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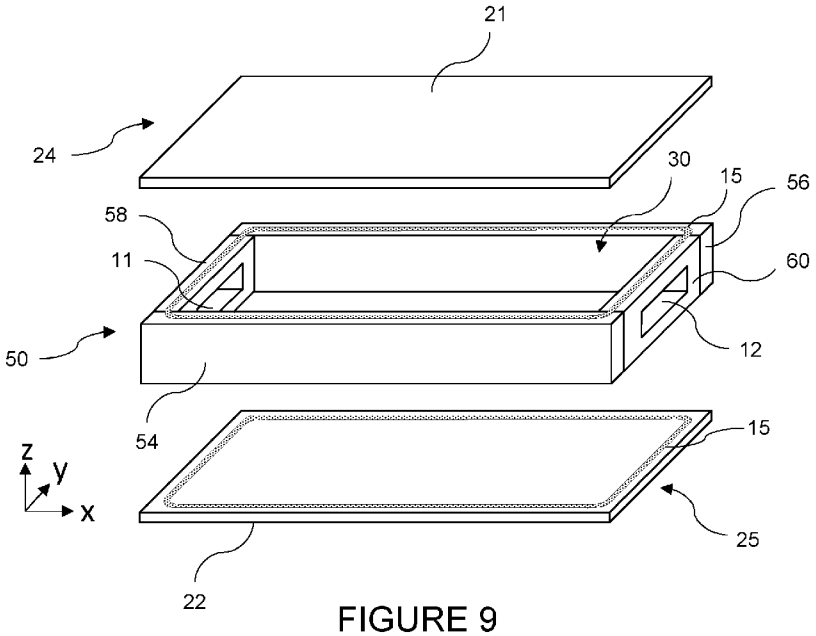

FIGURE 9

(57) Abstract: An aerosol-generating article (10) for use with an aerosol-generating device to generate an aerosol, the aerosol-generating article (10) comprising: a first planar external surface (29); a second planar external surface (22); a frame (50) positioned between the first planar external surface (21) and the second planar external surface (22); and an air inlet (11) and an air outlet (12), wherein the frame (50) comprises a first side portion (54) and a second side portion (56), the first side portion (54) and the second side portion (56) at least partially defining the cavity (30) and extending from the air inlet (12) to the air outlet (14) along the longitudinal axis of the aerosol-generating article (10), wherein the first side portion (54) is a support element and the second side portion (56) is a support element.

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AEROSOL-GENERATING ARTICLE

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

The present disclosure relates to an aerosol-generating article. The present disclosure also relates to an aerosol-generating device for use with the aerosol-generating article. The present disclosure also relates to an aerosol-generating system comprising the aerosol-generating device and the aerosol-generating article. The present disclosure also relates to a method of manufacturing the aerosol-generating article.

A typical aerosol-generating system comprises an aerosol-generating device and an aerosol-generating article comprising an aerosol-generating substrate. In use, the aerosol-generating device is arranged to heat a heating element that is positioned near, or in contact with, the aerosol-generating substrate which causes the aerosol-generating substrate to heat up and release volatile compounds. These volatile compounds are then entrained in air that is drawn through the aerosol-generating article. As the volatile compounds cool, they condense to form an aerosol that can be inhaled by a consumer.

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

However, a significant portion of the aerosol-generating substrate in these cylindrical aerosol-generating articles may not be sufficiently heated to form an aerosol during use. This is undesirable since the insufficiently heated portion of the aerosol-generating substrate contributes to the cost of manufacture and transport of the aerosol-generating article but does not contribute to the aerosol delivered to the consumer. Moreover, the components of these cylindrical aerosol-generating articles normally need to have the same or very similar outer diameters so that they can be brought together, accurately positioned in axial alignment and wrapped in a cigarette paper. This can lead to increased cost and complexity of manufacture.

It is an objective of the present disclosure to provide an aerosol-generating article in which a greater portion of the aerosol-generating substrate is sufficiently heated to form an aerosol during use. It is also an objective of the present disclosure to provide an aerosol-generating article that can be manufactured relatively efficiently and cheaply.

According to the present disclosure, there is provided an aerosol-generating article for use with an aerosol-generating device to generate an aerosol. The aerosol-generating article may

comprise a first planar external surface. The aerosol-generating article may comprise a second planar external surface. The aerosol-generating article may comprise a frame positioned between the first planar external surface and the second planar external surface. The aerosol-generating article may comprise an air inlet. The aerosol-generating article may comprise an air outlet. The frame may comprise a first side portion. The frame may comprise a second side portion. The first side portion and the second side portion may at least partially define the cavity. The first side portion and the second side portion may extend from the air inlet to the air outlet along the longitudinal axis of the aerosol-generating article. The first side portion may be a support element. The second side portion may be a support element.

According to the present disclosure, there is also provided an aerosol-generating article for use with an aerosol-generating device to generate an aerosol, the aerosol-generating article comprising: a first planar external surface; a second planar external surface; a frame positioned between the first planar external surface and the second planar external surface; and an air inlet and an air outlet, wherein the frame comprises a first side portion and a second side portion, the first side portion and the second side portion at least partially defining the cavity and extending from the air inlet to the air outlet along the longitudinal axis of the aerosol-generating article, wherein the first side portion is a support element and the second side portion is a support element.

Advantageously, the frame may allow the aerosol-generating article to be relatively thin whilst maintaining structural rigidity.

Advantageously, the provision of a frame comprising separate side portions may improve sealing of the airflow path between the air inlet and the air outlet. For example, sealing of the airflow path between the air inlet and the air outlet may be improved because the side portions provide increased surface area on the frame for adhesive bonding of the frame to the planar external surfaces.

