A fuel-less and battery-less cigarette lighter is a manually powered lighter that operates without the use of fuel. The lighter includes a super capacitor (low voltage, very high capacitance) that is discharged into a resistance. This resistance then becomes hot enough to light a cigarette or cigar upon contact. The super capacitor is charged by means of a mechanical system, such as the user winding or squeezing the lighter and a micro generator. After charging, a switch allows the capacitor to discharge into the resistance.
FUELLESS LIFELONG CIGARETTE LIGHTER

CROSS REFERENCE TO RELATED APPLICATIONS

The present application claims priority under 35 U.S.C. §119 on the U.S. Provisional Patent Application Ser. No. 60/190, 251, filed on Aug. 26, 2008, the disclosure of which is incorporated herein by reference.

FIELD

The present disclosure relates in general to portable cigarette lighters. More particularly, it relates to a fuel-less and battery-less cigarette lighter, which uses a super-capacitor and a resistance. An electrical charge from the super-capacitor is discharged onto the resistance to create heat energy, which in turn lights up a cigarette or a cigar on contact.

DESCRIPTION OF THE BACKGROUND ART

Lighters and the like are used in a number of different applications, which require an object to be ignited due to placement of the object in close proximity or in contact with the lighting means of the lighter. The most common and ubiquitous application is the lighting of tobacco products, such as cigarettes, cigars, etc. A lighter is most often used to ignite the tip of a tobacco product to permit smoking thereof. Other applications where a lighter is used include but are not limited to the lighting of candle, incense sticks, or other combustible fragrant or luminary objects.

While many different devices and sources of heat could be used to ignite a cigarette, some of the most common ways to ignite a cigarette include using a match; a coil that has been heated by passing an electric current through the coil; and a flame that is powered by a flammable liquid such as butane which is stored in a portion of the lighter.

Generally, cigarette lighters include a wick, which is activated by capillary action. The lower end of the wick is immersed in a fuel and a rotatably mounted flint, disposed in closely spaced relation to the tip of the wick, which produces a spark when rotated against an abrasive member, is disposed in close proximity. These lighters have a number of well-known disadvantages relating to the need to maintain fuel therein, such as the inefficiency of the flint-based spark-producing means, and the like. Moreover, the lighters can be used to start fires, either intentionally or accidentally. Additional drawbacks of such conventional lighters are equally well known. For example, the lighter fluid has an unpleasant smell. Moreover, the lighters are heavy and not inexpensive. Many inventors have developed improvements to the common lighter. For example, U.S. Pat. No. 5,268,553 discloses a battery powered lighter that uses a laser to ignite the tobacco. In another example, U.S. Pat. No. 5,235,157 discloses a battery powered lighter that uses a spiral electric heating element to elevate the temperature of the tobacco to ignite the cigarette. The same patent discloses a recessed opening into which the cigarette must be inserted to enable the heating element to contact the cigarette. The recessed opening is intended to inhibit the intentional setting of fires. Further, Chuange, in U.S. Pat. No. 4,507,704 discloses a battery-operated cigarette lighter that provides current to heat a filament that is positioned within housing. The size, weight, and expense of the Chuange device are not inconsiderable.

Common lighters require a fuel to create a flame, which requires refilling of the fuel supply or otherwise makes the lighters to be a disposable item. This causes the frustration when it runs out and the frequent purchase of new lighters—which can be several times a year. It is also a growing environmental issue with millions of lighters being disposed of each year. Other issues with common flame lighters are the difficulty to operate in windy conditions, the poor operation in wet environments, the risk of inadvertently setting fire by negligence, the propensity of the nozzle to become plugged, the ban on flame lighters aboard aircraft, etc. Battery operated cigarette lighters require frequent replacement of batteries, and the disposal of such batteries further carries inherent health and environmental hazards. Therefore, following a useful life of the batteries, they require further attention in processing a responsible disposal to avoid unintended hazards.

Although the art of cigarette lighters is well-developed, there remains a need for a lightweight and small lighter that can be held in the palm of one's hands but cannot be used to start intentional or unintentional fires. There is also a need for a lighter that is very inexpensive, small and light in weight. Further, the total elimination of fuel from a lighter would be a revolutionary change in age old custom of lighting a cigarette by using a flame. In addition, if the lighters can be made without the electrical energy from disposable batteries, users would have a relief from the annoyance of ever replacing batteries for lighters to light a cigarette.

