heated smoking article such that the internal heating elements are in direct contact with the aerosol-forming substrate.

Direct contact between an internal heating element of an aerosol-generating device and the aerosol-forming substrate of a heated smoking article can provide an efficient means for heating the aerosol-forming substrate to form an inhalable aerosol. In such a configuration, heat from the internal heating element may be conveyed almost instantaneously to at least a portion of the aerosol-forming substrate when the internal heating element is actuated, and this may facilitate the rapid generation of an aerosol. Furthermore, the overall heating energy required to generate an aerosol may be lower than would be the case in a smoking system comprising an external heater element where the aerosol-forming substrate does not directly contact the external heating element and initial heating of the aerosol-forming substrate occurs by convection or radiation. Where an internal heating element of an aerosol-generating device is in direct contact with an aerosol-forming substrate, initial heating of portions of the aerosol-forming substrate that are in direct contact with the internal heating element will be effected by conduction.

The present specification relates to an aerosol-generating article and a method of using an aerosol-generating article. In particular, the present specification relates to an aerosol-generating article comprising an aerosol-forming substrate for generating an inhalable aerosol when heated by an internal heating element of an aerosol-generating device. The specification also relates to a method of using such an aerosol-generating article with an aerosol-generating device comprising an internal heating element.

According to a first aspect, there is provided an aerosol-generating article for use in an aerosol-generating system comprising an electrically heated aerosol-generating device comprising an internal heating element. The aerosol-generating article comprises, in a linear sequential arrangement, an aerosol-forming substrate, a support element located immediately downstream of the aerosol-forming substrate, an aerosol-cooling element located downstream of the support element, and an outer wrapper circumscribing the aerosol-forming substrate, the support element and the aerosol-cooling element. The support element abuts the aerosol-forming substrate. The aerosol-forming substrate is penetrable by the heating element of the aerosol-generating device.

According to a second aspect, there is provided a method of using an aerosol-generating article according to the first aspect with an aerosol-generating device comprising a heating element. The method comprises the steps of inserting the heating element of the aerosol-generating device into the aerosol-forming substrate of the aerosol-generating article, raising the temperature of the heating element of the aerosol-generating device to heat the aerosol-forming substrate of the aerosol-generating article to generate an aerosol, and withdrawing the

CLAIMS:

1. An aerosol-generating article for use with an aerosol-generating device comprising a heating element, the aerosol-generating article comprising:

an aerosol-forming substrate;

a support element located immediately downstream of the aerosol-forming substrate;

an aerosol-cooling element located downstream of the support element; and

an outer wrapper circumscribing the aerosol-forming substrate, the support element and the aerosol-cooling element,

wherein the support element abuts the aerosol-forming substrate.

2. An aerosol-generating article according to claim 1 wherein the aerosol-forming substrate is located at an extreme upstream end of the aerosol-generating article.

3. An aerosol-generating article according to claim 1 further comprising:

a front plug upstream of the aerosol-forming substrate,

wherein the outer wrapper circumscribes the front plug and the front plug is penetrable by a heating element of an aerosol-generating device.

4. An aerosol-generating article according to any one of claims 1 to 3 wherein the aerosol-forming substrate comprises a gathered sheet of homogenised tobacco material.

5. An aerosol-generating article according to claim 4 wherein the sheet of homogenised tobacco material is crimped.

6. An aerosol-generating article according to any of claims 1 to 5 wherein the support element comprises a hollow tubular element.

7. An aerosol-generating article according to claim 6 wherein the support element comprises a hollow cellulose acetate tube.

8. An aerosol-generating article according to one of claims 1 to 7 wherein the aerosol-cooling element is located immediately downstream of the support element and abuts the support element.

9. An aerosol-generating article according to claim 8 wherein the aerosol-cooling element comprises a gathered sheet of biodegradable polymeric material.

10. An aerosol-generating article according to claim 9 wherein the aerosol-cooling element comprises a gathered sheet of polylactic acid.