Improving sealing of the airflow path between the air inlet and the air outlet may increase delivery of aerosol from the aerosol-generating article. Improving sealing of the airflow path between the air inlet and the air outlet may also reduce soiling of an aerosol-generating device which receives the aerosol-generating article.

Advantageously, providing the side portions as separate elements to the other portions of the frame may reduce material wastage during manufacture of the aerosol-generating article.

Advantageously, the side portions being support elements may improve structural rigidity of the aerosol-generating article.

The aerosol-generating article may comprise one or more aerosol-generating substrates.

The aerosol-generating article may have a length extending in an x-direction. The aerosol-generating article may have a width extending in a y-direction. The aerosol-generating article may have a thickness extending in a z-direction.

The aerosol-generating article may be a substantially flat aerosol-generating article or a substantially planar aerosol-generating article. In particular, a thickness of the aerosol-generating

article may less than 50 percent of both a length and a width of the aerosol-generating article. Advantageously, a smaller thickness may provide a small temperature gradient or difference across the thickness of the aerosol-generating substrate during heating.

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

The aerosol-generating article may have a laminated structure, for example the aerosol-generating article may comprise or be formed from at least two layers. In particular, the aerosol-generating article may comprise at least two of: a first external layer, a second external layer, a frame, a first frame layer, a second frame layer, a third frame layer, a first aerosol-generating substrate layer, and a second aerosol-generating substrate layer as discussed in more detail below.

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

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

The frame may be a planar frame.

The frame may define a frame aperture extending through the thickness of the frame. The frame aperture may define or form the airflow passage of the aerosol-generating article. The frame aperture may define or form the cavity of the aerosol-generating article. For example, the frame may have a hollow cuboid shape or a square hollow tube shape. As a further example, the frame may have a cross-section that is annular in shape, preferably the cross-section in an x/y plane is annular in shape.

The frame may comprise a frame outer surface. The frame outer surface may extend in a transverse direction, for example between the first planar external surface and the second planar external surface. The frame outer surface may at least partially define or form one or more external surfaces of the aerosol-generating article. For example, the frame outer surface may at least partially define or form one or more external walls of the aerosol-generating article. The frame outer surface may circumscribe or encircle the frame aperture. The frame outer surface may circumscribe or encircle the cavity.

The frame may comprise a frame inner surface. The frame inner surface may extend in a transverse direction, for example between the first planar external surface and the second planar external surface. The frame inner surface may define or form a frame aperture outer wall. The frame inner surface may define or form a cavity outer wall. The frame inner surface may circumscribe or encircle the frame aperture extending through the thickness of the frame. The frame inner surface may circumscribe or encircle the cavity.

The frame outer surface may circumscribe or encircle the frame inner surface. The frame inner surface and the frame outer surface may be concentric with one another.

The aerosol-generating article may comprise one or more external walls extending between the first planar external surface and the second planar external surface. The one or more external walls may collectively define an entire transverse external area of the aerosol-generating article. The frame may at least partially define each of the one or more external walls. The one or more external walls may circumscribe or encircle the cavity. The frame may define at least 60 percent, at least 70 percent, at least 80 percent, or at least 90 percent of the entire transverse external area of the aerosol-generating article.

The frame may comprise a plurality of portions.

The plurality of portions may be separate pieces. The plurality of portions may be separate pieces which may be attached or connected to one another to form the frame.

The frame may comprise a first side portion and a second side portion. The frame may comprise a first end portion and a second end portion. The frame may comprise a first side portion, a second side portion, a first end portion and a second end portion.

The first end portion may comprise the air inlet. The air inlet may be defined as an aperture through the first end portion. The air inlet may be defined as an aperture through the length of the first end portion. The first end portion may be located at an upstream end of the aerosol-generating article. The first end portion may define the upstream end of the aerosol-generating article.

The first end portion may be in physical contact with, and may be bonded to, the first side portion and the second side portion. The first end portion may be in physical contact with, and may be bonded to, an upstream end of the first side portion and an upstream end of the second side portion.

The second end portion may comprise the air outlet. The air outlet may be defined as an aperture through the second end portion. The air outlet may be defined as an aperture through the length of the second end portion. The second end portion may be located at a downstream end of the aerosol-generating article. The second end portion may define the downstream end of the aerosol-generating article.

The second end portion may be in physical contact with, and may be bonded to, the first side portion and the second side portion. The second end portion may be in physical contact with, and may be bonded to, a downstream end of the first side portion and a downstream end of the second side portion.

The first side portion and the second side portion may be in physical contact with, and may be bonded to, a downstream end of the first end portion. The first side portion and the second side portion may be in physical contact with, and may be bonded to, an upstream end of the second end portion.

At least one of the first end portion and the second end portion may comprise, or be made from, a cellulosic material. The first end portion and the second end portion may comprise, or be

made from, a cellulosic material. The cellulosic material may be paper, cigarette paper, tobacco paper, cardboard, wood, textile, natural fibres or artificial fibres.

The frame may comprise a peripheral wall. The peripheral wall may circumscribe or encircle at least a portion of the frame aperture extending through the thickness of the frame. The peripheral wall may circumscribe or encircle at least a portion of the cavity. The peripheral wall may circumscribe or encircle the frame aperture extending through the thickness of the frame. The peripheral wall may circumscribe or encircle the cavity.

The peripheral wall may be defined or formed by the frame outer surface and the frame inner surface. The peripheral wall may at least partially define or form one or more external surfaces or walls of the aerosol-generating article. The peripheral wall may define or form a frame aperture outer wall. The peripheral wall may define or form a cavity outer wall.

