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(54) AEROSOL-GENERATING ARTICLE COMPRISING A WRAPPER WITH A METAL LAYER

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(56) References cited:
WO-A1-2020/025723
WO-A1-2020/025731
WO-A1-2021/053029
CN-A- 110 973 694
US-A1- 2020 107 571
US-A1- 2021 106 046
US-A1- 2021 161 201

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Description

[0001] The present invention relates to an aerosol-generating article comprising a wrapper with a metal layer.

[0002] Aerosol-generating systems for delivering an aerosol to a user typically comprise an aerosol-generating article and an atomiser. The aerosol-generating article includes an aerosol-forming substrate. The atomiser is configured to generate an inhalable aerosol from an aerosol-forming substrate. Some known aerosol-generating systems comprise a thermal atomiser such as an electric heater or an inductive heating device. The thermal atomiser is configured to heat and vaporise the aerosol-forming substrate to generate an aerosol, which can be inhaled by a user. Typical aerosol-forming substrates for use in aerosol-generating systems are nicotine formulations, which may be liquid nicotine formulations comprising an aerosol former such as glycerine.

[0003] It would be desirable to provide an aerosol-generating article that provides improved nicotine delivery.

[0004] CN 110 973 694 A describes a "heated cigarette" comprising an aerosol-forming substrate and a wrapper, wherein the wrapper is wrapped around the aerosol-forming substrate. The article also includes tipping paper, a support section, a cooling section, and a filter. The wrapper comprises a metal layer and a hydrophobic layer, joined together by an adhesive layer. The metal layer is in contact with the aerosol-forming substrate. The thickness of the metal layer is 4-12 micrometres.

[0005] WO 2020/025723 A1 describes a laminate aerosol generating material, wherein the material comprises an aerosol-forming layer attached to a carrier layer, wherein the aerosol-forming layer comprises an amorphous solid and wherein the carrier comprises wood and/or cardboard.

[0006] There is also provided an aerosol-generating article comprising: an aerosol-forming substrate comprising one or more aerosol formers; and a wrapper, wherein the wrapper is wrapped around the aerosol-forming substrate, wherein the wrapper comprises a metal layer, wherein the aerosol-forming substrate has an aerosol former content of greater than or equal to 40 percent by weight, wherein the metal layer has a thickness of greater than or equal to 2 nanometres, and wherein the metal layer has a thickness of less than 2000 nanometres.

[0007] There is also provided an aerosol-generating system comprising aerosol-generating article, the aerosol-generating article comprising: an aerosol-forming substrate comprising one or more aerosol formers; and a wrapper, wherein the wrapper is wrapped around the aerosol-forming substrate, wherein the wrapper comprises a metal layer, and wherein the aerosol-forming substrate has an aerosol former content of greater than or equal to 40 percent by weight, wherein the metal layer has a thickness of greater than or equal to 2 nanometres, and wherein the metal layer has a thickness of less than 2000 nanometres.

[0008] The provision of a wrapper wrapped around the aerosol-forming substrate, and including a metal layer, provides better nicotine delivery when the aerosol-forming substrate comprises a high amount of aerosol former.

[0009] The inventors believe that the metal layer may form a barrier between a surface or surfaces of the aerosol-forming substrate and the other components of the aerosol-generating article. This barrier may reduce migration of one or more components of the aerosol-forming substrate, such as the aerosol former, out of the aerosol-forming substrate and into the other components of the aerosol-generating article.

[0010] The increase in the amount of nicotine delivered from the aerosol-forming substrate may be caused by the barrier reducing the migration of one or more components of the aerosol-forming substrate out of the aerosol-forming substrate.

[0011] As used herein, the term "aerosol-generating article" refers to an article for producing an aerosol. An aerosol-generating article typically comprises an aerosol-forming substrate that is suitable and intended to be heated or combusted in order to release volatile compounds that can form an aerosol. A conventional cigarette is lit when a user applies a flame to one end of the cigarette and draws air through the other end. The localised heat provided by the flame and the oxygen in the air drawn through the cigarette causes the end of the cigarette to ignite, and the resulting combustion generates an inhalable smoke. By contrast, in "heated aerosol-generating articles", an aerosol is generated by heating an aerosol-forming substrate and not by combusting the aerosol-forming substrate. Known heated aerosol-generating articles include, for example, electrically heated aerosol-generating articles.

[0012] As used herein, the term "aerosol-forming substrate" refers to a substrate that is capable of producing upon heating volatile compounds, which can form an aerosol. The aerosol generated from aerosol-forming substrate may be visible to the human eye or invisible and may include vapours (for example, fine particles of substances, which are in a gaseous state, that are ordinarily liquid or solid at room temperature) as well as gases and liquid droplets of condensed vapours.

[0013] As used herein with reference to the present invention, the term "susceptor element" refers to a material that can convert electromagnetic energy into heat. When located within a fluctuating electromagnetic field, eddy currents induced in the susceptor element cause heating of the susceptor element. As the susceptor element is located in thermal contact with the aerosol-forming substrate, the aerosol-forming substrate is heated by the susceptor element.

[0014] The wrapper may comprise a paper layer.

[0015] As used herein, the term "paper layer" is used to describe a layer formed from cellulosic fibres.

[0016] The paper layer may be a non-metallic layer. In other words, the paper layer is not a metal layer or an alloy layer.

[0017] The metal layer may be radially inward of the paper layer.

[0018] Alternatively, the metal layer may be radially outward of the paper layer.

[0019] The metal layer may be deposited on the paper layer. The metal layer may be formed by physical vapour deposition. Advantageously, depositing the metal layer on the paper layer may allow for the wrapper to be thin. When the aerosol-generating article includes a susceptor, a thin wrapper may result in less interaction with the magnetic field and it may not significantly alter the electromagnetic properties of the aerosol-generating article. In addition, use of a thin metal layer may reduce the amount of metal needed to form the metal layer, which may improve sustainability.

[0020] The wrapper may comprise a laminate of the metal layer fixed to the paper layer. The metal layer may be formed by lamination. Advantageously, use of lamination may provide a wrapper that is easier to manufacture. In addition, lamination may result in a more homogenous layer. Moreover, lamination may be a better option than deposition for an aerosol-generating article that is externally heated, due to the better thermo-conductivity of the thicker layers causing increased conduction of heat.

[0021] The wrapper may be wrapped around at least 50 percent of the entire length of the aerosol-forming substrate. The wrapper may be wrapped around at least 80 percent of the entire length of the aerosol-forming substrate. The wrapper may be wrapped around at least 90 percent of the entire length of the aerosol-forming substrate. The wrapper may be wrapped around at least 95 percent of the entire length of the aerosol-forming substrate.

[0022] The aerosol-generating article may comprise a plug containing the aerosol-forming substrate. The plug may be formed from a porous material. The wrapper may be wrapped around the plug.

[0023] The aerosol-generating article may comprise a rod of aerosol-forming substrate. The wrapper may be wrapped around the rod.

[0024] If the metal layer is too thin then it may not be possible to manufacture the metal layer, and the metal layer may have less anti-capillary properties. However, if the metal layer is too thick then there may be more interaction with a magnetic field when the aerosol-generating article is inductively heated, and the metal layer may be more expensive to manufacture.

[0025] The metal layer has a thickness of greater than or equal to 2 nanometres. The metal layer may have a thickness of greater than or equal to 5 nanometres. The metal layer may have a thickness of greater than or equal to 10 nanometres. The metal layer may have a thickness of greater than or equal to 15 nanometres. The metal layer may have a thickness of greater than or equal to 20 nanometres. The metal layer may have a thickness of greater than or equal to 25 nanometres. The metal layer may have a thickness of greater than or equal to 30 nanometres. The metal layer may have a thickness of greater than or equal to 40 nanometres. The metal layer may have a thickness of greater than or equal to 50 nanometres.

[0026] The metal layer may have a thickness of less than 1000 nanometres. The metal layer may have a thickness of less than 500 nanometres. The metal layer may have a thickness of less than 200 nanometres. The metal layer may have a thickness of less than 100 nanometres. The metal layer may have a thickness of less than 90 nanometres. The metal layer may have a thickness of less than 80 nanometres. The metal layer may have a thickness of less than 70 nanometres. The metal layer may have a thickness of less than 60 nanometres. The metal layer may have a thickness of less than 50 nanometres.

[0027] The metal layer may have a thickness of between 2 nanometres and 100 nanometres. The metal layer may have a thickness of between 2 nanometres and 90 nanometres. The metal layer may have a thickness of between 2 nanometres and 80 nanometres. The metal layer may have a thickness of between 2 nanometres and 70 nanometres. The metal layer may have a thickness of between 2 nanometres and 60 nanometres. The metal layer may have a thickness of between 2 nanometres and 50 nanometres.

[0028] The metal layer may have a thickness of between 5 nanometres and 100 nanometres. The metal layer may have a thickness of between 10 nanometres and 100 nanometres. The metal layer may have a thickness of between 15 nanometres and 100 nanometres. The metal layer may have a thickness of between 20 nanometres and 100 nanometres. The metal layer may have a thickness of between 25 nanometres and 100 nanometres. The metal layer may have a thickness of between 30 nanometres and 100 nanometres. The metal layer may have a thickness of between 40 nanometres and 100 nanometres. The metal layer may have a thickness of between 50 nanometres and 100 nanometres.

[0029] The metal layer may have a thickness of between 5 nanometres and 90 nanometres. The metal layer may have a thickness of between 5 nanometres and 80 nanometres. The metal layer may have a thickness of between 10 nanometres and 80 nanometres. The metal layer may have a thickness of between 10 nanometres and 70 nanometres. The metal layer may have a thickness of between 10 nanometres and 60 nanometres. The metal layer may have a thickness of between 15 nanometres and 60 nanometres. The metal layer may have a thickness of between 15 nanometres and 50 nanometres. The metal layer may have a thickness of between 20 nanometres and 50 nanometres. The metal layer may have a thickness of between 20 nanometres and 40 nanometres. The metal layer may have a thickness of between 25 nanometres and 40 nanometres. The metal layer may have a thickness of between 25 nanometres and 30 nanometres.

[0030] The metal layer may comprise one or more of the following metals: aluminium, chromium, copper, gold, nickel, silver, and tin. The metal layer may be formed from aluminium. The metal layer may comprise an aluminium layer. Advantageously, aluminium has a relatively low boiling point, which may make it easier to form the metal layer, particularly

when using vapour deposition. In addition, aluminium has a lower cost when compared to other metals.

[0031] If the paper layer is too thin then the paper layer may not provide enough resistance to tearing. If the paper layer is too thick then the wrapper may be too difficult to roll during manufacture, which may reduce the speed of manufacture of the aerosol-generating article.

[0032] The paper layer may have a thickness of greater than or equal to 10 micrometres. The paper layer may have a thickness of greater than or equal to 20 micrometres. The paper layer may have a thickness of greater than or equal to 40 micrometres.

[0033] The paper layer may have a thickness of less than 120 micrometres. The paper layer may have a thickness of less than 100 micrometres. The paper layer may have a thickness of less than 80 micrometres.

[0034] The paper layer may have a thickness of between 10 micrometres and 120 micrometres. The paper layer may have a thickness of between 10 micrometres and 100 micrometres. The paper layer may have a thickness of between 10 micrometres and 80 micrometres.

[0035] The paper layer may have a thickness of between 20 micrometres and 120 micrometres. The paper layer may have a thickness of between 20 micrometres and about 100 micrometres. The paper layer may have a thickness of between 20 micrometres and 80 micrometres.

[0036] The paper layer may have a thickness of between 40 micrometres and 120 micrometres. The paper layer may have a thickness of between 40 micrometres and 100 micrometres. The paper layer may have a thickness of between 40 micrometres and 80 micrometres.

