LOW TEMPERATURE ELECTRONIC VAPORIZATION DEVICE AND METHODS

CROSS REFERENCE

[0001] This application claims priority to U.S. Provisional Patent Application Serial No. 61/524,308, filed August 16, 2011, which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The use of tobacco products and the harmful side effects of smoking tobacco continue to gain increasing attention worldwide. As more regulations come into effect regarding smoking in the work place or in public, interest in developing alternative products is growing significantly. One method of reducing the harmful side effects of smoking is to not burn the tobacco products. This is because many of the harmful analytes, such as Hoffman analytes, obtained from smoking are received due to the burning of the material.

[0003] A difficulty of developing and marketing a device that can deliver an aerosolized tobacco product is catering to the user in terms of visual and physical appeal of use. A device that can be used multiple times to aerosolize a variety of different substances while providing similar sensations to the user as those from smoking, such as visual vapor, are desirable. A device and product that can aerosolize a tobacco product and reduce Hoffman analytes and mutagenic compounds delivered to a user as compared to smoking are also desirable.

SUMMARY OF THE INVENTION

[0004] A device for generating an inhalable aerosol is provided herein comprising: a mouthpiece, a body; an electronic heater within said body comprising a printed circuit board to heat a viscous vaporizable material to a generate an inhalable aerosol; and a temperature regulator. The inhalable aerosol can accommodate a pod comprising particles that are less than about 2 microns (in their longest dimension-whether length or width or depth) or loose leaf tobacco and other botanicals (no pods).

[0005] In one aspect, a resistive heating element and thermistor to monitor and precisely control vaporization temperature are disclosed for use in a device for aerosolizing a material. In some embodiments, the heating element comprises an electronic circuit with power transistor to drive the heater. In certain embodiments, the tail of the electronic circuit solders to a PCB (printed circuit board). In some embodiments, the device comprises aerogel insulation to maintain efficiency and low exposed surface temperature. In certain embodiments, the aerogel is a silica aerogel with reinforcing fibers (e.g., Pyrogel 2250 flexible aerogel blanket). In some embodiments, the device comprises a single button interface wherein the single button interface provides means for on, off and wake from sleep.

[0006] In some embodiments, the electronic heater comprises a polyimide thin film (“flex”) printed heater circuit (also or alternatively called a flexible heater circuit). In certain embodiments provide the electronic heater with soldered thermistor element for control loop. In certain embodiments, the device comprises a PID (proportional integral derivative) control loop to control operating temperature.

[0007] In some embodiments, the device comprises a magnetic charge connector. In some embodiments, the device comprises time or sensor based standby activation to conserve battery power. This may also or

LOW TEMPERATURE ELECTRONIC VAPORIZATION DEVICE AND METHODS

CROSS REFERENCE

[0001] This application claims priority to U.S. Provisional Patent Application Serial No. 61/524,308, filed August 16, 2011, which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The use of tobacco products and the harmful side effects of smoking tobacco continue to gain increasing attention worldwide. As more regulations come into effect regarding smoking in the work place or in public, interest in developing alternative products is growing significantly. One method of reducing the harmful side effects of smoking is to not burn the tobacco products. This is because many of the harmful analytes, such as Hoffman analytes, obtained from smoking are received due to the burning of the material.

[0003] A difficulty of developing and marketing a device that can deliver an aerosolized tobacco product is catering to the user in terms of visual and physical appeal of use. A device that can be used multiple times to aerosolize a variety of different substances while providing similar sensations to the user as those from smoking, such as visual vapor, are desirable. A device and product that can aerosolize a tobacco product and reduce Hoffman analytes and mutagenic compounds delivered to a user as compared to smoking are also desirable.

SUMMARY OF THE INVENTION

[0004] Disclosed herein is a device for generating an inhalable aerosol comprising:

a. a body;

b. an aerosol generator in the body comprising a vaporization chamber, wherein the aerosol generator is configured to generate an inhalable aerosol from a vaporisable material in the vaporisation chamber wherein such inhalable aerosol is deliverable to a user; and

c. a lid removably coupled to the body of the device, wherein the lid is configured to cover the vaporisation chamber;

characterised in that the device further comprises a magnetic hinge about which a first side of the lid can swivel away from the body of the device into an open position when a force is exerted on a second side of the lid) in an opposite direction toward the body of the device, and the lid can be removed entirely by overcoming the magnetic force of the hinge.

