PORTABLE COOLER WITH POWERED COOLING SYSTEM

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ABSTRACT
A portable cooler with a powered cooling system is disclosed. Preferred embodiments include wheels large and flexible enough for rolling over sand, grass, and other uneven surfaces, and handles for carrying and/or pulling. Pulling handles can include an extension that can be rigid or flexible and can be retractable. Power sources include rechargeable and/or exchangeable batteries, and/or a solar panel. Accessories in preferred embodiments include a power outlet for a cellular telephone, a power outlet for an iPod, a docking station for an iPod, an AC electrical outlet, a radio, a CD player, a tape player, an MP3 player, a television, audio headset outlets, and one or more audio speakers. In preferred embodiments, some or all of the power source, the cooling system, and the accessories are protected from water and/or sand. Some embodiments include a beverage holder, and in some of these embodiments the beverage holder is cooled.
FIG 7
PORTABLE COOLER WITH POWERED COOLING SYSTEM

FIELD OF THE INVENTION

[0001] The invention generally relates to portable coolers, and more specifically to means for cooling the interior of a portable cooler.

BACKGROUND OF THE INVENTION

[0002] When outdoor recreational activities continue for more than a short time, access to food and beverages is often desirable. This is especially true when the activities take place in warm weather and/or in bright sunlight. Examples include a day at the beach, a picnic in the park, and such like.

[0003] Sometimes it is not possible, or at least not convenient, to purchase desired food and/or beverages at a recreational location, and so it is often desirable to transport food and beverages to the recreational site from elsewhere. A thermally insulated “cooler” can be used to transport food and beverages, so as to protect them from warm weather, and ice or another frozen substance can be placed in the cooler so as to maintain the contents at a reduced temperature. However, this approach typically achieves only a limited reduction of temperature inside the cooler, and usually lasts only a few hours. When ice is used, there is also a tendency for water that results from melting of the ice to contaminate food and other contents of the cooler.

[0004] In addition to food and beverages, it is often desirable to have radios, tape players, cell phones, iPod’s, TV’s and/or other electronic devices available at a recreational site. This is often accomplished by transporting electronic devices to the recreational site that are portable and operate using battery power. However, battery lifetimes for such devices are limited, and may not be sufficient for the duration of a recreational experience, for example when the activity continues through the day and into the evening. This is especially true for portable equipment that is designed to provide music or other entertainment to groups of people, because such devices typically require significantly more electrical power than devices meant to serve only one person, and consequently they tend to have short battery lifetimes.

SUMMARY OF THE INVENTION

[0005] A portable cooler with a powered cooling system is disclosed. The cooler includes a thermally insulated container with an interior space, a portable power source cooperative with the thermally insulated container, and a portable, powered cooling system that is cooperative with the thermally insulated container and is able to remove heat from the interior space of the thermally insulated container.

[0006] Preferred embodiments include wheels that facilitate transportation of the portable cooler, and in some of these embodiments the wheels are sufficiently large and flexible to facilitate rolling of the cooler across sand, grass, and other uneven surfaces. Some preferred embodiments include a graspable carrying handle, and some of the embodiments include wheels that include a graspable pulling handle that facilitates pulling on the cooler so as to cause the cooler to roll in a desired direction. In some of these embodiments the graspable pulling handle includes an extension that facilitates pulling on the cooler by a standing individual, and in some of these embodiments the extension is flexible and/or retractable.

[0007] In preferred embodiments the power source and/or the cooling system is contained within a compartment that protects the contents against exposure to water and/or sand.

[0008] In preferred embodiments, the power source includes at least one battery, which in some embodiments is exchangeable and/or rechargeable. In some embodiments that include a rechargeable battery, the battery can be recharged from an automobile battery or an AC outlet. In preferred embodiments, the power source includes a solar panel, which in some embodiments is attached to an outward facing surface of the portable cooler.

[0009] Preferred embodiments include one or more of the following accessories: a power outlet for a cellular telephone, a power outlet for an iPod, a docking station for an iPod, an AC electrical outlet, a radio, a CD player, a tape player, an MP3 player, a television, an outlet for an audio headset, and one or more audio speakers. In preferred embodiments, some or all of the accessories are protected from water and/or sand by covers.