The peripheral wall may have a radial thickness. The radial thickness may be defined as the minimum distance between the frame outer surface and the frame inner surface, such as in the x/y plane.

The peripheral wall may have a radial thickness greater than or equal to 0.5 millimetres. The peripheral wall may have a radial thickness greater than or equal to 1.5 millimetres. The peripheral wall may have a radial thickness greater than or equal to 2.5 millimetres.

The peripheral wall may have a radial thickness less than or equal to 3.5 millimetres. The peripheral wall may have a radial thickness less than or equal to 2.5 millimetres.

The peripheral wall may have a radial thickness between 0.5 millimetres and 3.5 millimetres. The peripheral wall may have a radial thickness between 0.5 millimetres and 2.5 millimetres.

Advantageously, the peripheral wall having a radial thickness between 0.5 millimetres and 3.5 millimetres has been found to provide good structural strength for the aerosol-generating article whilst not using excess amounts of material which may increase manufacturing costs, and may limit the amount of heat that is undesirably transferred to the frame rather than the aerosol-generating substrate.

The frame may be made from or comprise a biodegradable material. The frame may be made entirely from a biodegradable material.

The frame may be made from or comprise a cellulosic material. The cellulosic material may comprise a sheet of cellulosic material. The cellulosic material may comprise cellulose fibres. The cellulosic material may be paper, paperboard, or cardboard. The frame may be made from or comprise a plant material, such as tobacco. The frame may be made entirely from a cellulosic material.

The aerosol-generating article may comprise one or more susceptor materials. The frame may comprise one or more susceptor materials. The one more susceptor materials may be in thermal contact with the aerosol-generating substrate. The one more susceptor materials may be in thermal contact with the cavity. The one or more susceptor materials may be incorporated within

the material of the frame. For example, the one or more susceptor material may be incorporated within the peripheral wall of the frame.

The one or more susceptor materials may be one or more particles, strips, threads, or wires of susceptor material. The one or more susceptor materials may be one or more sheets or layers of susceptor material. The one of more sheets or layers of susceptor material may be in the form of a mesh of susceptor material.

The susceptor material, in whatever form, may comprise one or more materials selected from the list consisting of: aluminium, iron and iron alloys, nickel and nickel alloys, cobalt alloys, stainless steel alloys, copper alloys, carbon, expanded carbon, and graphite.

The frame may have a thickness greater than or equal to 50 percent of the thickness of the aerosol-generating article. The frame may have a thickness greater than or equal to 70 percent of the thickness of the aerosol-generating article. The frame may have a thickness greater than or equal to 90 percent of the thickness of the aerosol-generating article. The frame may have a thickness greater than or equal to 95 percent of the thickness of the aerosol-generating article.

The frame may have a thickness less than or equal to 95 percent of the thickness of the aerosol-generating article. The frame may have a thickness less than or equal to 90 percent of the thickness of the aerosol-generating article. The frame may have a thickness less than or equal to 70 percent of the thickness of the aerosol-generating article.

The frame may have a thickness between 50 percent of the thickness of the aerosol-generating article and 95 percent of the thickness of the aerosol-generating article. The frame may have a thickness between 70 percent of the thickness of the aerosol-generating article and 95 percent of the thickness of the aerosol-generating article.

The frame may have a thickness greater than or equal to 1 millimetre, greater than or equal to 2 millimetres, greater than or equal to 3 millimetres, or greater than or equal to 4 millimetres. The frame may have a thickness less than or equal to 5.5 millimetres, less than or equal to 4.5 millimetres, less than or equal to 3.5 millimetres, less than or equal to 2.5 millimetres, or less than or equal to 1.5 millimetres. The frame may have a thickness between 1 millimetre and 5.5 millimetres. Preferably, the frame may have a thickness between 1.5 millimetres and 5.5 millimetres.

The frame may have a length that is equal to the length of the aerosol-generating article. The frame may have a length that is at least 90 percent of the length of the aerosol-generating article. The frame may have a length that is at least 95 percent of the length of the aerosol-generating article.

The frame may have a width that is equal to the width of the aerosol-generating article. The frame may have a width that is at least 90 percent of the width of the aerosol-generating article.

The frame may be a unitary component. Alternatively, the frame may comprise two or more layers. That is, the frame may have a laminated structure. Advantageously, the properties of each

layer may be individually optimised depending on the relative distance between the layer and aerosol-generating substrate or heater of the aerosol-generating device.

The frame may comprise a first frame layer and a second frame layer. The first frame layer and the second frame layer may be the only layers of the frame. That is, the frame may comprise no more than two layers or may comprise exactly two layers. The frame aperture may be defined through both the first frame layer and the second frame layer.

The frame may comprise a first frame layer, a second frame layer and a third frame layer. The second frame layer may be positioned between the first frame layer and the third frame layer. The first frame layer, the second frame layer and the third frame layer may be the only layers of the frame. That is, the frame may comprise no more than three layers or may comprise exactly three layers.

The first side portion may be separate to other pieces or portions forming the frame. The second side portion may be separate to other pieces or portions forming the frame.

The first side portion may be a rigid support element. The second side portion may be a rigid support element. Both the first side portion and the second portion may be rigid support elements.

The first side portion may be a wall. In other words, the first side portion may be a first side wall. The second side portion may be a wall. In other words, the second side portion may be a second side wall. Both the first side portion and the second side portion may be a wall. In other words, the first side portion may be a first side wall and the second side portion may be a second side wall.

At least one of the first side portion and the second side portion may extend from one end of the aerosol-generating article to the other end of the aerosol-generating article. The first side portion and the second side portion may both extend from one end of the aerosol-generating article to the other end of the aerosol-generating article.

