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(54) **SELF-CONTAINED ELECTRONIC SMOKING
DEVICE THAT PRODUCES SMOKE AND ASH
BY INCINERATION**

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(71) Applicant: **SAMUEL AARON KATZ, VAIL, CO**
(US)

(72) Inventor: **SAMUEL AARON KATZ, VAIL, CO**
(US)

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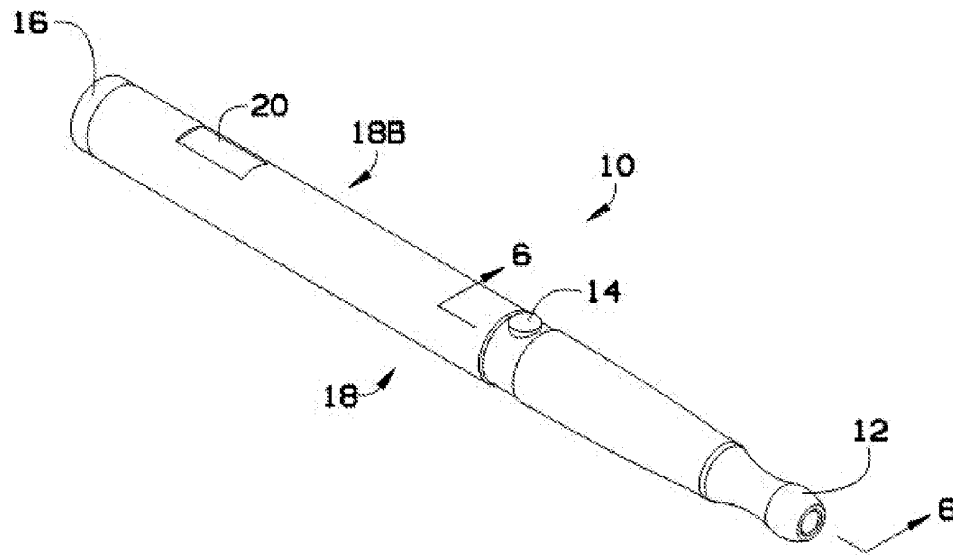