[0037] The aerosol-generating article may comprise an upstream element located upstream of the aerosol-forming substrate. The upstream element may be located adjacent to the aerosol-forming substrate.

[0038] Advantageously, provision of an upstream element in combination with the metal layer of the wrapper may result in reduced migration of one or more components of the aerosol-forming substrate to other parts of the aerosol-generating article.

[0039] The upstream element may comprise a porous element. The porous element may not significantly alter the resistance to draw of the aerosol-generating article.

[0040] The upstream element may comprise an annular element.

[0041] The wrapper may be wrapped around at least a portion of the upstream element. The wrapper may be wrapped around at least 5 percent of the length of the upstream element. The wrapper may be wrapped around at least 10 percent of the length of the upstream element. The wrapper may be wrapped around at least 20 percent of the length of the upstream element. The wrapper may be wrapped around at least 30 percent of the length of the upstream element. The wrapper may be wrapped around at least 40 percent of the length of the upstream element. The wrapper may be wrapped around at least 50 percent of the length of the upstream element. The wrapper may be wrapped around the entire length of the upstream element.

[0042] Advantageously, providing the wrapper over at least a portion of the upstream element may reduce migration of components of the aerosol-forming substrate through the join between the aerosol-forming substrate and the upstream element.

[0043] The upstream element may be made of any material suitable for use in an aerosol-generating article. The upstream element may be made of a same material as used for one of the other components of the aerosol-generating article. Suitable materials for forming the upstream element include filter materials, ceramic, polymer material, cellulose acetate, cardboard, zeolite or aerosol-generating substrate. The upstream element may be formed from a plug of cellulose acetate.

[0044] The upstream element may be formed of a heat resistant material. For example, the upstream element may be formed of a material that resists temperatures of up to 350 degrees Celsius. This may ensure that the upstream element is not adversely affected by the heating means for heating the aerosol-generating substrate.

[0045] The upstream element may have a diameter that is approximately equal to the diameter of the aerosol-generating article.

[0046] The upstream element may have a length of between 1 millimetre and 10 millimetres. The upstream element may have a length of between 3 millimetres and 8 millimetres. The upstream element may have a length of between 4 millimetres and 6 millimetres.

[0047] The upstream element may have a length of 5 millimetres.

[0048] The length of the upstream element can advantageously be varied in order to provide the desired total length of the aerosol-generating article. For example, where it is desired to reduce the length of one of the other components of the aerosol-generating article, the length of the upstream element may be increased in order to maintain the same overall length of the article.

[0049] The aerosol-generating article may comprise a downstream element located downstream of the aerosol-forming substrate. The downstream element may be located adjacent to the aerosol-forming substrate.

[0050] Advantageously, provision of an downstream element in combination with the metal layer of the wrapper may result in reduced migration of one or more components of the aerosol-forming substrate to other parts of the aerosol-

generating article.

[0051] The wrapper may be wrapped around at least a portion of the downstream element. The wrapper may be wrapped around at least 5 percent of the length of the downstream element. The wrapper may be wrapped around at least 10 percent of the length of the downstream element. The wrapper may be wrapped around at least 20 percent of the length of the downstream element. The wrapper may be wrapped around at least 30 percent of the length of the downstream element. The wrapper may be wrapped around at least 40 percent of the length of the downstream element. The wrapper may be wrapped around at least 50 percent of the length of the downstream element. The wrapper may be wrapped around the entire length of the downstream element.

[0052] Advantageously, providing the wrapper over at least a portion of the downstream element may reduce migration of components of the aerosol-forming substrate through the join between the aerosol-forming substrate and the downstream element.

[0053] The downstream element may be made of any material suitable for use in an aerosol-generating article. The downstream element may be made of a same material as used for one of the other components of the aerosol-generating article. Suitable materials for forming the downstream element include filter materials, ceramic, polymer material, cellulose acetate, cardboard, zeolite or aerosol-generating substrate. The downstream element may be formed from a plug of cellulose acetate.

[0054] The downstream element may be formed of a heat resistant material. For example, the upstream element may be formed of a material that resists temperatures of up to 350 degrees Celsius. This may ensure that the downstream element is not adversely affected by the heating means for heating the aerosol-generating substrate.

[0055] The downstream element may comprise a hollow tubular segment. The hollow tubular segment may also be located adjacent to the aerosol-forming substrate.

[0056] The hollow tubular segment may comprise a cellulose acetate tube. The hollow tubular segment may comprise two cellulose acetate tubes.

[0057] Advantageously, providing the wrapper over at least a portion of the hollow tubular segment may reduce migration of components of the aerosol-forming substrate through the join between the aerosol-forming substrate and the hollow tubular segment.

[0058] The downstream element may be located adjacent to the aerosol-forming substrate.

[0059] The downstream element may comprise a hollow tubular segment.

[0060] The downstream element may comprise a filter plug element.

[0061] The downstream element may comprise a second hollow tubular segment. The second hollow tubular segment may be located adjacent to the hollow tubular segment.

[0062] The wrapper may be wrapped around at least a portion of the second hollow tubular segment. The wrapper may be wrapped around at least 5 percent of the length of the second hollow tubular segment. The wrapper may be wrapped around at least 10 percent of the length of the second hollow tubular segment. The wrapper may be wrapped around at least 20 percent of the length of the second hollow tubular segment. The wrapper may be wrapped around at least 30 percent of the length of the second hollow tubular segment. The wrapper may be wrapped around at least 40 percent of the length of the second hollow tubular segment. The wrapper may be wrapped around at least 50 percent of the length of the second hollow tubular segment. The wrapper may be wrapped around the entire length of the second hollow tubular segment.

[0063] The downstream element may comprise a mouthpiece element at its downstream end. The mouthpiece element may comprise a mouth end cavity. The mouth end cavity may be defined by a hollow tubular element provided at the downstream end of the mouthpiece element. Alternatively, the mouth end cavity may be defined by the outer wrapper, wherein the outer wrapper extends in a downstream direction from the mouthpiece element.

[0064] The wrapper may be wrapped around at least a portion of the mouthpiece element. The wrapper may be wrapped around at least 5 percent of the length of the mouthpiece element. The wrapper may be wrapped around at least 10 percent of the length of the mouthpiece element. The wrapper may be wrapped around at least 20 percent of the length of the mouthpiece element. The wrapper may be wrapped around at least 30 percent of the length of the mouthpiece element. The wrapper may be wrapped around at least 40 percent of the length of the mouthpiece element. The wrapper may be wrapped around at least 50 percent of the length of the mouthpiece element. The wrapper may be wrapped around the entire length of the mouthpiece element.

[0065] In an aerosol-generating article, an upstream element, an aerosol-forming substrate, a hollow tubular segment, a second hollow tubular segment and a mouthpiece element may be referred to as elements of the aerosol-generating article.

[0066] The wrapper may be wrapped around at least one element of the aerosol-generating article. The wrapper may be wrapped around at least two elements of the aerosol-generating article. The wrapper may be wrapped around at least three elements of the aerosol-generating article. The wrapper may be wrapped around at least four elements of the aerosol-generating article. The wrapper may be wrapped around at least five elements of the aerosol-generating article. The wrapper may be wrapped around all elements of the aerosol-generating article. For example, in an aerosol-generating

article comprising an upstream element, an aerosol-forming substrate, a hollow tubular segment, a second hollow tubular segment and a mouthpiece element, wrapper may be wrapped around all of these elements.

[0067] The wrapper may be wrapped around at least 25 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 30 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 35 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 40 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 45 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 50 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 55 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 60 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 65 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 70 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 75 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 80 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 85 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 90 percent of the length of the aerosol-generating article. The wrapper may be wrapped around at least 95 percent of the length of the aerosol-generating article. The wrapper may be wrapped around 100 percent of the length of the aerosol-generating article.

[0068] The wrapper may be wrapped around substantially the whole of the length of the aerosol-generating article. The wrapper may be wrapped around the whole of the length of the aerosol-generating article.

[0069] One or more elements of the aerosol-generating article may comprise an element wrapper wrapped around substantially the whole length of the element. One or more elements of the aerosol-generating article may comprise an element wrapper wrapped around the whole length of the element.

[0070] For example, the aerosol-forming substrate may comprise an element wrapper wrapped around the length of the rod of the aerosol-forming substrate. The upstream element may comprise an element wrapper wrapped around the length of the upstream element. The hollow tubular segment may comprise an element wrapper wrapped around the length of the hollow tubular segment. The second hollow tubular segment may comprise an element wrapper wrapped around the length of the second hollow tubular segment. The mouthpiece element may comprise an element wrapper wrapped around the length of the mouthpiece element.

[0071] Preferably, when the wrapper is wrapped around the length of at least two elements of the aerosol-generating article, one or more of the elements comprises an element wrapper.

[0072] The element wrapper may comprise a paper layer.

[0073] The wrapper may be wrapped around and over the one or more element wrappers.

[0074] The aerosol-forming substrate may comprise a gel. The aerosol-forming substrate may comprise a film. The aerosol-forming substrate may comprise crimped tobacco. The aerosol-forming substrate may comprise cut tobacco filler.

[0075] The aerosol-forming substrate may comprise a colloid. The colloid may have discontinuous solid particles dispersed in a continuous liquid. The colloid may have discontinuous liquid particles dispersed in a continuous liquid. The colloid may have discontinuous liquid particles dispersed in a continuous solid.

[0076] The aerosol-forming substrate may be a solid.

[0077] The aerosol-forming substrate may be a film.

[0078] As used herein, unless indicated otherwise, the term "percent by weight" refers to dry weight.

[0079] The aerosol-forming substrate may have an aerosol former content of greater than 5 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 10 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 15 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 20 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 25 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 30 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 35 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 40 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 45 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than 50 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 60 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 70 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 80 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 95 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 97 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 99 percent by weight.

[0080] The aerosol-forming substrate may have an aerosol former content of greater than or equal to 99 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 97 percent by weight. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 95 percent by

weight. The aerosol-forming substrate may have an aerosol former content of less than 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of less than 80 percent by weight. The aerosol-forming substrate may have an aerosol former content of less than 70 percent by weight. The aerosol-forming substrate may have an aerosol former content of less than 60 percent by weight.

[0081] The aerosol-forming substrate may have an aerosol former content of between 40 percent by weight and 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 40 percent by weight and 80 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 40 percent by weight and 70 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 40 percent by weight and 60 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 40 percent by weight and 50 percent by weight.

[0082] The aerosol-forming substrate may have an aerosol former content of between 40 percent by weight and 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 50 percent by weight and 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 60 percent by weight and 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 70 percent by weight and 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 80 percent by weight and 90 percent by weight.

[0083] The aerosol-forming substrate may have an aerosol former content of between 50 percent by weight and 90 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 50 percent by weight and 80 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 60 percent by weight and 80 percent by weight. The aerosol-forming substrate may have an aerosol former content of between 60 percent by weight and 70 percent by weight.

[0084] The aerosol-forming substrate may have an aerosol former content of greater than or equal to 100 milligrams. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 200 milligrams. The aerosol-forming substrate may have an aerosol former content of greater than or equal to 250 milligrams.

[0085] The aerosol-forming substrate may have an aerosol former content of less than 500 milligrams. The aerosol-forming substrate may have an aerosol former content of less than 400 milligrams. The aerosol-forming substrate may have an aerosol former content of less than 300 milligrams.

[0086] The aerosol-forming substrate may have an aerosol former content of between 100 milligrams and 500 milligrams. The aerosol-forming substrate may have an aerosol former content of between 100 milligrams and 400 milligrams. The aerosol-forming substrate may have an aerosol former content of between 200 milligrams and 400 milligrams. The aerosol-forming substrate may have an aerosol former content of between 200 milligrams and 300 milligrams.

