USB RECHARGEABLE ELECTRONIC ELEMENT LIGHTER

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ABSTRACT
The present invention is a lighter having a body with a hollow interior cavity containing a rechargeable battery, a USB connector port, a heat transfer device, wherein said heat transfer device is constructed and arranged to propagate heat sufficient to ignite an article placed between 0.0-1.0 cm of said heat transfer device, and electronic circuitry in said cavity, wherein said circuitry accepts electrical input from said USB port, provides said electricity in a configuration to charge said rechargeable battery, and provides electricity to said heat transfer device.
USB RECHARGEABLE ELECTRONIC ELEMENT LIGHTER

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present apparatus relates to a rechargeable electronic element lighter, and, in particular, to a heat coil and USB connector fully contained within a single housing, that includes a number of safety improvements and features that assist and provide convenience to the user.

[0002] Many lighter devices are in popular use, with means to light a cigarette using electric or gas. It is preferred that a lighter be constructed in a manner that can easily transported in a users pocket. The most commonly used lighter contains a means to create a spark and ignitable flammable liquid that stored in close proximity to the flame to allow for a flow of flammable liquid to the spark to create a flame. The flame can be used to ignite the desired object.

[0003] A conventional lighter as described above has many disadvantages that are not found in an electric lighter. The flammable liquid is dangerous, particularly to children. The flame is not controlled and can burn the user. The portion of the conventional lighter surrounding the flame conducts heat and can burn the user. Offentimes the user will have to wait for the lighter to cool down after a failed attempt to light an object. The switch that releases fuel can be inadvertently depressed in a pocket and the fuel may escape. Conventional lighters may include a cap to minimize this problem, however a cap can break off, heat up, or get lost. The fuel is difficult to replace and flames can escape in the fuel replacement process. The fuel also makes manufacturing a conventional lighter more difficult, dangerous and expensive.

[0004] It is therefore desirable to provide a portable USB rechargeable electronic lighter device contained in a protective sliding housing that eliminates the need for flammable fuel.

SUMMARY OF THE INVENTION

[0005] In one embodiment, the invention is a system for providing an USB rechargeable electronic element lighter comprising:

A body portion;
A 3 position sliding switch within the body portion that can be accessed via a sliding switch aperture;
An access opening in the body portion for a heat coil connected to the sliding switch;
A rechargeable battery;
A USB connector connected to the sliding switch;
And a switch connector plate;
Wherein the switch connector plate connects the USB connector to the rechargeable battery when the sliding switch is placed in the charge position of the connector plate;
And wherein the connector plate connects the rechargeable battery to the heat coil when the sliding switch is placed in the heat position of the connector plate;
And wherein the connector plate contains an off position.

[0006] Additional functional features such as a led indicator that indicates optimal temperature on the heating element and indicates when the heating element begins cooling can be incorporated into the design. A thermostatic switch can turn off the heat coil at optimum temperature for lighting an object and for safety. The body portion can be frictionally engaged with the 3 position sliding switch such that the heat coil is only turned on upon depressing and sliding the switch to the heat position of the connector plate, so as to avoid accidental activation of the heating element. An embodiment without an access opening to the heat coil is also disclosed, where the heat coil is activated when slid outside the body portion.

[0007] The article is constructed and arranged so as to fit in a pants pocket or small purse.

[0008] In one embodiment, the body portion has openings on opposing ends for the heat coil and the USB connector. The USB connector and heat coil are attached to a sliding switch. When the sliding switch is depressed, a user can slide it to place the connector plate in the off position, the heat position, or the charge position. The heat coil can be any good heat conductor such as metal, or ceramic, and is preferably made of a metal that heats up and cools off relatively quickly. A standard USB connector can charge the rechargeable battery from any device with a powered USB port.

[0009] Also contemplated is a method of lighting an object, comprising—storing an electric charge in a rechargeable battery while in the charge position of the connector plate by inserting the USB connector into a computer or other charging device, sliding the 3 position sliding switch to the heat position, raising the temperature of the heat coil and lighting an object from the heat coil.

[0010] Also contemplated in another embodiment of the present invention is a method of lighting an object, said method consisting of:

providing a rechargeable battery operatively connected to a heat coil,
providing a USB connector operatively connected to said rechargeable battery;
securing said USB charger and said heating element within a main body portion;
slidably engaging said USB connector outside the main body portion;
connecting said USB charger to a powered USB port to power said rechargeable battery;
sliding said heat coil outside the main body portion and activating said heat coil;
lighting an object with said heating coil.

