

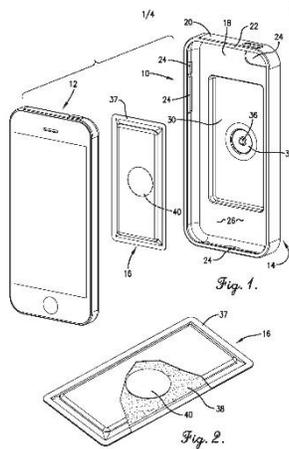
Background

Mobile phones and other portable electronic devices often fail to operate properly in cold temperatures. To alleviate this problem, some electronic devices have internal resistive type electrical heating mechanisms, but such heating mechanisms quickly drain the devices' batteries. External resistive-type heating devices have also been developed to warm electronic devices, but such heating devices require batteries or other sources of electricity.

Accordingly, there is a need for an improved way to warm portable electronic devices when used in cold temperatures.

Description

The present invention solves the above-described problems and provides a distinct advance in the art of heating mechanisms for mobile phones and other portable electronic devices. The product described herein is a case for an electronic device that both protects the electronic device from damage and heats the electronic device when it is used in cold temperatures. One embodiment of the case broadly comprises a housing for partially or completely enclosing the electronic device and a removable heating device that may be placed in or on the housing for warming the electronic device. The heating device generates heat via an exothermic reaction when activated and does not require electricity from the electronic device or a supplementary battery.



An embodiment of the heating device comprises a pouch in which a supersaturated solution of sodium acetate, calcium nitrate, or other chemicals and a metal disk are enclosed. The supersaturated solution undergoes an exothermic reaction, which generates heat when the metal disk is flexed or otherwise manipulated. After it is used, the heating device may be removed from the case and "re-charged" by boiling it in water or otherwise exposing it to high heat for a period of time. Additionally, a spare heating device could be inserted in the housing after the initial heating device

has been expended.

There are several possible ways to trigger the heating device. The metal disk could actuate when a user manually presses or otherwise manipulates the disk. Likewise, the case could include a control device that automatically actuates the metal disk when the ambient temperature drops below a minimum threshold temperature or upon receiving a triggering signal sent by the electronic device.

The case could also include a removable heating device with a pouch that is sub-divided into several separate compartments, with each compartment enclosing a volume of supersaturated salt solution and a metal disk. The supersaturated solution in each compartment undergoes an exothermic reaction and generates heat when the disk in that compartment is flexed or otherwise actuated. This allows the device to be used multiple times before it has to be removed from the case and re-charged and/or allows a user to activate a selected number of the compartments to provide a graduated level of warming. This invention could also include a control device that actuates the disks when the ambient temperature drops below a minimum threshold temperature or upon receiving a triggering signal from the electronic device.

Advantages

This heating case provides numerous advantages. Primarily, by employing a heating device that generates heat via an exothermic reaction, the heating case may warm a mobile phone or other electronic device without draining the device's battery or requiring an additional battery. The heating device may also be repeatedly re-charged and re-used. Additionally, by providing a removable heating device that is sub-divided into a number of separate compartments, a selected amount of heat may be provided and/or heat may be provided at selected time intervals.

Applications

This invention has applications for all mobile electronics that fail to operate in cold temperature conditions including:

- Mobile phones
- Tablets
- Cameras
- Two way radios
- Global Positioning Systems (GPS)
- Laptop computers
- Power tools

Intellectual Property Status

This technology is patent pending under US Patent application number 14/961,570 filed 12/07/2015.

Keyword List

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