The first side portion may be identical to the second side portion.

The first side portion may be an elongate member. The second side portion may be an elongate member.

The first side portion may extend from an upstream end of the aerosol-generating article to a downstream end of the aerosol-generating article. The second side portion may extend from an upstream end of the aerosol-generating article to a downstream end of the aerosol-generating article.

The first side portion may extend from a first end portion of the frame to a second end portion of the frame. The second side portion may extend from a first end portion of the frame to a second end portion of the frame.

The first side portion may be located at a lateral end of the frame. The first side portion may be located at a lateral end of the aerosol-generating article. The second side portion may be

located at a lateral end of the frame. The second side portion may be located at a lateral end of the aerosol-generating article.

The first side portion and the second side portion may be define opposing lateral faces of the frame. The first side portion and the second side portion may be define opposing lateral faces of the aerosol-generating article.

The first side portion may define a lateral face of the frame. The first portion may define a lateral face of the aerosol-generating article. The second side portion may define a lateral face of the frame. The second side portion may define a lateral face of the aerosol-generating article.

The first side portion and the second side portion may define opposing lateral faces of the frame. The first side portion and the second side portion may be define opposing lateral faces of the aerosol-generating article.

The first side portion and the second side portion may define outermost lateral faces of the aerosol-generating article.

The first side portion may have a round cross-section, a circular cross-section, an oval cross-section, a square cross-section, or a rectangular cross-section.

The second side portion may have a round cross-section, a circular cross-section, an oval cross-section, a square cross-section, or a rectangular cross-section.

The frame may comprise one or more elongate channels extending through it. The one or more elongate channels are therefore provided internally within the structure of the frame, for example within a wall of the frame. For example, the frame may comprise one or more elongate channels extending longitudinally through it. Alternatively or in addition, the frame may comprise one or more elongate channels extending transversely through it. The one or more elongate channels provide air flow pathways through the frame.

The aerosol-generating article may comprise an elongate flavour-bearing element. The elongate flavour-bearing element may be provided within the one or more elongate channels defined within the frame. The position of the one or more elongate channels may be adapted in order to control the distance between the elongate flavour-bearing element and the heating element when the aerosol-generating article is in place within an aerosol-generating device.

The first side portion may comprise a first elongate channel extending longitudinally through it. The second side portion may comprise a second elongate channel extending through it. At least one of the first elongate channel and the second elongate channel may contain an elongate flavour-bearing element. The frame may further comprise a first end portion and a second end portion. The first and second elongate channels may extend through the first end portion and the second end portion such that the elongate channels provide an airflow pathway all of the way through the frame between the downstream end and the upstream end.

The elongate flavour-bearing element or elements can conveniently be incorporated into the one or more elongate channels within the frame, which also act as air flow pathways through the frame. The positioning of an elongate flavour-bearing element within an air flow pathway may

enable the flavourant to be effectively released into the air passing through the frame and subsequently carried through the aerosol-generating article and mixed with the aerosol generated from the aerosol-forming substrate.

The aerosol-generating article may comprise a substrate wrapper. The substrate wrapper may circumscribe or encircle the aerosol-generating substrate. The substrate wrapper may circumscribe or encircle the aerosol-generating substrate, the first side portion and the second side portion. The substrate wrapper may be in physical contact with, and may be bonded to, the first side portion and the second side portion.

The substrate wrapper may be may comprise, or be made from, a cellulosic material. The cellulosic material may be paper, cigarette paper, tobacco paper, cardboard, wood, textile, natural fibres or artificial fibres.

At least one of the first side portion and the second side portion may comprise at least one corrugation. The first side portion may comprise at least one corrugation and the second side portion may comprise at least one corrugation. At least one of the first side portion and the second side portion may comprise a plurality of corrugations. The first side portion may comprise a plurality of corrugations and the second side portion may comprise a plurality of corrugations.

At least one of the first side portion and the second side portion may comprise, or be made from, a cellulosic material. The first side portion and the second side portion may comprise, or be made from, a cellulosic material. The cellulosic material may be paper, cigarette paper, tobacco paper, cardboard, wood, textile, natural fibres or artificial fibres.

At least one of the first side portion and the second side portion may comprise one or more aerosol-generating substrates. The first side portion may comprise one or more aerosol-generating substates and the second side portion may comprise one or more aerosol-generating substrates.

The one or more aerosol-generating substrates may comprise aerosol-generating material. Further features of the aerosol-generating material are described below.

The aerosol-generating material may comprise homogenised tobacco material. The homogenised may be in the form of one or more strips of homogenised tobacco material. The homogenised may be in the form of a plurality of strips of homogenised tobacco material. The homogenised may be in the form of a shredded sheet of homogenised tobacco material.

Homogenised tobacco material may be formed by agglomerating particles of tobacco material obtained by pulverising, grinding or comminuting plant material and optionally one or more of tobacco leaf lamina and tobacco leaf stems. The homogenised plant material may be produced by casting, extrusion, paper making processes or other any other suitable processes known in the art.

The first side portion may have a length of greater than or equal to 20 millimetres. The first side portion may have a length of greater than or equal to 22 millimetres. The first side portion may have a length of greater than or equal to 24 millimetres. The first side portion may have a length of greater than or equal to 26 millimetres. The first side portion may have a length of greater than

or equal to 28 millimetres. The first side portion may have a length of greater than or equal to 30 millimetres. The first side portion may have a length of greater than or equal to 32 millimetres.

The first side portion may have a length of less than 40 millimetres. The first side portion may have a length of less than 38 millimetres. The first side portion may have a length of less than 36 millimetres. The first side portion may have a length of less than 34 millimetres. The first side portion may have a length of less than 32 millimetres. The first side portion may have a length of less than 30 millimetres.

