ELECTRICAL LUNCH BOX

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ABSTRACT

The enclosed component is a food container especially created to warm and cool food and/or beverages housed therein simultaneously and/or separately and to keep food and/or beverages housed therein warm and/or cold. The said container features two different compartments, a cooled and a heated compartment equally separated by an insulated divider made of ABS to prevent each compartment from absorbing the neighboring temperature. Both compartments can be used as heated and/or cooled environment simultaneously and/or separately by setting its respective switch to the desired mode: warm and/or cold. Each compartment is constructed to be operated together or separately without affecting the temperature of each other. It also features a 6-foot car adapter, a 6-foot 12-volt AC adapter, a rectangular lid with four cup holders located one in each corner and plate holder in the middle, two removable trays for salad and/or fruit, and a soft belt/handle. It works by plugging into a car cigarette lighter or AC outlet. The overall Weight of the container is 5.9 lbs. It can be used by a variety of individuals such as, construction workers, taxi drivers, truck drivers, bus drivers, limo drivers, long distance travelers, Environment protection workers, nursing mothers to keep their baby’s bottles at ideal temperature, warm or cold. The thermoelectric machinery of the container is constructed as an integral modular body, which can be removed and/or installed from the main body of the container in one piece.
ELECTRICAL LUNCH BOX

[0001] This invention relates to a container having the capacity to warm up foods and beverages, to cool food and beverages and to keep foods and beverages at ideal temperatures, warm or cold. The four-sided wall and a base wall container is divided into two equal sized compartments both being used as cool and warm environments simultaneously and/or separately. There is an insulated lid constructed with four cup holders and a plate holder and arranged to hold four cups or four cans of soda when closed, and a removable tray member made of plastic, constructed and arranged for salad or fruit.

[0002] The outer layer is made of ABS (Acrylonitrile Butadiene Styrene) polymer) and aluminum in the inner shell. It is powered by a 12-volts-6-foot car adapter, and a 110-220 volts-5-Amp AC adapter. It features a lid with 4 cup holders and a plate holder, an iron sheet, a seal packing collar, 2 joints, a magnet, a heat/cold releaser, a fan, an electrical machinery, two removable salad or fruit trays, a soft belt/handle and two ON/OFF switches. It works by plugging it into a car cigarette lighter or an AC outlet. It weighs 5.9 lbs and measures 452x25x27 cm equivalent to 15.4x9x10.6 in (LxWxH).

[0003] The system, once plugged into the AC outlet and/or a car cigarette lighter and switched to the warm or cold position, has the capacity of warming the contents up to 65°C or 145°F. and cooling to 5°C or 41°F., but will never reach boiling or freezing point as the system will shut off.

[0004] It is useful for keeping foods or beverages or any item stored therein warm or cool. The said container also comprises: an iron sheet, 2 joints, a magnet, a seal packing collar, and a soft belt.

[0005] The electrically powered temperature maintaining apparatus is constructed and arranged to selectively warm or cool said product receiving compartment, said electrically powered temperature maintaining apparatus including a 6-foot power cord for connecting said electrically powered temperature maintaining apparatus to an electric power source either inside of a building or in the car cigarette lighter.

[0006] It is also useful for keeping items stored therein warm or cool and is suitable for use in automobiles, trucks, offices, defining a width 9 inch or 20 cm, a length 13 inch or 32 cm, and a height 10 inch or 27 cm. The container can sit in a stable position on the automobile seat, the floor or the truck and to permit said container to be used on the automobile seat without obstructing movement or vision of occupants of the automobile.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] These and other objects on the invention and the features and details of the construction and operation of certain embodiments are set forth and described with reference to the accompanying drawings, in which:

[0008] FIG. 1-A is an ABS outer structure of the lid made according to the present invention.

[0009] FIG. 1-B is a side elevation view of the lid made in accordance with the present invention.

[0010] FIG. 1-C is the back elevation view of the lid made in accordance with the present invention.

[0011] FIG. 1-D is a front elevation view of the lid made in accordance with the present invention.

