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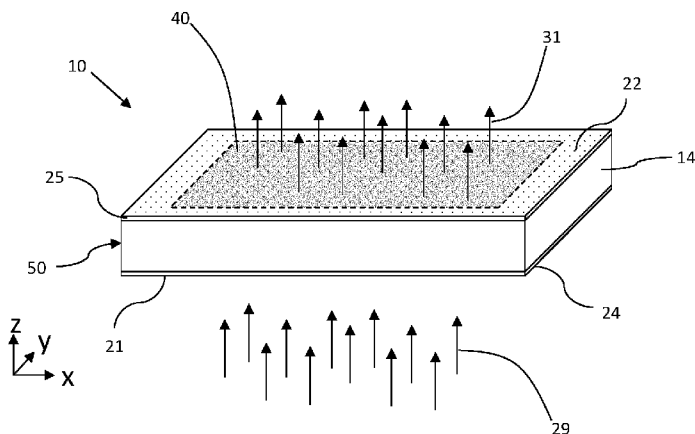


Figure 2

(57) Abstract: There is provided an aerosol-generating article (10; 400; 500) for use with an aerosol-generating device (100) to generate an aerosol. The aerosol-generating article (10; 400; 500) has a length extending in an x direction, a width extending in a y direction and a height extending in a z direction. The height is less than each of the length and the width. The aerosol-generating article (10; 400; 500) comprises a cavity (30) and an aerosol-generating substrate (40) positioned within the cavity (30). The aerosol-generating substrate (40) comprises an aerosol-former in an amount of at least 8 percent on a dry weight basis. The aerosol-generating article (10; 400; 500) also comprises at least one air permeable layer (24, 25) defining at least part of an external surface (14) of the aerosol-generating article (10; 400; 500).

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AN AEROSOL-GENERATING ARTICLE COMPRISING AN AIR PERMEABLE LAYER

The present disclosure relates to an aerosol-generating article comprising an aerosol-generating substrate. The present disclosure also relates to an aerosol-generating system comprising the aerosol-generating article and an aerosol-generating device.

A typical aerosol-generating article may appear similar to a conventional cigarette. For example, such an aerosol-generating article may be substantially cylindrical and comprise an aerosol-forming substrate and other components such as a mouthpiece filter element and a cooling element, all arranged together in the form of a rod and wrapped in a cigarette paper. Dimensions of typical aerosol-generating articles are often similar to the dimensions of conventional cigarettes.

However, a significant portion of the aerosol-forming substrate in these cylindrical aerosol-generating articles may not be sufficiently heated to form an aerosol during use. This is undesirable since the insufficiently heated portion of the aerosol-forming substrate contributes to the cost of manufacture and transport of the aerosol-generating article, but does not contribute to the aerosol delivered to an end user. This may be the case regardless of the way in which the aerosol-forming substrate is heated, for example regardless of whether a resistive or inductive heater is used and regardless of whether the aerosol-forming substrate is heated from the inside or the outside. Moreover, the components of these cylindrical aerosol-generating articles normally need to have the same or very similar outer diameters so that they can be brought together, accurately positioned in co-axial alignment and wrapped in a cigarette paper. This can lead to increased cost and complexity of manufacture.

It is an objective of the present disclosure to provide an aerosol-generating article in which a greater portion of the aerosol-generating substrate may be aerosolised during use. It is also an objective of the present disclosure to provide an aerosol-generating article that can be manufactured relatively efficiently and cheaply. It is also an objective of the present disclosure to provide an aerosol-generating article that provides improved aerosol delivery to a consumer.

According to the present disclosure, there is provided an aerosol-generating article for use with an aerosol-generating device to generate an aerosol. The aerosol-generating article may have a length extending in an x direction, a width extending in a y direction and a height extending in a z direction. The height may be less than each of the length and the width. The aerosol-generating article may comprise a cavity. The aerosol-generating article may comprise an aerosol-generating substrate positioned within the cavity. The aerosol-generating substrate may comprises an aerosol-former in an amount of at least 8 percent on a dry weight basis. The aerosol-generating article may comprises at least one air permeable layer. The at least one air permeable layer may define at least part of an external surface of the aerosol-generating article.

According to the present disclosure, there is provided an aerosol-generating article for use with an aerosol-generating device to generate an aerosol. The aerosol-generating article has a length extending in an x direction, a width extending in a y direction and a height extending in a z direction. The height is less than each of the length and the width. The aerosol-generating article comprises a cavity and an aerosol-generating substrate positioned within the cavity. The aerosol-generating substrate comprises an aerosol-former in an amount of at least 8 percent on a dry weight basis. The aerosol-generating article also comprises at least one air permeable layer defining at least part of an external surface of the aerosol-generating article.

For the purpose of the present disclosure, the “height” of the aerosol-generating article may also be referred to as the “thickness” of the aerosol-generating article.

Advantageously, providing an aerosol-generating article with a height that is less than each of the length and the width may increase or maximise a surface area to volume ratio of the aerosol-generating article. Advantageously, this may increase or maximise aerosol production from the aerosol-generating substrate during use.

Advantageously, providing an aerosol-generating substrate comprising an aerosol-former in an amount of at least 8 percent on a dry weight basis may further increase or maximise aerosol production from the aerosol-generating substrate during use.

Advantageously, providing the aerosol-generating article with at least one air permeable layer defining at least part of an external surface of the aerosol-generating article may facilitate release of generated aerosol from the cavity while also retaining the aerosol-generating substrate within the cavity.

The aerosol-generating substrate may comprise the aerosol-former in an amount of at least 9 percent on a dry weight basis, at least 10 percent on a dry weight basis, at least 15 percent on a dry weight basis, at least 20 percent on a dry weight basis, at least 25 percent on a dry weight basis, at least 30 percent on a dry weight basis, or at least 35 percent on a dry weight basis.

The aerosol-former may comprises at least one of one or more monohydric alcohols, one or more polyhydric alcohols, one or more polyhydric alcohol esters, and one or more mono-, di- or polycarboxylic acid esters. The one or more monohydric alcohols may comprise menthol. The one or more polyhydric alcohols may comprise at least one of glycerine, propylene glycol, polyethylene glycol, triethylene glycol, or 1,3-butanediol. The one or more polyhydric alcohol esters may comprise at least one of glycerol monoacetate, glycerol diacetate, and glycerol triacetate. The one or more mono-, di- or polycarboxylic acid esters may comprise at least one of dimethyl dodecanedioate and dimethyl tetradecanedioate.

Preferably, the aerosol-former comprises at least one of glycerine and propylene glycol. The aerosol-forming may comprise glycerine.

The external surface may comprise opposed first and second external surfaces, wherein the first and second external surfaces are spaced apart from each other in the z direction.

The first and second external surfaces may be planar. Preferably, the planar first and second external surfaces are parallel to each other.

5 The first and second external surfaces may be outwardly-convex external surfaces.

The first external surface may form a first side of the aerosol-generating article. The second external surface may form a second side of the aerosol-generating article. Preferably, the first side is opposite to the second side.

10 The first external surface may form a first face of the aerosol-generating article. The second external surface may form a second face of the aerosol-generating article. Preferably, the first face and the second face are the largest faces of the aerosol-generating article.

The aerosol-generating article may have a total external surface area. The first external surface may have a first surface area. The second external surface may have a second surface area. The first surface area and the second surface area together may form at least 40 percent
15 of the total external surface area, at least 45 percent of the total external surface area, at least 50 percent of the total external surface area, at least 55 percent of the total external surface area, at least 60 percent of the total external surface area, at least 65 percent of the total external surface area, at least 70 percent of the total external surface area, at least 75 percent of the total external surface area, or at least 80 percent of the total external surface area.

20 A ratio of the length to the height of the aerosol-generating article may be at least 2:1, at least 3:1, at least 4:1, at least 5:1, at least 10:1, at least 12:1, or at least 15:1.

A ratio of the length to the height of the aerosol-generating article may be no more than 15:1, no more than 12:1, no more than 10:1, no more than 5:1, no more than 4:1, no more than 3:1, or no more than 2.5:1.

25 A ratio of the width to the height of the aerosol-generating article may be at least 2:1, at least 3:1, at least 4:1, at least 5:1, at least 10:1, at least 12:1, or at least 15:1.

A ratio of the width to the height of the aerosol-generating article may be no more than 15:1, no more than 12:1, no more than 10:1, no more than 5:1, no more than 4:1, no more than 3:1, or no more than 2.5:1.

30 The aerosol-generating article may have a total external surface area. Preferably, the at least one air permeable layer defines at least 40 percent of the total external surface area, at least 45 percent of the total external surface area, at least 50 percent of the total external surface area, at least 55 percent of the total external surface area, at least 60 percent of the total external surface area, at least 65 percent of the total external surface area, at least 70 percent of the total
35 external surface area, at least 75 percent of the total external surface area, at least 80 percent of the total external surface area, at least 85 percent of the total external surface area, or at least 90 percent of the total external surface area.

The at least one air permeable layer may be a single air permeable layer. The single air permeable layer may at least partially defines the first and second external surfaces. The single air permeable layer may entirely define the first external surface and the second external surface.

5 The at least one air permeable layer may comprises a first air permeable layer and a second air permeable layer. The first air permeable layer may at least partially defines the first external surface and the second air permeable layer may at least partially define the second external surface. The first air permeable layer may entirely define the first external surface and the second air permeable layer may entirely define the second external surface.

10 The aerosol-generating article may comprise a frame, wherein the frame at least partially defines the cavity.

The frame may enhance the flexural stiffness of the aerosol-generating article and may provide the majority of the flexural stiffness of the aerosol-generating article.

The frame may define the air inlet at a bottom end of the cavity and an air outlet at a top end of the cavity.

15 Preferably, the cavity extends through a full height of the frame to define opposed upper and lower openings through corresponding upper and lower surfaces of the frame. Preferably, the lower opening forms the air inlet at the bottom end of the cavity. Preferably, the upper opening forms the air outlet at the top end of the cavity.

20 Preferably, the at least one air permeable layer overlies each of the air inlet and the air outlet. Advantageously, the at least one air permeable layer allows air and/or aerosol to flow through the air inlet and the air outlet while retaining the aerosol-generating substrate in the cavity.