The first side portion may have a length of between 20 millimetres and 40 millimetres. The first side portion may have a length of between 22 millimetres and 38 millimetres. The first side portion may have a length of between 24 millimetres and 36 millimetres. The first side portion may have a length of between 26 millimetres and 34 millimetres. The first side portion may have a length of between 28 millimetres and 32 millimetres.

The second side portion may have a length of greater than or equal to 20 millimetres. The second side portion may have a length of greater than or equal to 22 millimetres. The second side portion may have a length of greater than or equal to 24 millimetres. The second side portion may have a length of greater than or equal to 26 millimetres. The second side portion may have a length of greater than or equal to 28 millimetres. The second side portion may have a length of greater than or equal to 30 millimetres. The second side portion may have a length of greater than or equal to 32 millimetres.

The second side portion may have a length of less than 40 millimetres. The second side portion may have a length of less than 38 millimetres. The second side portion may have a length of less than 36 millimetres. The second side portion may have a length of less than 34 millimetres. The second side portion may have a length of less than 32 millimetres. The second side portion may have a length of less than 30 millimetres.

The second side portion may have a length of between 20 millimetres and 40 millimetres. The second side portion may have a length of between 22 millimetres and 38 millimetres. The second side portion may have a length of between 24 millimetres and 36 millimetres. The second portion may have a length of between 26 millimetres and 34 millimetres. The second side portion may have a length of between 28 millimetres and 32 millimetres.

The first side portion may have a length that is equal to the length of the aerosol-generating article. The first side portion may have a length of greater than or equal to 90 percent of the length of the aerosol-generating article. The first side portion may have a length of greater than or equal to 95 percent of the length of the aerosol-generating article.

The first side portion may have a length of between 90 percent of the length of the aerosol-generating article and 100 percent of the length of the aerosol-generating article. The first side portion may have a length of between 95 percent of the length of the aerosol-generating article and 100 percent of the length of the aerosol-generating article.

The second side portion may have a length that is equal to the length of the aerosol-generating article. The second side portion may have a length of greater than or equal to 90 percent of the length of the aerosol-generating article. The second side portion may have a length of greater than or equal to 95 percent of the length of the aerosol-generating article.

The second side portion may have a length of between 90 percent of the length of the aerosol-generating article and 100 percent of the width of the aerosol-generating article. The second side portion may have a length of between 95 percent of the length of the aerosol-generating article and 100 percent of the width of the aerosol-generating article.

The first side portion may have a width of greater than or equal to 1.5 millimetres. The first side portion may have a width of greater than or equal to 1.75 millimetres. The first side portion may have a width of greater than or equal to 2 millimetres. The first side portion may have a width of greater than or equal to 2.25 millimetres. The first side portion may have a width of greater than or equal to 2.5 millimetres.

The first side portion may have a width of less than 3.5 millimetres. The first side portion may have a width of less than 3.25 millimetres. The first side portion may have a width of less than 3 millimetres. The first side portion may have a width of less than 2.75 millimetres. The first side portion may have a width of less than 2.5 millimetres.

The first side portion may have a width of between 1.5 millimetres and 3.5 millimetres. The first side portion may have a width of between 1.75 millimetres and 3.25 millimetres. The first side portion may have a width of between 2 millimetres and 3 millimetres. The first side portion may have a width of between 2.25 millimetres and 2.75 millimetres.

The second side portion may have a width of greater than or equal to 1.5 millimetres. The second side portion may have a width of greater than or equal to 1.75 millimetres. The second side portion may have a width of greater than or equal to 2 millimetres. The second side portion may have a width of greater than or equal to 2.25 millimetres. The second side portion may have a width of greater than or equal to 2.5 millimetres.

The second side portion may have a width of less than 3.5 millimetres. The first side portion may have a width of less than 3.25 millimetres. The second side portion may have a width of less than 3 millimetres. The second side portion may have a width of less than 2.75 millimetres. The second side portion may have a width of less than 2.5 millimetres.

The second side portion may have a width of between 1.5 millimetres and 3.5 millimetres. The second side portion may have a width of between 1.75 millimetres and 3.25 millimetres. The second side portion may have a width of between 2 millimetres and 3 millimetres. The second side portion may have a width of between 2.25 millimetres and 2.75 millimetres.

The first side portion may have a width of greater than or equal to 5 percent of the width of the aerosol-generating article. The first side portion may have a width of greater than or equal to 10 percent of the width of the aerosol-generating article.

The first side portion may have a width of less than 10 percent of the width of the aerosol-generating article.

The first side portion may have a width of between 5 percent of the width of the aerosol-generating article and 10 percent of the width of the aerosol-generating article.

The second side portion may have a width of greater than or equal to 5 percent of the width of the aerosol-generating article. The second side portion may have a width of greater than or equal to 10 percent of the width of the aerosol-generating article.

The second side portion may have a width of less than 10 percent of the width of the aerosol-generating article.

The second side portion may have a width of between 5 percent of the width of the aerosol-generating article and 10 percent of the width of the aerosol-generating article.

The first side portion may have a thickness of greater than or equal to 1.5 millimetres. The first side portion may have a thickness of greater than or equal to 1.75 millimetres. The first side portion may have a thickness of greater than or equal to 2 millimetres. The first side portion may have a thickness of greater than or equal to 2.25 millimetres. The first side portion may have a thickness of greater than or equal to 2.5 millimetres.

The first side portion may have a thickness of less than 3.5 millimetres. The first side portion may have a thickness of less than 3.25 millimetres. The first side portion may have a thickness of less than 3 millimetres. The first side portion may have a thickness of less than 2.75 millimetres. The first side portion may have a thickness of less than 2.5 millimetres.