[0012] FIG. 2-A is the inner elevation view of the lid made in accordance with the present invention.

[0013] FIG. 2-B is an ABS inner structure view of the lid showing the indentation for the polyurethane insulation and the metal plate.

[0014] FIG. 2-C is a fragmentary sectional view of the inner component of the lid showing the metal plate and the hinges according to the present invention.

[0015] FIG. 2-D is fragmentary sectional view of the inner component of the lid showing a lining separating the inner component of the lid and the body of the lunch box according to the present invention.

[0016] FIG. 2-E is fragmentary sectional view of the inner component of the lid showing the hinges and the lining separating the inner component of the lid and the body of the lunch box according to the present invention.

[0017] FIG. 2-F is another fragmentary sectional view of the inner component of the lid showing a lining separating the inner component of the lid and the body of the lunch box according to the present invention.

[0018] FIG. 3-A is the outer shell view of the electrical machinery comprising, round thread like opening for the fan in the middle and the rectangular thread like opening on each side for the heat releaser.

[0019] FIG. 3-B is an elevation view of the top part of the outer shell of the thermoelectric machinery

[0020] FIG. 3-C is an elevation view of the right side of the threadlike opening of the outer shell of the thermoelectric machinery.

[0021] FIG. 3-D is an elevation view of the left side of the thread like opening of the outer shell of the thermoelectric machinery.

[0022] FIG. 3-E is another outer shell view of the electrical machinery comprising, round thread like opening for the fan in the middle and the rectangular thread like opening on each side for the heat releaser.

[0023] FIG. 3-F is another outer shell view of the electrical machinery comprising, round thread like opening for the fan in the middle and the rectangular thread like opening on each side for the heat releaser.

[0024] FIG. 4-A is an upward elevation view of the base of the outer shell portion of the lunch box showing the 4 pivots according to the present invention.

[0025] FIG. 4-B is the front view elevation of the front portion of the outer shell of the lunch box showing the openings for the heat releasers in accordance with the present invention.

[0026] FIG. 4-C is another upward elevation view of the base of the outer shell portion of the lunch box showing the 4 pivots according to the present invention.

[0027] FIG. 4-D illustrates the schematic view of the back portion of the main body of the embodiment of the lunch box in accordance with the present invention.

[0028] FIG. 4-E illustrates the schematic view of the outer shell of the main body of the embodiment of the lunch box in accordance with the present invention.

[0029] FIG. 5 illustrates the schematic view of the fan in accordance with the present invention.

[0030] FIG. 6 is a schematic view of the fan support in accordance with the present invention.

[0031] FIG. 7-A is a sectional view of the thermoelectric heat releaser in accordance with the present invention.

[0032] FIG. 7-B is a side sectional view of the thermoelectric heat releaser in accordance with the present invention.
FIG. 7-C is another schematic view of the thermoelectric heat releaser aluminum plate in accordance with the present invention.

FIG. 8 is another schematic view of the thermoelectric heat transfer aluminum plate in accordance with the present invention.

FIG. 9 is the schematic of the wire connection of the lunch box in accordance with the present invention.

FIG. 9-A is another schematic of the wire connection of the lunch box in accordance with the present invention.

FIG. 10-A illustrates the schematic of an upward view of the ABS material of the top half inner shell of both compartments of the lunch box in accordance with the present invention.

FIG. 10-B illustrates the schematic of a downward view of the ABS material of the top half inner shell of both compartments of the lunch box in accordance with the present invention.

FIG. 10-C illustrates another schematic of a downward view of the ABS material of the top half inner shell of both compartments of the lunch box in accordance with the present invention.

FIG. 11-A illustrates the schematic view of the aluminum material of the bottom half inner shell of both compartments of the lunch box in accordance with the present invention.

FIG. 11-B illustrates another schematic view of the aluminum material of the bottom half inner shell of both compartments of the lunch box in accordance with the present invention.