25 The at least one air permeable layer may comprise a single air permeable layer wrapped around at least part of the frame so that the single air permeable layer overlies both of the air inlet and the air outlet. Preferably, the single air permeable layer at least partially defines the first and second external surfaces. The single air permeable layer may entirely define the first external surface and the second external surface.

30 The at least one air permeable layer may comprise a first air permeable layer overlying the air inlet and a second air permeable layer overlying the air outlet. Preferably, the first air permeable layer at least partially defines the first external surface and the second air permeable layer at least partially defines the second external surface. The first air permeable layer may entirely define the first external surface and the second air permeable layer may entirely define the second external surface.

35 The frame may comprise a frame wall having an annular shape. Preferably, the annular shape of the frame wall defines the cavity. The frame wall may have a square annular shape or a rectangular annular shape. The frame wall may be free from apertures within the frame wall.

The frame may comprise a plurality of layers successively arranged over each other. Each of the plurality of layers may extend over the length of the aerosol-generating article.

The frame may comprise a cellulosic material. The cellulosic material may have a grammage between 300 grams per square metre and 900 grams per square metre. The cellulosic material may be paper, paperboard, or cardboard.

5 The at least one air permeable layer, or each air permeable layer, may have a permeability of at least 10 CORESTA units, at least 20 CORESTA units, at least 50 CORESTA units, at least 100 CORESTA units, at least 500 CORESTA units, at least 1000 CORESTA units, at least 1500 CORESTA units, at least 2000 CORESTA units, at least 2500 CORESTA units, at least 3000 CORESTA units, at least 3500 CORESTA units, or at least 4000 CORESTA units. The at least one air permeable layer, or each air permeable layer, may have a permeability of no more than
10 10,000 CORESTA units, no more than 8000 CORESTA units, or no more than 5000 CORESTA units.

The permeability of the at least one air permeable layer, or each air permeable layer, may be determined by utilising the International Standard test method ISO 2965:2009 and the result may be presented as cubic centimetres per minute per square centimetres and referred to as
15 "CORESTA units".

The at least one air permeable layer may be formed from a porous material. The porous material may have sufficient porosity to provide a desired amount of air permeability. The at least one air permeable layer may comprise at least one perforation extending through the porous material. The at least one perforation may increase the air permeability of the at least one air
20 permeable layer when compared to an air permeable layer formed from the same porous material without any perforations.

The at least one air permeable layer may be formed from a non-porous material comprising at least one perforation extending through the non-porous material.

In embodiments and examples in which the at least one air permeable layer comprises at
25 least one perforation, the at least one perforation may be a plurality of perforations. The plurality of perforations may be arranged in an array or a grid.

Each perforation may have a cross-sectional flow area of less than 20 square millimetres, less than 15 square millimetres, less than 10 square millimetres, less than 8 square millimetres, less than 6 square millimetres, less than 5 square millimetres, less than 4 square millimetres, or
30 less than 3 square millimetres.

The at least one air permeable layer may be formed from a cellulosic material. The at least one air permeable layer may be formed from a paper. The at least one air permeable layer may be formed from a perforated paper.

The at least one air permeable layer may have a grammage of between 11 grams per
35 square metre and 18 grams per square metre, preferably between 12 grams per square metre and 16 grams per square metre.

The at least one air permeable layer may have a thickness of between 50 micrometres and 80 micrometres, preferably between 60 micrometres and 70 micrometres.

The at least one air permeable layer may have a porosity of between 25 percent and 60 percent, preferably between 35 percent and 50 percent.

5 The at least one air permeable layer may have a number average pore size of between 0.3 micrometres and 0.95 micrometres, preferably between 0.4 micrometres and 0.8 micrometres, preferably between 0.45 micrometres and 0.75 micrometres.

10 The aerosol-generating article may comprise at least one heating element. The at least one heating element may overlie at least a part of the aerosol-generating substrate. The at least one heating element may overlie at least a part of the at least one air permeable layer. The at least one heating element may be arranged on the external surface of the aerosol-generating article.

The at least one heating element may be a porous heating element.

15 The at least one heating element may comprise at least one resistive heating element. The at least one heating element may comprise at least one resistive heating mesh.

The at least one heating element is a single heating element. Preferably, the single heating element is positioned on the external surface. In embodiments and examples in which the external surface comprises first and second external surfaces, the single heating element may be positioned on the first external surface or the second external surface.

20 Preferably, the single heating element extends between a first electrical contact and a second electrical contact.

25 Preferably, the single heating element is positioned on the first external surface, wherein the first external surface comprises a first end and a second end opposite the first end, wherein the first electrical contact is positioned at the first end of the first external surface, and wherein the second electrical contact is positioned at the second end of the first external surface.

30 Preferably, the aerosol-generating article comprises a peripheral external surface extending perpendicular to the first external surface and the second external surface. In embodiments and examples in which the aerosol-generating article comprises a frame, the frame may define the peripheral external surface. At least one of the first electrical contact and the second electrical contact may be positioned on the peripheral external surface, preferably both the first electrical contact and the second electrical contact are positioned on the peripheral external surface. The peripheral external surface may comprise a first end face and a second end face opposite the first end face. The first electrical contact may be positioned on the first end face and the second electrical contact may be positioned on the second end face.

35 The at least one heating element may comprise a first heating element and a second heating element.

Preferably, the first and second heating elements are positioned on the external surface. In embodiments and examples in which the external surface comprises first and second external surfaces, the first heating element may be positioned on the first external surface and the second heating element may be positioned on the second external surface.

5 Preferably, the first heating element extends between a first electrical contact and a second electrical contact. Preferably, the second heating element extends between a third electrical contact and a fourth electrical contact.

 The first external surface may comprise a first end and a second end opposite the first end. The second external surface may comprise a first end and a second opposite the first end.
10 The first electrical contact may be positioned at the first end of the first external surface. The second electrical contact may be positioned at the second end of the first external surface. The third electrical contact may be positioned at the first end of the second external surface. The fourth electrical contact may be positioned at the second end of the second external surface.

 The aerosol-generating article may comprises a peripheral external surface extending
15 perpendicular to the first external surface and the second external surface. In embodiments and examples in which the aerosol-generating article comprises a frame, the frame may define the peripheral external surface. At least one of the first electrical contact, the second electrical contact, the third electrical contact, and the fourth electrical contact may be positioned on the peripheral external surface. Preferably, each of the first electrical contact, the second electrical
20 contact, the third electrical contact, and the fourth electrical contact is positioned on the peripheral external surface.

 The peripheral external surface may comprise a first end face and a second end face opposite the first end face. The first electrical contact and the third electrical contact may be positioned on the first end face. The second electrical contact and the fourth electrical contact
25 may be positioned on the second end face.

 The aerosol-generating substrate may be in the form of at least one of a plurality of granules and a plurality of beads. The granules or beads may have a number average diameter of between 0.35 millimetres to 3 millimetres, preferably between 0.5 millimetres and 2.5 millimetres.

30 The aerosol-generating substrate may have a moisture content of between 5 percent and 35 percent by weight, preferably between 10 percent and 25 percent by weight.

 The aerosol-generating substrate may comprise tobacco leaf. The aerosol-generating substrate may comprise tobacco leaf in an amount of between 20 percent and 40 percent on a dry weight basis. The tobacco leaf may be ground tobacco leaf. Preferably, the ground tobacco
35 leaf has a number average particle size of between 100 mesh and 380 mesh, more preferably between 170 mesh and 320 mesh.

The aerosol-generating substrate may comprise cellulose fibres. The aerosol-generating substrate may comprise cellulose fibres in an amount of between 2 percent and 10 percent on a dry weight basis. The cellulose fibres may have a number average length of between 10 micrometres and 250 micrometres, preferably between 10 micrometres and 120 micrometres.

5 The aerosol-generating substrate may comprise tobacco fibres. The aerosol-generating substrate may comprise tobacco fibres in an amount of between 6 percent and 17 percent on a dry weight basis. The tobacco fibres may have a number average length of between 10 micrometres and 350 micrometres, preferably between 10 micrometres and 180 micrometres.

10 The aerosol-generating substrate may comprise at least one binder. The aerosol-generating substrate may comprise the at least one binder in an amount of 1 percent to 7 percent on a dry weight basis. The at least one binder may comprise at least one of a natural pectin, a guar gum, a land locust bean gum, a starch, alginate, methyl-, ethyl-, ethylhydroxymethyl- and carboxymethyl- celluloses, dextran, and xanthan gum.

15 The at least one air permeable layer may have a resistance to draw of at least 1 millimetre of water, at least 2 millimetres of water, at least 3 millimetres of water, at least 4 millimetres of water, or at least 5 millimetres of water.

20 The at least one air permeable layer may have a resistance to draw of no more than 100 millimetres of water, no more than 90 millimetres of water, no more than 80 millimetres of water, no more than 70 millimetres of water, no more than 60 millimetres of water, no more than 50 millimetres of water, or no more than 40 millimetres of water.

25 The at least one air permeable layer may have a resistance to draw of between 1 millimetre of water and 100 millimetres of water, preferably between 2 millimetres of water and 80 millimetres of water, preferably between 3 millimetres of water and 60 millimetres of water, preferably between 4 millimetres of water and 50 millimetres of water, preferably between 5 millimetres of water and 40 millimetres of water.

30 In embodiments and examples in which the at least one air permeable layer comprises a first air permeable layer and a second air permeable layer, the first and second air permeable layers together may have a resistance to draw of at least 1 millimetre of water, at least 2 millimetres of water, at least 3 millimetres of water, at least 4 millimetres of water, or at least 5 millimetres of water.

35 The first and second air permeable layers may together have a resistance to draw of no more than 100 millimetres of water, no more than 90 millimetres of water, no more than 80 millimetres of water, no more than 70 millimetres of water, no more than 60 millimetres of water, no more than 50 millimetres of water, or no more than 40 millimetres of water.

40 The first and second air permeable layers together may have a resistance to draw of between 1 millimetre of water and 100 millimetres of water, preferably between 2 millimetres of water and 80 millimetres of water, preferably between 3 millimetres of water and 60 millimetres

of water, preferably between 4 millimetres of water and 50 millimetres of water, preferably between 5 millimetres of water and 40 millimetres of water.

Preferably, the first air permeable layer and the second air permeable layer have the same resistance to draw.