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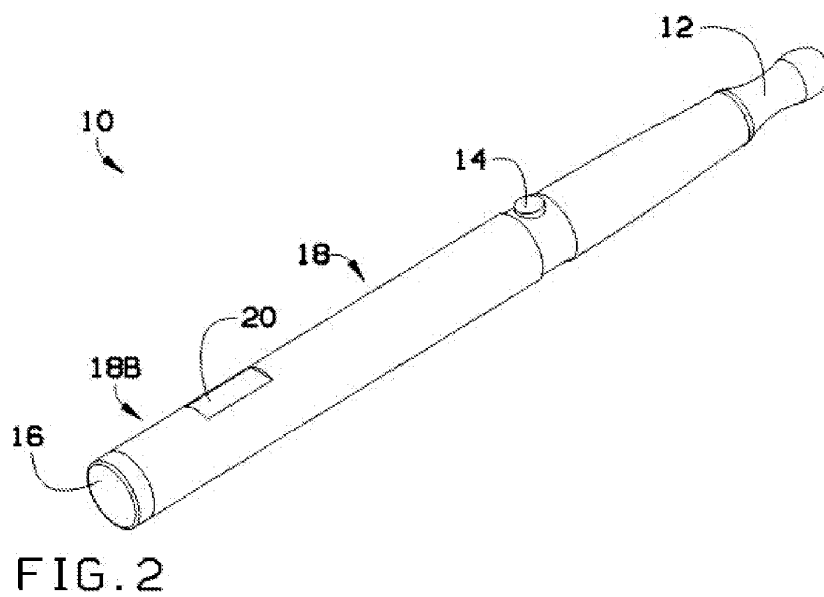
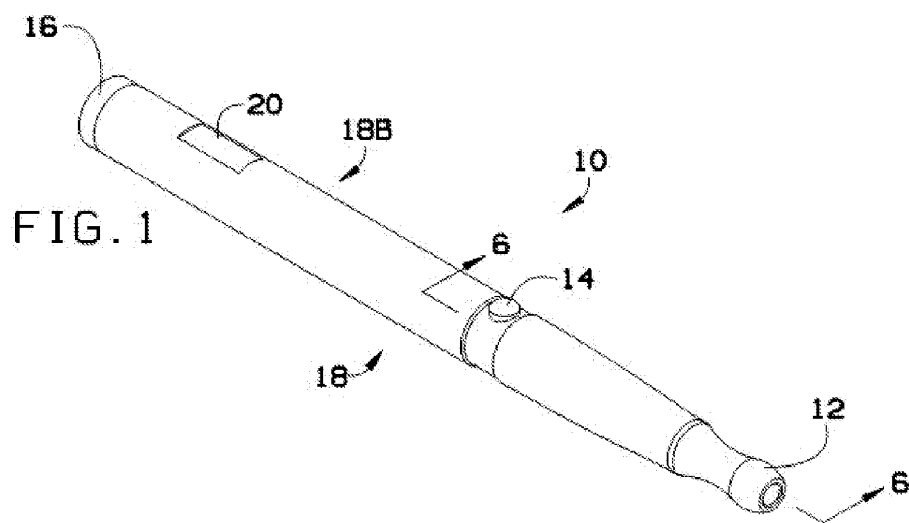
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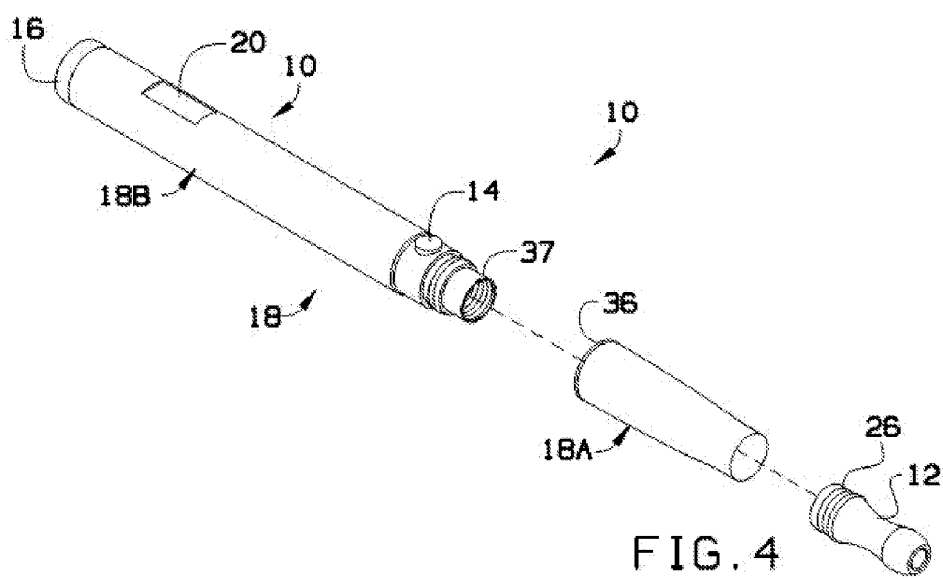
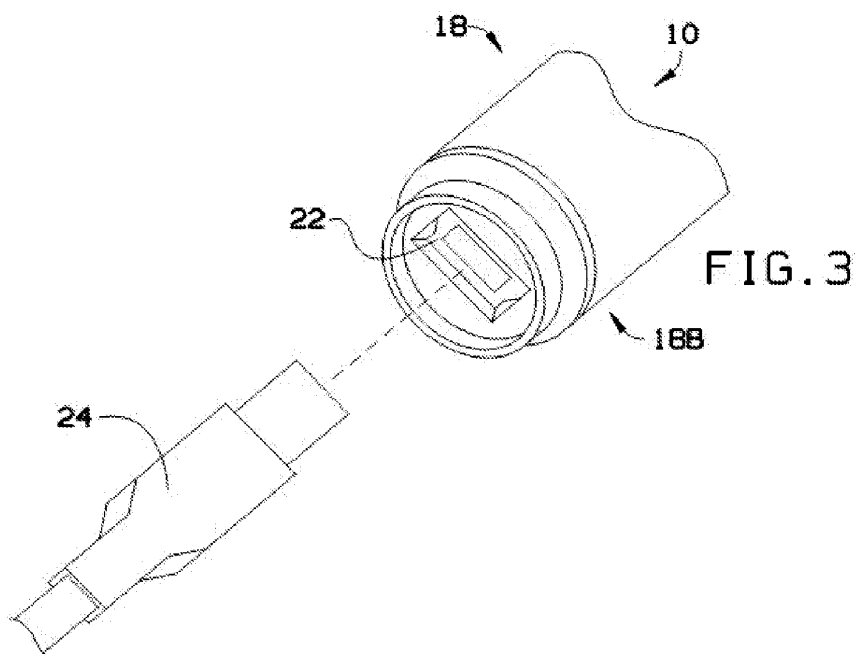
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(57) **ABSTRACT**