FIG. 11-C illustrates another schematic view of the aluminum material of the bottom half inner shell of both compartments of the lunch box in accordance with the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. 1-A shows another embodiment of the invention. It is an ABS outer structure of the said lid (1) of the said lunch box with various functions. The said lid (1) member was uniformly designed and constructed to reduce the amount of air moving from and to the said compartment of the said lunch box. The function of the said lid (1) member, provided it is kept close, will keep foods and beverages housed therein at ideal temperature for approximately 2 hours even if the system is not plugged into an outlet or in the cigarette lighter of a car. The outer portion of the said lid (1) member as shown in FIG. 1-A, is equipped with four round cup/bottle/can holders (2) located in each corner of the said lid (1) member. The said can/cup/bottle holders (2) were designed in the said lid (1) member to prevent beverages from spilling on the carpet of a vehicle in motion if left open. The said outer structure of the said lid (1) member is also equipped with a square plate holder (3), which unique function is simply to hold plates in a steady position to prevent foods from plates housed therein from falling on the carpet of a vehicle in motion.

In the embodiment of the invention illustrated in FIG. 2-A of the drawings, the inner elevation view of the said lid (4) member made of ABS comprises an indentation (5), housing in the left side of the said inner lid member. The said indentation (5) in left side of the inner lid (4) member provides room to house polyurethane made insulation therein with unique function to seal the left compartment to prevent air to escape from the left to the right compartment and vice versa. When the lunch box is placed in normal room temperature environment and the lunch box is set to cooling or heating mode, the temperature in that respective compartment will be higher or lower than the temperature of the environment where it is placed. If air moves in and out that compartment, foods or beverages housed in that compartment, will not reach the intended temperature within the compartment in question.

In the embodiment of the invention illustrated in FIG. 2-A and B of the drawings, the inner elevation (4) view of the said lid member made of ABS comprises an indentation (5), housing in the right side of the said inner lid (4) member. The said indentation (5) in right side of the inner lid member (4) provides room to house polyurethane made insulation therein with unique function to seal the right compartment to prevent air to escape from the right to left compartment and vice versa. When the lunch box is placed in normal room temperature environment and the lunch box is set to cooling or heating mode, the temperature in that respective compartment will be higher or lower than the temperature of the environment where it is placed. If air moves in and out that compartment, foods or beverages housed in that compartment, will not reach the intended temperature within the compartment in question.

The inner elevation view of the said lid member (4) also comprises a metal member (6) in FIG. 2-B in the front middle portion, which provides firm closure of the lid when that said metal member (6) is in FIG. 2-B is placed in a magnetic field. The inner elevation view of the said lid member (4) also comprises two hinges (7) in FIG. 2-B are fixedly positioned in the rear end of that said inner lid member (4) and the rear edge of the embodiment of the lunch box to serve as smooth pivot for closure and opening of the said lid member.