[0010] In preferred embodiments, one or more beverage holders are also included that can support open beverage containers such as a beverage cup, a soft drink can, a beer can, a plastic beverage bottle, a glass beverage bottle, a wine bottle, a beer bottle, and other beverage containers. In some of these embodiments, at least a portion of each beverage holder is cooled so as to maintain a beverage in the holder at a reduced temperature.

[0011] Further preferred embodiments include a sensor and regulator that regulate the temperature in the interior of the thermally insulated container, and in some of these embodiments means are included for setting and/or displaying the temperature.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 presents a perspective view of a basic embodiment of the invention;

[0013] FIG. 2 presents a side view of the embodiment of FIG. 1, showing a solar panel on the top of the cooler;

[0014] FIG. 3 presents a perspective view of an embodiment with added features compared to the embodiment of FIG. 1 and FIG. 2;

[0015] FIG. 4 presents a cross-sectional side view of the preferred embodiments of FIG. 3;

[0016] FIG. 5 presents a front view of the preferred embodiment of FIG. 3;

[0017] FIG. 6 presents a side view of the preferred embodiment of FIG. 3;

[0018] FIG. 7 presents a rear view of the preferred embodiment of FIG. 3; and

[0019] FIG. 8 presents a top view of the preferred embodiment of FIG. 3.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0020] With reference to FIG. 1, the portable, powered cooler includes a container 100 with an interior 102, a power source 104, and a powered cooling system 106 powered by the power source 102. In the embodiment of FIG. 1, the power source 104 is a rechargeable lithium ion battery contained within a compartment that protects the battery from exposure to sand and water. The cooling system 106 is contained in a similar compartment. The interior 102 of the container 100 is accessible by opening a lid 108 that is equipped with a car-
rying handle 110 and a latch 112. When the lid 108 is closed and the latch 112 is fastened, the portable cooler can be carried by holding the carrying handle 108. A switch 114 is provided to turn the cooling system 106 on and off, and a vent 116 is included to exhaust the heat removed from the interior 102 by the cooling system 106.

[0021] In this embodiment, a nickel-metal hydride battery is used, similar or identical to batteries used in laptop computers and similar devices. The cooling system is a solid-state thermoelectric cooler with no moving parts that operates at 12 VDC and draws between 3 and 4 Amps. It has a cooling capacity of 15 to 20 Watts, or 50 to 70 BTU/hr.

[0022] FIG. 2 shows a side view of the embodiment of FIG. 1. The top of the open lid 108 is visible, and it can be seen that a solar panel 200 is attached to it. In this embodiment, the solar panel is approximately 10" wide and 12" long, and when placed in direct sunlight it can produce up to 5 Amps of current at approximately 14 Volts. Excess power output from the solar panel 200 is used to charge the battery. When power from the solar panel 200 is not available, the battery 106 can provide about 10 Amp-hours of power at 12 Volts, which will operate the cooling system for about two to three hours.

[0023] FIG. 3 shows a perspective view of a preferred embodiment that includes additional features. Wheels 300, 302 and a pulling handle 304 are included to facilitate pulling on the portable cooler and rolling it across surfaces, thereby reducing the need to carry it. In this embodiment, the front of the portable cooler is supported by a single, pivoting wheel 300 so as to increase maneuverability. A shelf 306 is included inside of the interior 102 of the thermally insulated container 100, providing for convenient placement of smaller items that might otherwise be difficult to find when the cooler is filled. Other features include beverage holders 308, an iPod docking station 310, built-in acoustic speakers 312, a build-in radio/CD player 314, and three outlets for iPod headsets 316. Similar embodiments also include tape players, televisions, power outlets for recharging cell phones, AC outlets for powering items that normally connect to a wall outlet, and other features. The iPod docking station 310 and the radio/CD player 314 include covers that protect them from exposure to water and sand, and the iPod headset outlets include cover plugs (not shown) that perform a similar function.

[0024] Two rechargeable, sealed lead-acid batteries are used in the embodiment of FIG. 3 so as to provide sufficient power for the cooling system and all other included accessories. When the cooling system and all of the accessories are in use, the total power requirement is about 8 Amps at 12 Volts. The sealed lead-acid batteries weigh about 13 pounds and can provide up to 22 Amp-hours of power, thereby allowing for operation for two to three hours under maximum usage conditions.

