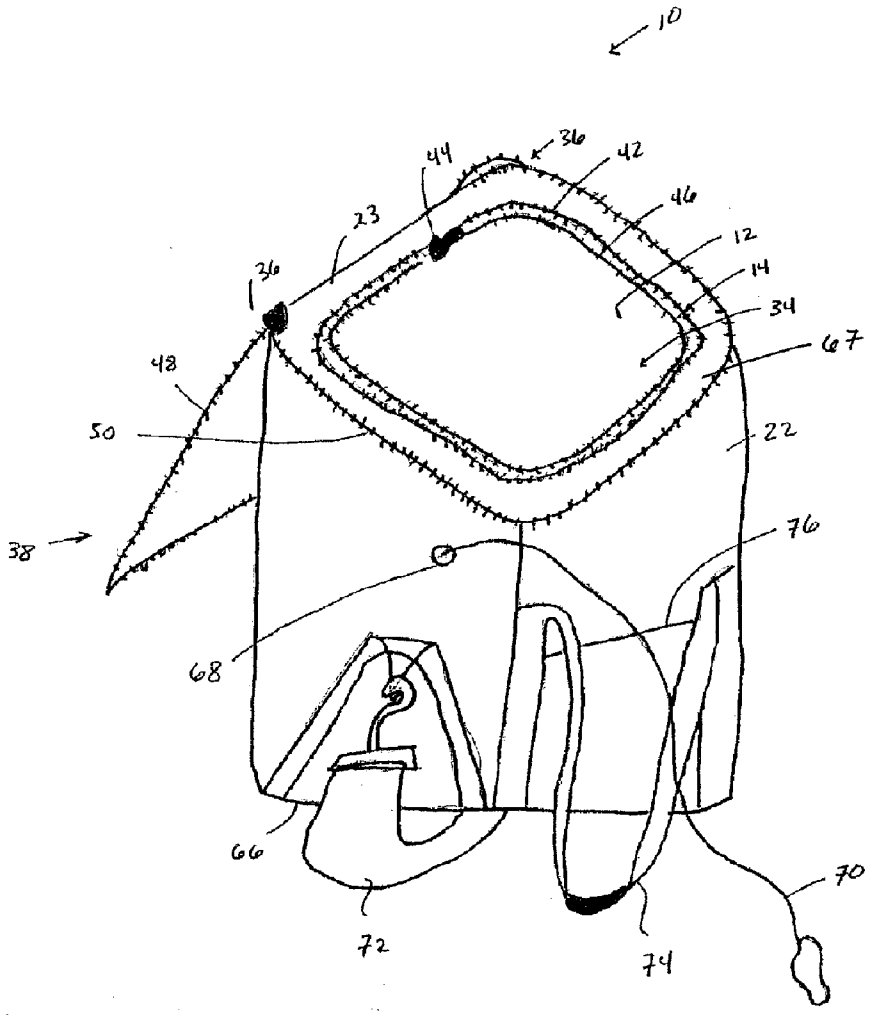
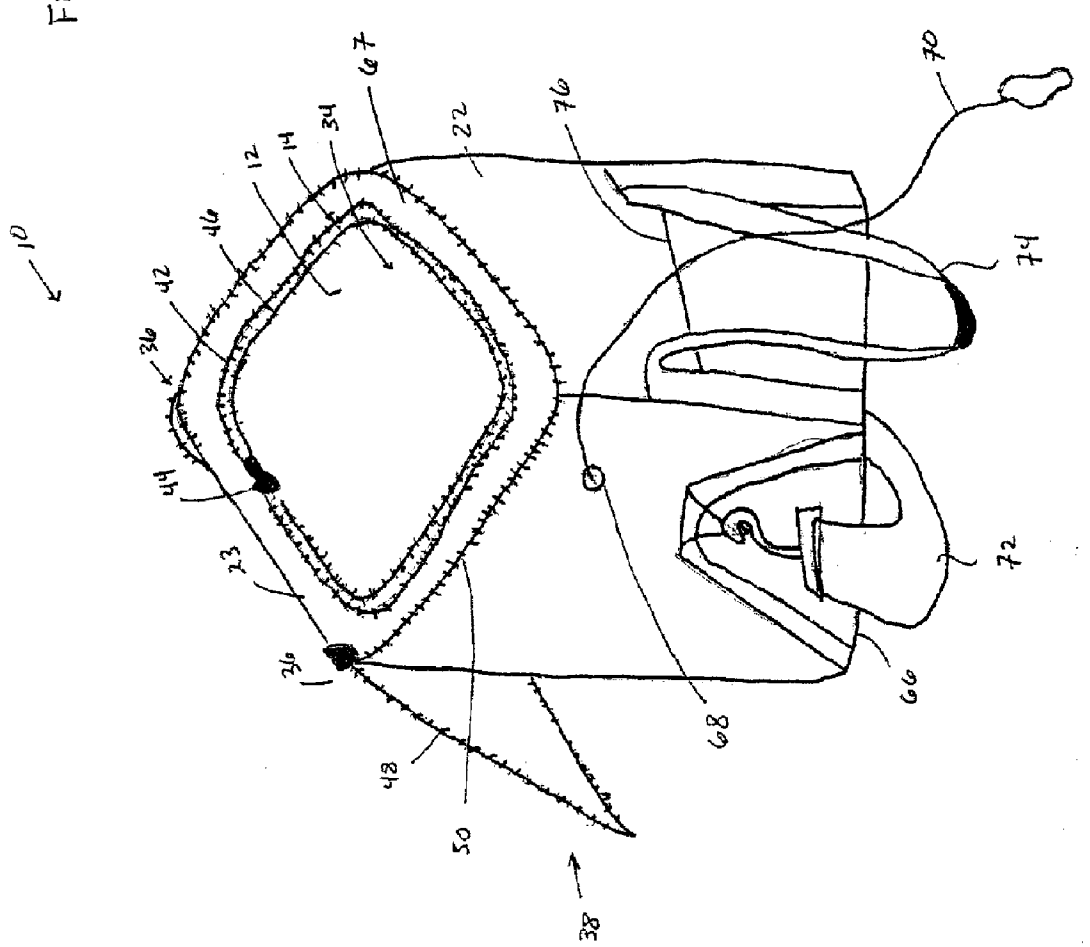