In the illustrated embodiment of the invention, FIG. 3-A-B-C-D-E-F, the outer shell of the thermoelectric machinery (8), securedly mounted to the front portion of the embodiment of the said lunch box by means of six metal screws (9), comprises two switches (10 and 11), one on the left and one on the right. A) The left switch (10) is connected to left compartment and can only regulate the activity and activation of the left compartment. The left switch (10) is designed in such a way as to turn only the left compartment independently either WARM, COLD or OFF. When the left switch (10) is set to the OFF position, the left compartment will be OFF. When set to WARM position, the left compartment will start to warm up and has the capacity of warming the contents to 55°C or 155°F. The system is designed in a way as to shut off the lunch box once the compartment reaches the highest temperature and will restart automatically once the compartment starts to cool off. When the left switch (10) is set to cold position, the left compartment will start to cool off and has the capacity of cooling the contents to 5°C or 41°F. The system is designed in a way as to shut off the lunch box once the compartment reaches the lowest temperature and will restart automatically once the compartment starts to warm up. B) The right switch (11) is connected to the right compartment and can only regulate the activity and activation of the right compartment. The right switch (11) is designed in such a way as to turn only the right compartment independently either WARM, COLD or OFF. When the right switch (11) is set to the OFF position, the right compartment will be OFF. When set to WARM position, the right compartment will start to warm up and has the capacity of warming the contents up to 65°C or 150°F. The system is designed in a way as to shut off the lunch box once the compartment reaches the highest temperature and will restart automatically once the compartment starts to cool off. When the right switch (11) is set to cold position, the right compartment will start to cool off and has the capacity of cooling the contents to 5°C or 41°F. The system is designed in a way as to shut off the lunch box once the compartment reaches the lowest temperature and will restart automatically once the compartment starts to warm up. When either switch is slid up, the red LED (12) light will turn ON,
which indicates the compartment is in warming mode and the content housed therein will warm up. When either switch is slid down, the green LED light (13) will turn ON, which indicates the compartment is in cooling mode and the content housed therein will cool off. One method of operation would be to heat and/or cool the container or content housed therein using the proper thermoregulator. Both compartments can be used in heating environments simultaneously and/or separately and both compartments can be used as cooling environments simultaneously and/or separately. The thermoelectric machinery (8) also comprises a round shape threadlike opening (14) and two rectangular threadlike openings (15) to allow air absorption by the fan and air release from the heat releaser respectively. The said thermoelectric machinery (8) is arranged and constructed to be attached to and removed from said main body as an integral modular body to facilitate proper installment and/or repair of said thermoelectric machinery (8). When the unit is turned on, whether to warming or to cooling mode, the middle red LED light (16) in the middle will be ON.

Moreover, in yet another embodiment of the invention, FIG. 4 shows the outer shell of the main body (17) with unique purpose to selectively warm and/or cool contents housed therein. This system comprises six walls inner surface [18(a, b, c, d, e, f)] and base (19) member, which supports the system and extending from said base wall member (19) to the edge of the main body member (17) of the lunch box. The said base wall body (19) is further divided into two equally sized compartments. Each compartment comprises four walls having a common lid and a top edge opposite to said base member. The two compartments are separated by an insulated wall (20), which prevents air to move across from one compartment to the other. In the front wall (18/) of this said main body member (17) is attached the thermoelectric machinery (8), arranged, built and constructed to selectively warm and/or cool the respective compartment attached to the specific switch.

In another illustrated embodiment of the invention, FIG. 5 shows a fan (21), securely mounted to the front wall (18/) portion of the said main body (17) of the said lunch box by means of rigid metal screws. When the fan (21) fails in the field, the electronics will operate at elevated temperature, thus lowering the operating life of the system. If the temperature achieves a high enough elevation, the unit will shut off. The fan (21) has been designed to protect the components of this apparatus and the entire system from the heat that is naturally generated. Cooling the system prevents annoying thermal shutdowns, extends the life of the unit and increases system performance. The said fan (21) also works to transfer heat from hot heat/cold releaser (23) and warm air in the compartment. The fan (21) illustrated in FIG. 5 runs during all processes to promote air temperature in the compartments, to transfer heat from environment air to the compartment at the same time. The said fan (21) draws heat from the heat/cold releaser (23) to said compartment.

Accordingly, illustrated in FIG. 6, another embodiment of the invention includes said fan support (22) securely attached to said front portion of said main body (18/). The said fan (21) is rigidly attached to said fan support (22) mounted coaxially within the embodiment of the main body (18/) of the outer shell of the unit by means of rigid screws as demonstrated in FIG. 6 of the invention.

FIG. 7 shows another embodiment of the invention, in which the heat/cold releasers (23) are rigidly mounted to said front portion of the main body. Two said heat/cold releasers (23) are attached in front of each said compartment where separately, each said heat/cold releaser (23) has the capacity to warm and cool each said compartment simultaneously and/or separately using a common fan (21).