[0011] In one embodiment, the present invention is a lighter comprising:

a body with a hollow interior cavity;
a rechargeable battery;
a USB connector port;
a heat transfer device, wherein said heat transfer device is constructed and arranged to propagate heat sufficient to ignite an article placed between 0.0-1.0 cm of said heat transfer device;
electronic circuitry in said cavity, wherein said circuitry accepts electrical input from said USB port, provides said electricity in a configuration to charge said rechargeable battery, and provides electricity to said heat transfer device;

[0012] In one embodiment, the present invention is a lighter comprising:

a body with a hollow interior cavity;
a rechargeable battery;
a USB connector port;
a heat transfer device, wherein said heat transfer device is constructed and arranged to propagate heat sufficient to ignite an article placed between 0.0-1.0 cm of said heat transfer device;
electronic circuitry in said cavity, wherein said circuitry accepts electrical input from said USB port, provides said electricity in a configuration to charge said rechargeable battery, and provides electricity to said heat transfer device;

[0013] The lighter heat transfer device is a heat conducting coil, a heat conducting plate or any other appropriate heat conducting structure suitable for propagating sufficient heat of ignition.

[0014] It is desired to provide a lighter that is operatively connected to a rechargeable battery so that the lighter can be charged without the necessity of a flame and without the need for flammable fuel.
The sufficient heat is generally that heat required to ignite a cigarette or cigar placed within 0.0-1.0 cm of said heat transfer device. This means the cigarette or cigar can actually touch the heat transfer device, or be placed with about 1.0 cm of the heat transfer device.

In one embodiment, the heat transfer device produces heat from 0.0-1.0 cm from said device of between 300-2200 degrees Fahrenheit.

The sensor is configured to measure time, temperature, or both and is operatively associated with the internal circuitry in a configuration such that electricity to said heating device is interrupted when a configured time, temperature, or both is detected by said sensor.

In one embodiment, the sensor is configured to interrupt electricity to said heating device after a time period of 3-20 seconds of electricity supplied to said heating device.

In one embodiment, the heat transfer device is slidably extended and retracted into said cavity.

In another embodiment, the heat transfer device is incorporated onto the main body.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1 is a perspective view of the invention in an environment of use.

FIG. 2 is a front view of an embodiment of the present invention.

FIG. 3 is a left side view of an embodiment of the present invention.

FIG. 4 is a right side view of an embodiment of the present invention.

FIG. 5 is a top view of an embodiment of the present invention.

FIG. 6 is a bottom view of an embodiment of the present invention.

FIG. 7 is a rear view of an embodiment of the present invention.

FIG. 8 is a sectional view along line A-A of FIG. 3 showing the invention in a charge configuration.

FIG. 9 is a sectional view along line A-A of FIG. 3 showing the invention in a heating or operational configuration.

FIG. 10 is a sectional view along line A-A of FIG. 3 showing the invention in storage or off configuration.

FIG. 11 is a power schematic of an embodiment of the present invention.

FIG. 12 is one embodiment of the invention being a sectional view along line A-A of FIG. 3 showing the invention in a heating or operational configuration.

FIG. 13 is a sectional view along line A-A of FIG. 3 showing the invention in storage or off configuration.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The article of the present invention is constructed and arranged to provide a rechargeable electronic lighter. Many people carry lighters in their pockets at all times and some electronic lighters are known. The article of the present invention allows a user to carry an electronic lighter with a rechargeable battery that can be charged via a common USB port and with built-in safety features.

As generally shown in FIG. 1, the present invention provides a USB rechargeable electronic lighter contained in a pocket size casing in accordance with an embodiment of the present invention. As understood in the art, the lighter of the present invention is hand operated being constructed and arranged to fit in the user's hand.

Lighter 10 is formed having hollow body portion 11 whereby internal components are housed a central cavity formed on the interior of said body 11. Formed in said body 11 is an access opening 12 whereby a user can insert a cigarette, cigar, and any other article in which ignition of a fire is desired such that said inserted article is positioned in close proximity to heat coil 16. Lighter 10 incorporates a USB connector 14 whereby said USB connector 14 extends outward from the interior of body portion 11, as shown in FIG. 12, through an opening in body portion 11 and retracts to a position with body portion 11 as shown in FIG. 13.

A sliding switch 13 is positioned on one side of body portion 11 and is positioned along a sliding switch aperture 15. None embodiment, sliding switch 13 is a three position sliding switch that is constructed and arranged to lock into one of three positions along aperture 15.

Body portion 11 has incorporated on the surface thereon, an LED indicator 24 that is connected to interior housed circuitry that provides a visual indicator as to the function of lighter 10. Function includes, charging, low battery, heat coil on and operating, and combinations thereof.

As shown in FIG. 8, lighter 10 is the charge position in (also as in FIG. 3), showing the sliding switch 13, in which a first sliding switch concave lock 18 is the charge position such that when switch slide body 21 is moved using switch 13, switch slide body 21 contacts lock 18 and secures the slideable switch 13 into a fixed position. The fixed position is overcome by additional application of pressure generally applied along slideable switch 18 in a direction substantially along the surface of the side of body 11 along the upper surface of sliding switch aperture 15.