Figure 1



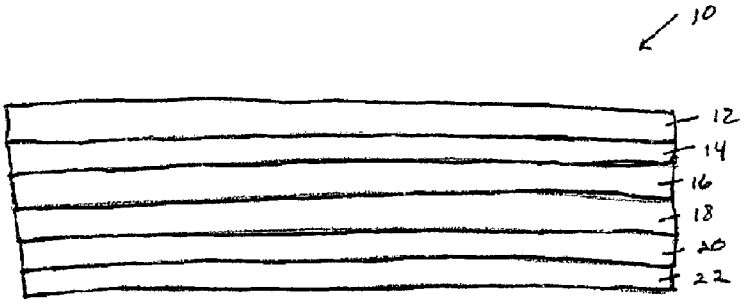


Figure 2

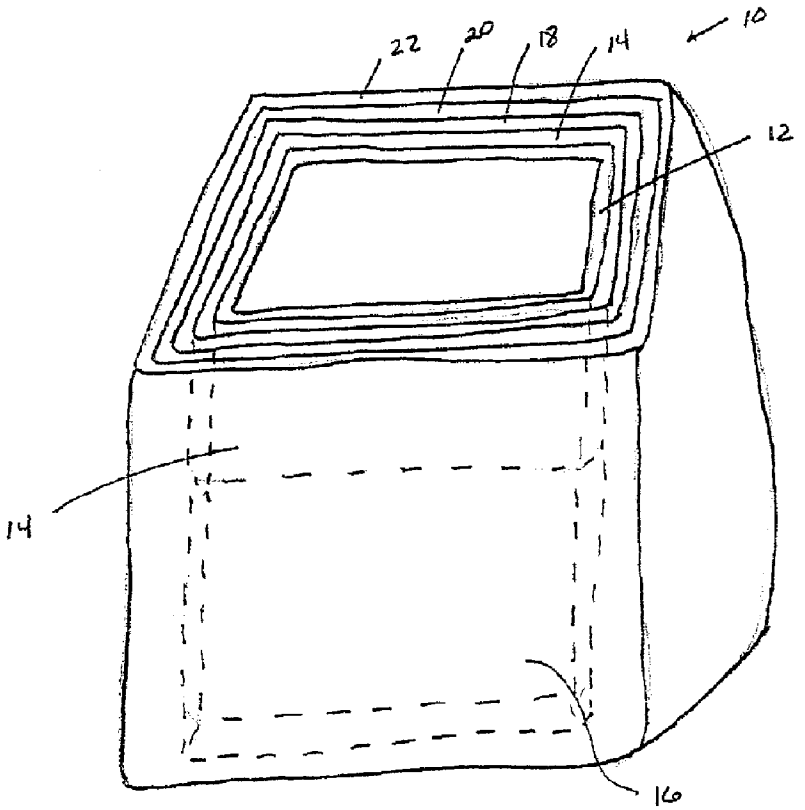


Figure 3

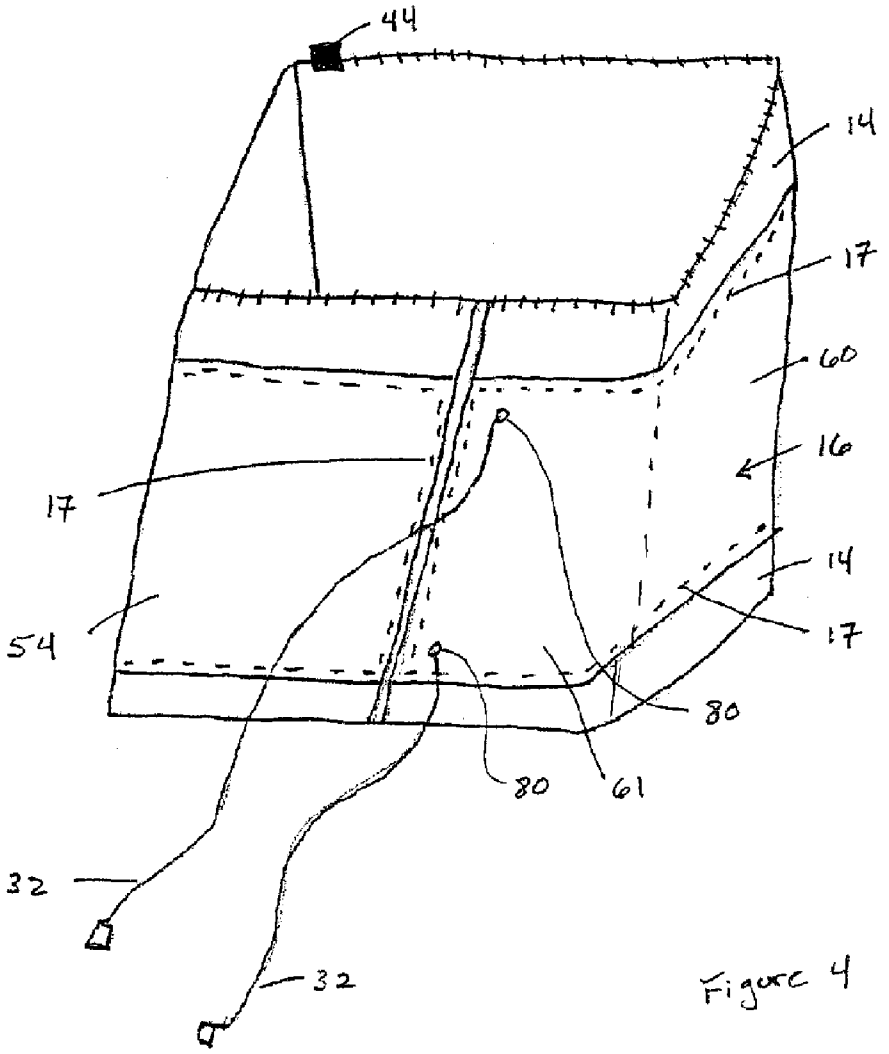


Figure 4

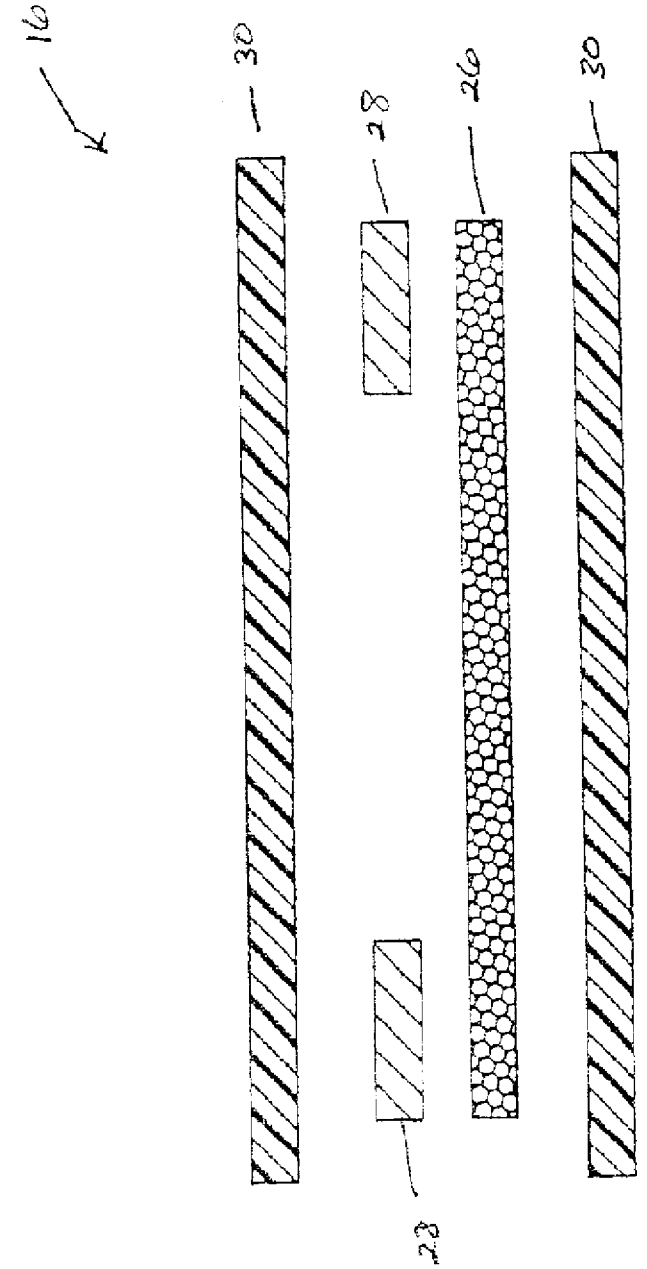


Figure 5

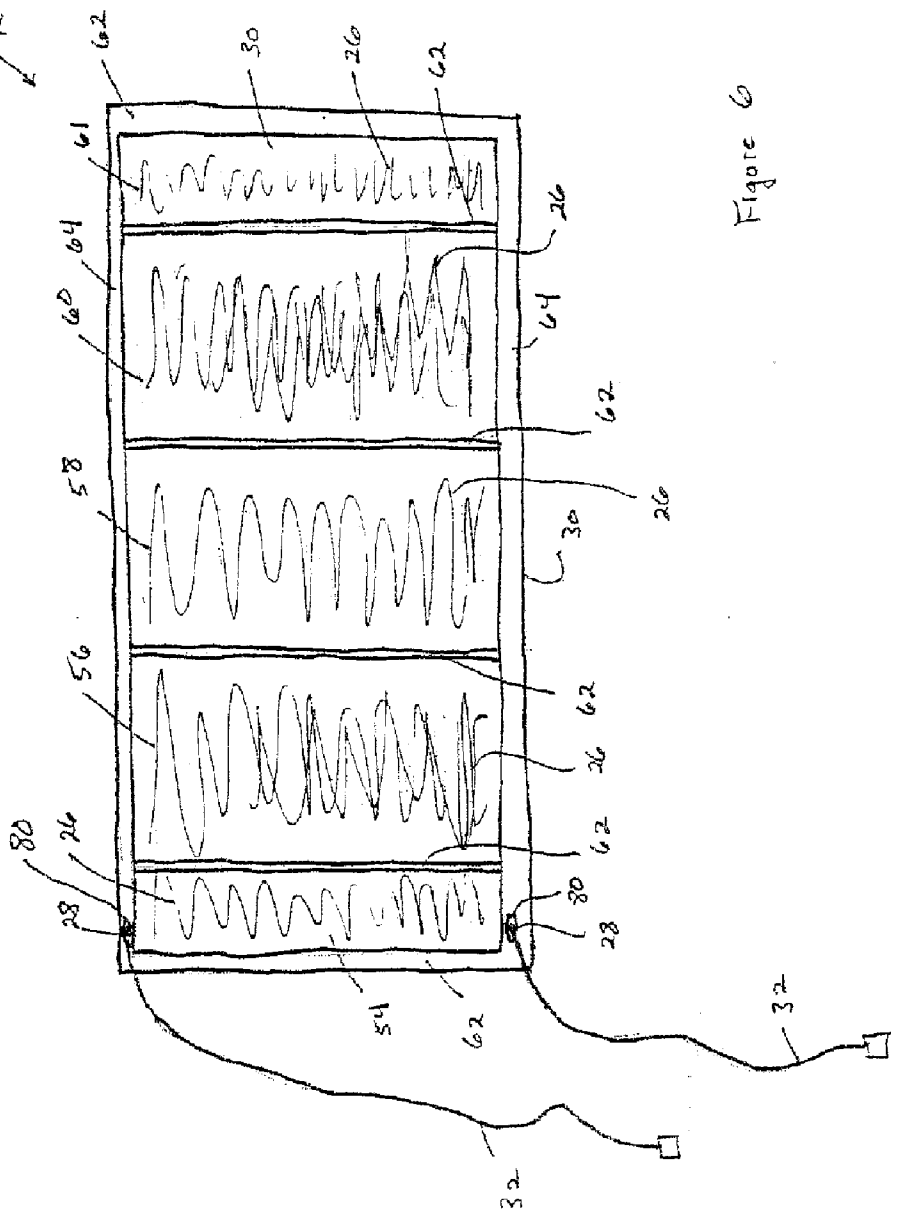

10
62
30
26
62
61
64
60
64
62
58
26
30
56
62
26
62
80
26
28
80
28
54
62
32
32

Figure 6

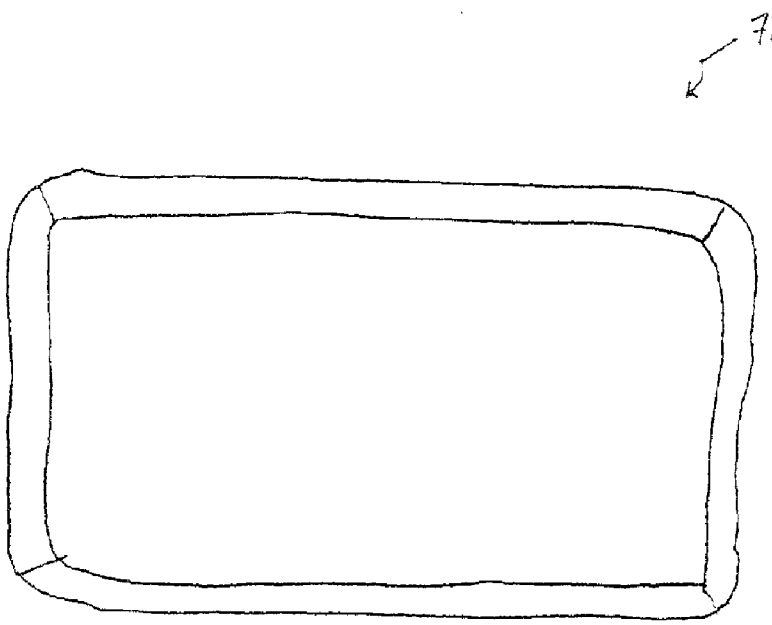


Figure 7

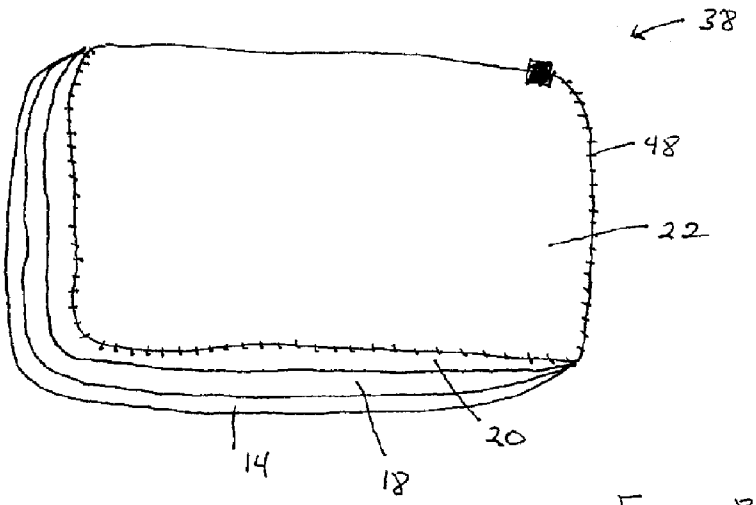


Figure 8

MULTI-LAYERED CARRIER

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 60/624,766 filed on Nov. 4, 2004.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention relates to a multi-layered carrier. More particularly, the invention relates to a multi-layered carrier capable of containing thermal heat and maintaining uniform temperatures in an efficient manner, wherein the multi-layered carrier is particularly beneficial in the food and beverage transportation industry.

[0004] 2. Background of the Invention