[0087] The aerosol-forming substrate may have an aerosol former content of greater than or equal to 0.05 grams per cubic centimetre. The aerosol-forming substrate may an aerosol former content of greater than or equal to 0.1 grams per cubic centimetre.

[0088] The aerosol-forming substrate may have an aerosol former content of less than 0.3 grams per cubic centimetre. The aerosol-forming substrate may have an aerosol former content of less than 0.25 grams per cubic centimetre.

[0089] The aerosol-forming substrate may have an aerosol former content of between 0.05 grams per cubic centimetre and 0.3 grams per cubic centimetre. The aerosol-forming substrate may have an aerosol former content of between 0.1 grams per cubic centimetre and 0.25 grams per cubic centimetre.

[0090] The one or more aerosol formers may comprise glycerine. The one or more aerosol formers may comprise propylene glycol. The one or more aerosol formers may comprise glycerine and propylene glycol.

[0091] The aerosol-forming substrate may comprise water.

[0092] The aerosol-forming substrate may have a water content of greater than or equal to 10 percent by weight. The aerosol-forming substrate may have a water content of greater than or equal to 15 percent by weight. The aerosol-forming substrate may have a water content of greater than or equal to 20 percent by weight.

[0093] The aerosol-forming substrate may have a water content of less than 30 percent by weight. The aerosol-forming substrate may have a water content of less than 25 percent by weight. The aerosol-forming substrate may have a water content of less than 20 percent by weight.

[0094] The aerosol-forming substrate may have a water content of between 10 percent by weight and 30 percent by weight. The aerosol-forming substrate may have a water content of between 10 percent by weight and 25 percent by weight. The aerosol-forming substrate may have a water content of between 15 percent by weight and 25 percent by weight. The aerosol-forming substrate may have a water content of between 15 percent by weight and 20 percent by weight. The aerosol-forming substrate may have a water content of between 20 percent by weight and 25 percent by weight.

[0095] The aerosol-forming substrate may comprise nicotine.

[0096] The aerosol-forming substrate may have a nicotine content of greater than or equal to 0.5 percent by weight. The aerosol-forming substrate may have a nicotine content of greater than or equal to 1 percent by weight. The aerosol-forming

substrate may have a nicotine content of greater than or equal to 1.5 percent by weight. The aerosol-forming substrate may have a nicotine content of greater than or equal to 2 percent by weight. The aerosol-forming substrate may have a nicotine content of greater than or equal to 2.5 percent by weight. The aerosol-forming substrate may have a nicotine content of greater than or equal to 5 percent by weight.

[0097] The aerosol-forming substrate may have a nicotine content of less than 5 percent by weight. The aerosol-forming substrate may have a nicotine content of less than 2.5 percent by weight. The aerosol-forming substrate may have a nicotine content of less than 2 percent by weight. The aerosol-forming substrate may have a nicotine content of less than 1.5 percent by weight.

[0098] The aerosol-forming substrate may have a nicotine content of between 0.5 percent by weight and 5 percent by weight. The aerosol-forming substrate may have a nicotine content of between 0.5 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have a nicotine content of between 1 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have a nicotine content of between 1 percent by weight and 2 percent by weight. The aerosol-forming substrate may have a nicotine content of between 1.5 percent by weight and 2 percent by weight. The aerosol-forming substrate may have a nicotine content of between 1 percent by weight and 1.5 percent by weight.

[0099] The aerosol-forming substrate may comprise a film-forming agent.

[0100] The film-forming agent may be a cellulose-based film-forming agent.

[0101] The cellulose-based film-forming agent may be a carboxymethyl cellulose.

[0102] The carboxymethyl cellulose may be sodium carboxymethyl cellulose.

[0103] The aerosol-forming substrate may have a film-forming agent content of greater than or equal to 0.5 percent by weight. The aerosol-forming substrate may have a film-forming agent content of greater than or equal to 1 percent by weight. The aerosol-forming substrate may have a film-forming agent content of greater than or equal to 1.5 percent by weight. The aerosol-forming substrate may have a film-forming agent content of greater than or equal to 2 percent by weight. The aerosol-forming substrate may have a film-forming agent content of greater than or equal to 2.4 percent by weight. The aerosol-forming substrate may have a film-forming agent content of greater than or equal to 2.5 percent by weight.

[0104] The aerosol-forming substrate may have a film-forming agent content of less than 5 percent by weight. The aerosol-forming substrate may have a film-forming agent content of less than 4 percent by weight. The aerosol-forming substrate may have a film-forming agent content of less than 3 percent by weight. The aerosol-forming substrate may have a film-forming agent content of less than 2.5 percent by weight.

[0105] The aerosol-forming substrate may have a film-forming agent content of between 0.5 percent by weight and 5 percent by weight. The aerosol-forming substrate may have a film-forming agent content of between 0.5 percent by weight and 4 percent by weight. The aerosol-forming substrate may have a film-forming agent content of between 1 percent by weight and 4 percent by weight. The aerosol-forming substrate may have a film-forming agent content of between 1 percent by weight and 3 percent by weight. The aerosol-forming substrate may have a film-forming agent content of between 1.5 percent by weight and 3 percent by weight. The aerosol-forming substrate may have a film-forming agent content of between 1.5 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have a film-forming agent content of between 2 percent by weight and 2.5 percent by weight.

[0106] The aerosol-forming substrate may have a carboxymethyl cellulose content of greater than or equal to 0.5 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of greater than or equal to 1 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of greater than or equal to 1.5 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of greater than or equal to 2 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of greater than or equal to 2.4 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of greater than or equal to 2.5 percent by weight.

[0107] The aerosol-forming substrate may have a carboxymethyl cellulose content of less than 5 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of less than 4 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of less than 3 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of less than 2.5 percent by weight.

[0108] The aerosol-forming substrate may have a carboxymethyl cellulose content of between 0.5 percent by weight and 5 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of between 0.5 percent by weight and 4 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of between 1 percent by weight and 4 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of between 1 percent by weight and 3 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of between 1.5 percent by weight and 3 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of between 1.5 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have a carboxymethyl cellulose content of between 2 percent by weight and 2.5 percent by weight.

[0109] The aerosol-forming substrate may comprise one or more acids.

[0110] The one or more acids may be one or more organic acids.

[0111] The one or more organic acids may be one or more carboxylic acids.

[0112] The one or more carboxylic acids may be lactic acid.

[0113] The one or more carboxylic acids may be levulinic acid.

[0114] The aerosol-forming substrate may have an acid content of greater than or equal to 0.5 percent by weight. The aerosol-forming substrate may have an acid content of greater than or equal to 1 percent by weight. The aerosol-forming substrate may have an acid content of greater than or equal to 1.5 percent by weight. The aerosol-forming substrate may have an acid content of greater than or equal to 1.7 percent by weight. The aerosol-forming substrate may have an acid content of greater than or equal to 2 percent by weight.

[0115] The aerosol-forming substrate may have an acid content of less than 5 percent by weight. The aerosol-forming substrate may have an acid content of less than 2.5 percent by weight. The aerosol-forming substrate may have an acid content of less than 2 percent by weight. The aerosol-forming substrate may have an acid content of less than 1.7 percent by weight. The aerosol-forming substrate may have an acid content of less than 1.5 percent by weight.

[0116] The aerosol-forming substrate may have an acid content of between 0.5 percent by weight and 5 percent by weight. The aerosol-forming substrate may have an acid content of between 0.5 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have an acid content of between 1 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have an acid content of between 1 percent by weight and 2 percent by weight. The aerosol-forming substrate may have an acid content of between 1.5 percent by weight and 2 percent by weight.

[0117] The aerosol-forming substrate may have a lactic acid content of greater than or equal to 0.5 percent by weight. The aerosol-forming substrate may have a lactic acid content of greater than or equal to 1 percent by weight. The aerosol-forming substrate may have a lactic acid content of greater than or equal to 1.5 percent by weight. The aerosol-forming substrate may a lactic acid content of greater than or equal to 1.7 percent by weight. The aerosol-forming substrate may have a lactic acid content of greater than or equal to 2 percent by weight.

[0118] The aerosol-forming substrate may have a lactic acid content of less than 5 percent by weight. The aerosol-forming substrate may have a lactic acid content of less than 2.5 percent by weight. The aerosol-forming substrate may have a lactic acid content of less than 2 percent by weight. The aerosol-forming substrate may have a lactic acid content of less than 1.7 percent by weight. The aerosol-forming substrate may have a lactic acid content of less than 1.5 percent by weight.

[0119] The aerosol-forming substrate may have a lactic acid content of between 0.5 percent by weight and 5 percent by weight. The aerosol-forming substrate may have a lactic acid content of between 0.5 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have a lactic acid content of between 1 percent by weight and 2.5 percent by weight. The aerosol-forming substrate may have a lactic acid content of between 1 percent by weight and 2 percent by weight. The aerosol-forming substrate may have a lactic acid content of between 1.5 percent by weight and 2 percent by weight.

[0120] The aerosol-forming substrate may have a moisture content of greater than or equal to 10 percent by weight. The aerosol-forming substrate may have a moisture content of greater than or equal to 15 percent by weight. The aerosol-forming substrate may have a moisture content of greater than or equal to 20 percent by weight. The aerosol-forming substrate may have a moisture content of greater than or equal to 25 percent by weight.

[0121] The aerosol-forming substrate may have a moisture content of less than 30 percent by weight. The aerosol-forming substrate may have a moisture content of less than 25 percent by weight. The aerosol-forming substrate may have a moisture content of less than 20 percent by weight. The aerosol-forming substrate may have a moisture content of less than 15 percent by weight.

[0122] The aerosol-forming substrate may have a moisture content of between 10 percent by weight and 30 percent by weight. The aerosol-forming substrate may have a moisture content of between 10 percent by weight and 25 percent by weight. The aerosol-forming substrate may have a moisture content of between 10 percent by weight and 20 percent by weight. The aerosol-forming substrate may have a moisture content of between 10 percent by weight and 15 percent by weight.

[0123] The aerosol-forming substrate may have a moisture content of between 15 percent by weight and 30 percent by weight. The aerosol-forming substrate may have a moisture content of between 20 percent by weight and 30 percent by weight. The aerosol-forming substrate may have a moisture content of between 25 percent by weight and 30 percent by weight.

[0124] The aerosol-forming substrate may have a moisture content of between 15 percent by weight and 25 percent by weight. The aerosol-forming substrate may have a moisture content of between 20 percent by weight and 25 percent by weight. The aerosol-forming substrate may have a moisture content of between 15 percent by weight and 20 percent by weight.

[0125] The moisture content is measured as according to the method defined in the description below.

[0126] The term "length" denotes the dimension of the aerosol-generating article or a component of the aerosol-generating article in the longitudinal direction.

[0127] The aerosol-generating article may have a length of less than 100 millimetres. The aerosol-generating article may have a length of less than 90 millimetres. The aerosol-generating article may have a length of less than 80 millimetres. The aerosol-generating article may have a length of less than 70 millimetres. The aerosol-generating article may have a length of less than 60 millimetres. The aerosol-generating article may have a length of less than 50 millimetres.

[0128] The aerosol-generating article may have a length of greater than or equal to 30 millimetres. The aerosol-generating article may have a length of greater than or equal to 35 millimetres. The aerosol-generating article may have a length of greater than or equal to 38 millimetres. The aerosol-generating article may have a length of greater than or equal to 40 millimetres. The aerosol-generating article may have a length of greater than or equal to 42 millimetres. The aerosol-generating article may have a length of greater than or equal to 45 millimetres.

[0129] The aerosol-generating article may have a length of between 38 millimetres and 70 millimetres. The aerosol-generating article may have a length of between 40 millimetres and 70 millimetres. The aerosol-generating article may have a length of between 42 millimetres and 70 millimetres.