Embodiments include an electronic smoking device that produces authentic smoke and ash by incinerating smoking material placed directly onto a heating source that obtains a high temperature. This heat could also be harnessed for warmth or lighting cigars and cigarettes. The device may be an electronic pipe with a housing compartment, a power source, an atomizer heating source, a mouthpiece, a power trigger, a charger, and airflow ducts. The heating source may include one or more filaments that get heated in the burnable material compartment. The device may be conical in shape as to be a compatible water-pipe accessory. The housing may include several separable sections, including a battery housing and a burn housing that may separate from each other. The device may include adapters including plugged bifurcated adapters, to mitigate leaking from burn housing into the battery adapter, a ceramic dish, and insulation.









SELF-CONTAINED ELECTRONIC SMOKING DEVICE THAT PRODUCES SMOKE AND ASH BY INCINERATION

CLAIM OF BENEFIT TO PRIOR APPLICATION

[0001] This application claims benefit to U.S. Provisional Patent Application 61/745,090, entitled “An electric (battery powered) smoking pipe. A filament in an electric cigarette for producing smoke,” filed Dec. 21, 2012. The U.S. Provisional Patent Application 61/745,090 is incorporated herein by reference.

BACKGROUND

[0002] The embodiments herein relate generally to electronic smoking devices, and more particularly to producing smoke and ash from fully combusted and incinerated smoking material for electronic cigarettes and electronic smoking pipes.

[0003] Many people smoke electronic cigarettes or pipes (hereafter referred to as “e-cig vaporizers”), which are designed to produce mere vapor combustion and aerosol inhalant, which are types of imitation smoke because no ash byproduct is produced. Some users turn to other smoking cessation devices and nicotine alternatives: like chewing tobacco, smokeless nicotine patches, nicotine gums, etc., to satisfy their craving to smoke. There are both, holistic (pipe like) vaporizers and e-cig vaporizers available that can do the same thing as each other, produce mere combustion vapor (i.e., imitation smoke that does not produce ash, or in some cases, vapor, sometimes called combustion smoke, from only slightly burning the plant matter to a point short of incinerating the plant matter to ash). However, there are no self-contained electronic smoking devices that incinerate matter into ash and smoke.

[0004] This is a problem for many former and current smokers of cigarettes and tobacco pipes. Instead of chewing gum or inhaling air from conventional non-incineration electric devices, some people would like to enjoy actual smoke and ash. Furthermore, some people prefer not to use external heating sources, which may be difficult to aim and even operate in turbulent conditions, and are flat out dangerous. To date, however, the only options a person has for smoking with actual smoke and ash includes traditional tobacco smoke products that are externally heated products or internally heated with gas. All other electronic self-contained smoking devices and e-cig vaporizers are not designed to incinerate plant matter thus they are not designed to create actual smoke and ash, but rather, are designed to create types of imitation smoke.

[0005] Therefore, what is needed is a self-contained electronic smoking device with an internal heating source (which essentially functions as a cordless, flame-less lighter) and an open interface in which the smoker can fill and refill, like a pipe, and incinerate the packed pipe matter, producing actual smoke and ash, instead of mere combustion vapor or aerosol.

BRIEF SUMMARY

[0006] Some embodiments of the invention include an electronic smoking device that produces smoke and ash by incinerating smoking material. The electronic smoking device comprises a heat source that heats the smoking material when the heat source is electrically powered. In some embodiments, the smoking material is placed adjacent to the heat

source. In some embodiments, the adjacently placed smoking material incinerates when the electrically charged heat source is heated to at least a threshold temperature. In some embodiments, the threshold temperature is a temperature that is sufficiently high to incinerate the smoking material.