[0005] A device for generating an inhalable aerosol is provided herein comprising: a mouthpiece, a body; an electronic heater within said body comprising a printed circuit board to heat a viscous vaporizable material to a generate an inhalable aerosol; and a temperature regulator. The inhalable aerosol can accommodate a pod comprising particles that are less than about 2 microns (in their longest dimension- whether length or width or depth) or loose leaf tobacco and other botanicals (no pods).

[0006] In one aspect, a resistive heating element and thermistor to monitor and precisely control vaporization temperature are disclosed for use in a device for aerosolizing a material. In some embodiments, the heating element comprises an electronic circuit with power transistor to drive the heater. In certain embodiments, the tail of the electronic circuit solders to a PCB (printed circuit board). In some embodiments, the device comprises aerogel

insulation to maintain efficiency and low exposed surface temperature. In certain embodiments, the aerogel is a silica aerogel with reinforcing fibers (e.g., Pyrogel 2250 flexible aerogel blanket). In some embodiments, the device comprises a single button interface wherein the single button interface provides means for on, off and wake from sleep.

[0007] In some embodiments, the electronic heater comprises a polyimide thin film ("flex") printed heater circuit (also or alternatively called a flexible heater circuit). In certain embodiments provide the electronic heater with soldered thermistor element for control loop. In certain embodiments, the device comprises a PID (proportional integral derivative) control loop to control operating temperature.

[0007A] In some embodiments, the device comprises a magnetic charge connector. In some embodiments, the device comprises time or sensor based standby activation to conserve battery power. This may also or

CLAIMS

1. A device (600) for generating an inhalable aerosol comprising:

a. a body;

b. an aerosol generator in the body comprising a vaporization chamber, wherein the aerosol generator is configured to generate an inhalable aerosol from a vaporisable material in the vaporisation chamber wherein such inhalable aerosol is deliverable to a user; and

c. a lid (676) removably coupled to the body of the device (600), wherein the lid (676) is configured to cover the vaporisation chamber;

characterised in that the device (600) further comprises a magnetic hinge about which a first side of the lid (676) can swivel away from the body of the device (600) into an open position when a force is exerted on a second side of the lid (676) in an opposite direction toward the body of the device, and the lid (676) can be removed entirely by overcoming the magnetic force of the hinge.

2. The device of claim 1, wherein the hinge comprises two magnets in the lid (676) and two magnets correspondingly placed in the body of the device (600) so as to form the hinge around which the lid (676) swivels.

3. The device of claim 1 or 2, wherein removal of the lid (676) from the body of the device (600) allows access to the vaporization chamber.

4. The device of any preceding claim, wherein the lid comprises a magnetic attachment or snap attachment configured to maintain the lid (676) in the closed position and/or prevent accidental opening of the lid (676).

5. The device of any preceding claim, wherein the lid (676) is recessed into the body of the device (600).

6. The device of any preceding claim, wherein the vaporization chamber is configured to accept the vaporizable material directly without placing the vaporizable material in a cartridge.

7. The device of any one of claims 1 to 5, wherein the vaporization chamber is configured to accept a cartridge containing the vaporizable material.

8. The device of any preceding claim, wherein an underside of the lid (676) is chamfered.

CLAIMS

1. A device for generating an inhalable aerosol comprising:

a. a body;

b. an aerosol generator in the body comprising a vaporization chamber, wherein the aerosol generator is configured to generate an inhalable aerosol from a vaporisable material in the vaporisation chamber wherein such inhalable aerosol is deliverable to a user; and

c. a lid removably coupled to the body of the device, wherein the lid is configured to cover the vaporisation chamber;

characterised in that the device further comprises a magnetic hinge about which a first side of the lid can swivel away from the body of the device into an open position when a force is exerted on a second side of the lid) in an opposite direction toward the body of the device, and the lid can be removed entirely by overcoming the magnetic force of the hinge.

2. The device of claim 1, wherein the hinge comprises two magnets in the lid and two magnets correspondingly placed in the body of the device so as to form the hinge around which the lid swivels.

3. The device of claim 1 or 2, wherein removal of the lid from the body of the device allows access to the vaporization chamber.

4. The device of any preceding claim, wherein the lid comprises a magnetic attachment or snap attachment configured to maintain the lid in the closed position and/or prevent accidental opening of the lid.

5. The device of any preceding claim, wherein the lid is recessed into the body of the device.

6. The device of any preceding claim, wherein the vaporization chamber is configured to accept the vaporizable material directly without placing the vaporizable material in a cartridge.

7. The device of any one of claims 1 to 5, wherein the vaporization chamber is configured to accept a cartridge containing the vaporizable material.

8. The device of any preceding claim, wherein an underside of the lid is chamfered.