The first side portion may have a thickness of between 1.5 millimetres and 3.5 millimetres. The first side portion may have a thickness of between 1.75 millimetres and 3.25 millimetres. The first side portion may have a thickness of between 2 millimetres and 3 millimetres. The first side portion may have a thickness of between 2.25 millimetres and 2.75 millimetres.

The second side portion may have a thickness of greater than or equal to 1.5 millimetres. The second side portion may have a thickness of greater than or equal to 1.75 millimetres. The second side portion may have a thickness of greater than or equal to 2 millimetres. The second side portion may have a thickness of greater than or equal to 2.25 millimetres. The second side portion may have a thickness of greater than or equal to 2.5 millimetres.

The second side portion may have a thickness of less than 3.5 millimetres. The first side portion may have a thickness of less than 3.25 millimetres. The second side portion may have a thickness of less than 3 millimetres. The second side portion may have a thickness of less than 2.75 millimetres. The second side portion may have a thickness of less than 2.5 millimetres.

The second side portion may have a thickness of between 1.5 millimetres and 3.5 millimetres. The second side portion may have a thickness of between 1.75 millimetres and 3.25 millimetres. The second side portion may have a thickness of between 2 millimetres and 3 millimetres. The second side portion may have a thickness of between 2.25 millimetres and 2.75 millimetres.

The first side portion may have a thickness of greater than or equal to 50 percent of the thickness of the aerosol-generating article. The first side portion may have a thickness of greater than or equal to 70 percent of the thickness of the aerosol-generating article. The first side portion may have a thickness of greater than or equal to 90 percent of the thickness of the aerosol-generating article. The first side portion may have a thickness of greater than or equal to 95 percent of the thickness of the aerosol-generating article.

The first side portion may have a thickness of less than 95 percent of the thickness of the aerosol-generating article. The first side portion may have a thickness of less than 90 percent of the thickness of the aerosol-generating article. The first side portion may have a thickness of less than 70 percent of the thickness of the aerosol-generating article.

The first side portion may have a thickness of between 50 percent of the thickness of the aerosol-generating article and 95 percent of the thickness of the aerosol-generating article. The first side portion may have a thickness of between 70 percent of the thickness of the aerosol-generating article and 95 percent of the thickness of the aerosol-generating article.

The second side portion may have a thickness of greater than or equal to 50 percent of the thickness of the aerosol-generating article. The second side portion may have a thickness of greater than or equal to 70 percent of the thickness of the aerosol-generating article. The second side portion may have a thickness of greater than or equal to 90 percent of the thickness of the aerosol-generating article. The second side portion may have a thickness of greater than or equal to 95 percent of the thickness of the aerosol-generating article.

The second side portion may have a thickness of less than 95 percent of the thickness of the aerosol-generating article. The second side portion may have a thickness of less than 90 percent of the thickness of the aerosol-generating article. The second side portion may have a thickness of less than 70 percent of the thickness of the aerosol-generating article.

The second side portion may have a thickness of between 50 percent of the thickness of the aerosol-generating article and 95 percent of the thickness of the aerosol-generating article. The second side portion may have a thickness of between 70 percent of the thickness of the aerosol-generating article and 95 percent of the thickness of the aerosol-generating article.

The one or more aerosol-generating substrates may comprise an aerosol-generating substrate layer. Advantageously, the aerosol-generating substrate layer can be made thin and, therefore, quickly heat up and release volatile compounds to form an aerosol. Advantageously, the aerosol-generating substrate layer can be positioned close to a heater of an aerosol-generating device.

The aerosol-generating substrate layer may comprise an aerosol-generating material. The aerosol-generating material may be any aerosol-generating material described herein. The aerosol-generating material may be in the form of a sheet of aerosol-generating material. The sheet of aerosol-generating material may be any sheet of aerosol-generating material described

herein. The aerosol-generating substrate layer may be, and may be made entirely of, a sheet of aerosol-generating material.

The aerosol-generating substrate layer may be positioned between the frame and the first planar external surface. The aerosol-generating substrate layer may be positioned between the frame and the second planar external surface. The aerosol-generating substrate layer may be in physical contact with, and may be bonded to, the frame.

The aerosol-generating substrate layer may be positioned between the frame and the outer wrapper. The outer wrapper is discussed in more detail below. The aerosol-generating substrate layer may in physical contact with, and may be bonded to, both the frame and the outer wrapper.

The aerosol-generating substrate layer may be positioned between the frame and the first planar external layer. The aerosol-generating substrate layer may be positioned between the frame and the second planar external layer. The first planar external layer and the second planar external layer are discussed in more detail below. The aerosol-generating substrate layer may in physical contact with, and may be bonded to, both the frame and the first planar external layer. The aerosol-generating substrate layer may in physical contact with, and may be bonded to, both the frame and the second planar external layer.

The aerosol-generating substrate layer may overlie an end of the cavity. The aerosol-generating substrate layer may define or form a wall of the cavity, such as the first cavity end wall or the second cavity end wall. Advantageously, the aerosol-generating substrate layer may therefore be in, or at least partially define or form, the airflow passage thereby allowing released volatile compounds to quickly form an aerosol.

The one or more aerosol-generating substrates may comprise a first aerosol-generating substrate layer and a second aerosol-generating substrate layer. Advantageously, a first and a second aerosol-generating substrate layer may allow rapid generation of a satisfactory volume of aerosol compared with using a single aerosol-generating substrate layer.