[0007] The electronic smoking device of some embodiments comprises a housing compartment, a power source, an atomizing heat source, and a detachable mouthpiece. In some embodiments, the heat source is an atomizer that comprises a heat-conducting coil (filament) in one of a cartridge with electrical wires, an adapter, and a housing. In other embodiments, the heat source comprises any heat conductor. In some embodiments, the housing comprises a plurality of separable sections. In some embodiments, the separable sections comprise a battery housing section and a burn housing section that separates from each other. In some embodiments, the mouthpiece separates from the burn housing section. In some embodiments, the electronic smoking device further comprises one or more of a set of adapters (with airflow ducts), a ceramic dish, insulation, a bifurcated adapter plug, a housing with airflow ducts, a charger, and a power/trigger button. In some embodiments, the electronic smoking device is one of an electronic pipe, an electronic burpen, and an electronic cigarette.

[0008] The preceding Summary is intended to serve as a brief introduction to some embodiments of the invention. It is not meant to be an introduction or overview of all inventive subject matter disclosed in this specification. The Detailed Description that follows and the Drawings that are referred to in the Detailed Description will further describe the embodiments described in the Summary as well as other embodiments. Accordingly, to understand all the embodiments described by this document, a full review of the Summary, Detailed Description, and Drawings is needed. Moreover, the claimed subject matters are not to be limited by the illustrative details in the Summary, Detailed Description, and Drawings, but rather are to be defined by the appended claims, because the claimed subject matter can be embodied in other specific forms without departing from the spirit of the subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Having described the invention in general terms, reference is now made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

[0010] FIG. 1 conceptually illustrates a front perspective view of an electronic smoking device that produces smoke and ash by incinerating smoking material in some embodiments.

[0011] FIG. 2 is a rear perspective view in some embodiments of the electronic smoking device illustrated in FIG. 1.

[0012] FIG. 3 conceptually illustrates a detailed exploded view of a USB charging port in some embodiments of an electronic smoking device that produces smoke and ash by incinerating smoking material.

[0013] FIG. 4 conceptually illustrates an exploded view of the electronic smoking device illustrated in FIG. 2.

[0014] FIG. 5 conceptually illustrates an exploded view of different parts of the burn housing cartridge of the electronic smoking device illustrated in FIG. 2.

[0015] FIG. 6 conceptually illustrates a detailed cross-sectional view of the air flow including the open interface design of the burnable material compartment which enables direct unobstructed proximity to the heating element of an elec-

tronic smoking device that produces smoke and ash by incinerating smoking material in some embodiments.

DETAILED DESCRIPTION

[0016] In the following detailed description, several examples and embodiments of the invention are described. However, it will be clear to a person skilled in the art that the invention is not limited to the embodiments set forth and can be adapted for any of several other uses.

[0017] Some embodiments of the invention include an electronic smoking device that produces smoke and ash by incinerating smoking material. The electronic smoking device comprises a heat source that heats the smoking material when the heat source is electrically powered. In some embodiments, the smoking material is placed adjacent to the heat source. In some embodiments, the adjacently placed smoking material incinerates when the electrically charged heat source is heated to at least a threshold temperature. In some embodiments, the threshold temperature is a temperature that is sufficiently high to incinerate the smoking material.

[0018] The electronic smoking device of some embodiments comprises a housing compartment, a power source, an atomizing heat source, and a detachable mouthpiece. In some embodiments, the heat source comprises one or more heat-conducting coils (filaments) in one or more of a cartridge, an atomizer, and a housing. In some embodiments, the housing comprises a plurality of separable sections. In some embodiments, the separable sections comprise a battery housing section and a burn housing section that separate from each other. In some embodiments, the electronic smoking device comprises a mouthpiece that corresponds with the burn housing section, a battery that corresponds with the adapter end of the atomizer housing section, and a charger that corresponds with the battery housing. In some embodiments, the mouthpiece separates from the burn housing section. In some embodiments, the electronic smoking device further comprises a set of adapters (which may have airflow ducts), a ceramic dish, insulation, a bifurcated adapter plug, a charger, a housing with airflow ducts, and a power button/trigger. In some embodiments, the electronic smoking device is one of an electronic pipe, an electronic burnpen, and an electronic cigarette.