[0130] The aerosol-generating article may have a length of between 38 millimetres and 60 millimetres. The aerosol-generating article may have a length of between 40 millimetres and 60 millimetres.

[0131] The aerosol-generating article may have a length of between 38 millimetres and 50 millimetres. The aerosol-generating article may have a length of between 42 millimetres and 50 millimetres.

[0132] The aerosol-generating article may have a length of 45 millimetres.

[0133] The aerosol-generating article may have an external diameter of less than 15 millimetres. The aerosol-generating article may have an external diameter of less than 12 millimetres. The aerosol-generating article may have an external diameter of less than 10 millimetres. The aerosol-generating article may have an external diameter of less than 8 millimetres.

[0134] The aerosol-generating article may have an external diameter of greater than or equal to 5 millimetres. The aerosol-generating article may have an external diameter of greater than or equal to 6 millimetres. The aerosol-generating article may have an external diameter of greater than or equal to 7 millimetres.

[0135] The aerosol-generating article may have an external diameter of between 5 millimetres and 12 millimetres. The aerosol-generating article may have an external diameter of between 6 millimetres and 12 millimetres. The aerosol-generating article may have an external diameter of between 7 millimetres and 12 millimetres.

[0136] The aerosol-generating article may have an external diameter of between 5 millimetres and 10 millimetres. The aerosol-generating article may have an external diameter of between 6 millimetres and 10 millimetres. The aerosol-generating article may have an external diameter of between 7 millimetres and 10 millimetres.

[0137] The aerosol-generating article may have an external diameter of between 5 millimetres and 8 millimetres. The aerosol-generating article may have an external diameter of between 6 millimetres and 8 millimetres. The aerosol-generating article may have an external diameter of between 7 millimetres and 8 millimetres.

[0138] The aerosol-generating article may comprise an outermost wrapper wrapped around at least the aerosol-forming substrate and the wrapper.

[0139] The outermost wrapper may be formed from paper.

[0140] The aerosol-generating article may comprise a susceptor element. The aerosol-generating article may comprise a plurality of susceptor elements.

[0141] The susceptor element may be an elongate susceptor element. The susceptor element may be rod-shaped. The susceptor element may be flat. Preferably, the susceptor element has a length of 12 mm. Preferably, the susceptor element has a width of 5 mm. Preferably, the susceptor element has a thickness of 60 μm.

[0142] When used for describing the susceptor element, the term "elongate" means that the susceptor element has a length dimension that is greater than its width dimension or its thickness dimension. For example, the length dimension may be greater than twice the width dimension or the thickness dimension.

[0143] The susceptor element may be arranged substantially longitudinally within the aerosol-generating article. This means that the length dimension of the susceptor element is arranged to be approximately parallel to the longitudinal direction of the aerosol-generating article. For example, the susceptor element may be arranged to be within plus or minus 10 degrees of parallel to the longitudinal direction of the aerosol-generating article. The susceptor element may be positioned in a radially central position within the aerosol-generating article. The susceptor element may extend along the longitudinal axis of the rod.

[0144] The susceptor element may be provided within the aerosol-forming substrate. The susceptor element may extend the entire length of the aerosol-forming substrate.

[0145] The susceptor element may be a plurality of susceptor particles which may be deposited on or embedded within the aerosol-forming substrate. The susceptor particles may be immobilized by the aerosol-forming substrate and remain at an initial position. The susceptor particles may be homogeneously distributed in the aerosol- forming substrate. Due to the particulate nature of the susceptor, heat may be produced according to the distribution of the particles in the aerosol-forming substrate. Alternatively, the susceptor element may be in the form of one or more sheets, strips, shreds or rods that may be placed next to or embedded in the aerosol-forming substrate. The aerosol-forming substrate may comprise one or

more susceptor strips.

[0146] As used herein, the term "thickness" refers to the distance through the susceptor, from one external face to another external face. The susceptor element may have a thickness of between 1 millimetre and 5 millimetres. The susceptor element may have a thickness of between 0.01 millimetres and 2 millimetres. The susceptor element may have a thickness of between 0.5 millimetres and 2 millimetres. The susceptor element may have a thickness of between 10 micrometres and 500 micrometres. The susceptor element may have a thickness of between 10 micrometres and 100 micrometres.

[0147] The susceptor may have a constant cross- section. The susceptor element may have a circular cross-section. If the susceptor element has a circular cross-section, the susceptor element may have a diameter of between 1 millimetre and 5 millimetres. The diameter of a susceptor with a non-circular cross-section, such as a flat susceptor, may be equivalent to the thickness of the flat susceptor.

[0148] The susceptor element may have a diameter of less than 5 millimetres. The susceptor element may have a diameter of less than 4 millimetres. The susceptor element may have a diameter of less than 3 millimetres. The susceptor element may have a diameter of less than 2 millimetres.

[0149] The susceptor element may have a diameter of greater than or equal to 1 millimetre. The susceptor element may have a diameter of greater than or equal to 2 millimetres. The susceptor element may have a diameter of greater than or equal to 3 millimetres The susceptor element may have a diameter of greater than or equal to 4 millimetres.

[0150] For example, when the susceptor element has a circular cross-section, the width of the susceptor element may be the same as the diameter of the susceptor element.

[0151] A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 3000. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 2750. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 2500. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 2250. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 2000. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 1750. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 1500. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 1250. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be less than 1000.

[0152] A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 1000. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 1250. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 1500. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 1750. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 2000. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 2250. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 2500. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 2750. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be greater than or equal to 3000.A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1000 and 3000. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1250 and 3000. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1250 and 2750. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1500 and 2750. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1500 and 2500. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1750 and 2500. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1750 and 2250. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 2000 and 2250. A ratio of the thickness of the susceptor element to the thickness of the metal layer may be between 1750 and 2000.

[0153] The total exposed surface area of the aerosol-forming substrate may be maximised by increasing the bulk density of the aerosol-forming substrate so that a greater amount of the substrate, and therefore potentially a larger exposed surface area, can be provided per unit volume of the plug of aerosol-forming substrate. The efficiency of release of aerosol from a given volume of aerosol-forming substrate can thereby be improved.

[0154] Mitigating migration of components away from an aerosol-forming substrate may be particularly important when the bulk density is high because the aerosol-forming substrate has move contact with the wrapper.

[0155] The bulk density of the aerosol-forming substrate may be greater than or equal to 100 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or equal to 200 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or equal to 300 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or equal to 400 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or equal to 500 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or

equal to 600 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or equal to 750 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or equal to 850 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be greater than or equal to 1000 milligrams per cubic centimetre of the aerosol-forming substrate.

[0156] The bulk density of the aerosol-forming substrate may be less than 2000 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be less than 1750 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be less than 1500 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be less than 1250 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be less than 1000 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be less than 850 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may less than 750 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be less than 600 milligrams per cubic centimetre of the aerosol-forming substrate.

[0157] The bulk density of the aerosol-forming substrate may be between 100 milligrams per cubic centimetre of the aerosol-forming substrate and 2000 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be between 200 milligrams per cubic centimetre of the aerosol-forming substrate and 1500 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be between 300 milligrams per cubic centimetre of the aerosol-forming substrate and 1000 milligrams per cubic centimetre of the aerosol-forming substrate. The bulk density of the aerosol-forming substrate may be between 400 milligrams per cubic centimetre of the aerosol-forming substrate and 600 milligrams per cubic centimetre of the aerosol-forming substrate.

[0158] The bulk density of the aerosol-forming substrate corresponds to the total weight of the aerosol-forming substrate (in milligrams), not including the weight of any carrier material, divided by the total volume of the aerosol-forming substrate (in cubic centimetres).

[0159] The aerosol-generating system may include an aerosol-generating device.

[0160] The aerosol-generating device may comprise a housing defining a device cavity configured to receive at least a portion of the aerosol-generating article.

[0161] The aerosol-generating device may comprise an atomiser configured to generate an aerosol from the aerosol-forming substrate.

[0162] The atomiser may be a thermal atomiser.

[0163] As used herein, the term "thermal atomiser" describes an atomiser that is configured to heat the aerosol-forming substrate to generate an aerosol.

[0164] The aerosol-generating device may comprise any suitable type of thermal atomiser. For example, the thermal atomiser may comprise a heater. The thermal atomiser may comprise an electric heater. In one example, the thermal atomiser may comprise an electric heater comprising a heating element. The heating element may be a resistive heating element. In one example, the heating element may comprise a heater blade or pin adapted to be inserted into the aerosol-forming substrate so that the aerosol-forming substrate is heated from its inside. In another example, the heating element may partially or completely surround the aerosol-forming substrate and heat the aerosol-forming substrate circumferentially from its outside.

[0165] In another example, the thermal atomiser may comprise an inductive heating device. Inductive heating devices typically comprise an induction source that is configured to be coupled to a susceptor element, which may be provided externally to the aerosol-forming substrate or internally within the aerosol-forming substrate. The induction source generates an alternating electromagnetic field that induces magnetization or eddy currents in the susceptor element. The susceptor element may be heated as a result of hysteresis losses or induced eddy currents which heat the susceptor element through ohmic or resistive heating.

[0166] The aerosol-generating device may include a susceptor. The susceptor element may be as described above in relation to the aerosol-generating article.

[0167] An aerosol-generating device comprising an inductive heating device may be configured to receive an aerosol-generating article having the aerosol-forming substrate and a susceptor element in thermal proximity to the aerosol-forming substrate. Typically, the susceptor element is in direct contact with the aerosol-forming substrate and heat is transferred from the susceptor element to the aerosol-forming substrate primarily by conduction.

[0168] Examples of electrically operated aerosol-generating systems having inductive heating devices and aerosol-generating articles having susceptor elements are described in WO-A1-95/27411 and WO-A1-2015/177255.

[0169] The aerosol-generating device may comprise a battery and control electronics.

[0170] It will be appreciated that any features described herein in relation to one embodiment of an aerosol-forming substrate, an aerosol-generating article, an aerosol-generating device, or an aerosol-generating system may also be

applicable to other embodiments of aerosol-forming substrates, an aerosol-generating articles, an aerosol-generating devices, or aerosol-generating systems according to this disclosure. A feature described in relation to one embodiment may be equally applicable to another embodiment in accordance with this disclosure. It will also be appreciated that an aerosol generator according to this disclosure may be provided in an aerosol-generating device without a cartridge. Accordingly, any of the features described herein with relation to a cartridge may be equally applicable to an aerosol-generating device.

[0171] The invention will be further described with reference to the drawings shown in the accompanying Figures, in which:

Figure 1 shows a schematic side sectional view of an aerosol-generating article in accordance with the invention;
Figure 2 shows a schematic side sectional view of another aerosol-generating article in accordance with the invention;
Figure 3 shows a schematic side sectional view of another aerosol-generating article in accordance with the invention;
Figure 4 shows a schematic side sectional view of another aerosol-generating article in accordance with the invention;
Figure 5 shows a schematic side sectional view of another aerosol-generating article in accordance with the invention; and
Figure 6 shows a schematic side sectional view of another aerosol-generating article in accordance with the invention.

[0172] Aerosol-generating systems for delivering an aerosol to a user typically comprise an aerosol-generating article and an atomiser. The aerosol-generating article includes an aerosol-forming substrate. The atomiser is configured to generate an inhalable aerosol from an aerosol-forming substrate. Some known aerosol-generating systems comprise a thermal atomiser such as an electric heater or an inductive heating device. The thermal atomiser is configured to heat and vaporise the aerosol-forming substrate to generate an aerosol, which can be inhaled by a user. Typical aerosol-forming substrates for use in aerosol-generating systems are nicotine formulations, which may be liquid nicotine formulations comprising an aerosol former such as glycerine.