The first aerosol-generating substrate layer may comprise an aerosol-generating material. The aerosol-generating material may be any aerosol-generating material described herein. The aerosol-generating material may be in the form of a sheet of aerosol-generating material. The sheet of aerosol-generating material may be any sheet of aerosol-generating material described herein. The first aerosol-generating substrate layer may be, and may be made entirely of, a sheet of aerosol-generating material.

The second aerosol-generating substrate layer may comprise an aerosol-generating material. The aerosol-generating material may be any aerosol-generating material described herein. The aerosol-generating material may be in the form of a sheet of aerosol-generating material. The sheet of aerosol-generating material may be any sheet of aerosol-generating material described herein. The second aerosol-generating substrate layer may be, and may be made entirely of, a sheet of aerosol-generating material.

The first aerosol-generating substrate layer may be positioned between the frame and the first planar external surface. The first aerosol-generating substrate layer may be in physical contact with, and may be bonded to, the frame.

The first aerosol-generating substrate layer may be positioned between the frame and the outer wrapper. The first aerosol-generating substrate layer may in physical contact with, and may be bonded to, both the frame and the outer wrapper.

The first aerosol-generating substrate layer may be positioned between the frame and the first planar external layer. The first aerosol-generating substrate layer may in physical contact with, and may be bonded to, both the frame and the first planar external layer.

The second aerosol-generating substrate layer may be positioned between the frame and the second planar external surface. The second aerosol-generating substrate layer may be in physical contact with, and may be bonded to, the frame.

The second aerosol-generating substrate layer may be positioned between the frame and the outer wrapper. The second aerosol-generating substrate layer may in physical contact with, and may be bonded to, both the frame and the outer wrapper.

The second aerosol-generating substrate layer may be positioned between the frame and the second planar external layer. The second aerosol-generating substrate layer may in physical contact with, and may be bonded to, both the frame and the second planar external layer.

The first aerosol-generating substrate layer and the second aerosol-generating substrate layer may overlie opposing ends of the cavity. The first aerosol-generating substrate layer and the second aerosol-generating substrate layer may define or form opposing end walls of the cavity. That is, the frame, the first aerosol-generating substrate layer and the second aerosol-generating substrate layer may collectively define the cavity.

One or more of the aerosol-generating substrate layer, the first aerosol-generating substrate layer and the second aerosol-generating substrate layer may have a thickness greater than or equal to 100 micrometres, greater than or equal to 200 micrometres, greater than or equal to 300 micrometres, greater than or equal to 400 micrometres, or greater than or equal to 500 micrometres.

One or more of the aerosol-generating substrate layer, the first aerosol-generating substrate layer and the second aerosol-generating substrate layer may have a thickness less than or equal to 600 micrometres, less than or equal to 500 micrometres, less than or equal to 400 micrometres, less than or equal to 300 micrometres, or less than or equal to 300 micrometres.

One or more of the aerosol-generating substrate layer, the first aerosol-generating substrate layer and the second aerosol-generating substrate layer may have a thickness between 100 micrometres and 600 micrometres, between 200 micrometres and 500 micrometres, between 200 micrometres and 400 micrometres, or between 200 micrometres and 300 micrometres.

The aerosol-generating substrate layer may have a length substantially the same as the length of the frame. The aerosol-generating substrate layer may have a length substantially the same as the length of the aerosol-generating article.

The first aerosol-generating substrate layer may have a length substantially the same as the length of the frame. The first aerosol-generating substrate layer may have a length substantially the same as the length of the aerosol-generating article.

The second aerosol-generating substrate layer may have a length substantially the same as the length of the frame. The second aerosol-generating substrate layer may have a length substantially the same as the length of the aerosol-generating article.

The aerosol-generating substrate layer may have a width substantially the same as the width of the frame. The aerosol-generating substrate layer may have a width substantially the same as the width of the aerosol-generating article.

The first aerosol-generating substrate layer may have a width substantially the same as the width of the frame. The first aerosol-generating substrate layer may have a width substantially the same as the width of the aerosol-generating article.

The second aerosol-generating substrate layer may have a width substantially the same as the width of the frame. The second aerosol-generating substrate layer may have a width substantially the same as the width of the aerosol-generating article.

The first planar external surface may be a planar upper surface and the second planar external surface may be a planar lower surface. The first planar external surface may be positioned parallel to the second planar external surface. The first planar external surface may extend in the x/y plane. The second planar external surface may extend in the x/y plane. The second planar external surface may be spaced from the first planar external surface in the z-direction or transverse direction. The distance between the first planar external surface and the second planar external surface in the z-direction or transverse direction may define the thickness of the aerosol-generating article.

The aerosol-generating article may comprise an outer wrapper. The outer wrapper may be hydrophobic. The outer wrapper may comprise a hydrophobic material.

The outer wrapper may define or form the first planar external surface. The outer wrapper may define or form the second planar external surface. The outer wrapper may define or form both the first planar external surface and the second planar external surface.

The outer wrapper may circumscribe or encircle the frame. The outer wrapper may be in physical contact with, and may be bonded to, the frame. The outer wrapper may overlie opposing ends of the cavity. The outer wrapper may define or form opposing end walls of the cavity, such as the first cavity end wall and the second cavity end wall. That is, the frame and the outer wrapper may collectively define the cavity.

The outer wrapper may circumscribe or encircle the substrate wrapper. The outer wrapper may circumscribe or encircle the substrate wrapper, the aerosol-generating substrate, the first end

portion and the second end portion. The outer wrapper may be in physical contact with, and may be bonded to, the substrate wrapper. The outer wrapper may be in physical contact with, and may be bonded to, the substrate wrapper, the first end portion and the second end portion.