[0019] By way of example, FIG. 1 conceptually illustrates a front perspective view of an example electronic smoking device in some embodiments. The electronic pipe 10 comprises a housing 18, a mouthpiece 12, a power button/trigger 14, a cap 16, and a digital display 20. In some embodiments, the housing 18 is a singular pipe incinerator combination. In some other embodiments, the electronic smoking device comprises a burn housing section 18A and a battery housing section 18B. In some embodiments, the burn housing section 18A includes a filament (described by reference to FIGS. 5 and 6) that is designed to get extremely hot and promote incineration of smoking materials within the burnable material compartment (not visible in this figure, but present inside the burn housing, and also called the bowl) or dish or anywhere within the cartridge. In some embodiments, there is no buffer or space between the bowl and the filament allowing the dish to be incorporated as part of the burnable material compartment, thereby causing incineration when the filament gets red hot. In some embodiments, the temperature is limited by a heat setting, such that the filament cannot exceed the maximum temperature. For example, an Ohm to volt ratio can be set, or the resistance of the electrical wires can be manipu-

lated. The burn housing section 18A connects to the mouthpiece 12 acts as a straw or funnel to provide the smoke produced in the burn housing section 18A. In the example electronic pipe 10 illustrated in this figure, there is a battery housing section 18B which provides electronic power to the electronic pipe 10. However, in some embodiments, the electronic pipe 10 has electric passthrough abilities, allowing it to connect to an AC power source or generate power from an alternative source, such as a solar panel.

[0020] FIG. 2 is a rear perspective view in some embodiments of the electronic smoking device illustrated in FIG. 1. As shown in this figure, the cap 16 provides an end piece covering the end of the electronic smoking device. When a user smokes the electronic smoking device, air flow streams through slits (ducts) positioned throughout the electronic pipe 10 and is directed toward the mouthpiece 12. The power button/trigger 14 in some embodiments provides a way to start the electronic pipe incineration process, and can be automatic or manual and may be illuminated when triggered. For example, a user of the pipe 10 may activate the power button/trigger 14 which incinerates a smoking product present in the burn housing 18A and produces smoke and ash, thereby allowing the user to experience smoking with authentic smoke and ash from an electronic smoking device. In some embodiments, when a filament is present in the burn housing 18A, activating the power button/trigger 14 causes the filament to be heated red hot (e.g., at temperatures between, but not limited to, 230 and 1150 degrees Celsius, although the typical combustion zones for incense materials and smoking materials hover around 500 degrees Celsius, between 300 and 600), thereby producing actual smoke and ash when the user inhales air through the mouthpiece.

[0021] Although illustrated in FIGS. 1 and 2, the digital display 20 is an optional feature of the electronic pipe 10 which provides information about the available amount of power from the batteries and/or the active temperature of the heat source and/or usage count.

[0022] In some embodiments, batteries are not used as the power source. In some cases, the electronic pipe receives power through a charge port 22 which is revealed when the cap 16 is removed. FIG. 3 conceptually illustrates a detailed exploded view of a charging port in some embodiments of an electronic pipe. As shown in this figure, a charging plug 24 plugs into the charge port 22 at the end of the housing 18. In some embodiments, the charge port 22 is included at the end of the housing 18 instead of the cap 16. In some embodiments, the electronic smoking device includes passthrough technology and may use a wired power source (i.e., a power cord). In other embodiments, the electronic pipe 10 comprises both the charge port 22 and the cap 16. In these embodiments, the charge port 22 is revealed when the cap 16 (not shown in this figure) is removed and is hidden when the cap is stationed at the end of the electronic pipe 10. In the embodiments of FIG. 3, the charge port 22 is revealed when the cap 16 is removed and is hidden when the cap is stationed at the end of the electronic pipe 10.

[0023] In some embodiments, the charge port 22 is a universal port that supports charging by any of several methods. For instance, the electronic pipe 10 can be charged when a power source is connected to the charge port 22, such as by a connected solar panel or a power source connected to the charge port 22 via a universal serial bus (USB) cable or other such power passthrough connection.