[0005] Delivery of perishable items, such as food and beverage items, has grown in popularity as an increasing number of individuals rely on food delivery services for their meals. Unfortunately, a frequently encountered problem in the food transportation industry is the dilemma of maintaining the food and/or beverage at its proper serving temperature. That is, all too commonly, the food and/or beverage is sent out for delivery at its serving temperature, and by the time the item is received by the consumer, the item has cooled to sub par temperatures. Such cooling can allow the growth of food borne bacteria, causing illness, and oftentimes affects the freshness and/or the taste of the food and/or beverage item, and creates an inconvenience to the consumer.

[0006] Thermal bags for carrying food products have been in use for many years, and electrically heated thermal bags using resistance wires have been in use for pizza delivery, for example, in more recent years. However, issues of electrical safety and the longevity of thermostats, thermal fuses, and resistance wires in a flexible use, as well as hot spots in the surfaces of these thermal bags have limited their acceptance in the market place.

[0007] Therefore, what is needed in the art is a multi-layered carrier that can transport perishable items to a consumer while maintaining the proper serving temperature of the perishable delivery item such that the item is served to the consumer in its safest, freshest, most proper form. While not specifically directed at the food delivery market, the present invention overcomes this and other problems by providing a uniform heat throughout the walls of the carrier as well as a totally sealed electric heater. In addition, through its high level of insulation and heat reflection it is able to maintain temperatures of food products without requiring a high heat output from the heater.