11. An aerosol-generating article according to any one of claims 1 to 9 further comprising:
a mouthpiece located at an extreme downstream end of the aerosol-generating article,
wherein the outer wrapper circumscribes the mouthpiece.

12. An aerosol-generating article according to claims 10 wherein the mouthpiece comprises a plug of cellulose acetate tow.

13. A method of using an aerosol-generating article according to any one of claims 1 to 12 with an aerosol-generating device comprising a heating element, the method comprising the steps of:
inserting the heating element of the aerosol-generating device into the aerosol-forming substrate of the aerosol-generating article;
raising the temperature of the heating element of the aerosol-generating device to heat the aerosol-forming substrate of the aerosol-generating article to generate an aerosol; and
withdrawing the heating element of the aerosol-generating device from the aerosol-forming substrate of the aerosol-generating article.

14. An aerosol-generating system comprising:
an aerosol-generating device comprising a heating element; and
an aerosol-generating article for use with the aerosol-generating device, the aerosol-generating article comprising:
an aerosol-forming substrate;
a support element located immediately downstream of the aerosol-forming substrate;
an aerosol-cooling element located downstream of the support element; and
an outer wrapper circumscribing the aerosol-forming substrate, the support element and the aerosol-cooling element,
wherein the support element abuts the aerosol-forming substrate and the aerosol-forming substrate is penetrable by the heating element of the aerosol-generating device.

15. A method of using an aerosol-generating system according to claim 14, the method comprising the steps of:

inserting the heating element of the aerosol-generating device into the aerosol-forming substrate of the aerosol-generating article;

raising the temperature of the heating element of the aerosol-generating device to heat the aerosol-forming substrate of the aerosol-generating article to generate an aerosol; and

withdrawing the heating element of the aerosol-generating device from the aerosol-forming substrate of the aerosol-generating article.

heated smoking article such that the internal heating elements are in direct contact with the aerosol-forming substrate.

Direct contact between an internal heating element of an aerosol-generating device and the aerosol-forming substrate of a heated smoking article can provide an efficient means for heating the aerosol-forming substrate to form an inhalable aerosol. In such a configuration, heat from the internal heating element may be conveyed almost instantaneously to at least a portion of the aerosol-forming substrate when the internal heating element is actuated, and this may facilitate the rapid generation of an aerosol. Furthermore, the overall heating energy required to generate an aerosol may be lower than would be the case in a smoking system comprising an external heater element where the aerosol-forming substrate does not directly contact the external heating element and initial heating of the aerosol-forming substrate occurs by convection or radiation. Where an internal heating element of an aerosol-generating device is in direct contact with an aerosol-forming substrate, initial heating of portions of the aerosol-forming substrate that are in direct contact with the internal heating element will be effected by conduction.

US 5,499,636 discloses a cigarette adapted for use in an electrical cigarette system. The cigarette comprises a tobacco rod having filled and unfilled portions arranged so that external electrical heater elements may overlap the filled and unfilled tobacco rod portions. The cigarette is inserted into a receptacle at a front end portion of a lighter in order to be smoked.

The present specification relates to an aerosol-generating article and a method of using an aerosol-generating article. In particular, the present specification relates to an aerosol-generating article comprising an aerosol-forming substrate for generating an inhalable aerosol when heated by an internal heating element of an aerosol-generating device. The specification also relates to a method of using such an aerosol-generating article with an aerosol-generating device comprising an internal heating element.

According to a first aspect, there is provided an aerosol-generating article for use in an aerosol-generating system comprising an electrically heated aerosol-generating device comprising an internal heating element. The aerosol-generating article comprises, in a linear sequential arrangement, an aerosol-forming substrate, a support element located immediately downstream of the aerosol-forming substrate, an aerosol-cooling element located downstream of the support element, and an outer wrapper circumscribing the aerosol-forming substrate, the support element and the aerosol-cooling element. The support element abuts the aerosol-forming substrate. The aerosol-forming substrate is penetrable by the heating element of the aerosol-generating device.