[0173] The aerosol-forming substrate is typically held within a plug of a porous material. It has been found that, in some cases, a quantity of one or more components of the aerosol-forming substrate, such as glycerine or nicotine, may leak out of the plug and migrate to other parts of the aerosol-generating article. Migration of the aerosol-forming substrate away from the plug may reduce the amount of aerosol-forming substrate that can be vaporised and then inhaled by a user.

[0174] Accordingly, migration of a components of the aerosol-forming substrate away from the plug may have a negative impact of the user experience provided by the aerosol-generating article. For example, migration of nicotine from the aerosol-forming substrate may reduce the amount of nicotine that can be inhaled by a user.

[0175] It has been found that migration of components of the aerosol-forming substrate away from the plug is particularly a problem for aerosol-forming substrates having significant quantities of aerosol-former, such as an aerosol former content of greater than 40 percent by weight. This may be because an increased proportion of glycerine in the aerosol-forming substrate provides a more fluid aerosol-forming substrate, which is more liable to leak.

[0176] One known solution is to wrap the aerosol-generating article in hydrophobic paper. However, the present inventors have found that when using hydrophobic paper, some of the aerosol former in the aerosol-forming substrate may migrate into the paper during the process of manufacturing the aerosol-generating article. This can dampen or soften the hydrophobic paper, which may make the aerosol-generating article difficult to handle, or may result in the aerosol-generating becoming jammed in a machine used for manufacturing the aerosol-generating article.

[0177] It would be desirable to provide an aerosol-generating article that has a reduced likelihood of a component of the aerosol-forming substrate migrating from the aerosol-forming substrate to another part of the aerosol-generating article.

[0178] Figure 1 shows an example of an aerosol-generating article 10.

[0179] The aerosol-generating article 100 includes a rod 12 of aerosol-forming substrate. In this example, the rod 12 of aerosol-forming substrate is formed by crimping a portion of a sheet of cast leaf tobacco.

[0180] The aerosol-generating article 100 also includes a downstream section 14 and an upstream section 16. The downstream section 14 is at a location downstream of the rod 12 of aerosol-forming substrate. The upstream section 16 is at a location upstream of the rod 12 of aerosol-forming substrate. In this example, the aerosol-generating article 100 extends from an upstream end (or distal end) 18 to a downstream end (or mouth end) 20.

[0181] In the example shown in Figure 1, the aerosol-generating article 100 has an overall length of about 45 millimetres.

[0182] The downstream section 14 includes a support element 22 located immediately downstream of the rod 12 of aerosol-forming substrate. The support element 22 is in longitudinal alignment with the rod 12 of aerosol-forming substrate.

[0183] In the example shown in Figure 1, the upstream end of the support element 22 abuts the downstream end of the rod 12 of aerosol-forming substrate.

[0184] The downstream section 14 includes an aerosol-cooling element 24. The aerosol-cooling element 24 is located immediately downstream of the support element 22. The aerosol-cooling element 24 is in longitudinal alignment with the rod 12 of aerosol-forming substrate and the support element 22. In the example shown in Figure 1, an upstream end of the

aerosol-cooling element 24 abuts a downstream end of the support element 22.

[0185] The support element 22 and the aerosol-cooling element 24 together define an intermediate hollow section 50 of the aerosol-generating article 10.

[0186] The support element 22 includes a first hollow tubular segment 26. In the example of Figure 1, the first hollow tubular segment 26 is provided in the form of a hollow cylindrical tube made of cellulose acetate. The first hollow tubular segment 26 defines an internal cavity 28 that extends all the way from an upstream end 30 of the first hollow tubular segment 26 to a downstream end 32 of the first hollow tubular segment 26. The internal cavity 28 is substantially empty, and so substantially unrestricted airflow is enabled along the internal cavity 28.

[0187] In the example shown in Figure 1, the first hollow tubular segment 26 has a length of about 8 millimetres, an external diameter of about 7.25 millimetres, and an internal diameter of about 1.9 millimetres. Thus, a thickness of a peripheral wall of the first hollow tubular segment 26 is about 2.67 millimetres.

[0188] The aerosol-cooling element 24 includes a second hollow tubular segment 34. In the example of Figure 1, the second hollow tubular segment 34 is provided in the form of a hollow cylindrical tube made of cellulose acetate. The second hollow tubular segment 34 defines an internal cavity 36 that extends all the way from an upstream end 38 of the second hollow tubular segment to a downstream end 40 of the second hollow tubular segment 34. The internal cavity 36 is substantially empty, and so substantially unrestricted airflow is enabled along the internal cavity 36.

[0189] In the example shown in Figure 1, the second hollow tubular segment 34 has a length of about 8 millimetres, an external diameter of about 7.25 millimetres, and an internal diameter of about 3.25 millimetres. Thus, a thickness of a peripheral wall of the second hollow tubular segment 34 is about 2 millimetres. Thus, a ratio between the internal diameter of the first hollow tubular segment 26 and the internal diameter of the second hollow tubular segment 34 is about 0.75.

[0190] The aerosol-generating article 100 has a ventilation zone 60 provided at a location along the second hollow tubular segment 34. In the example of Figure 1, the ventilation zone 60 is provided at about 2 millimetres from the upstream end of the second hollow tubular segment 34. A ventilation level of the aerosol-generating article 100 is about 25 percent.

[0191] The downstream section 14 includes a mouthpiece element 42 at a location downstream of the intermediate hollow section 50. The mouthpiece element 42 is positioned immediately downstream of the aerosol-cooling element 24. As shown in the drawing of Figure 1, an upstream end of the mouthpiece element 42 abuts the downstream end 40 of the aerosol-cooling element 18.

[0192] In the example of Figure 1, the mouthpiece element 42 is provided in the form of a cylindrical plug of low-density cellulose acetate. The mouthpiece element 42 has a length of about 12 millimetres and an external diameter of about 7.25 millimetres.

[0193] In the example of Figure 1, the rod 12 of aerosol-forming substrate has an external diameter of about 7.25 millimetres and a length of about 12 millimetres.

[0194] The aerosol-generating article 100 includes an elongate susceptor element 44 within the rod 12 of aerosol-forming substrate. The susceptor element 44 is arranged substantially longitudinally within the aerosol-generating substrate, such as to be approximately parallel to the longitudinal direction of the rod 12 of aerosol-forming substrate. The susceptor element 44 is positioned in a radially central position within the rod 12 and extends effectively along the longitudinal axis of the rod 12.

[0195] The susceptor element 44 extends all the way from an upstream end to a downstream end of the rod 12 of aerosol-forming substrate. In effect, the susceptor element 44 has substantially the same length as the rod 12 of aerosol-forming substrate.

[0196] In the example of Figure 1, the susceptor element 44 is provided in the form of a strip and has a length of about 12 millimetres, a thickness of about 60 micrometres, and a width of about 4 millimetres.

[0197] The upstream section 16 includes an upstream element 46. The upstream element 46 is located immediately upstream of the rod 12 of aerosol-forming substrate. The upstream element 46 is in longitudinal alignment with the rod 12.

[0198] The downstream end of the upstream element 46 abuts the upstream end of the rod 12 of aerosol-forming substrate. Advantageously, this may prevent the susceptor element 44 from being dislodged. Further, this may ensure that the user cannot accidentally contact the heated susceptor element 44 after use.

[0199] In the example of Figure 1, the upstream element 46 is provided in the form of a cylindrical plug of cellulose acetate. The upstream element 46 has a length of about 5 millimetres.

[0200] The aerosol-generating article 100 includes a wrapper 70. The wrapper 70 is wrapped around the rod 12 of aerosol-forming substrate. The wrapper 70 includes a metal layer. In the example of Figure 1, the metal is aluminium. In the example of Figure 1, the wrapper 70 also includes a paper layer. In one example, the metal layer is deposited on the paper layer. For example, the metal layer may be deposited on the paper layer by use of vapour deposition. In another example, the metal layer is fixed to the paper layer. For example, the metal layer and the paper layer may be bonded together to form a laminate.

[0201] In the example of Figure 1, the metal layer has a thickness of 40 nanometres, and the paper layer has a thickness of 60 micrometres.

[0202] In some examples, the wrapper 70 is wrapped around the entire of the circumferential surface area of the rod 12 of

aerosol-forming substrate.

[0203] The wrapper 70 is provided to act as a physical barrier between the rod 12 of aerosol-forming substrate and other components of the aerosol-generating article 10.

[0204] The aerosol-generating article 100 includes an outermost wrapper 80. In the example of Figure 1, the outermost wrapper 80 is wrapped around all of the components of the aerosol-generating article 10. The outermost wrapper 80 is also wrapper around the wrapper 70.

[0205] Figures 2, 3, 4, 5 and 6 show alternative examples to the example shown in Figure 1. The aerosol-generating article 200 of Figure 2, the aerosol-generating article 300 of Figure 3, the aerosol-generating article 400 of Figure 4, the aerosol-generating article 500 of Figure 5, and the aerosol-generating article 600 of Figure 6 are the same as the aerosol-generating article 100 of Figure 1 except for the following differences.

[0206] In the example shown in Figure 2, the wrapper 70 is wrapped around both the rod 12 of aerosol-forming substrate and the upstream element 46. In contrast, in the example shown in Figure 1, the wrapper 70 is only wrapped around the rod 12 of aerosol-forming substrate.

[0207] In the example of Figure 2, the wrapper 70 is wrapped around the entire length of the upstream element 46. However, in some examples, the wrapper 70 may only be wrapped around part of the length of the upstream element 46.

[0208] In the example of Figure 2, the upstream element 46 is pre-wrapped with a paper element wrapper (not shown), which is positioned underneath the wrapper 70.

[0209] In the example shown in Figure 3, the wrapper 70 is wrapped around both the rod 12 of aerosol-forming substrate and the first hollow tubular segment 26. In contrast, in the example shown in Figure 1, the wrapper 70 is only wrapped around the rod 12 of aerosol-forming substrate.

[0210] In the example of Figure 3, the wrapper 70 is wrapped around the entire length of the first hollow tubular segment 26. However, in some examples, the wrapper 70 may only be wrapped around part of the length of the first hollow tubular segment 26.

[0211] In the example shown in Figure 4, the wrapper 70 is wrapped around the entire length of the upstream element 46, the rod 12 of aerosol-forming substrate and the first hollow tubular segment 26. In contrast, in the example shown in Figure 1, the wrapper 70 is only wrapped around the rod 12 of aerosol-forming substrate.

[0212] In the example of Figure 4, the wrapper 70 is wrapped around the entire length of the first hollow tubular segment 26. However, in some examples, the wrapper 70 may only be wrapped around part of the length of the first hollow tubular segment 26.

[0213] In the example shown in Figure 5, the wrapper 70 is wrapped around the entire length of the upstream element 46, the rod 12 of aerosol-forming substrate, the first hollow tubular segment 26 and the second hollow tubular segment 34. In contrast, in the example shown in Figure 1, the wrapper 70 is only wrapped around the rod 12 of aerosol-forming substrate.

[0214] In the example of Figure 5, the wrapper 70 is wrapped around the entire length of the first hollow tubular segment 26 and the entire length of the second hollow tubular segment 34. However, in some examples, the wrapper 70 may only be wrapped around part of the length of the first hollow tubular segment 26 and/or part of the length of the second hollow tubular segment 34.

[0215] In the example shown in Figure 6, the wrapper 70 is wrapped around the entire length of all elements of the aerosol-generating article 600. In other words, in the example of Figure 6, the wrapper 70 is wrapped around the upstream element 46, the rod 12 of aerosol-forming substrate, the first hollow tubular segment 26, the second hollow tubular segment 34, and the mouthpiece element 42. In contrast, in the example shown in Figure 1, the wrapper 70 is only wrapped around the rod 12 of aerosol-forming substrate.