SUMMARY OF THE INVENTION

[0008] The above-discussed and other drawbacks and deficiencies of the prior art are overcome or alleviated by a multi-layered carrier comprising a primary liner, a secondary liner, a heater, a reflector, an insulator, and a jacket. The heater generates heat and comprises a conductive fabric layer such that the heater is thin and flexible, thereby allowing the heater to be bent and otherwise contorted to fit its operating environment. Additionally, the heater produces uniform temperatures throughout the multi-layered carrier and has a high fatigue life. The reflector and the insulator serve to retain the heat in the multi-layered carrier thereby indefinitely maintaining the temperature of the multi-layered carrier. There are no carriers of the prior art having the same commercial application quality as the novel carrier disclosed herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] **FIG. 1** is a schematic depicting a top elevational view of an exemplary multi-layered carrier;

[0010] **FIG. 2** is a schematic depicting a cross-sectional view of the multi-layered carrier depicted in **FIG. 1**;

[0011] **FIG. 3** is a schematic depicting a cross-sectional elevational view of the multi-layered carrier depicted in **FIG. 1**;

[0012] **FIG. 4** is a schematic depicting a side view of an exemplary heating component;

[0013] **FIG. 5** is a schematic depicting a cross-sectional view of an exemplary heater;

[0014] **FIG. 6** is a schematic depicting an elevational view of a surface of an exemplary heater;

[0015] **FIG. 7** is a schematic depicting an exemplary tray; and

[0016] **FIG. 8** is a schematic depicting an exemplary multi-layered cover.

DETAILED DESCRIPTION OF THE INVENTION

[0017] In general, disclosed herein is a multi-layered carrier capable of containing thermal heat in a uniform and efficient manner, wherein the multi-layered carrier is particularly useful in the food and beverage transportation business. The various layers forming the multi-layered carrier may be positioned relative to each other in a variety of ways, wherein the positioning depends on the amount of heat contained within the carrier and the melting points of the various layers.

[0018] An exemplary multi-layered carrier will be described with reference to the figures. However, the figures are for illustrative purposes only, and modifications and alterations as would be obvious to one of ordinary skill in the art are contemplated and incorporated herein.

[0019] Referring to **FIGS. 1-3**, an exemplary multi-layered carrier **10** comprises a primary liner **12**, a secondary liner **14**, a heater **16**, a reflector **18**, an insulator **20**, and a jacket **22**. With the exception of jacket **22**, which is preferably disposed on the lateral sides, a bottom side **66**, and a top side **67** of carrier **10**, the remaining layers are preferably disposed on at least one of any of the lateral sides, bottom side **66**, and top side **67**. All or some of the layers may additionally be disposed in a cover **38** of multi-layered carrier **10**.

[0020] Primary liner **12** serves as the innermost layer of multi-layered carrier **10**. Primary liner **12** may comprise a variety of materials, wherein vinyl is preferred as it is an easily cleaned material. In order to facilitate the cleaning of multi-layered carrier **12** resulting from, for example, food

and/or beverage spillage, primary liner **12** may be removable. An exemplary fastening device for removably attaching primary liner **12** to multi-layered carrier **10** comprises an inner zipper, wherein both of primary liner **12** and secondary liner **14** comprise teeth **46** and **42** respectively to form the zipper. However, primary liner **12** may also be removably attached to multi-layered carrier **10** by a variety of fastening elements comprising buttons, hook and loop fastener tapes such as Velcro®, snaps, combinations of the foregoing, and the like. In these embodiments, the secondary liner, or other layer to which the primary liner is attached, has corresponding fastening means. Or, primary liner **12** may be disposed adjacent to the secondary liner or other layer without the use of fastening means, whereby primary liner **12** is fitted to the multi-layered carrier such that it does not shift or move when positioned. Alternatively, primary liner **12** may be permanently attached to multi-layered carrier **10** by, for example, stitching or sealing primary liner **12** onto at least one of the other layers forming multi-layered carrier **10**.

[**0021**] Referring to **FIGS. 1 and 4**, in an exemplary embodiment secondary liner **14** serves as an attachment site for heater **16**. Additionally, secondary liner **14** comprises teeth **42** and slider **44** such that secondary liner **14** can be attached to primary liner **12** by a zipping mechanism. Secondary liner **14** preferably comprises nylon.

[**0022**] Heater **16**, which, in an exemplary embodiment, is disposed between secondary liner **14** and reflector **18**, is thin, flexible, produces uniform temperatures throughout multi-layered carrier **10**, has a high fatigue life, and can be mass-produced at an economical cost as contrasted with conventional heaters utilized in carriers. In addition, heater **16** can be operated at voltages ranging from about 12 volts to about 120 volts from either alternating current ("AC") or direct current ("DC") power supplies.

[**0023**] An exemplary heater and process for making the heater is described in U.S. Pat. No. 6,483,087 to Gardner et al., which is incorporated herein in its entirety. Referring to **FIGS. 4-6**, in the present invention, heater **16** comprises a conductive fabric layer **26**, two bus bars **28** positioned at opposing edges of conductive fabric layer **26** sandwiched between two outer thermoplastic layers **30**.

[**0024**] Conductive fabric layer **26** can be made from various materials, which are known in the art, and comprises electrically conductive fibers. In a preferred embodiment, conductive fabric layer **26** comprises electrically conductive fibers, and more preferred carbon fibers, in particular, nickel-coated carbon fibers. In this embodiment, the conductive fibers are chopped fibers and are converted into a non-woven conductive fabric using papermaking techniques. An organic binder is used to hold the fibers together in conductive fabric layer **26**. The thickness, density, fiber, coating and predominant fiber direction of the fabric all determine the final resistivity of heater **16**. Depending on the size of heater **16** and power output required, the appropriate length of conductive fabric layer **26** can be cut from a supply roll or an entire roll can be used for mass producing the heater elements.

