CANDLE SNUFFER WITH AIR FILTER

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ABSTRACT
A candle snuffer has a handle and head, and a suction mechanism that pulls gas from the head and through a filter. Snuffer heads can be painted or otherwise decorated, and in especially preferred embodiments snuffer heads can be detachable and interchangeable. The suction mechanism is preferably motorized, and preferably has a rather small operating capacity. The filter can be upstream or downstream of the motor, and preferably filters out particles down to 5 μm in size.
CANDLE SNUFFER WITH AIR FILTER

FIELD OF THE INVENTION

[0001] The field of the invention is candle snuffers.

BACKGROUND

[0002] Candles have been used for thousands of years, and for much of that time people have used candle snuffers to extinguish the flames. In some instances candle snuffers have included sophisticated functions, including for example U.S. Pat. No. 1,941,082 to Benziger (December 1933) and U.S. Pat. No. 5,344,390 to Phare (September 1994). The Benziger patent teaches a candle snuffer having a bulb that can be squeezed to provide a puff of air used in extinguishing the flame. Phare contemplates using gas from a CO2 cartridge to extinguish the flame.

[0003] These and all other extraneous materials discussed herein are incorporated by reference in their entirety. Where a definition or use of a term in an incorporated reference is inconsistent or contrary to the definition of that term provided herein, the definition of that term provided herein applies and the definition of that term in the reference does not apply.

[0004] One aspect that was not addressed by Benziger and Phare was reduction in smoke emitted by the snuffed out candle wick. That issue was squarely addressed by U.S. Pat. No. 6,267,581 to Harrison (July 2001), which teaches extinguishing a candle by subjecting the flame to a water mist. The ‘581 device was apparently not commercially successful, however, presumably because users don’t necessarily want water on their candles or surrounding objects, and also because the mist doesn’t necessarily work very well in eliminating smoke.

Thus, there is still a need for a candle snuffer that reduces or even eliminates smoke from extinguishing candles.

SUMMARY OF THE INVENTION

[0006] The present invention provides apparatus, systems and methods in which a candle snuffer has a handle and head, and a suction mechanism that pulls a gas from the head and through a filter.

[0007] The snuffer head can comprise any suitable material(s), but in preferred embodiments comprises non-flammable ceramic material or a metal. Snuffer heads can advantageously be painted or otherwise decorated, and in especially preferred embodiments snuffer heads can be decorative and interchangeable.

[0008] The suction mechanism and filter can be placed in any suitable location relative to the head, but are preferably placed within the handle. Although not strictly necessary, the snuffer head and the handle can be coupled by a gas conduit of a suitable length, preferably between about 5 to 10 cm long. The conduit could alternatively be much longer, as for example in a candle extinguisher embodiment for snuffing candles in chandeliers, or atop shelving. Unless the context clearly indicates otherwise, all ranges set forth herein should be interpreted as including their endpoints.

[0009] The suction mechanism is preferably motorized, and preferably has a rather small operating capacity. Thus, in especially preferred embodiments, the suction mechanism has an operating capacity of no more than 8000 cm^3 per minute, and emits a noise of less than 70 db during normal operation.

[0010] The filter can be upstream or downstream of the motor, and preferably filters out particles down to 5 μm in size.

[0011] Various objects, features, aspects and advantages of the inventive subject matter will become more apparent from the following detailed description of preferred embodiments, along with the accompanying drawings in which like numerals represent like components.

BRIEF DESCRIPTION OF THE DRAWING

[0012] FIG. 1 is a vertical cross-section of a preferred candle snuffer.

[0013] FIG. 2 is a side view of a metal preferred snuffer head, showing an opening for coupling to the gas conduit and handle.

[0014] FIG. 3 is a side view of a ceramic snuffer head, showing painted decoration.

DETAILED DESCRIPTION

[0015] In FIG. 1, a candle snuffer 100 generally comprises a snuffer head 110, a gas conduit 120 and a handle 130.

[0016] Snuffer head 110 is shown here as having a typical frustoconical shape and size, which in this case has a base that measures about 3 cm wide and about 4-5 cm tall. Those skilled in the art will of course appreciate that other shapes and sizes would also work, including full cones, shapes with oval or rectangular, hexagonal or other horizontal cross-sections.

[0017] As best seen in FIG. 2, snuffer head 110 has a rim 114 that defines an opening for receiving an end of the gas conduit 120. In this instance, coupling between the head 110 and the conduit 120 is accomplished by a snap fitting, and is orientation specific by virtue of the gas conduit 120 having a projection 122 that mates with a cutout 112 in the head 110. All manner of other couplings are also considered, including for example a simple screw fitting in which the rim 114 and gas conduit 120 have mating threads (not shown).

[0018] Snuffer head 110 can include any suitable material or materials, including especially metals (including alloys), ceramics, and composites. Of particular interest are sniffer heads having painted, etched or other decorations. Snuffer head 300 in FIG. 3 has a decorative design 316 which should be interpreted euphemistically as possible designs.

