[006] Certain components of the gas-phase vaporizable material may condense after being vaporized due to cooling and/or changes in pressure to thereby form an aerosol that includes particles (gas and/or solid) suspended in at least some of the air drawn into the vaporizer device via the puff. If the vaporizable material includes a semi-volatile compound (e.g. a compound such as nicotine, which has a relatively low vapor pressure under inhalation temperatures and pressures), the inhalable aerosol may include that semi-volatile compound in some local equilibrium between the gas and condensed phases.

[007] The term vaporizer device, as used herein consistent with the current subject matter, generally refers to portable, self-contained, devices that are convenient for personal use. Typically, such devices are controlled by one or more switches, buttons, touch sensitive devices, or other user input functionality or the like (which can be referred to generally as controls) on the vaporizer, although a number of devices that may wirelessly communicate with an external controller (e.g., a smartphone, a smart watch, other wearable electronic devices, etc.) have recently become available. Control, in this context, refers generally to an ability to influence one or more of a variety of operating parameters, which may include without limitation any of causing the heater to be turned on and/or off, adjusting a minimum and/or maximum temperature to which the heater is heated during operation, various games or other interactive features that a user might access on a device, and/or other operations.

SUMMARY

[008] In certain embodiments of the current subject matter, challenges associated with the presence of liquid vaporizable materials in or near certain susceptible components of an electronic vaporizer device may be addressed by inclusion of one or more of the features described herein or comparable/equivalent approaches as would be understood by one of ordinary skill in the art.

[009] According to a first aspect, there is provided a vaporizer device including: an absolute pressure sensor positioned to detect a first pressure of air along an airflow path connecting air outside of a vaporizer device body with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device; an additional absolute pressure sensor positioned to detect a second pressure of air representative of ambient air pressure to which the vaporizer device is exposed; an additional sensor; and a controller configured to perform operations including: receiving a first signal from the absolute pressure sensor representative of the first pressure and a second signal from the additional absolute pressure sensor representative of the second pressure, determining, based on at least the first signal and the second signal, that a puff is occurring, the puff comprising air flowing along the

airflow path in reaction to a user drawing on the mouthpiece, receiving a third signal from the additional sensor and adapting the determining that the puff is occurring based on the third signal, and causing, in response to the determining, electrical current to be delivered to a resistive heating element of the vaporizer device, the delivered electrical current causing heating of a vaporizable material for forming of an inhalable aerosol in the air flowing along the airflow path.

[009a] According to a second aspect, there is provided a method including: receiving, at an electronic circuitry, a first signal from an absolute pressure sensor of a vaporizer device and a second signal from an additional absolute pressure sensor of the vaporizer device, the first signal representing a first pressure, and the second signal representing a second pressure, the absolute pressure sensor disposed to experience the first pressure of air, which occurs along an airflow path connecting air outside of a vaporizer device body of the vaporizer device with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device, the additional absolute pressure sensor disposed to detect the second pressure of air, which is representative of ambient air pressure to which the vaporizer device is exposed; determining that a puff is occurring based on at least the first signal and the second signal, the puff comprising air flowing along the airflow path in reaction to a user drawing on the mouthpiece; receiving a third signal from an additional sensor of the vaporizer device and adapting the determining that the puff is occurring based on the third signal and causing electrical current to be delivered to a resistive heating element of the vaporizer device in response to the determining.

[0010] According to a third aspect, there is provided a vaporizer device including: an absolute pressure sensor positioned to detect a first pressure of air along an airflow path connecting air outside of a vaporizer device body with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device; an additional absolute pressure sensor positioned to detect a second pressure of air representative of ambient air pressure to which the vaporizer device is exposed; and a controller configured to perform operations including: receiving a first signal from the absolute pressure sensor representative of the first pressure and a second signal from the additional absolute pressure sensor representative of the second pressure, detecting, based on the first signal and the second signal, a pressure change unrelated to a puff, excluding the pressure change unrelated to a puff, determining, based on at least the first signal and the second signal, that a puff is occurring, the puff comprising air flowing along the airflow path in reaction to a user drawing on the mouthpiece, and causing, in response to the determining, electrical current to be delivered to a resistive heating element of the vaporizer device, the delivered electrical current causing

heating of a vaporizable material for forming of an inhalable aerosol in the air flowing along the airflow path.