[0024] In some embodiments, the battery housing section **18B** includes rechargeable batteries that are charged by the charging plug **24** when it is plugged into the charging port **22**. These power features provide a user of the electronic pipe great mobility and convenience, as the user is free to move around while using the electronic pipe, so long as the batteries are charged, or can be used while charging.

[0025] For embodiments having a separable housing **18**, the pipe **10** is dismantled and assembled with relative ease. FIG. **4** conceptually illustrates an exploded view of the electronic pipe illustrated in FIG. **2**. In this figure, the separate housing sections are shown, including the burn housing **18A** and the battery housing **18B**. The mouthpiece **12** is also shown. In some embodiments, the mouthpiece separates from the other sections of the pipe housing **18**. The mouthpiece includes an O-ring **26**, which secures it to the burn housing section **18A**. Although the examples described by reference to FIG. **4** focus on both threaded turn mechanisms and O-ring fittings to disassemble and re-assemble the parts, a person skilled in the art would understand that any attaching/detaching mechanism can be used. For example, the different parts could be snapped together or twist locked together, or magnetically connected.

[0026] To better understand the overall manner in which the electronic smoking device is able to produce smoke and ash, the burn housing section **18A** operation is described by way of example in FIG. **5**, which conceptually illustrates an exploded view of the different parts within the burn housing of the electronic pipe illustrated in FIG. **2**. As shown in this figure, the inside of the burn housing section **18A** includes an adapter **36**, a ceramic dish **40**, an insulation sleeve **50**, a metal sleeve **42**, and a filament **32**. While some electronic cigarettes use wicks and leading liquid lines with their filaments or coils to vaporize material, and others use only the filament/coil to produce dry vapor combustion smoke, the electronic smoking device of some embodiments described in this disclosure has no buffer or screen between the ceramic dish **40** and the filament **32** (i.e., no distance between the smoking material and the heat source). This direct proximity of the smoking material to the filament/coil promotes incineration of the smoking material. In some embodiments, the filament gets hot by assigning an Ohm/Volt ratio that may limit the heat. The Ohm is also known as the resistance. In some embodiments, the ceramic dish **40** holds the filament which is centered in the bottom of the burnable material compartment of the burn housing. In further embodiments, the airflow is centered through the ceramic dish **40** directly through the filament **32**, thereby creating a concentrated heat source in line with the airflow.

[0027] All other electronic smoking devices to date are only designed to vaporize smoking material, creating an imitation smoke. In contrast, the electronic smoking device of some embodiments described in this disclosure includes multiple modes of operation. These modes comprise at least one mode in which authentic smoke and ash are generated by incinerating the smoking material and yet another mode in which the smoking material is vaporized, without generating smoke and ash, through combustion. A volt variance is an easy way to provide this feature. This heat variance feature would primarily be used when incinerating smoking materials with varying auto-combustion temperatures, given the importance that many people place on having a device that produces authentic ash and smoke.

[0028] A more detailed example of the operation of the electronic smoking device described above is presented in the next example. In particular, FIG. **6** conceptually illustrates a detailed cross-sectional view showing air flow from the housing **18** through the filament **32**, which produces smoke and ash, and then to the mouthpiece **12** of the electronic pipe **10**. As shown in this figure, the electronic pipe **10** comprises a housing **18** comprising a battery housing section **18B** and a burn housing section **18A**. The electronic pipe **10** further comprises a mouthpiece **12**, a button trigger **14** on the battery housing **18B**, and at least one battery **30** within the battery housing **18B**. In some embodiments, the housings **18A** and **18B** connect by the adapters **36** which have air intakes **38** to promote sufficient airflow **46** through the burn housing section **18A** when a user inhales through the mouthpiece **12**. A burnable material compartment **44** or the upper distal hollow portion of the burn housing (including the coil, dish, and adapter area) connects to a mouthpiece in some embodiments.