5 The first air permeable layer may have a first resistance to draw and the second air permeable layer may have a second resistance to draw, wherein the first resistance to draw is different to the second resistance to draw. In examples and embodiments in which the first air permeable layer overlies an air inlet and the second air permeable layer overlies an air outlet, preferable the second resistance to draw is smaller than the first resistance to draw.

10 The aerosol-generating article may have a resistance to draw of at least 20 millimetres of water, at least 25 millimetres of water, or at least 30 millimetres of water.

The aerosol-generating article may have a resistance to draw of no more than 60 millimetres of water, no more than 55 millimetres of water, or no more than 50 millimetres of water.

15 The aerosol-generating article may have a resistance to draw of between 20 millimetres of water and 60 millimetres of water, preferably between 25 millimetres of water and 55 millimetres of water, preferably between 30 millimetres of water and 50 millimetres of water.

The aerosol-generating article may have a resistance to draw of between 10 millimetres of water and 21 millimetres of water, preferably between 13 millimetres of water and 18 millimetres of water.

20 Unless otherwise specified, resistance to draw (RTD) is measured in accordance with ISO 6565-2015. The RTD refers to the pressure required to force air through the full length or thickness of a component, such as the at least one air permeable layer, or the whole aerosol-generating article. The terms “pressure drop” or “draw resistance” of a component or article may also refer to the “resistance to draw”. Such terms generally refer to the measurements made in accordance
25 with ISO 6565-2015 and are normally carried out at under test at a volumetric flow rate of about 17.5 millilitres per second at the output or downstream end of the measured component at a temperature of about 22 degrees Celsius, a pressure of about 101 kPa (about 760 Torr) and a relative humidity of about 60%.

30 The aerosol-generating article may be a substantially flat aerosol-generating article or a substantially planar aerosol-generating article. In particular, the height of the aerosol-generating article may be less than 50 percent of both the length and the width of the aerosol-generating article.

35 The aerosol-generating article may have a quadrilaterally-faced hexahedron shape. The aerosol-generating article may have a rectangular prism shape. The aerosol-generating article may have a cuboid shape. The aerosol-generating article may have a cylindrical shape. The aerosol-generating article may have a right-angled cylinder shape.

Substantially the entirety of the aerosol-generating article, excluding the aerosol-generating substrate and (if present) adhesive, may be paper or cardboard.

The aerosol-generating article may have a cellulose acetate content of less than 5 percent. The aerosol-generating article may have a cellulose acetate content of less than 3 percent. The aerosol-generating article may have a cellulose acetate content of less than 1 percent.

The aerosol-generating article may comprise at least one of a taggant and a machine readable indicium positioned at the first end of the aerosol-generating article. The aerosol-generating article may comprise at least one of a taggant and a machine readable indicium positioned at the second end of the aerosol-generating article. The at least one of a taggant and a machine readable indicium may facilitate identification of the aerosol-generating article by an aerosol-generating device.

According to the present disclosure there is also provided an aerosol-generating system comprising an aerosol-generating article according any of the examples or embodiments described herein and an aerosol-generating device comprising a chamber for receiving the aerosol-generating article.

The aerosol-generating device may comprise at least one blocking element arranged to engage the external surface of the aerosol-generating article when the aerosol-generating article is received within the chamber. The at least one blocking element may be arranged to bifurcate an airflow flowing into the aerosol-generating article during use. The at least one blocking element is arranged to bifurcate an airflow flowing out of the aerosol-generating article during use.

In embodiments in which the cartridge comprises at least one heating element extending between two or more electrical contacts, preferably, the aerosol-generating device comprises a plurality of device electrical contacts arranged to engage the corresponding electrical contacts of the cartridge when the cartridge is received within the chamber.

Preferably, the aerosol-generating device comprises a controller to control a supply of power to the at least one heating element. Preferably, the aerosol-generating device is configured to heat the aerosol-generating substrate to form an aerosol, for example an inhalable aerosol.

As used herein, the term "aerosol-generating article" may refer to an article able to generate, or release, an aerosol.

As used herein, the term "aerosol-forming substrate" may refer to a substrate capable of releasing an aerosol or volatile compounds that can form an aerosol. Such volatile compounds may be released by heating the aerosol-forming substrate. An aerosol-forming substrate may comprise an aerosol-forming material. An aerosol-forming substrate may be adsorbed, coated, impregnated, or otherwise loaded onto a carrier or support. An aerosol-forming substrate may conveniently be part of an aerosol-generating article or smoking article.

As used herein, the term "aerosol-generating device" may refer to a device for use with an aerosol-generating article to enable the generation, or release, of an aerosol.

As used herein, the term “aerosol former” may refer to any suitable known compound or mixture of compounds that, in use, facilitates formation of an aerosol. The aerosol may be a dense and stable aerosol. The aerosol may be substantially resistant to thermal degradation at the operating temperature of the aerosol-forming substrate or aerosol-generating article.

5 As used herein with reference to the invention, the term “nicotine”, is used to describe nicotine, nicotine base or a nicotine salt.

As used herein with reference to the invention, the terms “proximal”, “distal”, “upstream” and “downstream” are used to describe the relative positions of components, or portions of components, of the aerosol-generating article.

10 As used herein, the term “homogenised tobacco material” encompasses any tobacco material formed by the agglomeration of particles of tobacco material. Sheets or webs of homogenised tobacco material are formed by agglomerating particulate tobacco obtained by grinding or otherwise powdering of one or both of tobacco leaf lamina and tobacco leaf stems. In addition, homogenised tobacco material may comprise a minor quantity of one or more of tobacco
15 dust, tobacco fines, and other particulate tobacco by-products formed during the treating, handling and shipping of tobacco. The sheets of homogenised tobacco material may be produced by casting, extrusion, paper making processes or other any other suitable processes known in the art.

The term “cast leaf” is used herein to refer to a product made by a casting process that is
20 based on casting a slurry comprising plant particles (for example, clove particles or tobacco particles and clove particles in a mixture) and a binder (for example, guar gum) onto a supportive surface, such as a belt conveyor, drying the slurry and removing the dried sheet from the supportive surface. An example of the casting or cast leaf process is described in, for example, US-A-5,724,998 for making cast leaf tobacco. In a cast leaf process, particulate plant materials
25 are produced by pulverizing, grinding, or comminuting parts of the plant. The particles produced from one or more plants are mixed with a liquid component, typically water, to form a slurry. Other components in the slurry may include fibres, a binder and an aerosol former. The particulate plant materials may be agglomerated in the presence of the binder. The slurry is cast onto a supportive surface and dried into a sheet of homogenized plant material. Preferably, homogenized plant
30 material used in articles according to the present invention may be produced by casting. Such homogenized plant material may comprise agglomerated particulate plant material.

As used herein, resistance to draw is expressed with the units of pressure “mm H₂O” or “mm WG” or “mm of water gauge” and may be measured in accordance with ISO 6565:2002.

The invention is defined in the claims. However, below there is provided a non-exhaustive
35 list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein.

Example 1: An aerosol-generating article for use with an aerosol-generating device to generate an aerosol, the aerosol-generating article having a length extending in an x direction, a width extending in a y direction and a height extending in a z direction, the height being less than each of the length and the width, the aerosol-generating article comprising:

5 a cavity;

an aerosol-generating substrate positioned within the cavity, the aerosol-generating substrate comprising an aerosol-former in an amount of at least 8 percent on a dry weight basis; and

10 at least one air permeable layer defining at least part of an external surface of the aerosol-generating article.

Example 2: An aerosol-generating article according to Example 1, wherein the aerosol-generating substrate comprises the aerosol-former in an amount of at least 9 percent on a dry weight basis, preferably at least 10 percent on a dry weight basis.

Example 3: An aerosol-generating article according to Example 1 or 2, wherein the aerosol-former comprises at least one of one or more monohydric alcohols, one or more polyhydric alcohols, one or more polyhydric alcohol esters, and one or more mono-, di- or polycarboxylic acid esters.

Example 4: An aerosol-generating article according to Example 3, wherein the one or more monohydric alcohols comprises menthol.

20 Example 5: An aerosol-generating article according to Example 3 or 4, wherein the one or more polyhydric alcohols comprises at least one of glycerine, propylene glycol, polyethylene glycol, triethylene glycol, or 1,3-butanediol.

Example 6: An aerosol-generating article according to Example 3, 4 or 5, wherein the one or more polyhydric alcohol esters comprises at least one of glycerol monoacetate, glycerol diacetate, and glycerol triacetate.

Example 7: An aerosol-generating article according to any of Examples 3 to 6, wherein the one or more mono-, di- or polycarboxylic acid esters comprises at least one of dimethyl dodecanedioate and dimethyl tetradecanedioate.

Example 8: An aerosol-generating article according to any preceding Example, wherein the aerosol-former comprises glycerine.

Example 9: An aerosol-generating article according to any preceding Example, wherein the external surface comprises opposed first and second external surfaces, wherein the first and second external surfaces are spaced apart from each other in the z direction.

Example 10: An aerosol-generating article according to Example 9, wherein the first and second external surfaces are planar.

Example 11: An aerosol-generating article according to Example 10, wherein the first and second external surfaces are parallel to each other.

Example 12: An aerosol-generating article according to Example 9, wherein the each of the first and second external surfaces is an outwardly-convex external surface.

Example 13: An aerosol-generating article according to any of Examples 9 to 12, wherein the first external surface forms a first face of the aerosol-generating article, wherein the second external surface forms a second face of the aerosol-generating article, and wherein the first face and the second face are the largest faces of the aerosol-generating article.

Example 14: An aerosol-generating article according to any of Examples 9 to 13, wherein the aerosol-generating article has a total external surface area, wherein the first external surface has a first surface area, wherein the second external surface has a second surface area, and wherein the first surface area and the second surface area together form at least 40 percent of the total external surface area, at least 45 percent of the total external surface area, at least 50 percent of the total external surface area, at least 55 percent of the total external surface area, at least 60 percent of the total external surface area, at least 65 percent of the total external surface area, at least 70 percent of the total external surface area, at least 75 percent of the total external surface area, or at least 80 percent of the total external surface area.

Example 15: An aerosol-generating article according to any of Examples 9 to 14, wherein the first external surface forms a first side of the aerosol-generating article, and wherein the second external surface forms a second side of the aerosol-generating article opposite to the first side.