[0216] In the examples of Figures 1, 2, 3, 4, 5 and 6, the rod 12 is a porous medium loaded with an amount of aerosol-forming substrate. An example formulation of a suitable aerosol-forming substrate is shown in Table 1.

Table 1

Example	A	B	C
Glycerine (% by weight)	74.4	72.7	50
Water (% by weight)	20	20	0
Nicotine (% by weight)	1.5	2	0
Sodium Carboxymethyl Cellulose (% by weight)	2.4	0	6.25
Lactic Acid (% by weight)	1.7	0	0
Low Acyl Gellan (% by weight)	0	3	0
Calcium (% by weight)	0	1	0
Levulnic Acid (% by weight)	0	1.3	0

(continued)

Example	A	B	C
Hydroxypropylmethyl Cellulose (% by weight)	0	0	12.5
Cellulose Fibres (% by weight)	0	0	31.25

[0217] The moisture content of Example A is 20 percent by weight. In this example, the moisture content includes all the glycerine content and the water content of the formulation.

[0218] The moisture content of an aerosol-forming substrate is measured according to the following method:

1. Conditioning the aerosol-forming substrate using forced air flow at a temperature of 22°C, a humidity of 50% relative humidity, and a pressure of 100 kPa;
2. Ceasing conditioning when there is no longer a change in weight of the aerosol-forming substrate above 0.2% of the total weight over a time period of three hours; and
3. Carrying out the Karl Fischer titration method on the aerosol-forming substrate:

a. Extracting the moisture by shaking the aerosol-forming substrate with dry methanol;
b. Injecting an aliquot portion of the aerosol-forming substrate into a titration vessel;
c. Titrating the aliquot portion of the aerosol-forming substrate with a pyridine-free Karl Fischer-reagent; and
d. Calculating the moisture content using the following equation:

$$WT = \frac{(VT - (B \times Va)) \times E \times V \times 100}{M \times Va}$$

Wt = moisture content (%)
Vt = volume of reagent used for titration of the sample extract [ml]
B = blank value
Va = volume of the aliquot portion of the sample titrated [ml]
E = water equivalent [mgH_2O/ml]
V = total volume of the sample extract prepared [ml]
M = mass of the test portion [mg]

[0219] From this method, the moisture content in weight % of the aerosol-forming substrate can be obtained.

Table 2

	Example 1 (Aerosol-Generating Article without a Wrapper Comprising a Metal Layer)	Example 2 (Aerosol-Generating Article with a Wrapper Comprising a Metal Layer)
Nicotine Yield (micro-grams)	278	461

[0220] The provision of a wrapper 70 that is wrapped around the rod 12 of aerosol-forming substrate, and includes a metal layer, may help to contain one or more of the components of the aerosol-forming substrate within the rod 12. In other words, the wrapper 70 may help to reduce migration of one or more components of an aerosol-forming substrate away from the rod 12 and into other parts of the aerosol-generating article 100.

[0221] Table 2 shows the nicotine yield from a rod 12 of the aerosol-forming substrate of Example A within the aerosol-generating articles of Example 1 and Example 2.

[0222] The aerosol-generating article of Example 1 is a typical aerosol-generating article that does not include a wrapper with a metal layer wrapped around the aerosol-forming substrate. Instead, the wrapper in the aerosol-generating article of Example 1 is a simple paper wrapper. The aerosol-generating article of Example 2 is the aerosol-generating article 100 as described above and as shown in Figure 1.

[0223] As is shown in Table 2, the nicotine yield from the plug 12 of aerosol-forming substrate is 278 micrograms when the aerosol-generating article 100 does not include the wrapper 70. However, when the aerosol-generating article 100 does include the wrapper 70, the nicotine yield from the rod 12 of aerosol-forming substrate increases by 66% to 461

micrograms.

[0224] Accordingly, the provision of a wrapper 70 that is wrapped around the rod 12 of aerosol-forming substrate, and includes a metal layer, increases the nicotine yield from the rod 12 of aerosol-forming substrate.

[0225] The increase in nicotine yield is because the metal layer of the wrapper may prevent or at least reduce the migration of components of the aerosol-forming substrate, such as the aerosol-former, out of the rod 12 and into other parts of the aerosol-generating article 100. It follows that if more of the aerosol-forming substrate is retained within in the rod 12 then it is possible to yield more nicotine from the aerosol-forming substrate.

[0226] An increase in nicotine yield from the rod 12 of aerosol-forming substrate may lead to an improvement in the user experience.

Claims

1. An aerosol-generating article (100) comprising:

an aerosol-forming substrate comprising one or more aerosol formers; and
a wrapper (70),
wherein the wrapper (70) is wrapped around the aerosol-forming substrate,
wherein the wrapper (70) comprises a metal layer,
wherein the aerosol-forming substrate has an aerosol former content of greater than or equal to 40 percent by weight,
wherein the metal layer has a thickness of greater than or equal to 2 nanometres, and
wherein the metal layer has a thickness of less than 2000 nanometres.

2. An aerosol-generating article (100) according to claim 1, wherein the wrapper (70) comprises a paper layer.

3. An aerosol-generating article (100) according to claim 2, wherein the metal layer is radially inward of the paper layer.

4. An aerosol-generating article (100) according to claim 2 or claim 3, wherein the wrapper (70) comprises the metal layer deposited on the paper layer.

5. An aerosol-generating article (100) according to any preceding claim, wherein the wrapper (70) is wrapped around the entire length of the aerosol-forming substrate.

6. An aerosol-generating article (100) according to any preceding claim, wherein the aerosol-forming substrate has an aerosol former content of greater than or equal to 50 percent by weight.

7. An aerosol-generating article (100) according to any preceding claim, wherein the aerosol-forming substrate has an aerosol former content of greater than or equal to 60 percent by weight.

8. An aerosol-generating article (100) according to any preceding claim, wherein the aerosol-forming substrate has an aerosol former content of between 40 percent by weight and 90 percent by weight.

9. An aerosol-generating article (100) according to any preceding claim, wherein the aerosol-forming substrate has an aerosol former content of between 50 percent by weight and 80 percent by weight.

10. An aerosol-generating article (100) according to any preceding claim, wherein the aerosol-forming substrate has an aerosol former content of greater than or equal to 100 milligrams.

11. An aerosol-generating article (100) according to any preceding claim, wherein the one or more aerosol formers comprise one or more of glycerine and propylene glycol.

12. An aerosol-generating article (100) according to any preceding claim, wherein the aerosol-forming substrate has a moisture content of greater than or equal to 10 percent by weight, measured as according to the method defined in the description.

13. An aerosol-generating article (100) according to any preceding claim, comprising an outermost wrapper (70) wrapped around at least the aerosol-forming substrate and the wrapper (70).

14. An aerosol-generating article (100) according to any preceding claim, comprising a susceptor element (44).

Patentansprüche

1. Aerosolerzeugender Artikel (100), aufweisend:

Aerosolbildendes Substrat, umfassend einen oder mehrere Aerosolbildner, und
eine Umhüllung (70),
wobei die Umhüllung (70) um das aerosolbildende Substrat gewickelt ist,
wobei die Umhüllung (70) eine Metallschicht umfasst,
wobei das aerosolbildende Substrat einen Aerosolbildnergehalt von mehr als oder gleich 40 Gewichtsprozent aufweist,
wobei die Metallschicht eine Dicke von mehr als oder gleich 2 Nanometern aufweist, und
wobei die Metallschicht eine Dicke von weniger als 2000 Nanometern aufweist.

2. Aerosolerzeugender Artikel (100) gemäß Anspruch 1, wobei die Umhüllung (70) eine Papierschicht aufweist.

3. Aerosolerzeugender Artikel (100) gemäß Anspruch 2 wobei sich die Metallschicht radial nach innen gerichtet in der Papierschicht befindet.

4. Aerosolerzeugender Artikel (100) gemäß Anspruch 2 oder Anspruch 3, wobei die Umhüllung (70) die auf der Papierschicht befindliche Metallschicht umfasst.

5. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei die Umhüllung (70) um die gesamte Länge des aerosolbildenden Substrats gewickelt ist.

6. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei das aerosolbildende Substrat einen Aerosolbildnergehalt von mehr als oder gleich 50 Gewichtsprozent aufweist.

7. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei das aerosolbildende Substrat einen Aerosolbildnergehalt von mehr als oder gleich 60 Gewichtsprozent aufweist.

8. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei das aerosolbildende Substrat einen Aerosolbildnergehalt zwischen 40 Gewichtsprozent und 90 Gewichtsprozent aufweist.

9. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei das aerosolbildende Substrat einen Aerosolbildnergehalt zwischen 50 und 80 Gewichtsprozent aufweist.

10. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei das aerosolbildende Substrat einen Aerosolbildnergehalt von mehr als oder gleich 100 Milligramm aufweist.

11. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei der eine oder die mehreren Aerosolbildner einen oder mehrere von Glycerin und Propylenglykol umfassen.

12. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, wobei das aerosolbildendes Substrat einen Feuchtigkeitsgehalt von größer als oder gleich 10 Gewichtsprozent, gemessen gemäß dem in der Beschreibung definierten Verfahren, aufweist.

13. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, der eine äußere Umhüllung (70) umfasst, die wenigstens um das aerosolbildende Substrat und die Umhüllung (70) gewickelt ist.

14. Aerosolerzeugender Artikel (100) gemäß einem beliebigen vorhergehenden Anspruch, der ein Suszeptorelement (44) umfasst.

Revendications

1. Article de génération d'aérosol (100) comprenant :

   un substrat formant aérosol comprenant un ou plusieurs agents de formation d'aérosol ; et
   une enveloppe (70),

   dans lequel l'enveloppe (70) est enveloppée autour du substrat formant aérosol,
   dans lequel l'enveloppe (70) comprend une couche de métal,
   dans lequel le substrat formant aérosol a une teneur en agent de formation d'aérosol supérieure ou égale à 40 pour cent en poids, dans lequel la couche de métal a une épaisseur supérieure ou égale à 2 nanomètres, et
   dans lequel la couche de métal a une épaisseur inférieure à 2000 nanomètres.

2. Article de génération d'aérosol (100) selon la revendication 1, dans lequel l'enveloppe (70) comprend une couche de papier.

3. Article de génération d'aérosol (100) selon la revendication 2, dans lequel la couche de métal est située radialement vers l'intérieur de la couche de papier.

4. Article de génération d'aérosol (100) selon la revendication 2 ou la revendication 3, dans lequel l'enveloppe (70) comprend la couche de métal déposée sur la couche de papier.

5. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel l'enveloppe (70) est enveloppée autour de la toute la longueur du substrat formant aérosol.

6. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel le substrat formant aérosol a une teneur en agent de formation d'aérosol supérieure ou égale à 50 pour cent en poids.

7. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel le substrat formant aérosol a une teneur en agent de formation d'aérosol supérieure ou égale à 60 pour cent en poids.

8. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel le substrat formant aérosol a une teneur en agent de formation d'aérosol d'entre 40 pour cent en poids et 90 pour cent en poids.

9. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel le substrat formant aérosol a une teneur en agent de formation d'aérosol d'entre 50 pour cent en poids et 80 pour cent en poids.

10. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel le substrat formant aérosol a une teneur en agent de formation d'aérosol supérieure ou égale à 100 milligrammes.

11. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel les un ou plusieurs agents de formation d'aérosol comprennent un ou plusieurs parmi la glycérine et la propylène glycol.

12. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, dans lequel le substrat formant aérosol a une teneur en humidité supérieure ou égale à 10 pour cent en poids, mesurée selon le procédé défini dans la description.

13. Article de génération d'aérosol (100) selon l'une quelconque des revendications précédentes, comprenant en outre une enveloppe (70) la plus extérieure enveloppée autour d'au moins le substrat formant aérosol et l'enveloppe (70).