[**0025**] In a preferred embodiment of the invention, the electrically conductive fabric layer is consolidated. A consolidated conductive fabric layer results from the consolidating step during the laminating process. Consolidation is a process by which thermoplastic layers **30** of heater **16** are brought to a gelling state under pressure during bonding of heater **16** and to a predetermined thickness. This causes the electrically conductive fibers of conductive fabric **26** to be brought into intimate contact with one another through the laminating process.

[**0026**] In an exemplary method of forming the heater, the carbon filaments are manufactured from a polymer fiber under high temperature and pressure within an inert environment. The fibers can be coated with a metal, such as nickel, brass, silver or other suitable metal or a combination thereof, by one of several processes, tailoring the temperature coefficient of resistance (the rate at which the electrical resistance of a medium changes as a result of a change in temperature) and resistivity of the final fabric. Fibers are combined into a row and chopped to a desired length between about 3 millimeters and 12 millimeters or longer. Fiber length is a major factor in determining conductive fabric layer **26**'s resistance, flexibility, structural conformity, and heat uniformity.

[**0027**] Thermoplastic films **30** for use in heater **16** can be of various types and are commercially available. In a preferred embodiment, the thermoplastic films **30** are polyetherimide (Ultem.RTM., Westlake Plastics, Inc., Pa.), polyetheretherketone (Victrex.RTM., Westlake Plastics, Inc. Pa.), polyamide (Kapton.RTM., E. I. Dupont de Nemours, Del.), polyethersulfone, sulfone, polyvinylidine fluoride (Kynar.RTM., PVDF, Westlake Plastics, Inc., Pa.), acetobutylstyrene (Cycolac, ABS, Westlake Plastics, Inc., Pa.), polyphenylene oxide (Noryl.RTM., Westlake Plastics, Inc., Pa.), and the like.

[**0028**] Heater **16** is preferably attached to electrical leads **32** at bus bars **28**. Bus bars **28** can be made of various materials such as copper, brass or silver foils. In a preferred embodiment, however, the bus bars are made of copper foils. In another embodiment, heater **16** further comprises a glass veil (not shown) disposed on the outer surfaces of the thermoplastic layers **30** for additional reinforcement.

[**0029**] Heater **16** can further comprises cuts (not shown) perpendicular to and through at least one of bus bars **28** in a zigzag pattern for creating a circuit and to increase the resistance of heater **16**. In another embodiment, heater **16** further comprises an outer layer of thermoplastic or silicon rubber (not shown) for increasing the dielectric strength of heater **16**.

[**0030**] An exemplary process for making heater **16** suitable for incorporation into the multi-layered carrier of the invention comprises disposing an electrically conductive fabric layer **26** onto the first layer of thermoplastic layer **30**. Bus bars **28**, preferably made of copper foil, are disposed on opposing edges of electrically conductive fabric layer **26** so that bus bars **28** are in contact with electrically conductive fabric layer **26** and are parallel to one another. Once bus bars **28** are in contact with conductive fabric layer **26**, they can be attached to the conductive fabric layer **26** by piercing a hole through bus bars **28** and conductive fabric layer **26** using a piercing rivetor apparatus. The action of piercing causes the metal displaced to form a hole to curl and flatten under the conductive fabric layer **26**, thereby securing bus bars **28** to conductive fabric layer **26**. Thereafter, the second layer of thermoplastic layer **30** is disposed on electrically conductive fabric layer **26** and bus bars **28** to form a heater assembly. Once the heater layers are assembled, the heater

assembly is heated at suitable temperatures to a set thickness to consolidate the conductive fabric layer **26** sandwiched in thermoplastic film layers **30**, thereby forming a single sheet heater **16**. After consolidation of the layers, and especially of conductive fabric layer **26**, heater **16** is transferred to a cooling chamber to quench heater **16** at its maximum consolidation state. A glass fiber reinforcement layer can be disposed on the outer surfaces of the thermoplastic layers **30** prior to consolidation and depending on heater **16**'s output requirement.

[**0031**] While the process described above can be performed on a small scale to produce a number of small heaters using a hydraulic press, the process can be adapted for manufacturing heater elements and heaters in high volume using a roller laminating apparatus. In roller lamination, the heater element is produced in a single long sheet of indefinite length and width, which length and width are only limited by the length and width of the starting materials and machinery used. The heater element made through roller lamination can be stored in rolls, and heaters can be made from segments of the heater element as required. In this embodiment, the process comprises combining electrically conductive fabric layer **26** from a roll supply with two metal foil bus bars **28**, wherein bus bars **28** are positioned parallel to one another at opposing edges of and contacting conductive fabric layer **26** in the direction of the roll. Bus bars **28** are secured to conductive fabric layer **26** by making a hole in conductive fabric layer **26** and bus bars **28** by piercing the components in a piercing rivetor apparatus as described above. Once bus bars **28** are secured to the conductive fabric layer **26**, conductive fabric layer **26** containing bus bars **28** is drawn between two layers of thermoplastic films **30** forming a sandwich type structure assembly. The heater assembly sandwich is then fed through a pinch roller, which has been preheated at a predetermined temperature and set at a predetermined pressure to cause gelling of thermoplastic layers **30**. The gelling of thermoplastic layers **30** causes some of the thermoplastic to flow through conductive fabric layer **26**, fusing the films and consolidating the conductive fibers into a single sheet heater element. Once consolidation occurs, the resultant single sheet fabric heater is drawn over a cooling chamber so that maximal consolidation of the layers is maintained. Individual heaters can be made by cutting a section from the heater sheet roll with a tooling die or a water jet cutter, attaching electrical leads by ultrasonic welding and laminating it once more with a layer of thermoplastic, thereby maintaining the gap cut by the die or water jet and providing a final dielectric layer.