Example 16: An aerosol-generating article according to any preceding Example, wherein a ratio of the length to the height is at least 2:1, at least 3:1, at least 4:1, at least 5:1, at least 10:1, at least 12:1, or at least 15:1.

Example 17: An aerosol-generating article according to any preceding Example, wherein a ratio of the length to the height is no more than 15:1, no more than 12:1, no more than 10:1, no more than 5:1, no more than 4:1, no more than 3:1, or no more than 2.5:1.

Example 18: An aerosol-generating article according to any preceding Example, wherein a ratio of the width to the height is at least 2:1, at least 3:1, at least 4:1, at least 5:1, at least 10:1, at least 12:1, or at least 15:1.

Example 19: An aerosol-generating article according to any preceding Example, wherein a ratio of the width to the height is no more than 15:1, no more than 12:1, no more than 10:1, no more than 5:1, no more than 4:1, no more than 3:1, or no more than 2.5:1.

Example 20: An aerosol-generating article according to any preceding Example, further comprising a frame, wherein the frame at least partially defines the cavity.

Example 21: An aerosol-generating article according to Example 20, wherein the frame defines an air inlet at a bottom end of the cavity and an air outlet at a top end of the cavity.

Example 22: An aerosol-generating article according to Example 21, wherein the at least one air permeable layer overlies each of the air inlet and the air outlet.

Example 23: An aerosol-generating article according to Example 22, wherein the at least one air permeable layer comprises a single air permeable layer wrapped around at least part of the frame so that the single air permeable layer overlies both of the air inlet and the air outlet.

Example 24: An aerosol-generating article according to Example 23 in combination with any of Examples 9 to 15, wherein the single air permeable layer at least partially defines the first and second external surfaces.

Example 25: An aerosol-generating article according to Example 24, wherein the single air permeable layer entirely defines the first external surface and the second external surface.

Example 26: An aerosol-generating article according to Example 22, wherein the at least one air permeable layer comprises a first air permeable layer overlying the air inlet and a second air permeable layer overlying the air outlet.

Example 27: An aerosol-generating article according to Example 26 in combination with any of Examples 9 to 15, wherein the first air permeable layer at least partially defines the first external surface and wherein the second air permeable layer at least partially defines the second external surface.

Example 28: An aerosol-generating article according to Example 27, wherein the first air permeable layer entirely defines the first external surface and wherein the second air permeable layer entirely defines the second external surface.

Example 29: An aerosol-generating article according to any of Examples 20 to 28, wherein the frame comprise a frame wall having an annular shape.

Example 30: An aerosol-generating article according to Example 29, wherein the frame wall has a square annular shape or a rectangular annular shape.

Example 31: An aerosol-generating article according to Example 29 or 30, wherein the frame wall is free from apertures within the frame wall.

Example 32: An aerosol-generating article according to any of Examples 20 to 31, wherein the frame is formed from a cellulosic material.

Example 33: An aerosol-generating article according to any of Examples 20 to 32, wherein the frame is formed from at least one of a paper-based material, cardboard, and a cardboard laminate.

Example 34: An aerosol-generating article according to any of Examples 9 to 15, wherein the at least one air permeable layer is a single air permeable layer, and wherein the single air permeable layer at least partially defines the first and second external surfaces.

Example 35: An aerosol-generating article according to Example 34, wherein the single air permeable layer entirely defines the first external surface and the second external surface.

Example 36: An aerosol-generating article according to any of Examples 9 to 15, wherein the at least one air permeable layer comprises a first air permeable layer and a second air permeable

layer, wherein the first air permeable layer at least partially defines the first external surface, and wherein the second air permeable layer at least partially defines the second external surface.

Example 37: An aerosol-generating article according to Example 36, wherein the first air permeable layer entirely defines the first external surface and wherein the second air permeable layer entirely defines the second external surface.

Example 38: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer is formed from a cellulosic material.

Example 39: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer is formed from a paper, optionally a perforated paper.

Example 40: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer has a grammage of between 11 grams per square metre and 18 grams per square metre, preferably between 12 grams per square metre and 16 grams per square metre.

Example 41: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer has a thickness of between 50 micrometres and 80 micrometres, preferably between 60 micrometres and 70 micrometres.

Example 42: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer has a porosity of between 25 percent and 60 percent, preferably between 35 percent and 50 percent.

Example 43: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer has a number average pore size of between 0.3 micrometres and 0.95 micrometres, preferably between 0.4 micrometres and 0.8 micrometres, preferably between 0.45 micrometres and 0.75 micrometres.

Example 44: An aerosol-generating article according to any preceding Example, further comprising at least one heating element.

Example 45: An aerosol-generating article according to Example 44, wherein the at least one heating element overlies at least a part of the aerosol-generating substrate.

Example 46: An aerosol-generating article according to Example 44 or 45, wherein the at least one heating element is a porous heating element.

Example 47: An aerosol-generating article according to Example 44, 45 or 46, wherein the at least one heating element comprises at least one resistive heating mesh.

Example 48: An aerosol-generating article according to any of Examples 44 to 47, wherein the at least one heating element is a single heating element.

Example 49: An aerosol-generating article according to Example 48, wherein the single heating element is positioned on the external surface.

Example 50: An aerosol-generating article according to Example 49 in combination with any of Examples 9 to 15, wherein the single heating element is positioned on the first external surface or the second external surface.

Example 51: An aerosol-generating article according to any of Examples 48 to 50, wherein the single heating element extends between a first electrical contact and a second electrical contact.

Example 52: An aerosol-generating article according to Example 51 in combination with any of Examples 9 to 15, wherein the single heating element is positioned on the first external surface, wherein the first external surface comprises a first end and a second end opposite the first end, wherein the first electrical contact is positioned at the first end of the first external surface, and wherein the second electrical contact is positioned at the second end of the first external surface.

Example 53: An aerosol-generating article according to Example 51 in combination with any of Examples 9 to 15, wherein the aerosol-generating article comprises a peripheral external surface extending perpendicular to the first external surface and the second external surface, and wherein at least one of the first electrical contact and the second electrical contact is positioned on the peripheral external surface, preferably wherein both the first electrical contact and the second electrical contact are positioned on the peripheral external surface.

Example 54: An aerosol-generating article according to Example 53, wherein the peripheral external surface comprises a first end face and a second end face opposite the first end face, wherein the first electrical contact is positioned on the first end face and wherein the second electrical contact is positioned on the second end face.

Example 55: An aerosol-generating article according to any of Examples 44 to 47, wherein the at least one heating element comprises a first heating element and a second heating element.

Example 56: An aerosol-generating article according to Example 55, wherein the first and second heating elements are positioned on the external surface.

Example 57: An aerosol-generating article according to Example 56 in combination with any of Examples 9 to 15, wherein the first heating element is positioned on the first external surface and wherein the second heating element is positioned on the second external surface.

Example 58: An aerosol-generating article according to any of Examples 55 to 57, wherein the first heating element extends between a first electrical contact and a second electrical contact, and wherein the second heating element extends between a third electrical contact and a fourth electrical contact.

Example 59: An aerosol-generating article according to Example 58 in combination with any of Examples 9 to 15, wherein the first external surface comprises a first end and a second end opposite the first end, wherein the second external surface comprises a first end and a second end opposite the first end, wherein the first electrical contact is positioned at the first end of the first external surface, wherein the second electrical contact is positioned at the second end of the first external surface, wherein the third electrical contact is positioned at the first end of the second

external surface, and wherein the fourth electrical contact is positioned at the second end of the second external surface.

Example 60: An aerosol-generating article according to Example 58 in combination with any of Examples 9 to 15, wherein the aerosol-generating article comprises a peripheral external surface extending perpendicular to the first external surface and the second external surface, and wherein at least one of the first electrical contact, the second electrical contact, the third electrical contact, and the fourth electrical contact is positioned on the peripheral external surface, preferably wherein each of the first electrical contact, the second electrical contact, the third electrical contact, and the fourth electrical contact is positioned on the peripheral external surface.

Example 61: An aerosol-generating article according to Example 60, wherein the peripheral external surface comprises a first end face and a second end face opposite the first end face, wherein the first electrical contact and the third electrical contact are positioned on the first end face, and wherein the second electrical contact and the fourth electrical contact are positioned on the second end face.

Example 62: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating substrate is in the form of at least one of a plurality of granules and a plurality of beads.

Example 63: An aerosol-generating article according to Example 62, wherein the granules or beads have a number average diameter of between 0.35 millimetres to 3 millimetres, preferably between 0.5 millimetres and 2.5 millimetres.

Example 64: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating substrate has a moisture content of between 5 percent and 35 percent by weight, preferably between 10 percent and 25 percent by weight.

Example 65: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating substrate comprises tobacco leaf.

Example 66: An aerosol-generating article according to Example 65, wherein the aerosol-generating substrate comprises tobacco leaf in an amount of between 20 percent and 40 percent on a dry weight basis.

Example 67: An aerosol-generating article according to Example 65 or 66, wherein the tobacco leaf is ground tobacco leaf, preferably wherein the ground tobacco leaf has a number average particle size of between 100 mesh and 380 mesh, preferably between 170 mesh and 320 mesh.

Example 68: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating substrate comprises cellulose fibres.

Example 69: An aerosol-generating article according to Example 68, wherein the aerosol-generating substrate comprises cellulose fibres in an amount of between 2 percent and 10 percent on a dry weight basis.

Example 70: An aerosol-generating article according to Example 68 or 69, wherein the cellulose fibres have a number average length of between 10 micrometres and 250 micrometres, preferably between 10 micrometres and 120 micrometres.

Example 71: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating substrate comprises tobacco fibres.

Example 72: An aerosol-generating article according to Example 71, wherein the aerosol-generating substrate comprises tobacco fibres in an amount of between 6 percent and 17 percent on a dry weight basis.

Example 73: An aerosol-generating article according to Example 71 or 72, wherein the tobacco fibres have a number average length of between 10 micrometres and 350 micrometres, preferably between 10 micrometres and 180 micrometres.

Example 74: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating substrate comprises at least one binder.

Example 75: An aerosol-generating article according to Example 74, wherein the aerosol-generating substrate comprises the at least one binder in an amount of 1 percent to 7 percent on a dry weight basis.