14. Article de génération d'aérosol (100) selon l'une quelconque revendication précédente, comprenant un élément suscepteur (44).

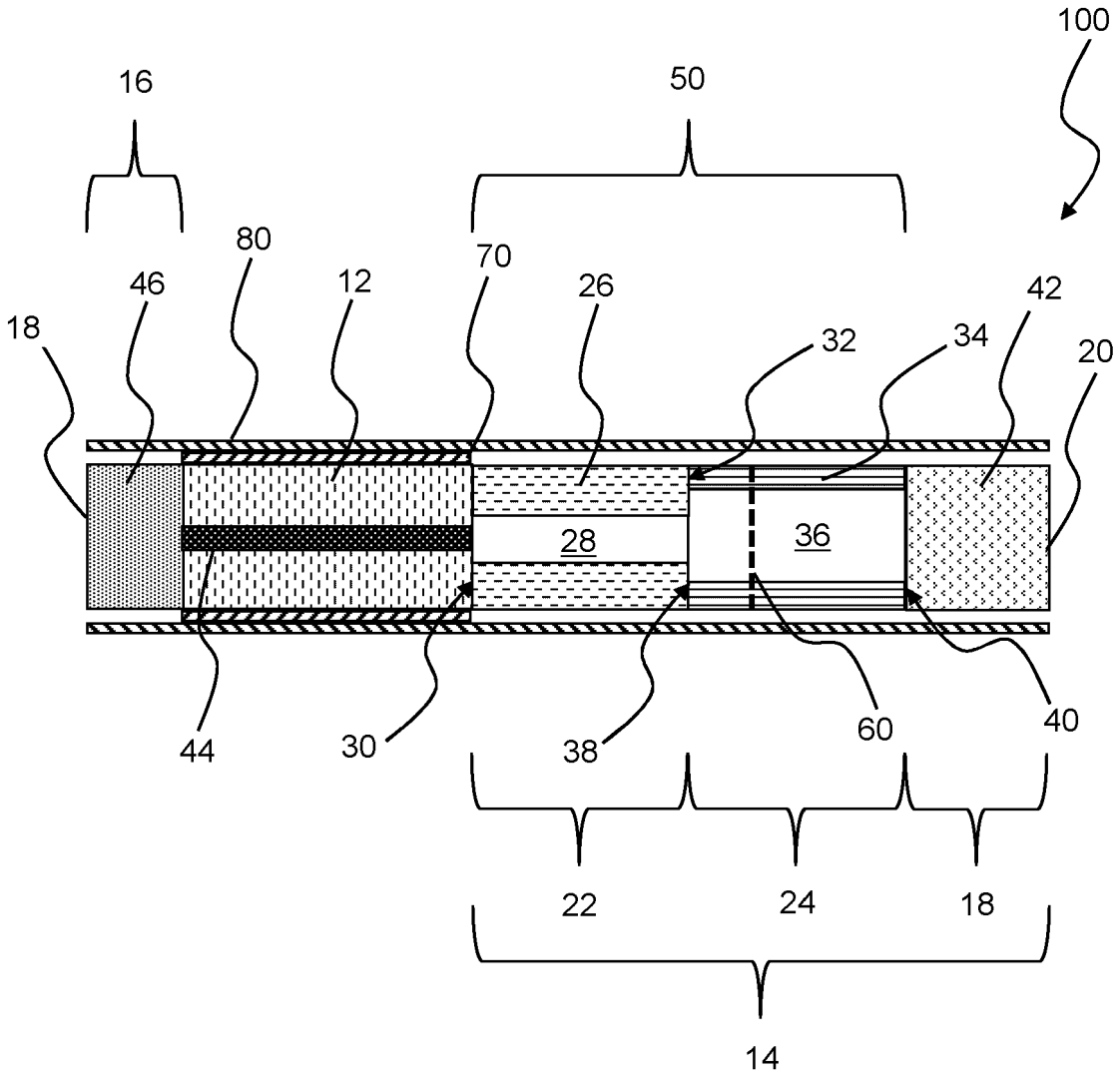

Figure 1

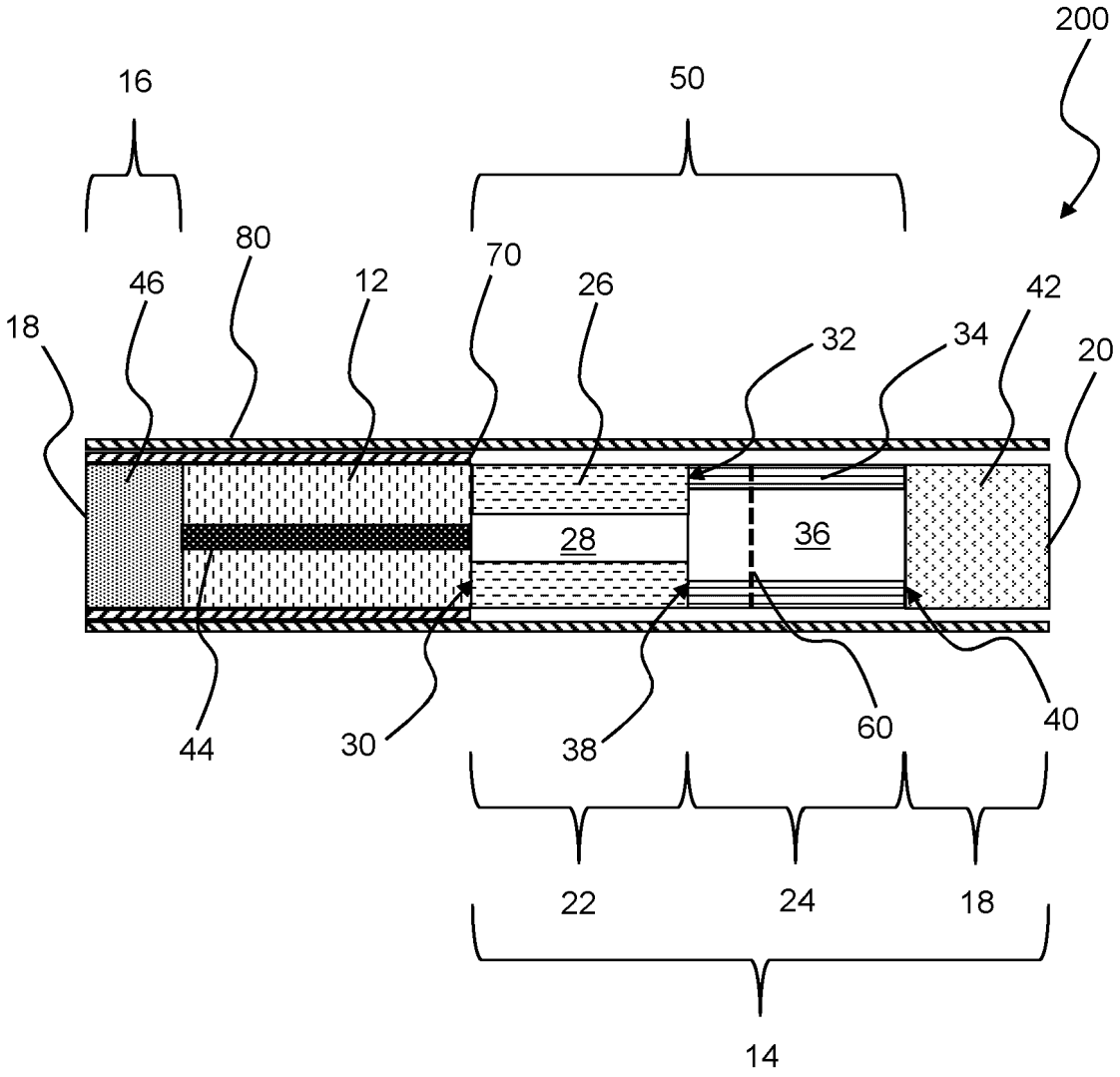

Figure 2

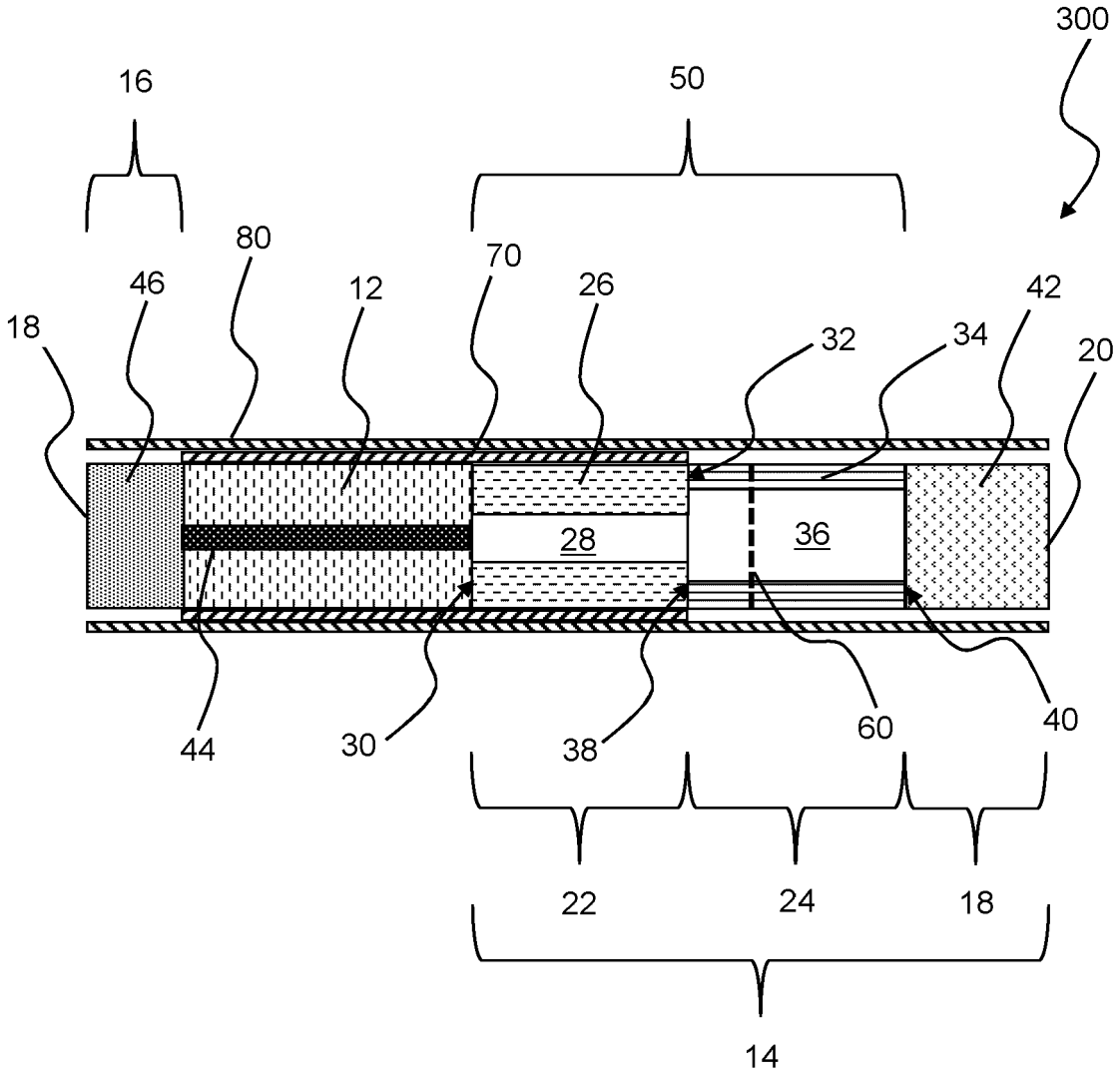

Figure 3