[0010a] According to a fourth aspect, there is provided a method including: receiving, at an electronic circuitry, a first signal from an absolute pressure sensor of a vaporizer device and a second signal from an additional absolute pressure sensor of the vaporizer device, the first signal representing a first pressure, and the second signal representing a second pressure, the absolute pressure sensor disposed to experience the first pressure of air, which occurs along an airflow path connecting air outside of a vaporizer device body of the vaporizer device with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device, the additional absolute pressure sensor disposed to detect the second pressure of air, which is representative of ambient air pressure to which the vaporizer device is exposed; detecting, based on the first signal and the second signal, a pressure change unrelated to a puff; excluding the pressure change unrelated to a puff; determining that a puff is occurring based on at least the first signal and the second signal, the puff comprising air flowing along the airflow path in reaction to a user drawing on the mouthpiece; and causing electrical current to be delivered to a resistive heating element of the vaporizer device in response to the determining.

[0011] In optional embodiments, one or more of the following features may be included in any feasible combination. The operations can further comprise receiving a third signal from an additional sensor and adapting the determining that the puff is occurring based on the third signal. The additional sensor can comprise an accelerometer or another motion sensing device. The airflow path may include a particular orifice size, which can be known and well-characterized, and the absolute pressure sensor may provide a measurement of the pressure drop resulting from a user taking a puff.

[0012] In some embodiments, the operations performed by the controller further comprise calculating an air velocity and volumetric flow rate, determining an amount of the vaporizable material converted to the vapor phase per unit time, and controlling an amount of the inhalable aerosol generated for a given volume of air based on the calculating and the determining. The operations can further include controlling a temperature of the heater, and/or providing a consistent aerosol concentration across different puff strengths. In yet some other embodiments, the operations performed by the controller further comprise applying a correction for ambient pressure to correct for effects of atmospheric pressure on an amount of airflow. The operations can further include prompting the user to take a sample puff or a series of sample puffs, and/or characterizing and storing information regarding a relative strength of a puffing power of the user. In still yet other embodiments, the operations

can further include varying a size of a pressure drop required to indicate a puff based on the relative strength of the puffing power of the user to better detect actual puffs and reject false positives in detection of user puffing activity.

[0013] Disclosed herein is a vaporizer device having a vaporizer device body shell and an internal skeleton may include a gasket configured to prevent passage of liquids between a volume within a cartridge-receiving receptacle of a vaporizer device body and a volume within the vaporizer device body shell containing internal electronic circuitry (optionally including one or more electronic components, circuit boards, etc.) and/or a power supply. The gasket may include a connective feature via which a pressure sensing device that is connected to part of the internal electronic circuitry is exposed to air pressure in the cartridge-receiving receptacle. Improved sealing of the gasket with the vaporizer device body can be achieved by positioning of a supportive rib on the gasket between a vaporizer device shell and an internal skeleton of the vaporizer device body.

[0014] The vaporizer device may include an electrical contact pin for electrical coupling with a contact of a cartridge configured to be insertably received within a cartridge-receiving receptacle of a vaporizer device body. The electrical contact pin may include a liquid-resistant feature.

[0015] Systems and methods consistent with this approach are described as well as articles that comprise a tangibly embodied machine-readable medium operable to cause one or more machines (e.g., computers, microcontrollers, or the like, which may include general and/or special purpose processors or circuitry, etc.) to result in operations described herein. Similarly, computer systems are also described that may include a processor and a memory coupled to the processor. The memory may include one or more programs that cause the processor to perform one or more of the operations described herein.

[0016] The details of one or more embodiments of the subject matter described herein are set forth in the accompanying drawings and the description below. Other features and advantages of the subject matter described herein will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0017] The accompanying drawings, which are incorporated in and constitute a part of this specification, show certain aspects of the subject matter disclosed herein and, together with

CLAIMS

1. A vaporizer device comprising:

an absolute pressure sensor positioned to detect a first pressure of air along an airflow path connecting air outside of a vaporizer device body with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device;

an additional absolute pressure sensor positioned to detect a second pressure of air representative of ambient air pressure to which the vaporizer device is exposed;

an additional sensor; and

a controller configured to perform operations comprising:

receiving a first signal from the absolute pressure sensor representative of the first pressure and a second signal from the additional absolute pressure sensor representative of the second pressure,

determining, based on at least the first signal and the second signal, that a puff is occurring, the puff comprising air flowing along the airflow path in reaction to a user drawing on the mouthpiece,

receiving a third signal from the additional sensor and adapting the determining that the puff is occurring based on the third signal, and

causing, in response to the determining, electrical current to be delivered to a resistive heating element of the vaporizer device, the delivered electrical current causing heating of a vaporizable material for forming of an inhalable aerosol in the air flowing along the airflow path.