[0019] Gas conduit 120 is preferably about 5 to 10 cm long, but could also measure up to a meter or even longer, as for example in a candle extinguisher embodiment for snuffing candles in chandeliers, or atop shelving. At the other extreme, the head and the handle could juxtapose another, and in that instance the gas conduit would simply be the opening between head and the handle. Contemplated gas conduits can be made from any suitable material(s), including once again metal(s), ceramic(s), and/or composite(s).

[0020] Handle 130 generally includes downstream extensions 132A, 132B of the gas conduit 120, batteries 134A, 134B, a suction mechanism 136, a filter 138, and a switch 139. Each of these components can be conventional, and their cooperation to achieve the purposes of the device is well within the skill of the art given the teachings herein. Thus, housing 130 includes electric wiring (not shown) that couples the batteries 134A, 134B with the switch 139 and the suction mechanism 136.

[0021] Suction mechanism 136 includes a motor 136A and a fan 136B. Motor 136A is preferably a low capacity motor,
sufficient to provide sufficient suction capacity, but low enough to reduce noise, battery drain and cost. To that end preferred motors cooperate with the fan 136B to pull no more than 8000 cm\(^3\) of air per minute, and emits a noise of less than 70 db during normal operation. These limitations are not, of course, strictly necessary to practice the inventive subject matter, and for example motors are contemplated that pull \(\leq 2000\), \(\leq 4000\), \(\leq 12,000\), and \(\leq 24,000\) cm of air per minute. Similarly, motors are contemplated that emits noises of \(\leq 30\), \(\leq 50\), \(\leq 80\), \(\leq 90\) db. Still further, to facilitate long battery, and user convenience, switch 139 can advantageously include a timer that automatically shuts down power to the motor after a given time period, such as \(\leq 5\), \(\leq 7\), \(\leq 10\), or \(\leq 20\) seconds.

[0022] Filter 138 is preferably a HEPA filter, but in any event is sufficient to filter out at least 50%, more preferably at least 80%, and most preferably at least 95% of the mass of smoke particles encountered by the filter at some point in the life of the filter. In especially preferred embodiments the filter 138 can filter out particles having a diameter of \(\leq 5\) microns (\(\mu\)m), more preferably particles with diameters of \(\leq 3\) \(\mu\)m, and most preferably particles with diameters of \(\leq 2\) \(\mu\)m.

[0023] Those skilled in the art should also appreciate that each of the elements shown herein is representative of all components that would satisfy the requirements. Thus, batteries 134A, 134B can be replaced by any suitable power supply, including for example a single battery, a capacitor (not shown), a power cord (not shown) that could be connected to utility current (not shown), and so forth. Similarly, suction mechanism 136 could be replaced by other mechanisms (e.g. a bellows) that do not involve a fan. Those skilled in the art should also appreciate that various components can be user replaceable. Thus, the batteries 134A, 134B and the filter 138 should all be considered as user replaceable, even though the Drawing does not expressly depict doors or other mechanisms for users to access and replace those components.

[0024] It should also be apparent to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms "comprises" and "comprising" should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referred.

Where the specification claims refers to at least one of something selected from the group consisting of A, B, C . . . and N, the text should be interpreted as requiring only one element from the group, not A plus N, or B plus N, etc.

1. A device comprising:
   a handle;
   a snuffer head sized and dimensioned and having materials appropriate to receive an end of a handle to snuff out a flame;
   a gas conduit gaseously coupling the handle and the head, such that the snuffer head generally points in a direction different from the conduit; and
   a suction mechanism that pulls a gas from the head and through a smoke filter.

2. The device of claim 1, wherein the handle includes at least part of at least one of the suction mechanism and the smoke filter.

3. The device of claim 1, wherein the snuffer head comprises a non-flammable ceramic material.

4. The device of claim 1, wherein the snuffer head comprises a metal.

5. The device of claim 1, further comprising a disconnect mechanism by which a user can replace the snuffer head with a replacement head.

6. The device of claim 5, wherein the disconnect mechanism is orientation specific.

7. The device of claim 1, wherein the gas conduit is at least 10 cm long.

8. The device of claim 1, wherein the gas conduit comprises a metal.

9. The device of claim 1, wherein the suction mechanism includes a motor.

10. The device of claim 1, wherein the suction mechanism has an operating capacity of no more than 8000 cm\(^3\) per minute.

11. The device of claim 1, wherein the suction mechanism emits a noise of less than 70 db during normal operation.

12. The device of claim 1, wherein the smoke filter filters out particles 5 \(\mu\)m in size.

13. The device of claim 1, further comprising a battery electrically coupled to power the suction mechanism.

14. The device of claim 13, wherein the battery is rechargeable.

15. The device of claim 1, further comprising a timer switch that controls an operation of the suction mechanism.

16. The device of claim 15, wherein the timer switch operates the suction mechanism less than or equal to 10 sec.

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