Example 76: An aerosol-generating article according to Example 74 or 75, wherein the at least one binder comprises at least one of a natural pectin, a guar gum, a land locust bean gum, a starch, alginate, methyl-, ethyl-, ethylhydroxymethyl- and carboxymethyl- celluloses, dextran, and xanthan gum.

Example 77: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating article has a resistance to draw of between 20 millimetres of water and 60 millimetres of water, preferably between 25 millimetres of water and 55 millimetres of water, preferably between 30 millimetres of water and 50 millimetres of water.

Example 78: An aerosol-generating article according to any preceding Example, wherein the at least one porous layer has a resistance to draw of between 1 millimetre of water and 100 millimetres of water, preferably between 2 millimetres of water and 80 millimetres of water, preferably between 3 millimetres of water and 60 millimetres of water, preferably between 4 millimetres of water and 50 millimetres of water, preferably between 5 millimetres of water and 40 millimetres of water.

Example 79: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer has a permeability of at least 10 CORESTA units, at least 20 CORESTA units, at least 50 CORESTA units, at least 100 CORESTA units, at least 500 CORESTA units, at least 1000 CORESTA units, at least 1500 CORESTA units, at least 2000 CORESTA units, at least 2500 CORESTA units, at least 3000 CORESTA units, at least 3500 CORESTA units, or at least 4000 CORESTA units.

Example 80: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer has a permeability of no more than 10,000 CORESTA units, no more than 8000 CORESTA units, or no more than 5000 CORESTA units.

Example 81: An aerosol-generating article according to any preceding Example, wherein the at least one air permeable layer is formed from a non-porous material and comprises at least one perforation extending through the non-porous material.

Example 82: An aerosol-generating article according to any of Examples 1 to 80, wherein the at least one air permeable layer is formed from a porous material.

Example 83: An aerosol-generating article according to any preceding Example, wherein the aerosol-generating article has a total external surface area, and wherein the at least one air permeable layer defines at least 40 percent of the total external surface area, at least 45 percent of the total external surface area, at least 50 percent of the total external surface area, at least 55 percent of the total external surface area, at least 60 percent of the total external surface area, at least 65 percent of the total external surface area, at least 70 percent of the total external surface area, at least 75 percent of the total external surface area, at least 80 percent of the total external surface area, at least 85 percent of the total external surface area, or at least 90 percent of the total external surface area.

Example 84: An aerosol-generating system comprising:

an aerosol-generating article according to any preceding Example; and

an aerosol-generating device comprising a chamber for receiving the aerosol-generating article.

Example 85: An aerosol-generating system according to Example 84, wherein the aerosol-generating device comprises at least one blocking element arranged to engage the external surface of the aerosol-generating article when the aerosol-generating article is received within the chamber.

Example 86: An aerosol-generating system according to Example 85, wherein the at least one blocking element is arranged to bifurcate an airflow flowing into the aerosol-generating article during use.

Example 87: An aerosol-generating system according to Example 85 or 86, wherein the at least one blocking element is arranged to bifurcate an airflow flowing out of the aerosol-generating article during use.

Examples will now be further described with reference to the figures in which:

Figure 1 shows an exploded perspective view of an aerosol-generating article according to a first embodiment of the present disclosure;

Figure 2 shows a perspective view of the aerosol-generating article of Figure 1 in an assembled configuration;

Figure 3 shows a cross-sectional view of an aerosol-generating device for use with the aerosol-generating article of Figure 2;

Figure 4 shows a cross-sectional view of an aerosol-generating system comprising the aerosol-generating article of Figure 2 and the aerosol-generating device of Figure 3;

5 Figure 5 shows an enlarged partial cross-sectional view of an aerosol-generating system comprising the aerosol-generating article of Figure 2 and an alternative aerosol-generating device;

Figure 6 shows a partially exploded perspective view of an aerosol-generating article according to a second embodiment of the present disclosure;

10 Figure 7 shows a perspective view of the aerosol-generating article of Figure 6 in an assembled configuration;

Figure 8 shows a partially exploded perspective view of an aerosol-generating article according to a third embodiment of the present disclosure; and

15 Figure 9 shows a perspective view of the aerosol-generating article of Figure 8 in an assembled configuration.

Figures 1 and 2 show an aerosol-generating article 10 according to a first embodiment of the present disclosure. The aerosol-generating article 10 comprises a first air permeable layer 24 forming a first external surface 21, a second air permeable layer 25 forming a second external surface 22, and a frame 50 positioned between the first air permeable layer 24 and the second air permeable layer 25. The first and second external surfaces 21, 22 are planar external surfaces and form part of the overall external surface 23 of the aerosol-generating article 10. Each of the first air permeable layer 24 and the second air permeable layer 25 is formed from paper. The paper has a relatively high porosity, which may be formed by perforating the paper.

25 The aerosol-generating article 10 has a length extending in the x-direction, a width extending in the y-direction and a height or thickness extending in the z-direction. The aerosol-generating article 10 has a length of 30 millimetres, a width of 10 millimetres, and a thickness of 3.1 millimetres.

30 The aerosol-generating article 10 is a substantially flat aerosol-generating article or substantially planar aerosol-generating article. In particular, the thickness of the aerosol-generating article 10 is less than 50 percent of both the length and the width of the aerosol-generating article. The aerosol-generating article 10 has a generally rectangular cuboid shape and a laminated structure formed by the first air permeable layer 24, the frame 50 and the second air permeable layer 25. The first air permeable layer 24, the frame 50 and the second air permeable layer 25 are bonded together with an adhesive 15, in particular guar gum.

35 The frame 50 has a length of 30 millimetres, a width of 10 millimetres, and a thickness of 2.7 millimetres. The frame 50 is made from cardboard and partially defines a cavity 30. The cavity

30 has length of 26 millimetres, a width of 6 millimetres, and a thickness of 2.7 millimetres. Therefore, the cavity 30 has a volume of about 421.2 cubic millimetres.

An aerosol-generating substrate 40 is positioned within the cavity 30. The aerosol-generating substrate 40 comprises an aerosol-generating material in the form of tobacco cut filler and has an aerosol-former content of at least 8 percent by weight on a dry weight basis. As shown, the aerosol-generating substrate 40 fills the entire volume of the cavity 30. In the example of Figures 1 and 2, the aerosol-generating substrate 40 has a packing density of about 0.87, a density of about 0.3 grams per cubic centimetre, and a mass of about 110 milligrams. In another example, the aerosol-generating substrate 40 may have a different packing density, a different density and a different mass. For example, aerosol-generating substrate 40 may have a packing density of 0.64, a density of 0.35 grams per cubic centimetre, and a mass of about 95 milligrams.

The cavity 30 extends between a lower opening that forms an air inlet 27 and an upper opening that forms an air outlet 28. The first air permeable layer 24 and the second air permeable layer 25 overlie the air inlet 27 and the air outlet 28 respectively to retain the aerosol-generating substrate 40 in the cavity 30. As shown in Figure 2, during use an incoming airflow 29 may enter the aerosol-generating article 10 by flowing through the first air permeable layer 24 and the air inlet 27. As the airflow traverses the cavity 30 through the aerosol-generating substrate 40, aerosol from the aerosol-generating substrate 40 is entrained in the airflow. An outgoing airflow 31 containing the aerosol exits the aerosol-generating article 10 through the air outlet 28 and the second air permeable layer 25.

Figure 3 shows a cross-sectional view of an aerosol-generating device 100 for use with the aerosol-generating article 10 of Figures 1 and 2. The aerosol-generating device 100 comprises a housing 102 defining a chamber 104 for receiving the aerosol-generating article 10. A mouthpiece 106 is configured for removable attachment to the housing 102 to allow a user to insert the aerosol-generating article 10 into and remove the aerosol-generating article 10 from the chamber 104.

The aerosol-generating device 100 also comprises a first heating element 108 and a second heating element 110 arranged at the bottom and top of the chamber 104 so that the aerosol-generating article 10 is positioned between the first and second heating elements 108, 110 when the aerosol-generating article 10 is received within the chamber 104. A controller 112 is configured to control a supply of power from a power supply 114 to each of the first and second heating elements 108, 110 during use. The power supply 114 is a rechargeable battery.

Each of the first and second heating elements 108, 110 is a resistive heating mesh so that air may flow through the first and second heating elements 108, 110 during use. The housing 102 defines an airflow pathway 116 extending from a device air inlet 118, through the first heating element 108, through the chamber 104, through the second heating element 110, and into the mouthpiece 106.

Figure 4 shows the aerosol-generating device 100 combined with the aerosol-generating article 10 to form an aerosol-generating system 200. During use, the controller 112 supplies power from the power supply 114 to each of the first and second heating elements 108, 110 to heat the aerosol-generating substrate 40, which generates an aerosol. When a user puffs on the mouthpiece 106, air flows along the airflow pathway 116 through the aerosol-generating substrate 40 to entrain the aerosol in the airflow for delivery to the user through the mouthpiece 106.

Figure 5 shows an enlarged cross-sectional view of the aerosol-generating article 10 received in an aerosol-generating device 300 having an alternative arrangement to the aerosol-generating device 100 of Figures 3 and 4. The aerosol-generating device 300 is similar to the aerosol-generating device 100 of Figures 3 and 4 and like reference numerals designate like parts.

The aerosol-generating device 300 differs by the configuration of the second heating element and the airflow through the housing. More specifically, the aerosol-generating device 300 comprises a second heating element 310 that extends across only a portion of the aerosol-generating substrate 40 when the aerosol-generating article 10 is received within the chamber 104. The housing 302 also comprises a blocking element 320 that engages the second external surface 22 of the aerosol-generating article 10 adjacent an end of the second heating element 310. During use the blocking element 320 bifurcates the airflow exiting the aerosol-generating article 10.

Figures 6 and 7 show an aerosol-generating article 400 according to a second embodiment of the present disclosure. The aerosol-generating article 400 is similar to the aerosol-generating article 10 of Figures 1 and 2 and like reference numerals designate like parts.