[**0032**] During the manufacturing process, the heater is configured to fit the multi-layered carrier of the present invention. Referring to **FIG. 6**, in an exemplary embodiment, heater **16** comprises upper and lower thermoplastic layers **30** which each comprise vertical seals **62** and horizontal seals **64** to create segments **54**, **56**, **58**, **60**, and **61**. One each of bus bars **28** is located and runs along the length of its respective horizontal seal **64**. A conductive fabric layer **26** is disposed in each of segments **54**, **56**, **58**, **60**, and **61**, and leads **32** are connected to respective bus bars **28**, and emanate outwardly from vias **80**. In this embodiment, vertical seals **62** assist in creating folds whereby heater **16** can be more easily fitted into multi-layered carrier **10**. For example, referring to **FIGS. 4 and 6**, in an exemplary embodiment, each of segments **54**, **56**, **58**, **60**, and **61** may be disposed on separate lateral sides of secondary liner **14** such that segments **54** and **61** are opposite to segment **58** and segment **56** is opposite to segment **60**. Heater **16** is preferably disposed such that each of vertical seals **62** are disposed along the edges connecting adjacent lateral sides of multi-layered carrier **10**.

[**0033**] Again referring to **FIGS. 1-3**, in addition to heater **16**, multi-layered carrier **10** further comprises reflector **18**, which preferably comprises aluminized films or fabrics made of polyester, polyethylene, Mylar® sold by DuPont, urethane coated nylon, reflective laminates, non-woven polyolefins or polyvinylchloride, and the like, and combinations comprising at least one of the foregoing, wherein aluminized polyester is preferred. Reflector **18** reflects the heat generated from heater **16** to preserve the temperature in a cavity **34**. It is noted that the reflector may be positioned as shown in the figures, or it may be positioned elsewhere between or among the layers of the carrier. Alternatively, the reflector may be completely dispensed with such as when a consumer's specifications require a lower temperature range than what is typical for the field of application.

[**0034**] Still referring to **FIGS. 1-3**, carrier **10** further comprises insulator **20**. Insulator **20** preferably comprises compressed spun polyester, low-density polyester foam, Thinsulate® sold by 3M Company, cellular urethane alone or in combination with polystyrene, wherein compressed spun polyester, such as NU Foam® by Fairfield, is particularly preferred. Insulator **20** further preserves the temperature in cavity **34** by preventing the escape of heat generated by heater **16** through jacket **22**.

[**0035**] Jacket **22** of carrier **10** may comprise canvas, nylon, vinyl, and the like, wherein a vinyl coated nylon is particularly preferred. An especially preferred vinyl coated nylon is ballistic nylon produced by DuPont, which is sold under the tradename Cordura®.

[**0036**] At least one of jacket **22**, insulator **20**, reflector **18**, heater **16**, secondary layer **14**, and primary layer **12** forms a bottom side **66** of carrier **10**. Additionally, referring to **FIG. 1**, jacket **22** comprises a top layer **23** that conceals heater **16**, reflector **18**, and insulator **20**.

[**0037**] Referring to **FIGS. 1 and 8**, in an exemplary embodiment, multi-layered carrier **10** further comprises a multi-layered cover **38** attached to top layer **23** of jacket **22** by means of an outer zipper **36**. In an exemplary embodiment, multi-layered cover **38** comprises secondary liner **14**, reflector **18**, insulator **20**, and jacket **22** as described previously herein.

[**0038**] The various components forming multi-layered carrier **10** may be assembled in a variety of ways. Referring to the figures, in an exemplary embodiment, insulator **20** is positioned between jacket **22** and reflector **18** preferably by sliding insulator **20** and reflector **18** into position. Heater **16** is attached to secondary liner **14** by wrapping heater **16** around secondary liner **14**, and securing heater **16** thereto by fastening means, such as, stitches **17**, to form heating component **40**. Heating component **40** may be attached to top surface **23** of jacket **22** by stitching, for example. Primary liner **12** may be removably secured onto multi-layered carrier **10** by means of an inner zipper, wherein primary liner **12** comprises teeth **46** complimentary to teeth **42** on secondary liner **14**. A slider **44** may be used to zip or unzip the inner zipper such that primary liner **12** may be attached or removed from multi-layered carrier **10**.

[0039] Cover **38** comprises teeth **48** complimentary to teeth **50** to form outer zipper **36**, wherein teeth **50** may be located on top surface **23** of jacket **22**. A slider **52** slides over teeth **48** and **50** to zip or unzip cover **38**, thereby closing or opening multi-layered carrier **10**.

[0040] Electrical leads **32**, which extend from vias **80** of heater **16**, are electrically connected to a plug **70**. Plug **70** exits carrier **10** via an eyelet **68** formed in jacket **22**. Plug **70** is configured such that it can be plugged into either an AC or DC power supply, such as is found in the cigarette lighter of an automobile.

[0041] Referring to **FIG. 1**, multi-layered carrier **10** may further comprise carrying means whereby multi-layered carrier **10** can be easily conveyed. For example, multi-layered carrier **10** may comprise a shoulder strap **72** which straddles opposite sides of multi-layered carrier **10**, and/or two handles **74**, wherein each of handles **74** is located on opposite sides of multi-layered carrier **10**. Additionally, multi-layered carrier **10** may comprise a pocket **76**, into which plug **70**, for example, can be easily stored.

[0042] Referring to **FIG. 7**, multi-layered carrier **10** may further comprise a tray **78**, onto which the perishable item(s) can be placed. An exemplary tray **78** provides a flat, hard surface onto which the perishable item(s) can be placed, thereby reducing the fall or spillage of the perishable item(s). Tray **78** may be positioned on the bottom floor of the carrier, i.e., on the primary layer. Tray **78** is removable from multi-layered carrier **10**, thereby providing a convenient serving device to a consumer, wherein the consumer can also eat and/or drink directly from tray **78**. An exemplary tray **78** comprises a conventional cafeteria-style serving tray.