SUMMARY

In accordance with an illustrative embodiment of the present disclosure, a lightweight and small fuel-less and battery-less lighter assembly that can be held in one's hand is provided. The lighter assembly further has a housing, which nests a super-capacitor and a resistance for receiving electrical charges from the super-capacitor to heat itself up for generating adequate heat for lighting a cigarette, a cigar, and the like, on contact. The fuel-less and battery-less lighter assembly includes:

- A housing having a body and plurality of outer faces; a recess is disposed on one of its outer faces; the recess partially receiving a handle; the handle may be spring loaded or may be of a winding crank type, which handle is removably attached with the housing such that, when squeezed or wound by the crank, it exerts an inward force from outside of the housing.

- A set of gears fixedly mounted within the housing, juxtaposed with the handle; the gears receiving and converting inward force exerted by the handle into kinetic energy.

- A micro generator fixedly mounted within the housing, the micro generator being disposed adjacent to said gear set and connected therewith; the micro generator converting the kinetic energy from the set of gears into electrical energy.

- A circuit board is fixedly mounted within the housing; the circuit board receiving the electrical energy from the micro generator and further processing said electrical energy.

- A super-capacitor is fixedly mounted within the housing, the super-capacitor further having low voltage and high capacitance; the super-capacitor receiving said processed electrical energy from said circuit board. In an embodiment, the maximum operating voltage of
the super-capacitor of the present disclosure does not exceed ten volts, and the operating capacitance of the super-capacitor is at least 10 Farads. In another embodiment, the maximum operating voltage of the super-capacitor is 12 volts, and the operating capacitance of the super-capacitor is 5 Farads. However, one skilled in the art will recognize that the operating ratings disclosed herein are exemplary and non-limiting.

FIG. 1 is a front isometric view of the fuel-less and battery-less cigarette lighter according to the disclosure;

FIG. 2 is a side view of the fuel-less and battery-less cigarette lighter according to the disclosure; and

FIG. 3 is a sectional front view of the fuel-less and battery-less cigarette lighter according to the disclosure.

Similar reference characters denote corresponding features consistently throughout the drawings.

DETAILED DESCRIPTION

The present disclosure is directed towards a fuel-less and battery-less lighter assembly 10, as shown in FIG. 1. The fuel-less and battery-less lighter assembly 10 includes a housing 20 having a body and plurality of outer faces. A recess 30 is disposed on one of its outer faces. A recess 30 partially and removably receives a handle 40. The handle 40 may be spring loaded and removably attached with the housing 20 such that, when squeezed, the handle 40 exerts inward force from outside of the housing 20.

A set of gears 50 fixedly mounted within the housing 20, juxtaposed with the handle 40, the gear set 50 receiving and converting the inward force exerted by the handle 40 into kinetic energy.

A micro generator 60 is fixedly mounted within the housing 20, the micro generator 60 is disposed adjacent to said gear set 50 and connected therewith; the micro generator 60 converts the kinetic energy from the gear set 50 into electrical energy. A circuit board 70 is fixedly mounted within the housing 20; the circuit board 70 receives the electrical energy from the micro generator 60, and further processes said electrical energy.

A super-capacitor 80 is fixedly mounted within the housing 20, the super-capacitor 80 further having low voltage and high capacitance; the super-capacitor 80 receives said processed electrical energy from said circuit board 70.

A control switch 90 is partially mounted on the body of the housing 20 such that, a portion of the switch 90 protrudes outside of the body of the housing 20 for easy on and off operations; the control switch 90 is connected to the super-capacitor 80; the control switch 90 discharges the electrical energy stored in the super-capacitor 80 on a need basis by activating the control switch 90, and when not needed, the control switch 90 is turned off to preserve the electrical energy in the super-capacitor 80.

An electrical resistance 100 is partially mounted in a suitable recess on the body of the housing 20 of the lighter assembly 10 such that a top portion of the resistance 100 exposes from the surface of the housing 20; the resistance 100 further includes at least one heating element; the control switch 90 is further connected to the resistance 100; the control switch 90 discharges the electrical charges stored in the super-capacitor 80 into the resistance 100, whereby the at least one heating element of the resistance 100 adequately heats up and lights a cigarette on contact.