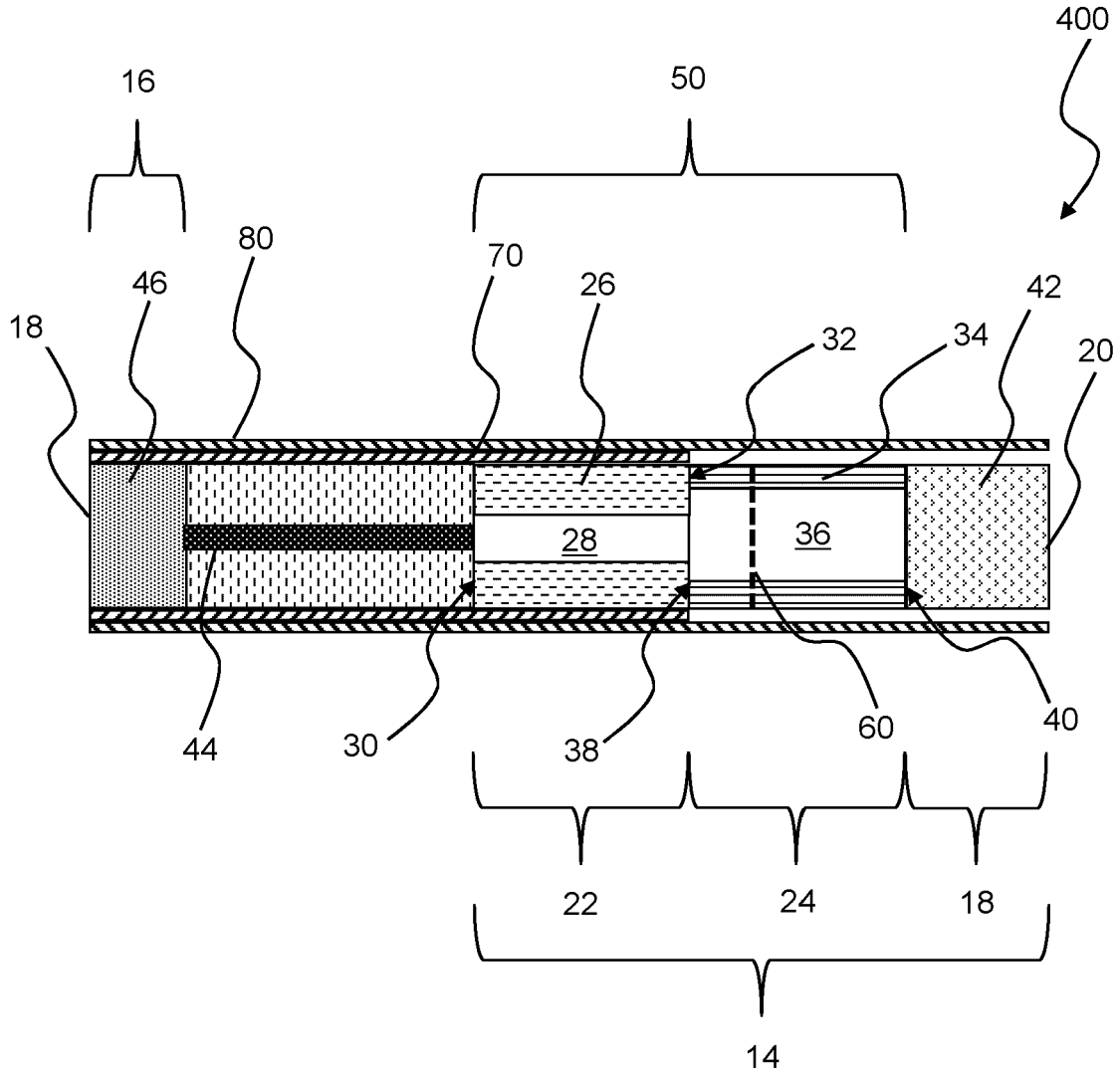

Figure 4

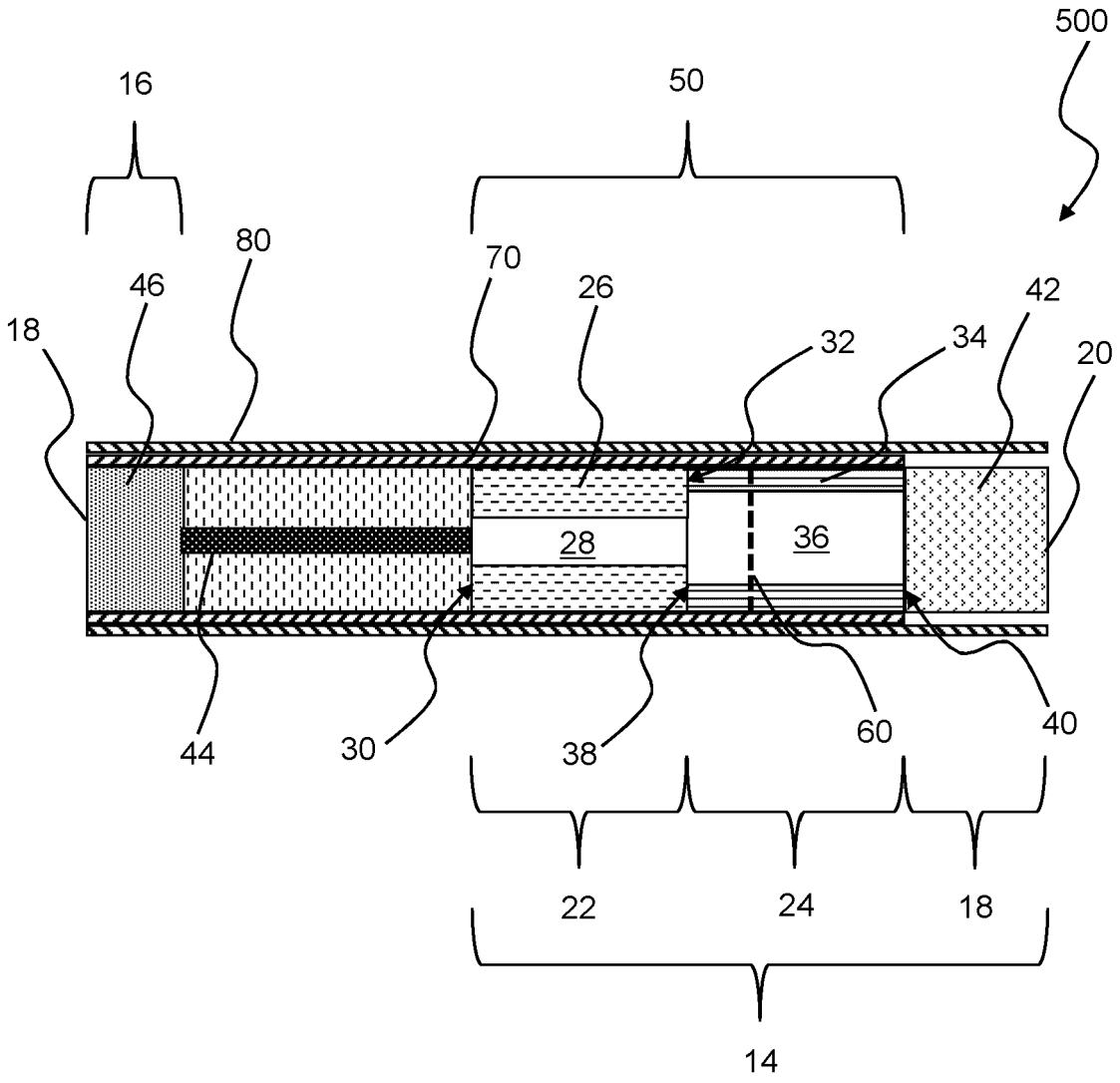

Figure 5

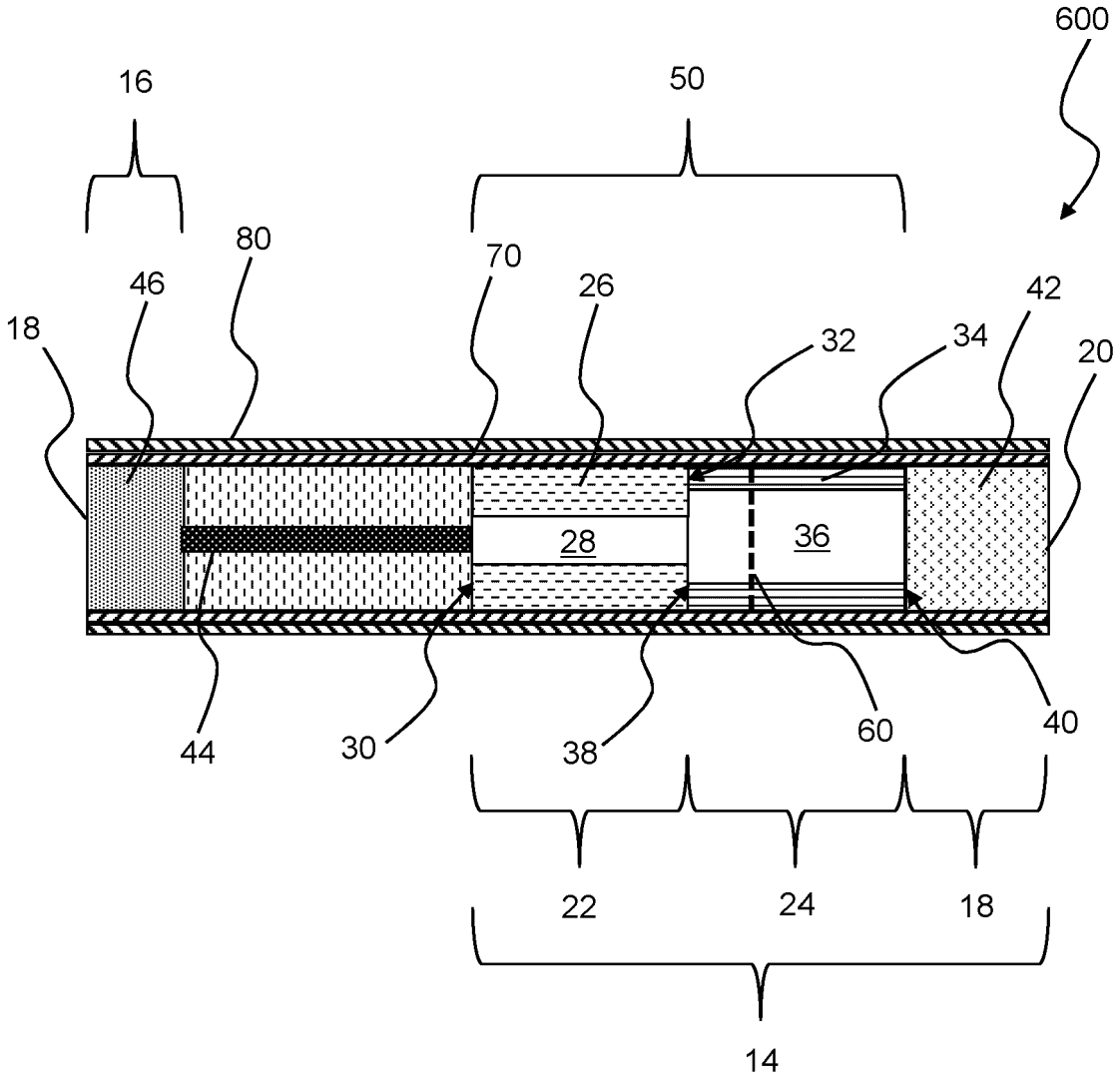

Figure 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 110973694 A **[0004]**
- WO 2020025723 A1 **[0005]**
- WO 9527411 A1 **[0168]**
- WO 2015177255 A1 **[0168]**