[0025] FIG. 4 shows a sectional side view of the embodiment of FIG. 3, in which thermal insulation 400 is visible surrounding the interior 102 of the container 100. In this embodiment, the pulling handle 304 is attached to the container 100 by a rigid extension 402 that is retractable into the body of the cooler. In similar embodiments, a cord or other flexible extension is used. In FIG. 4 it can be seen that a carrying handle 104 is attached to the rear of the portable cooler, so as to facilitate carrying the cooler when rolling is not practical.

[0026] A front view of the embodiment of FIG. 3 and FIG. 4 is shown in FIG. 5, and a side view is shown in FIG. 6. In FIG. 6, it can be seen that a solar panel 600 is attached to the top of the lid 108. In this embodiment, the solar panel is approximately 20"x24" in size and produces approximately 10 A at 14 V in direct sunlight, the power being divided more or less equally between the cooling system and the additional features.

[0027] FIG. 7 presents a rear view of the embodiment of FIG. 3, FIG. 4, FIG. 5, and FIG. 6, showing the location of the battery compartment 104, and FIG. 8 is a top view of the same embodiment.

[0028] Other modifications and implementations will occur to those skilled in the art without departing from the spirit and the scope of the invention as claimed. Accordingly, the above description is not intended to limit the invention except as indicated in the following claims.

What is claimed is:

1. A portable, powered cooler comprising:
   a thermally insulated container having an interior space;
   a portable power source cooperative with the thermally insulated container;
   and a portable, powered cooling system, cooperative with the portable power storage device, the portable, powered cooling system being capable of removing heat from the interior space of the thermally insulated container.

2. The portable, powered cooler of claim 1, further comprising wheels that facilitate transportation of the portable, powered cooler.

3. The portable, powered cooler of claim 2, wherein the wheels are sufficiently large and flexible to facilitate rolling of the cooler across sand, grass, and other uneven surfaces.

4. The portable, powered cooler of claim 2, further comprising a grasping pulling handle that facilitates pulling on the cooler so as to cause the cooler to roll in a desired direction.

5. The portable, powered cooler of claim 4, wherein the grasping pulling handle includes an extension that facilitates pulling on the cooler by a standing individual.

6. The portable, powered cooler of claim 5 wherein the extension is at least one of flexible and retractable.

7. The portable, powered cooler of claim 1, wherein at least one of the power source and the cooling system is protected against exposure to at least one of water and sand.

8. The portable, powered cooler of claim 1, wherein the power source includes at least one battery.

9. The portable, powered cooler of claim 8, wherein at least one battery is exchangeable.

10. The portable, powered cooler of claim 8, wherein at least one battery is rechargeable.

11. The portable, powered cooler of claim 8, wherein at least one battery can be recharged from at least one of an automobile battery, an AC electrical outlet, and a solar panel.

12. The portable, powered cooler of claim 1, wherein the power source includes a solar panel.

13. The portable, powered cooler of claim 8, wherein the solar panel is attached to an outward facing surface of the cooler.

14. The portable, powered cooler of claim 1, further comprising an accessory chosen from the following list:
   a power outlet for a cellular telephone;
   a power outlet for an iPod;
   a docking station for an iPod;
   an AC electrical outlet;
   a radio;
   a CD player;
   a tape player;
an MP3 player;
  a television;
  an outlet for an audio headset; and
  at least one audio speaker.
15. The portable, powered cooler of claim 14, wherein the accessory is protected from exposure to at least one of water and sand.
16. The portable, powered cooler of claim 1, further comprising at least one beverage holder for supporting an open beverage container that is at least one of a beverage cup, a soft drink can, a beer can, a plastic beverage bottle, a glass beverage bottle, a wine bottle, a beer bottle, and other beverage containers.
17. The portable, powered cooler of claim 16, wherein a portion of at least one beverage holder is cooled so as to maintain a beverage in a container supported by the beverage holder at a reduced temperature.
18. The portable, powered cooler of claim 1, further comprising a temperature sensor and regulator that monitors and maintains the temperature in the interior space of the thermally insulated container.
19. The portable, powered cooler of claim 18, further comprising at least one of means for setting a desired temperature and means for displaying the measured temperature of the interior space of the thermally insulated container.
20. The portable, powered cooler of claim 1, further comprising a graspable carrying handle that facilitates carrying the portable, powered cooler.