The aerosol-generating article 400 differs by the addition of a first heating element 408 and a second heating element 410. The first heating element 408 comprises a resistive mesh extending between a first electrical contact 422 and a second electrical contact 424. The second heating element 410 comprises a resistive mesh extending between a third electrical contact 426 and a fourth electrical contact 428. The first heating element 408, the first electrical contact 422 and the second electrical contact 424 are arranged on the first external surface 21 and secured to the first air permeable layer 24 using an adhesive. The second heating element 410, the third electrical contact 426 and the fourth electrical contact 428 are arranged on the second external surface 22 and secured to the second air permeable layer 25 using an adhesive.

The aerosol-generating article 400 may be used with an aerosol-generating device having a similar configuration to the aerosol-generating device 100 of Figures 3 and 4 but without the first and second heating elements 108, 110 in the aerosol-generating device. Instead, the aerosol-generating device comprises a plurality of device contacts for engaging the first, second, third and fourth electrical contacts to supply power to the first and second heating elements 408, 410.

Figures 8 and 9 show an aerosol-generating article 500 according to a third embodiment of the present disclosure. The aerosol-generating article 500 is similar to the aerosol-generating article 400 of Figures 6 and 7 and like reference numerals designate like parts.

The aerosol-generating article 500 differs by the arrangement of the first, second, third and fourth electrical contacts. More specifically, the first electrical contact 522, the second electrical contact 524, the third electrical contact 526 and the fourth electrical contact 528 are folded at an angle of 90 degrees with respect to the first and second heating elements 408, 410 so that the first, second, third and fourth electrical contacts each overlie a peripheral external surface 530 formed by the frame 50.

For the purpose of the present description and of the appended claims, except where otherwise indicated, all numbers expressing amounts, quantities, percentages, and so forth, are to be understood as being modified in all instances by the term "about". Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein. In this context, therefore, a number "A" is understood as $A \pm 10\%$ of "A". Within this context, a number "A" may be considered to include numerical values that are within general standard error for the measurement of the property that the number "A" modifies. The number "A", in some instances as used in the appended claims, may deviate by the percentages enumerated above provided that the amount by which "A" deviates does not materially affect the basic and novel characteristic(s) of the claimed invention. Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein. The terms "in which" and "wherein" are used synonymously through this specification.

Claims

1. An aerosol-generating article for use with an aerosol-generating device to generate an aerosol, the aerosol-generating article having a length extending in an x direction, a width extending in a y direction and a height extending in a z direction, the height being less than each
5 of the length and the width, the aerosol-generating article comprising:

a cavity;

an aerosol-generating substrate positioned within the cavity, the aerosol-generating substrate comprising an aerosol-former in an amount of at least 8 percent on a dry weight basis;

10 and

at least one air permeable layer defining at least part of an external surface of the aerosol-generating article.

2. An aerosol-generating article according to claim 1, wherein the at least one porous layer
15 has a resistance to draw of between 1 millimetre of water and 100 millimetres of water, preferably between 2 millimetres of water and 80 millimetres of water, preferably between 3 millimetres of water and 60 millimetres of water, preferably between 4 millimetres of water and 50 millimetres of water, preferably between 5 millimetres of water and 40 millimetres of water.

3. An aerosol-generating article according to claim 1 or 2, wherein the aerosol-generating article has a resistance to draw of between 20 millimetres of water and 60 millimetres of water, preferably between 25 millimetres of water and 55 millimetres of water, preferably between 30 millimetres of water and 50 millimetres of water.

4. An aerosol-generating article according to claim 1, 2 or 3, wherein the at least one air permeable layer has a permeability of at least 10 CORESTA units, at least 20 CORESTA units, at least 50 CORESTA units, at least 100 CORESTA units, at least 500 CORESTA units, at least 1000 CORESTA units, at least 1500 CORESTA units, at least 2000 CORESTA units, at least 2500 CORESTA units, at least 3000 CORESTA units, at least 3500 CORESTA units, or at least 4000
30 CORESTA units.

5. An aerosol-generating article according to any preceding claim, wherein the at least one air permeable layer has a permeability of no more than 10,000 CORESTA units, no more than 8000 CORESTA units, or no more than 5000 CORESTA units.

6. An aerosol-generating article according to any preceding claim, wherein the at least one air permeable layer is formed from a porous material.

7. An aerosol-generating article according to any preceding claim, wherein the at least one air permeable layer is formed from paper.

8. An aerosol-generating article according to any of claims 1 to 5, wherein the at least one air permeable layer is formed from a non-porous material and comprises at least one perforation extending through the non-porous material.

9. An aerosol-generating article according to any preceding claim, wherein the aerosol-generating article has a total external surface area, and wherein the at least one air permeable layer defines at least 40 percent of the total external surface area, at least 45 percent of the total external surface area, at least 50 percent of the total external surface area, at least 55 percent of the total external surface area, at least 60 percent of the total external surface area, at least 65 percent of the total external surface area, at least 70 percent of the total external surface area, at least 75 percent of the total external surface area, at least 80 percent of the total external surface area, at least 85 percent of the total external surface area, or at least 90 percent of the total external surface area.

10. An aerosol-generating article according to any preceding claim, wherein the external surface comprises opposed first and second external surfaces, wherein the first and second external surfaces are spaced apart from each other in the z direction.

11. An aerosol-generating article according to claim 10, wherein the first and second external surfaces are planar.

12. An aerosol-generating article according to claim 11, wherein the first and second external surfaces are parallel to each other.

13. An aerosol-generating article according to any of claims 10 to 12, wherein the at least one air permeable layer is a single air permeable layer, and wherein the single air permeable layer at least partially defines the first and second external surfaces.

14. An aerosol-generating article according to any of claims 10 to 12, wherein the at least one air permeable layer comprises a first air permeable layer and a second air permeable layer, wherein the first air permeable layer at least partially defines the first external surface, and wherein the second air permeable layer at least partially defines the second external surface.

15. An aerosol-generating system comprising:
an aerosol-generating article according to any preceding claim; and
an aerosol-generating device comprising a chamber for receiving the aerosol-generating article.