FIG. 8-A-B-C show another embodiment of the invention in which the thermoregulator member transfer heat/cold released by said heat/cold releasers to said compartment. Made of aluminum, one end of said heat transfer (24) shown in FIG. 8A is securely and rigidly attached to said heat releaser (23) of FIG. 7 A-B-C via 2 rigid metal screws (25). Made of aluminum, another end of said heat transfer (26) shown in FIG. 8C is securely and rigidly attached to said lower half of the inner shell of the lunch box via 4 rigid metal screws (27) of FIG. 8-C. Its function is simply to transfer heat/cold to the compartment.

FIG. 9 demonstrates another embodiment of the invention. Shown is the different wiring connection in the thermoelectric machinery (8) of FIG. 3-A-B-C-D-E. The unit operates through two distinct mechanisms: heating and cooling which utilizes the same thermoelectric machinery, which comprises of a pair of DC positive/negative wiring connectors shown in FIG. 9 in accordance with the present invention. It is achieved with DC polarity wiring, in such condition, one pole is connected with the positive connector of DC power supply with 12 V DC usually and another pole is connected with the negative connector of DC power supply (28). The second mechanism of cooling is achieved by using the same thermoelectric machinery shown in FIG. 3, which serves as an electrical cooler with DC polarity wiring, in such condition the pole is connected with the negative connector of DC power supply (28) and pole is connected with the positive connector of DC power. When the current is reverse, the said fan draws cool air from said heat releaser (23) shown in FIG. 7 to said compartment. The purpose of these wires is to join the fan (21), heat releaser (23), the heat transfer (26) to the switches and electrical circuits. Positive and negative wires were used and they can be identified by their coloring, black for negative (30) and red for positive (29). The wiring connection is done in a way so that each compartment can be operated separately and/or simultaneously with their respective switch, but they use a common power supply for operation. The connection is as follows: From the power supply (28), the positive (red) wire (29) is attached to the positive pole on the electrical board where the positive current is sent to the positive pole of both switches. From the positive pole of the switch, the current is then branched to the positive poles of both heat releasers (23) to warm up the compartments and the positive pole of the fan (21) to turn that said fan on. The reverse current flow just cools the compartments. From the power supply, the negative (black) wire (30) is attached to the negative pole on the electrical board where the negative current is sent to the negative pole of both switches. From the negative pole of the switch, the current is then branched to the negative poles of both heat releasers to cool the compartments and the negative pole of the fan to turn that said fan on. The fan’s positive and negative wires are connected to the positive and negative wires that conduct current to both heat releasers respectively so that the fan can be turned on once the switch is turned on either during the warming and during the cooling of each compartment. The fan (21) is always turned on during warming and cooling modes.

In the embodiment of the invention illustrated in FIG. 10 of the drawings, the inner shell of the lunch box is rigidly mounted and extending from the edge (31) of the main body member to top half (32) of the inner shell body of the lunch box made of ABS. The front edge of the inner shell comprises a metal magnetic field (33), when aligned with the metal (6) in the inner portion of the lid member (4) creates a magnetic field for firm closure of the said lid member. This
top half of the inner shell (32) of the said lunch box is rigidly attached to the bottom half (34) of the inner shell of the lunch box made of aluminum. The said bottom half (34) of the inner shell of the lunch box made of aluminum is rigidly attached to the heat transfer (26), which is also attached to the heat releaser (23). The said bottom half (34) of the inner shell of the lunch box made of aluminum whose function is to warm any content housed therein to a maximum temperature of 145° F. or 65° C. and cool to a minimum temperature of 41° F. or 5° C. and will not reach boiling and/or freezing point.

[0053] In the embodiment of the invention illustrated in FIG. 11 of the drawings, the inner four-walled container housing an internal space and an inner container housing base are fabricated of aluminum (33) body having high thermal conductivity to provide maximal thermal conductivity therebetween.

[0054] As many embodiments of the invention have been listed, the inventor also contemplates that additional embodiments of the invention will be excluded and not shown in the drawings. These other features include an adapter for vehicle's cigarette lighter, an OME nylon made handle/belt, an AC adapter, and two trays for fruits and/or salad.