According to a second aspect, there is provided a method of using an aerosol-generating article according to the first aspect with an aerosol-generating device comprising a heating

element. The method comprises the steps of inserting the heating element of the aerosol-generating device into the aerosol-forming substrate of the aerosol-generating article, raising the temperature of the heating element of the aerosol-generating device to heat the aerosol-forming substrate of the aerosol-generating article to generate an aerosol, and withdrawing the

CLAIMS:

1. An aerosol-generating article (10) for use with an aerosol-generating device comprising a heating element for insertion into an aerosol-forming substrate (20) of the aerosol-generating article (10), the aerosol-generating article (10) comprising:

an aerosol-forming substrate (20); and

a support element (30) located immediately downstream of the aerosol-forming substrate (20), wherein the support element (30) abuts the aerosol-forming substrate (20);

characterised in that the aerosol-generating article (10) comprises an aerosol-cooling element (40) located downstream of the support element (30),

an outer wrapper (60) circumscribing the aerosol-forming substrate (20), the support element (30) and the aerosol-cooling element (40),

and in that the aerosol-forming substrate (20) is located at an extreme upstream end (80) of the aerosol-generating article (10), the aerosol-forming substrate (20) comprising a gathered sheet of homogenised tobacco material.

2. An aerosol-generating article according to claim 1 wherein the sheet of homogenised tobacco material is textured.

3. An aerosol-generating article according to claim 1 or 2 wherein the sheet of homogenised tobacco material is crimped.

4. An aerosol-generating article according to any of claims 1 to 3 wherein the support element (30) comprises a hollow tubular element.

5. An aerosol-generating article according to claim 4 wherein the support element (30) comprises a hollow cellulose acetate tube.

6. An aerosol-generating article according to one of claims 1 to 5 wherein the aerosol-cooling element (40) is located immediately downstream of the support element (30) and abuts the support element (30).

7. An aerosol-generating article according to claim 6 wherein the aerosol-cooling element (40) comprises a gathered sheet of biodegradable polymeric material.

8. An aerosol-generating article according to claim 7 wherein the aerosol-cooling element (40) comprises a gathered sheet of polylactic acid.

9. An aerosol-generating article according to any one of claims 1 to 8 further comprising: a mouthpiece (50) located at an extreme downstream end (70) of the aerosol-generating article, wherein the outer wrapper (60) circumscribes the mouthpiece (50).

10. An aerosol-generating article according to claim 9 wherein the mouthpiece (50) comprises a plug of cellulose acetate tow.

11. A method of using an aerosol-generating article according to any one of claims 1 to 10 with an aerosol-generating device (110) comprising a heating element (120), the method comprising the steps of:

inserting the heating element (120) of the aerosol-generating device (110) into the aerosol-forming substrate (20) of the aerosol-generating article (10);

raising the temperature of the heating element (120) of the aerosol-generating device (110) to heat the aerosol-forming substrate (20) of the aerosol-generating article (10) to generate an aerosol; and

withdrawing the heating element (120) of the aerosol-generating device (110) from the aerosol-forming substrate (20) of the aerosol-generating article (10).

12. An aerosol-generating system (100) comprising:

an aerosol-generating device (110) comprising a heating element (120); and

an aerosol-generating article (10) according to any of claims 1 to 10, wherein the aerosol-forming substrate (20) is penetrable by the heating element (120) of the aerosol-generating device (110).

13. A method of using an aerosol-generating system (100) according to claim 12, the method comprising the steps of:

inserting the heating element (120) of the aerosol-generating device (110) into the aerosol-forming substrate (20) of the aerosol-generating article (10);

raising the temperature of the heating element (120) of the aerosol-generating device (110) to heat the aerosol-forming substrate (20) of the aerosol-generating article (10) to generate an aerosol; and

withdrawing the heating element (120) of the aerosol-generating device (110) from the aerosol-forming substrate (20) of the aerosol-generating article (10).