[0029] In some embodiments, a set of electrical wires **34** connect from the battery **30** near the button trigger **14** to the adapters **36** and **37** and then to the filament **32** in order to heat the filament. In some embodiments, the insulation sleeve **50** and/or a sleeve **42** surrounds the ceramic dish **40** to ensure that the filament **32** is properly centered over the airflow within the burnable material compartment **44**. The ceramic dish **40** is also included in the burn housing **18A**, surrounding the filament **32** so that no buffer or space exists within the burnable material compartment, from the adapter towards the large opening. In some embodiments, the burnable material compartment **44** connects to the mouthpiece **12** by the mouthpiece O-ring **26**. With this example configuration, a user of the electronic pipe **10** can inhale air through the mouthpiece **12** such that airflow **46** is drawn from the air intakes **38** of the adapters **36** and **37**, through the filament **32** causing burnable material resident in the burnable material compartment **44** to incinerate and thereby generate ash and smoke which the user inhales as the airflow **46** exits the mouthpiece **12**.

[0030] In some embodiments, the battery (or power cord) powers an atomizer whose filament gets red hot within the housing **18A**. This housing is the bowl of the pipe and also houses the heating element. After the bowl is loaded, a mouthpiece may be attached. To smoke, provide power to the filament. Almost anything touching a red hot filament should burn into smoke and ash. This key feature allows this device to additionally function as a cordless lighter for cigars and cigarettes, as well as being a cordless electronic incense and fragrance device. In some other embodiments, the electronic smoking device can be used as a cordless electronic space heater. The electronic smoking device can thereby operate as a cordless electronic warming device.

[0031] Air intakes are in the adapters, housing, and ceramic dish, and air flows right through the center of the filament. This device gets hot enough to burn given that the filament is close enough to the loaded substance to burn such given substance. All parts used in construction near the heating element are flame retardant and heat resistant. Made to modern standards, with the same filament in car lighters and household toasters, or nichrome coils in standard modern electronic cigarettes; also includes ceramic, metallic, and other heat resistant parts that don't burn easily are used for the atomizer and parts nearby. As a unit, the atomizer of some

embodiments comprises at least the filament **32**, an adapter **36**, the insulation **48**, the ceramic dish **40**, and the set of electrical wires **34**.

[0032] In some embodiments, the burn housing **18A** works as a pipe bowl and also contains the heating element. In some embodiments, one end of the housing **18A** has an adapter and the other end is open interfaced. The Volt/Ohm ratio in some embodiments is configured so that the adapter **36** has the proper resistance to make the filament **32** become red hot, or hot enough to burn. For example, some electronic pipes may set the volt/Ohm ratio to 3.7 volts to 1.0-5.0 Ohm resistance depending on the gauge of the coil, which in this example may be 0.2 mm in diameter. However, as heating source (i.e., coil) details differ, a person skilled in the art would understand that other Ohm/volt ratios may apply for other heating sources. (In some embodiments that use battery power, the battery can be any standard use battery. For example, dry cell, alkaline and lithium ion batteries can be used, but lithium ion may provide enhance use due to longer lasting power and other power features. In some embodiments, the self-contained electronic smoking device may possess passthrough capabilities to power itself. In some embodiments, the threading is a compatible threading setting (e.g., 510 threading).

[0033] In some embodiments, the electronic pipe comprises a single filament. In some other embodiments, the electronic pipe comprises a plurality of filaments. In some embodiments, each filament is made of a conductive material, such as an electric coil made of nichrome, an alloy, a pure metal, or other such materials. In some embodiments, the filament can be replaced with a larger heavy duty filament. In some embodiments, the size and position of the air ducts may be altered to allow more or less airflow. In some embodiments, the air flow **46** can be designed for a different path than the air flow **46** shown by reference to FIG. 6.

[0034] The electronic pipe of some embodiments further comprises a set of accessory items. The accessory items can be any small items that would be user friendly and easy to carry with the electronic pipe, such as packing tools, scrapers, storage containers, cases, mouthpieces, conical water-pipe adapting cartridges and fittings, cleaning tools, screens, a compression spring (to keep the smoking material in position), and solar panels.