2. The vaporizer device as in claim 1, wherein the additional sensor comprises an accelerometer or another motion sensing device.

3. The vaporizer device as in any preceding claim, wherein the airflow path includes a known and well-characterized orifice size, and wherein the absolute pressure sensor provides a

measurement of the pressure drop resulting from a user taking a puff, wherein the operations performed by the controller further comprise:

calculating an air velocity and volumetric flow rate;

determining an amount of the vaporizable material converted to the vapor phase per unit time; and

controlling an amount of the inhalable aerosol generated for a given volume of air based on the calculating and the determining.

4. The vaporizer device as in claim 3, wherein the operations performed by the controller further comprise: controlling a temperature of the heater.

5. The vaporizer device as in any of claims 3 to 4, wherein the operations performed by the controller further comprise: providing a consistent aerosol concentration across different puff strengths.

6. The vaporizer device as in any of claims 3 to 5, wherein the operations performed by the controller further comprise: applying a correction for ambient pressure to correct for effects of atmospheric pressure on an amount of airflow.

7. The vaporizer device as in any of claims 3 to 6, wherein the operations performed by the controller further comprise:

prompting the user to take a sample puff or a series of sample puffs; and

characterizing and storing information regarding a relative strength of a puffing power of the user.

8. The vaporizer device as in claim 7, wherein the operations performed by the controller further comprise: varying a size of a pressure drop required to indicate a puff based on the relative strength of the puffing power of the user to better detect actual puffs and reject false positives in detection of user puffing activity.

9. A method comprising:

receiving, at an electronic circuitry, a first signal from an absolute pressure sensor of a vaporizer device and a second signal from an additional absolute pressure sensor of the vaporizer device, the first signal representing a first pressure, and the second signal representing a second pressure, the absolute pressure sensor disposed to experience the first pressure of air, which occurs along an airflow path connecting air outside of a vaporizer device body of the vaporizer device with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device, the additional absolute pressure sensor disposed to detect the second pressure of air, which is representative of ambient air pressure to which the vaporizer device is exposed;

determining that a puff is occurring based on at least the first signal and the second signal, the puff comprising air flowing along the airflow path in reaction to a user drawing on the mouthpiece;

receiving a third signal from an additional sensor of the vaporizer device and adapting the determining that the puff is occurring based on the third signal and

causing electrical current to be delivered to a resistive heating element of the vaporizer device in response to the determining.

10. The method as in claim 9, wherein the additional sensor comprises an accelerometer or another motion sensing device.

11. The method as in any of claims 9 to 10, wherein the airflow path includes a known and well-characterized orifice size, and wherein the absolute pressure sensor provides a measurement of the pressure drop resulting from a user taking a puff, wherein the method further comprises:

calculating an air velocity and volumetric flow rate;

determining an amount of the vaporizable material converted to the vapor phase per unit time; and

controlling an amount of the inhalable aerosol generated for a given volume of air based on the calculating and the determining.

12. The method as in claim 11, further comprising: controlling a temperature of the heater.

13. The method as in any of claims 11 to 12, further comprising: providing a consistent aerosol concentration across different puff strengths.

14. The method as in any of claims 11 to 13, further comprising: applying a correction for ambient pressure to correct for effects of atmospheric pressure on an amount of airflow.

15. The method as in any of claims 11 to 14, further comprising:

prompting the user to take a sample puff or a series of sample puffs; and

characterizing and storing information regarding a relative strength of a puffing power of the user.

16. The method as in claim 15, further comprising: varying a size of a pressure drop required to indicate a puff based on the relative strength of the puffing power of the user to better detect actual puffs and reject false positives in detection of user puffing activity.