1 / 8

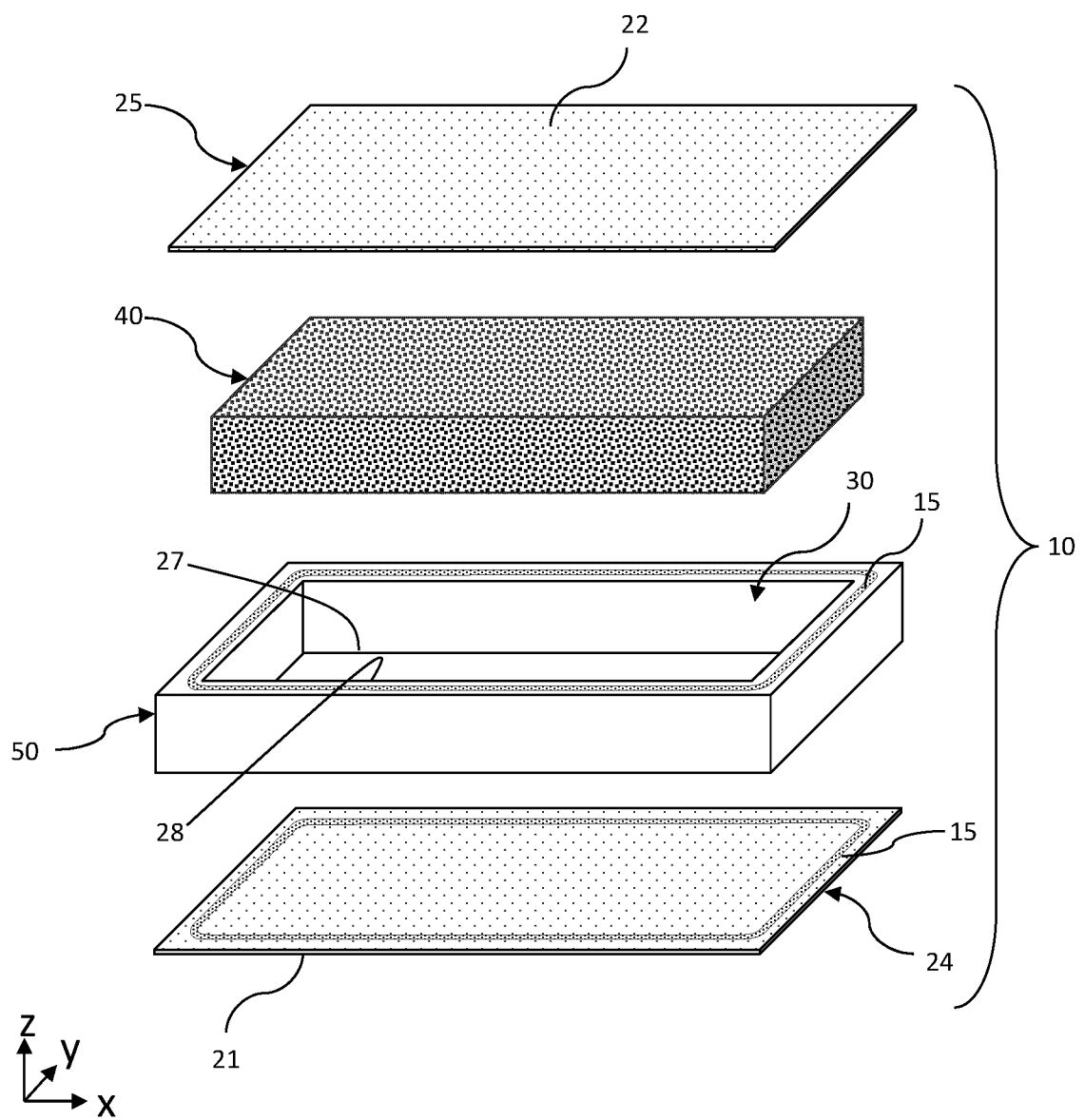


Figure 1

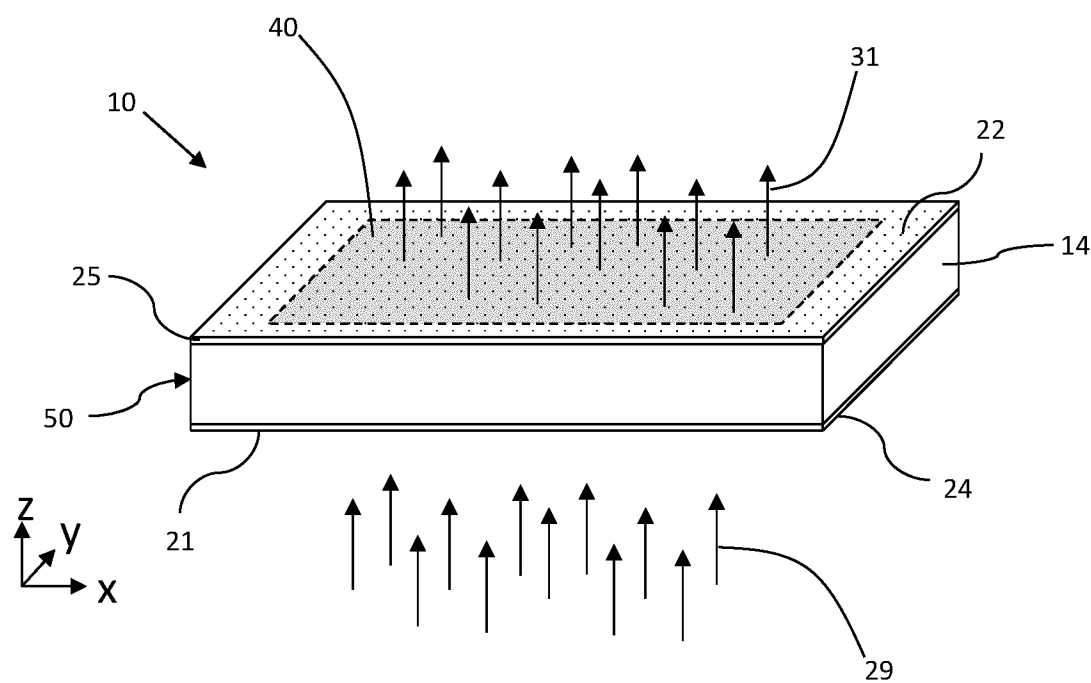


Figure 2

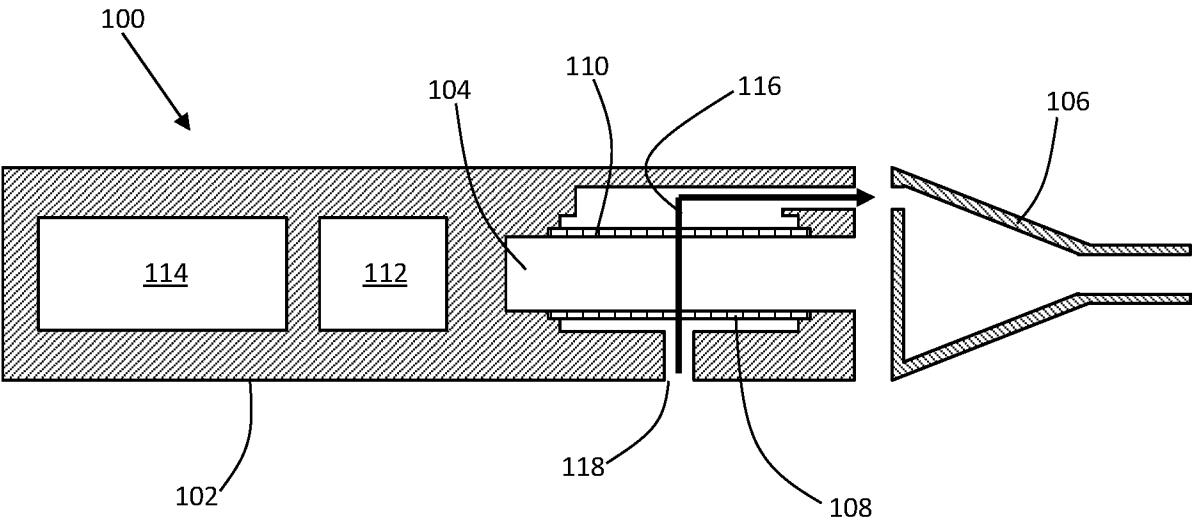


Figure 3

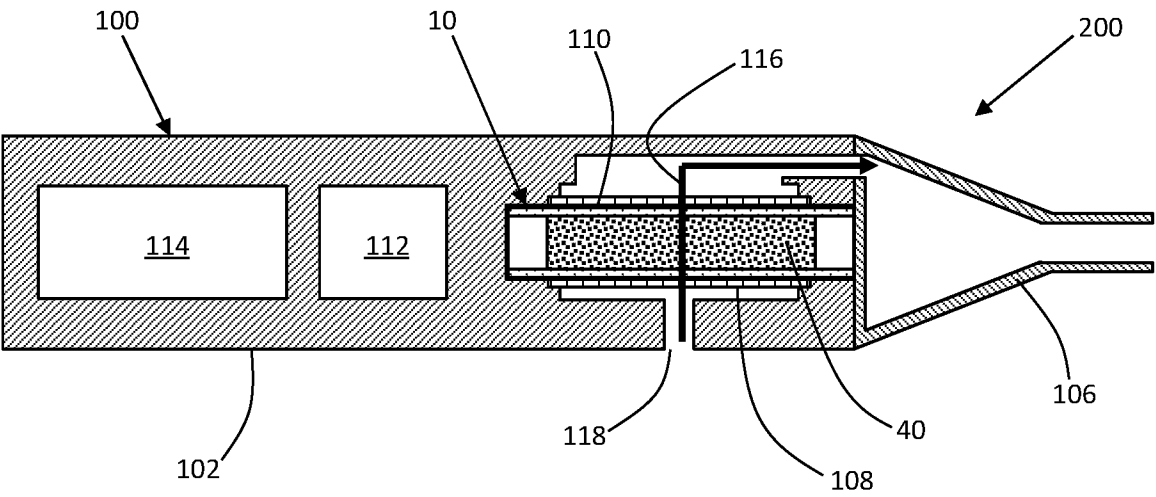


Figure 4

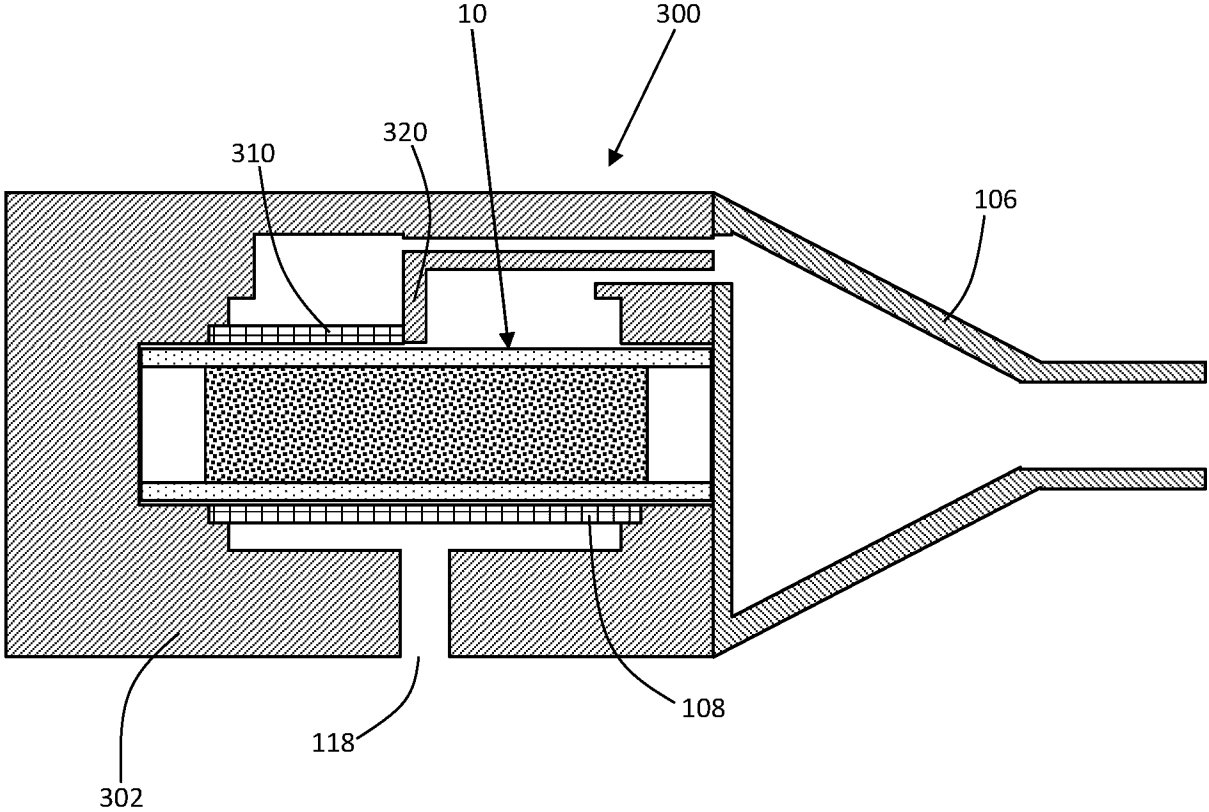


Figure 5

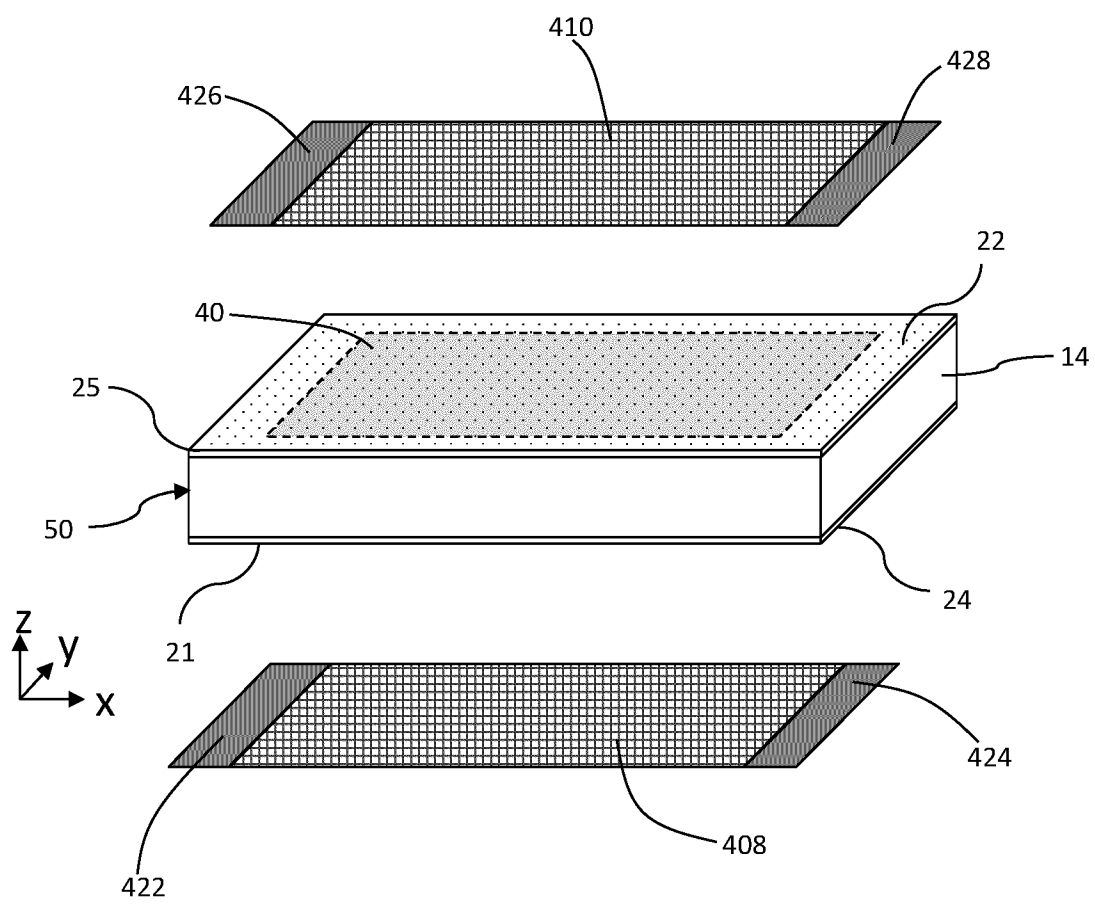


Figure 6

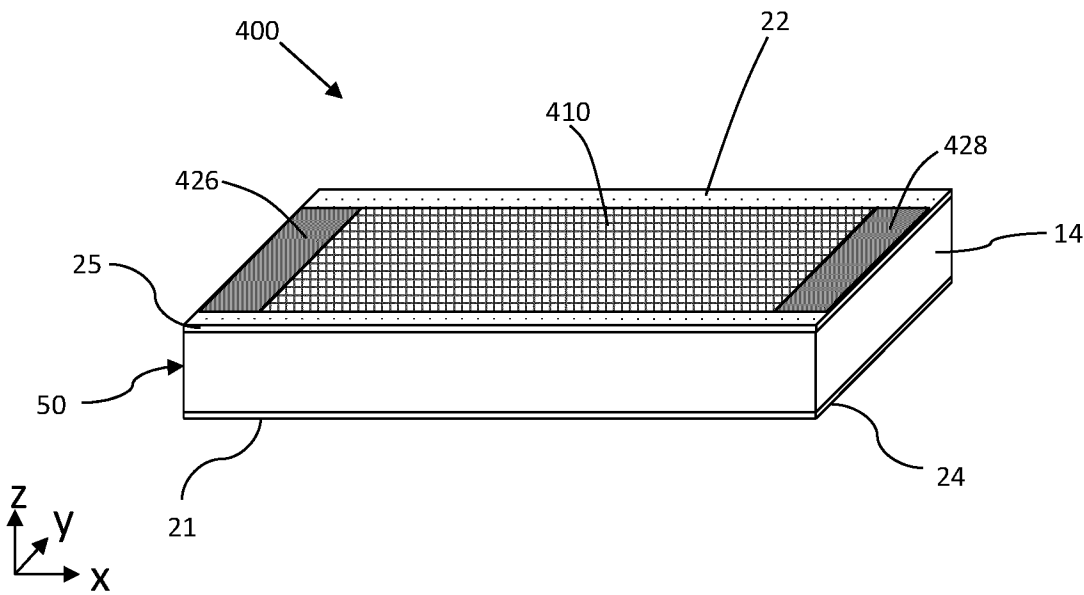


Figure 7

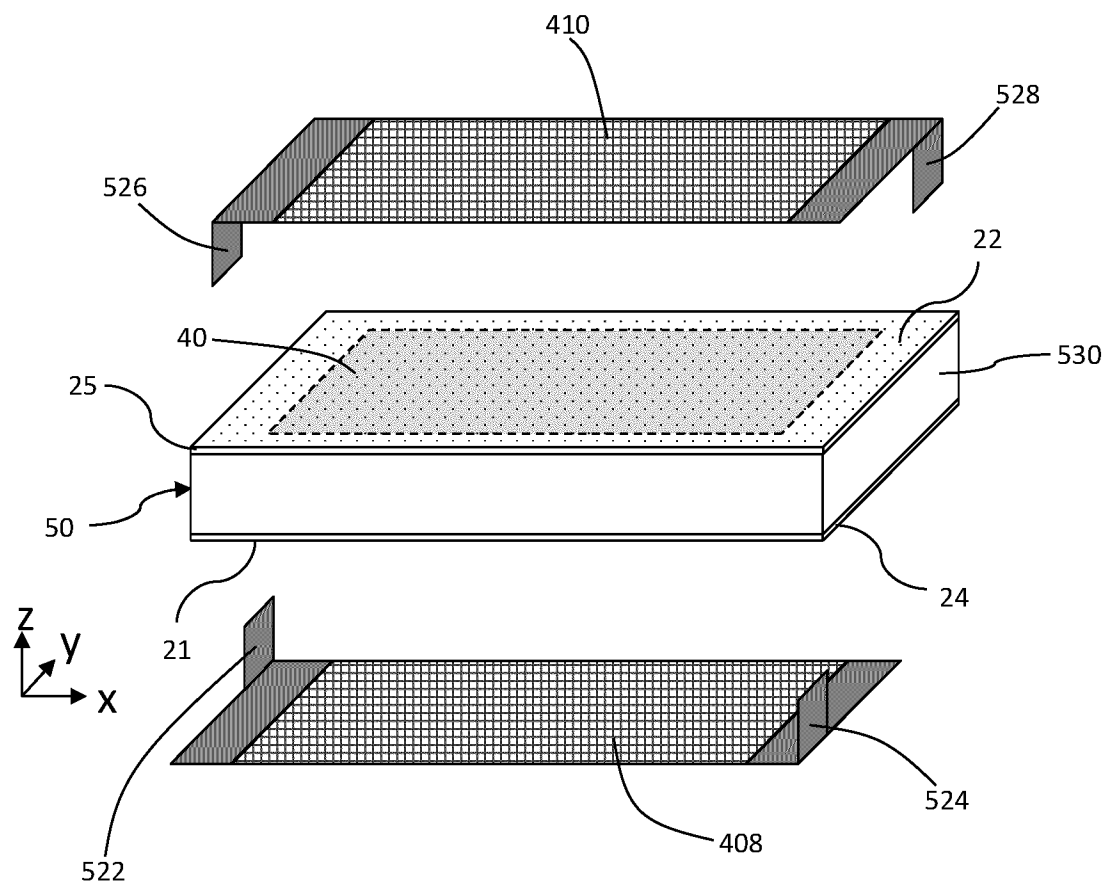


Figure 8

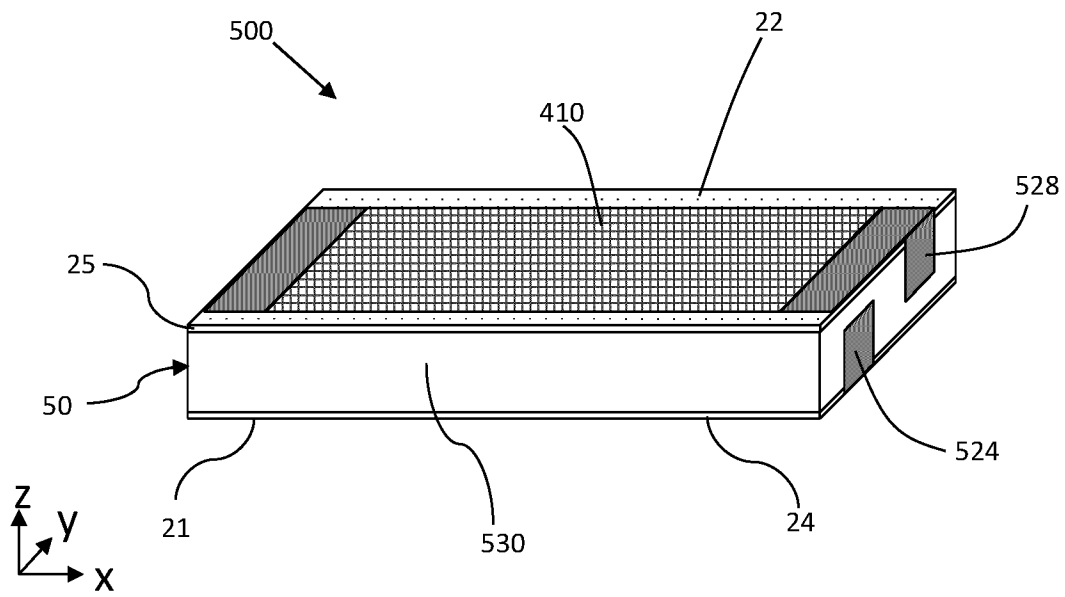


Figure 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/088163

A. CLASSIFICATION OF SUBJECT MATTER

INV. A24F40/42

ADD. A24D1/20 A24F40/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24F A24D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	figures 1-3 paragraph [0047] paragraph [0053] paragraph [0083] paragraph [0112] paragraph [0110] - paragraph [0119] -----	7,13
Y	US 2021/212364 A1 (BATISTA RUI NUNO [CH] ET AL) 15 July 2021 (2021-07-15) figures 1-7 paragraph [0027] paragraph [0047] -----	7
Y	WO 2022/263653 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 22 December 2022 (2022-12-22) figures 1A,1B -----	13



Further documents are listed in the continuation of Box C.



See patent family annex.

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"Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 April 2025

Date of mailing of the international search report

30/04/2025

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Schwertfeger, C

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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