Claims

1. A cartridge for an e-vaping device, comprising:

a reservoir configured to hold a pre-vapor formulation;

a dispensing interface configured to draw the pre-vapor formulation from the reservoir;

a heating element coupled to the dispensing interface, the heating element configured to heat pre-vapor formulation drawn into the dispensing interface, the heating element extending along an outer surface of the dispensing interface; and

a conductive element extending through an interior of the dispensing interface;

wherein the heating element has a first temperature coefficient of electrical resistivity;

wherein the conductive element has a second temperature coefficient of electrical resistivity; and

wherein the second temperature coefficient of electrical resistivity is greater than the first temperature coefficient of resistivity.

2. The cartridge of claim 1, wherein the conductive element at least partially extends along a central longitudinal axis of the dispensing interface.

3. The cartridge of claim 1 or 2, wherein

the dispensing interface includes a fibrous wicking material; and

the conductive element is woven through an interior of the fibrous wicking material.

4. The cartridge of claim 1, 2 or 3, wherein the heating element includes a heater coil wire at least partially extending around an outer surface of the dispensing interface.

5. The cartridge of claim 1, wherein the conductive element has a temperature coefficient of electrical resistivity of at least about 1.5x10^-4 microohms-m/degrees Celsius between temperatures of about 21 degrees Celsius and about 327 degrees Celsius.

6. The cartridge of claim 5, wherein the conductive element has a temperature coefficient of electrical resistance of at least 1.5 milliohms/degrees Celsius between temperatures of about 21 degrees Celsius and about 327 degrees Celsius.

7. The cartridge of any preceding claim, wherein the dispensing interface is configured to establish a bridge electrical circuit between the heating element and the conductive element when

an amount of pre-vapor formulation drawn into the dispensing interface is greater than or equal to a threshold amount.

8. The cartridge of claim 7, further comprising:

a sensor wire coupled to the dispensing interface separately from the conductive element and the heating element, the sensor wire being configured to carry an electrical signal propagating through the bridge electrical circuit.

9. An e-vaping device, comprising:

a cartridge, the cartridge including,

a reservoir configured to hold a pre-vapor formulation;

a dispensing interface configured to draw the pre-vapor formulation from the reservoir;

a heating element coupled to the dispensing interface, the heating element configured to heat pre-vapor formulation drawn into the dispensing interface, the heating element extending along an outer surface of the dispensing interface; and

a conductive element extending through an interior of the dispensing interface;

wherein, the heating element has a first temperature coefficient of electrical resistivity;

wherein the conductive element has a second temperature coefficient of electrical resistivity; and

wherein the second temperature coefficient of electrical resistivity is greater than the first temperature coefficient of electrical resistivity; and

a power supply configured to selectively supply electrical power to the heating element.

10. The e-vaping device of claim 9, further comprising:

control circuitry configured to,

determine an electrical resistance of the conductive element;

determine a temperature of the dispensing interface based on the electrical resistance of the conductive element; and

control the electrical power supplied to the heating element based on the temperature of the dispensing interface.

11. The e-vaping device of claim 10, wherein the control circuitry is configured to control the electrical power supplied to the heating element to maintain the temperature of the dispensing interface below a threshold temperature.

12. The e-vaping device of claim 10 or 11, wherein the control circuitry is configured to detect changes in the electrical resistance of the conductive element, the changes having a magnitude of at least one milliohm.

13. The e-vaping device of any of claims 9 to 12, wherein,

the dispensing interface is configured to establish a bridge electrical circuit between the heating element and the conductive element when an amount of pre-vapor formulation drawn into the dispensing interface is greater than or equal to a threshold amount.

14. The e-vaping device of claim 13, further comprising:

control circuitry configured to determine whether an amount of pre-vapor formulation in the cartridge is greater than or equal to a threshold amount based on whether the bridge electrical circuit is established between the heating element and the conductive element.

15. The e-vaping device of claim 13 or 14, further comprising:

control circuitry configured to,

receive a bridge electrical signal, the bridge electrical signal being transmitted between the heating element and the conductive element through the bridge electrical circuit;

determine an electrical resistance of the bridge electrical circuit based on the bridge electrical signal; and

determine an amount of pre-vapor formulation in the cartridge based on the determined electrical resistance of the bridge electrical circuit.

16. The e-vaping device of claim 15, wherein the control circuitry is configured to,

transmit an initial electrical signal through at least a portion of at least one of the conductive element and the heating element; and

determine the amount of pre-vapor formulation in the cartridge based on both the initial electrical signal and the bridge electrical signal.

17. The e-vaping device of claim 15 or 16, further comprising:

a sensor wire coupled to the dispensing interface separately from the conductive element and the heating element, the sensor wire being configured to carry the bridge electrical signal; and

wherein the control circuitry is configured to receive the bridge electrical signal through the sensor wire.

18. The e-vaping device of any of claims 9 to 17, wherein the power supply includes a rechargeable battery.

19. The e-vaping device of any of claims 9 to 18, wherein the cartridge and the power supply are configured to be removably connected to each other.

20. A method, comprising:

coupling a dispensing interface to a reservoir to configure the dispensing interface to draw a pre-vapor formulation from the reservoir;

coupling a heating element to the dispensing interface such that,

the heating element extends along an outer surface of the dispensing interface, and

the heating element is operable to heat pre-vapor formulation drawn into the dispensing interface;

configuring a conductive element to be within an interior of the dispensing interface such that the conductive element is configured to receive heat from the heating element through the interior of the dispensing interface, wherein the heating element has a first temperature coefficient of electrical resistivity, wherein the conductive element has a second temperature coefficient of electrical resistivity, and wherein the second temperature coefficient of electrical resistivity is greater than the first temperature coefficient of electrical resistivity.

21. The method of claim 20, further comprising:

electrically coupling control circuitry to at least the conductive element, the control circuitry configured to,

determine an electrical resistance of the conductive element;

determine a temperature of the dispensing interface based on the electrical resistance of the conductive element; and

control electrical power supplied to the heating element based on the temperature of the dispensing interface.

22. The method of claim 20 or 21, further comprising:

electrically coupling control circuitry to at least the conductive element, the control circuitry configured to determine whether an amount of pre-vapor formulation in the reservoir is greater than or equal to a threshold amount based on whether the dispensing interface establishes a bridge electrical circuit between the heating element and the conductive element.

23. The method of any of claims 20 to 22, further comprising:

electrically coupling control circuitry to at least the conductive element, the control circuitry configured to determine whether an amount of pre-vapor formulation in the reservoir is greater than or equal to a threshold amount based on whether an electrical resistance of a bridge electrical circuit between the heating element and the conductive element is less than a threshold amount.

24. The method of any of claims 20 to 23, further comprising:

configuring the conductive element to be within the interior of the dispensing the interface such that the conductive element is configured to only receive heat from the heating element through the interior of the dispensing interface.