[0043] Although the multi-layered carrier depicted in the Figures comprises a square shape, it is contemplated herein that the multi-layered carrier may comprise a wide variety of shapes and dimensions as ultimately directed by the use of the multi-layered carrier. Nevertheless, in an exemplary embodiment, the multi-layered carrier comprises a length of about 9 inches to about 24 inches, a height of about **9** to about **24** inches, and a width of about 9 to about 24 inches.

[0044] The multi-layered carrier disclosed herein is able to maintain the temperature of perishable items, particularly, those perishable items that are to be maintained at a federally-determined bacteriological temperature safety zone prior to delivery. For example, the multi-layered carrier can maintain perishable items at a temperature of at least about 140 degrees Fahrenheit. The temperature can be maintained for as long as the heater remains plugged into an electrical power source, which is significantly better than the prior art multi-layered carriers, in which temperature can be maintained for only about 2 hours. Additionally, the multi-layered component can be manufactured at a cost significantly lower than electrically heated thermal multi-layered carriers of the prior art. The heater disclosed herein is malleable, such that it can be incorporated into a variety of shaped and dimensioned multi-layered carriers. Additionally, the heater distributes heat in an even manner, thereby increasing the efficiency of the multi-layered carrier.

What is claimed is:

1. A multi-layered carrier comprising:

a first layer;

a jacket;

a laminated fabric heater disposed between the first layer and the jacket, wherein the heater comprises a consolidated electrically conductive fabric layer, a plurality of bus bars, a first thermoplastic layer, and a second thermoplastic layer, wherein the first and second thermoplastic layers sandwich the consolidated electrically conductive fabric layer and the plurality of bus bars to form a fused single sheet; and

a cavity formed from the assembly of the first layer, the jacket, and the heater;

wherein the multi-layer carrier provides for the even distribution of heat throughout the cavity.

2. The multi-layered carrier of claim 1, wherein the consolidated electrically conductive fabric layer comprises nickel-coated carbon fibers.

3. The multi-layered carrier of claim 1, further comprising electrical leads attached to the bus bars.

4. The multi-layered carrier of claim 3, further comprising a plug attached to the electrical leads, wherein the plug is further attachable to a motor vehicle's power supply.

5. The multi-layered carrier of claim 1, wherein the thermoplastic layers are thermoplastic films selected from the group consisting of polyetherimide, polyetheretherketone, polyethersulfone, sulfone, polyvinylidine fluoride, acetobutylstyrene, polyphenylene oxide and polyamide.

6. The multi-layered carrier of claim 1, further comprising an insulator disposed between the heater and the jacket.

7. The multi-layered carrier of claim 6, wherein the insulator comprises at least one of compressed spun polyester, low-density polyester foam, and cellular urethane alone or in combination with polystyrene.

8. The multi-layered carrier of claim 8, further comprising a reflector disposed between the heater and the insulator.

9. The multi-layered carrier of claim 8, wherein the reflector comprises at least one of aluminized films and fabrics made of polyester, polyethylene, urethane coated nylon, non-woven polyolefins or polyvinylchloride.

10. The multi-layered carrier of claim 1, further comprising a second layer in contact with the first layer opposite to the heater.

11. The multi-layered carrier of claim 12, wherein the second layer comprises vinyl.

12. The multi-layered carrier of claim 1, further comprising a tray disposed within the cavity.

13. The multi-layered carrier of claim 1, wherein:

the first layer comprises lateral sides, wherein adjacent lateral sides are connected to each other via edges; and the heater further comprises:

a first horizontal seal extending along a top outer edge of the heater;

a second horizontal seal extending along a bottom outer edge of the heater;

a plurality of vertical seals each extending from the first horizontal seal to the second horizontal seal, wherein the vertical seals divide the heater into distinct segments;

wherein each of the vertical seals is disposed on the respective edge of the first layer.

14. The multi-layered carrier of claim 1, further comprising one or more layers disposed between the heater and the jacket, wherein at least one of the layers comprises an insulator, wherein the insulator comprises at least one of compressed spun polyester, low-density polyester foam, and cellular urethane alone or in combination with polystyrene.

15. The multi-layered carrier of claim 14, wherein at least one of the layers comprises a reflector, wherein the reflector comprises at least one of aluminized films and fabrics made of polyester, polyethylene, urethane coated nylon, non-woven polyolefins or polyvinylchloride.

16. A multi-layered carrier comprising:

a combination element comprising:

a first layer comprising lateral sides, wherein adjacent lateral sides are connected to each other via edges; and

a heater for generating heat comprising:

a first horizontal seal extending along a top outer edge of the heater;

a second horizontal seal extending along a bottom outer edge of the heater; and

a plurality of vertical seals each extending from the first horizontal seal to the second horizontal seal, wherein the vertical seals divide the heater into distinct segments, wherein each segment comprises:

a consolidated electrically conductive fabric layer, a first thermoplastic layer, and a second thermoplastic layer,

wherein the first and second thermoplastic layers sandwich the consolidated electrically conductive fabric layer;

wherein the first and second horizontal seals and the vertical seals comprise a thermoplastic;

wherein each of the vertical seals is disposed on the respective edge of the first layer; and

a plurality of layers surrounding at least one of the first layer and the heater, wherein the plurality of layers retain the heat generated by the heater.

17. The multi-layer carrier of claim 16, wherein the plurality of layers comprises an insulator.

18. The multi-layer carrier of claim 17, wherein the plurality of layers further comprises a reflector.

19. The multi-layer carrier of claim 17, wherein the combination element and the plurality of layers are arranged to create a cavity, and further comprising a tray disposed within the cavity.

* * * * *