1. A container for food and drink that can provide convenient warming and cooling temperature to food and drink housed therein comprising: a main body having two compartments, a base wall and a four-sided walls, a first and second equally sized inner compartments, parallel, and separated by an insulated polyurethane made divider having internal space respectively.

2. The container as claimed in claim 1 wherein the outer layer or four sidewalls, is made of ABS (Acrylonitrile Butadiene Styrene) polymer as well as the top half part of the inner 4-walled layer of each compartment.

3. The container as claimed in claim 1 has two equally sized compartments whereas said compartments are made of Aluminum at the bottom half of the inner 4-walled layer and at the base.

4. The container as claimed in claim 1 has a rectangular lid member also made of ABS (Acrylonitrile Butadiene Styrene) polymer. The said lid member of the container in claim 1 defines a planar structure with specific general function to keep the said system closed as well as holding cans of beverages, bottles of beverages, and plates in stable position.

5. The container as claimed in claim 4 has 4 round shape can holders and a square shape plate holder located on each corner and in the center of said lid member respectively.

6. The container as claimed in claim 5 wherein said lid member is connected to said main body through hinges in the back so as to be opened from the front of the container.

7. The container as claimed in claim 1 wherein the front of the main body of said container is equipped with a thermoelectric machinery mounted on said front portion of the main body of said container.

8. The apparatus as claimed in claim 7 wherein 2 Warm/Off/Cold switches are located in the center of the thermoelectric machinery with unique function to turn the apparatus to warm/cold and Off modes respectively.

9. The apparatus as claimed in claim 7 is equipped with Red LED indication lights located in the medial aspect of the Warm/Off/Cold each switch and on top indicating that the compartment is set to warm; Green LED indication lights located in the medial aspect of the Warm/Off/Cold each switch and exactly below the red LED light indicating that the compartment is set to cool; RED LED light in the middle, between the red (warm) and green (cold) LED indicating the system of claim 1, either compartment or both compartment, is powered on and in use.

10. The apparatus as claimed in claim 7 wherein an electric port, located in front of the left compartment, at the same level of the switches and the LED indication lights to plug the AC and the Car Adapters.

11. The apparatus as claimed in claim 7 has a thread-like round opening located in the center below the switches/LED indication lights, whereas a fan is located in the inner aspect of the thermoelectric machinery, uses that opening for the purpose of blowing air; also has a thread-like rectangular openings, extending from the mid-section to the lower end, front corner of the thermoelectric machinery, to allow hot and/or cold air to escape, serving to cool off said container.

12. The container as claimed in claim 4 wherein two hinges in the back portion of the said lid member connect said lid member to said main body of the container to allow said lid member to open and close during active motion.

13. The apparatus as claimed in claim 4 wherein the said lid member comprises 2 square shaped indentations located in the inner lid portion, filled with polyurethane insulation, one on each side on the compartment to prevent air from escaping the compartment when the said lid member is closed.

14. The apparatus as claimed in claim 4 wherein comprises a metal plate located in the front, mid-portion of the said lid member to allow firm closure of that said lid member.

15. The container as claimed in claim 1 has metal plate with a magnetic field, located in the center portion on the said container, and when attached to the metal plate of claim 14, allows firm closure of the lid.

16. The container as claimed in claim 1 has two squared-shape trays, one for each compartment, with height extending from top to midway of the compartment, to carry fruit and/or salad.

17. The container as claimed in claim 1 has a 120-220 volts AC adapter with a 6-foot extension cord for the operation of that said container; also has a 12 volts DC car adaptor with a 6-foot extension cord, for the cigarette lighter of the vehicle.

18. The container as claimed in claim 1 is equipped with a fan rigidly attached rigidly to the front of the main body, whose function is to selectively redirect exhaust air from the fan.

19. The container as claimed in claim 1 is equipped with two heat releasers attached to the front of the main body, in front of each compartment, whose function is to selectively redirect exhaust air from the fan.

20. The container as claimed in claim 1 wherein a belt/handle, extending from each side of the system, exactly in the middle, serving to carry said container of claim 1.