Switch connector plate 17 has incorporated thereon, first sliding switch concave lock 18, a second sliding switch concave lock 19, and a third sliding switch concave lock 20. Each of locks 18, 19, 20, are constructed and arranged to interact with switch slide body 21 in order to hold switch slide body 21 into a fixed position. When switch slide body 21 is in position secured by lock 18, circuit board 23, completes a circuit of the USB connector 14 and the rechargeable battery 22 and allows the flow of electricity from an external power source connected to USB connector 14 that ultimately charges battery 22. When sliding switch 13 is accessed through the sliding switch aperture 15, a user can slide the switch slide body 21 to the off position which would include switch slide body 21 interacting and locking at lock 19. When switch slide body 21 is locked at lock 20, the system completes a circuit connected to heat coil 16 and rechargeable battery 22 powers heat coil 16 to light or ignite an object on or in close proximity to heat coil 16.

As shown in FIG. 10, sliding switch 13 interacts with lock 19 and positions switch slide body 21 in the off position. In this position, lighter 10 is powered off and is not charging or heating.

As shown in FIG. 11, a power schematic of circuit board 22 in which USB connector 14 completes a circuit with rechargeable battery 23 when sliding switch 13 on the switch
connector plate 17 is in lock 18. When sliding switch 13 on the switch connector plate 17 is in the off position at lock 19, there is no completed circuit. Heat coil 16 completes a circuit with rechargeable battery 23 when sliding switch 13 on the switch connector plate 17 is in heat position at lock 20. The completed circuit can be broken by the thermo switch 25 upon reaching an optimal and/or threshold temperature.

Fig. 12 is one embodiment of the invention showing a sectional view along line A-A of Fig. 3. In this embodiment, the sliding switch 13 is accessed through the sliding switch aperture 15 to slide the heat coil 16 out of body portion 11 to position switch connector plate 17 in the heat position being lock 20. The circuit board 23 completes a circuit of the heat coil 16 and the rechargeable battery 22. A user can slide the switch slide body 21 along the switch connector plate 17 to the off position being lock 19, or to the charge position being lock 18.

Fig. 13 is one embodiment of the invention showing a sectional view along line A-A of Fig. 3. In this embodiment, the sliding switch 13 is accessed through the sliding switch aperture 15, to slide the heat coil 16 into body portion 11 to position switch connector plate 17 in the off position being lock 19. The circuit board 23 breaks a circuit of the heat coil 16 and the rechargeable battery 22.

In an embodiment of the invention, the sliding switch extends 0.0-2.0 cm outside the body portion through a sliding switch aperture that is cut to fit the sliding switch only when slid to the off position, the charge position, or the heat position. The sliding switch is accessed through the sliding switch aperture and slid to the desired position where is locks into place in the sliding switch aperture.

While the invention has been described in its preferred form or embodiment with some degree of particularity, it is understood that this description has been given only by way of example and that numerous changes in the details of construction, fabrication, and use, including the combination and arrangement of parts, may be made without departing from the spirit and scope of the invention.

I claim:

1. A lighter comprising:
   a body with a hollow interior cavity;
   a rechargeable battery;
   a USB connector port;
   a heat transfer device, wherein said heat transfer device is constructed and arranged to propagate heat sufficient to ignite an article placed between 0.0-1.0 cm of said heat transfer device;
   electronic circuitry in said cavity, wherein said circuitry accepts electrical input from said USB port, provides said electricity in a configuration to charge said rechargeable battery, and provides electricity to said heat transfer device;
   a safety switch incorporated with a sensor, wherein said safety switch interrupts electricity to said heat transfer device when any of time threshold, temperature threshold, temperature level, and combinations thereof are reached and detected by said sensor.

2. The lighter of claim 1 wherein said heat transfer device is a heat conducting coil.

3. The lighter of claim 1 wherein said heat transfer device is a heat conducting plate.

4. The lighter of claim 1 wherein said heat transfer device produces heat sufficient to ignite a cigarette or cigar placed within 0.0-1.0 cm of said heat transfer device.

5. The lighter of claim 1 wherein said heat transfer device produces heat from 0.0-1.0 cm from said device of between 300-2200 degrees Fahrenheit.

6. The lighter of claim 1 wherein said sensor is configured to measure time, temperature, or both.

7. The lighter of claim 1 wherein said sensor is operatively associated with said circuitry.

8. The lighter of claim 1 wherein said sensor is operatively associated with said circuitry and said circuitry is configured to interrupt electrically to said heating device when a configured time, temperature, or both is detected by said sensor.

9. The lighter of claim 1, wherein said sensor is configured to interrupt electrically to said heating device after a time period of 3-20 seconds of electricity supplied to said heating device.

10. The lighter of claim 1 wherein said heat transfer device is slidably extended and retracted into said cavity.

11. The lighter of claim 1 wherein said heat transfer device is incorporated onto said main body.

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