17. A vaporizer device comprising:

an absolute pressure sensor positioned to detect a first pressure of air along an airflow path connecting air outside of a vaporizer device body with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device;

an additional absolute pressure sensor positioned to detect a second pressure of air representative of ambient air pressure to which the vaporizer device is exposed; and

a controller configured to perform operations comprising:

receiving a first signal from the absolute pressure sensor representative of the first pressure and a second signal from the additional absolute pressure sensor representative of the second pressure,

detecting, based on the first signal and the second signal, a pressure change unrelated to a puff,

excluding the pressure change unrelated to a puff,

determining, based on at least the first signal and the second signal, that a puff is occurring, the puff comprising air flowing along the airflow path in reaction to a user drawing on the mouthpiece, and

causing, in response to the determining, electrical current to be delivered to a resistive heating element of the vaporizer device, the delivered electrical current causing heating of a vaporizable material for forming of an inhalable aerosol in the air flowing along the airflow path.

18. The vaporizer device as in claim 17, further comprising an additional sensor, and wherein the operations further comprise receiving a third signal from an additional sensor, and wherein the determining that the puff is occurring is also based on the third signal.

19. The vaporizer device as in claim 18, wherein the additional sensor comprises an accelerometer or another motion sensing device.

20. The vaporizer device as in any preceding claim, wherein the airflow path includes a known and well-characterized orifice size, and wherein the absolute pressure sensor provides a measurement of the pressure drop resulting from a user taking a puff, wherein the operations performed by the controller further comprise:

calculating an air velocity and volumetric flow rate;

determining an amount of the vaporizable material converted to the vapor phase per unit time; and

controlling an amount of the inhalable aerosol generated for a given volume of air based on the calculating and the determining.

21. The vaporizer device as in claim 20, wherein the operations performed by the controller further comprise: providing a consistent aerosol concentration across different puff strengths.

22. The vaporizer device as in any of claims 20 to 21, wherein the operations performed by the controller further comprise: applying a correction for ambient pressure to correct for effects of atmospheric pressure on an amount of airflow.

23. The vaporizer device as in any of claims 20 to 22, wherein the operations performed by the controller further comprise:

prompting the user to take a sample puff or a series of sample puffs; and

characterizing and storing information regarding a relative strength of a puffing power of the user.

24. The vaporizer device as in claim 23, wherein the operations performed by the controller further comprise: varying a size of a pressure drop required to indicate a puff based on the relative strength of the puffing power of the user to better detect actual puffs and reject false positives in detection of user puffing activity.

25. A method comprising:

receiving, at an electronic circuitry, a first signal from an absolute pressure sensor of a vaporizer device and a second signal from an additional absolute pressure sensor of the vaporizer device, the first signal representing a first pressure, and the second signal representing a second pressure, the absolute pressure sensor disposed to experience the first pressure of air, which occurs along an airflow path connecting air outside of a vaporizer device body of the vaporizer device with a vaporization chamber of the vaporizer device and a mouthpiece of the vaporizer device, the additional absolute pressure sensor disposed to detect the second pressure of air, which is representative of ambient air pressure to which the vaporizer device is exposed;

detecting, based on the first signal and the second signal, a pressure change unrelated to a puff;

excluding the pressure change unrelated to a puff;

determining that a puff is occurring based on at least the first signal and the second signal, the puff comprising air flowing along the airflow path in reaction to a user drawing on the mouthpiece; and

causing electrical current to be delivered to a resistive heating element of the vaporizer device in response to the determining.

26. The method as in claim 25, wherein the vaporizer device further comprises an additional sensor, and wherein the method further comprises receiving a third signal from the additional sensor, and wherein the determining that the puff is occurring is also based on the third signal.

27. The method as in claim 26, wherein the additional sensor comprises an accelerometer or another motion sensing device.

28. The method as in any of claims 25 to 27, wherein the airflow path includes a known and well-characterized orifice size, and wherein the absolute pressure sensor provides a measurement of the pressure drop resulting from a user taking a puff, wherein the method further comprises:

calculating an air velocity and volumetric flow rate;

determining an amount of the vaporizable material converted to the vapor phase per unit time; and

controlling an amount of the inhalable aerosol generated for a given volume of air based on the calculating and the determining.

29. The method as in claim 28, further comprising: providing a consistent aerosol concentration across different puff strengths.

30. The method as in any of claims 28 to 29, further comprising: applying a correction for ambient pressure to correct for effects of atmospheric pressure on an amount of airflow.

31. The method as in any of claims 28 to 30, further comprising:

prompting the user to take a sample puff or a series of sample puffs; and

characterizing and storing information regarding a relative strength of a puffing power of the user; and

varying a size of a pressure drop required to indicate a puff based on the relative strength of the puffing power of the user to better detect actual puffs and reject false positives in detection of user puffing activity.