In the preferred embodiment of the present disclosure, in operation, a manual force is exerted either by squeezing the handle 40 or winding a crank. The manual force is transferred to the juxtaposed gear set 50 fixedly mounted within the housing 20 of the lighter assembly 10. The gear set 50 converts the manual force to kinetic energy; the kinetic energy from the gear set is transferred to the micro generator. Successfully, the micro generator converts the kinetic energy into electrical energy; further, the micro generator transfers the electrical energy to the adjoining electric circuit board; the circuit board processes the electrical energy to charge the super-capacitor with low voltage (which voltage, in an embodiment, does not exceed 10 volts) and high capacitance (which capacitance, in an embodiment, is at least 10 Farads).

In another embodiment, the voltage of the super-capacitor is 12 volts, and the capacitance is 5 Farads. One skilled in the art will recognize, however, that the operating ratings set forth herein are exemplary only and are not intended to be limiting. When a user turns on the control switch, the super-capacitor, laden with low voltage and high capacitance, discharges the stored charges into the resistance, whereby, the heating element of the resistance is heated to create heat for the user to light up a cigarette without using a lighted flame of fire.

These and other features of the present disclosure will become readily apparent upon further review of the following specification and drawings.
and high capacitance, discharges the stored charges into the resistance 100, whereby, the heating element of the resistance 100 is heated to create heat energy for the user to light up a cigarette without using a lighted flame of fire.

[0030] In an alternative embodiment, the handle 40 may be replaced with a winding crank to exert manual force to create kinetic energy by the gear set 50. A manual force may be exerted and transferred to the gear set 50 by winding the crank; whereby kinetic energy is produced and transferred to micro generator 60; the kinetic energy is further converted into electrical energy by the micro generator 60; the electrical energy is then processed by the circuit board 70. The processed electrical energy is further channeled to the super-capacitor 80, which is then enriched with low voltage and high capacitance. By turning on the control switch 90, the super-capacitor 80 is enabled to discharge the stored energy into the resistance 100, whereby the heating element of the resistance 100 is heated to produce adequate heat to light up a cigarette or a cigar without lighting a flame of fire.

[0031] It is to be understood that the present disclosure is not limited to the embodiments described herein, but encompasses any and all embodiments within the scope of the following claims.

Having described the disclosure what is claimed is:

1. A fuel-less and a battery-less hand-held cigarette lighter, comprising:
   a housing having a body and plurality of outer faces;
   a recess is disposed on one of the outer faces of the housing;
   the recess partially receiving a handle; the handle is removably attached to the housing exerting an inward force when squeezed thereon;
   a gear set fixedly mounted within the housing, juxtaposed with the said handle; the gear set receives and converts the said inward force by the handle into kinetic energy;
   a micro generator fixedly mounted within the housing; the micro generator is disposed adjacent to said gear set and connected therewith; the micro generator converts the said kinetic energy into electrical energy;
   a circuit board is fixedly mounted within the housing; the circuit board is communicably juxtaposed with the micro generator; the circuit board further processes said electrical energy;
   a super-capacitor is fixedly mounted within the housing; the super-capacitor further including low voltage and high capacitance; the super-capacitor further receives said processed electrical energy and stores said electrical energy as electrical charge;
   a control switch is fixedly mounted on the body of the housing, partially protruding from the housing; the control switch is connected to the super-capacitor; and an electrical resistance is partially and fixedly mounted in a recess on the body of the housing; a portion of the resistance exposed outwardly from one of the faces of the housing, the resistance further including at least one heating element; the resistance is further connected to said control switch, whereby, when the control switch is turned on, the super-capacitor discharges the stored electrical charges into the resistance, thereby heating the at least one heating element for lighting a cigarette.

2. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the maximum operating voltage of the super-capacitor does not exceed ten volts.

3. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the level of minimum operating capacitance is at least ten Farads.

4. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the maximum operating voltage of the super-capacitor does not exceed 12 volts.

5. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the level of minimum operating capacitance is at least five Farads.

6. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the housing is constructed with a metallic material.

7. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the housing is constructed with a plastic material.

8. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the handle is a spring loaded handle removably attached with the housing.

9. The fuel-less and battery-less cigarette lighter as described in claim 8, wherein the inward force is applied to the handle by squeezing the handle against the body of the housing.

10. The fuel-less and battery-less cigarette lighter as described in claim 1, wherein the handle is a winding crank removably attached with the housing.

11. The fuel-less and battery-less cigarette lighter as described in claim 10, wherein the inward force is applied to the handle by winding the crank of the handle.

* * * * *