[0035] The housing material comprises one or more of glass, metal, alloy metal, and other materials that can withstand the high temperatures produced by the heating source. The example electronic pipes shown by reference to FIGS. 1-6 do not specify particular dimensions of individual parts, as any dimensions can be used. For example, the electronic pipe in the examples above could have included longer/shorter or narrower/wider housing sections, and/or mouthpiece. The electronic pipe of some embodiments could also have a separate detachable bowl and heating element to make repacking or cleaning the bowl easier (i.e., not within the burn housing section, as described above by reference to FIG. 4). Moreover, the shape in some embodiments can be another type of shape, such as conical, cylindrical, etc. The filament could also be interchanged with any heat conducting source. The heat source could be reversed so that the bowl was packed on the opposite side of the heater.

[0036] Thus, when a person uses an electronic pipe as described in this specification, the person will be able to satisfy their cravings because they will not be limited to imitation smoke, thereby enjoying the pleasurable effects of smoke that is produced by naturally burning tobacco or other

such smoking material into smoke and ash. Since the heating source is internal, the smoking device can be used to heat anything at short range, so long as the item intended to be burned to ash or heated is put up to the heating element. Then, all that a user must do to use the electronic pipe is to (i) pack the cartridge properly (e.g., with a smoking material and not too loosely or too tightly), (ii) activate the power button/trigger while inhaling, and, depending on personal preference, (iii) optionally insert a screen between the filament and the burnable material (i.e., so as to vaporize the material without producing smoke), or (iv) remove any screen insert previously in place between the filament and the burnable material (i.e., so as to produce smoke and ash, if a screen had already been in place). A pipe screen may also be added within the cartridge and/or mouthpiece, to trap debris.

[0037] While the invention has been described with respect to certain specific embodiments, it will be appreciated that many modifications and changes may be made by those skilled in the art without departing from the spirit of the invention. It is intended, therefore, by the appended claims to cover all such modifications and changes as fall within the true spirit and scope of the invention.

We claim:

1. A self-contained electronic smoking device that produces smoke and ash, said electronic smoking device comprising:

- a power source housing for holding one of a battery and a non-battery power source to provide power for a heating source;
- a filament for heating burnable material;
- an open interfaced smoking chamber;
- a dish for housing the filament;
- a charge port for connecting a power source, wherein the battery is a rechargeable battery that recharges when the power source is connected to the charge port;
- a burn housing connected to the power source housing and comprising a bowl for holding burnable material directly adjacent to the filament to incinerate the burnable material and produce the smoke and ash;
- a power trigger button for activating a heating process that heats the filament to a temperature at which the burnable material incinerates;
- a digital display for displaying a set of digital readouts comprising at least one of a temperature readout of the heat source, a time estimate for the remaining battery life, and a usage count;
- a set of electrical wires that connect from the battery to electrically heat the filament; and
- a mouthpiece connected to the burn housing for allowing the user to inhale airflow through the electronic smoking device.

2. The electronic smoking device of claim **1** further comprising:

- a cordless burn house for holding burnable incense material; and
- an open interfaced burning chamber that burns scented material for allowing the user to smell fragrance, wherein the airflow inhaled through the mouthpiece is scented by the electronic smoking device.

3. The electronic smoking device of claim **1**, wherein the airflow inhaled through the mouthpiece comprises smoke generated by the filament incinerating the burnable material into smoke and ash.

4. The electronic smoking device of claim 3, wherein the airflow inhaled through the mouthpiece further comprises imitation smoke.

5. The electronic smoking device of claim 1, wherein the burnable material compartment is a bowl comprising a filament dish and an area adjacent to the filament to incinerate the burnable material.

6. The electronic smoking device of claim 1, wherein burn housing is heated to a particular temperature based on a ratio of Ohms to volts which provide sufficient resistance to make the filament become red hot and incinerate the burnable material to produce actual smoke and ash.

7. The electronic smoking device of claim 6, wherein the atomizer is built without any of a wick, a leading liquid line, and a leading liquid line holder, said atomizer producing actual smoke and ash when the coil is heated to a particular temperature based the gauge of the coil and the ratio of Ohms to volts aimed to incinerate the burnable material into actual smoke and ash.

8. An electronic smoking device that can be used in conjunction with a water pipe, wherein said electronic smoking device is operable in a manner that is conducive for smoking through water pipes.

9. An electronic smoking device that can be used as a cordless electronic space heater, available in a variety of sizes, and used in the cold to keep warm.

10. An electronic smoking device that can be used as a cordless flame-less lighter for cigars and cigarettes.

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