The outer wrapper may circumscribe or encircle the frame and the aerosol-generating substrate layer. The outer wrapper may be in physical contact with, and may be bonded to, both the frame and the aerosol-generating substrate layer.

The outer wrapper may circumscribe or encircle the frame, the first aerosol-generating substrate layer and the second aerosol-generating substrate layer. The outer wrapper may be in physical contact with, and may be bonded to, both the first aerosol-generating substrate layer and the second aerosol-generating substrate layer.

The aerosol-generating article may comprise a first planar external layer and a second planar external layer. The first planar external layer may be an upper layer and the second planar external layer may be a lower layer.

The first planar external layer may define or form the first planar external surface. The first planar external layer may extend in the x/y plane. The second planar external layer may define or form the second planar external surface. The second planar external layer may extend in the x/y plane.

The first planar external layer may be in physical contact with, and may be bonded to, the frame. The first planar external layer may overlie an end of the cavity. The first planar external layer may define or form a wall of the cavity, such as the first cavity end wall.

The second planar external layer may be in physical contact with, and may be bonded to, the frame. The second planar external layer may overlie an end of the cavity. The second planar external layer may define or form a wall of the cavity, such as the second cavity end wall.

The first planar external layer and the second planar external layer may overlie opposing ends of the cavity. The first planar external layer and the second planar external layer may define or form opposing end walls of the cavity, such as the first cavity end wall and the second cavity end wall. That is, the frame, the first planar external layer and the second planar external layer may collectively define the cavity.

The first planar external layer may be spaced, such as in a transverse direction, from the frame. For example, the aerosol-generating substrate layer or the first aerosol-generating substrate layer may be positioned between the first planar external layer and the frame. The first planar external layer may be in physical contact with, and may be bonded to, the aerosol-generating substrate layer or the first aerosol-generating substrate layer.

The second planar external layer may be spaced, such as in a transverse direction, from the frame. For example, the aerosol-generating substrate layer or the second aerosol-generating substrate layer may be positioned between the second planar external layer and the frame. The second planar external layer may be in physical contact with, and may be bonded to, the aerosol-generating substrate layer or the second aerosol-generating substrate layer.

The first planar external layer may be hydrophobic. The first planar external layer may comprise a hydrophobic material. The second planar external layer may be hydrophobic. The second planar external layer may comprise a hydrophobic material.

One or more of the outer wrapper, the first planar external layer and the second planar external layer may comprise, or be made from, a cellulosic material. The cellulosic material may be paper, cigarette paper, tobacco paper, cardboard, wood, textile, natural fibres or artificial fibres.

One or more of the outer wrapper, the first planar external layer and the second planar external layer may be an aerosol-generating substrate comprising an aerosol-generating material. The aerosol-generating material may be any aerosol-generating material described herein. In particular, the aerosol-generating material may be in the form of a sheet of aerosol-generating material. The sheet of aerosol-generating material may be any sheet of aerosol-generating material described herein. Alternatively, one or more of the outer wrapper, the first planar external layer and the second planar external layer may not comprise any aerosol-generating material, particularly in embodiments comprising an aerosol-generating substrate layer, a first aerosol-generating substrate layer, a second aerosol-generating substrate layer or an aerosol-generating substrate positioned within the cavity. One or more of the outer wrapper, the first planar external layer and the second planar external layer may be substantially nicotine-free.

One or more of the outer wrapper, the first planar external layer and the second planar external layer may have a thickness greater than or equal to 25 micrometres, greater than or equal to 30 micrometres, greater than or equal to 35 micrometres, greater than or equal to 40 micrometres, or greater than or equal to 45 micrometres.

One or more of the outer wrapper, the first planar external layer and the second planar external layer may have a thickness less than or equal to 55 micrometres, less than or equal to 50 micrometres, less than or equal to 45 micrometres, less than or equal to 40 micrometres, or less than or equal to 35 micrometres.

One or more of the outer wrapper, the first planar external layer and the second planar external layer may have a thickness between 25 micrometres and 55 micrometres, between 25 micrometres and 45 micrometres, or between 30 micrometres and 45 micrometres.

One or more of the outer wrapper, the first planar external layer and the second planar external layer may have a length substantially the same as the length of the frame. One or more of the outer wrapper, the first planar external layer and the second planar external layer may have a length substantially the same as the length of the aerosol-generating article.

One or more of the first planar external layer and the second planar external layer may have a width substantially the same as the width of the frame. One or more of the first planar external layer and the second planar external layer may have a width substantially the same as the width of the aerosol-generating article.

The cavity may have a thickness greater than or equal to 0.5 millimetres. The cavity may have a thickness greater than or equal to 1.5 millimetres. The cavity may have a thickness greater

than or equal to 2.5 millimetres. The cavity may have a thickness greater than or equal to 3.5 millimetres.

The cavity may have a thickness less than or equal to 4.5 millimetres. The cavity may have a thickness less than or equal to 3.5 millimetres. The cavity may have a thickness less than or equal to 2.5 millimetres. The cavity may have a thickness less than or equal to 1.5 millimetres.

The cavity may have a thickness between 0.5 millimetres and 4.5 millimetres. The cavity may have a thickness between 1 millimetre and 4.5 millimetres. Preferably, the cavity may have a thickness between 2.8 millimetres and 3.3 millimetres.

The cavity may have a length greater than or equal to 14 millimetres. The cavity may have a length equal to a greater than 18 millimetres. The cavity may have a length greater than or equal to 22 millimetres. The cavity may have a thickness greater than or equal to 30 millimetres. The cavity may have a thickness greater than or equal to 38 millimetres.

The cavity may have a length less than or equal to 40 millimetres. The cavity may have a thickness less than or equal to 34 millimetres. The cavity may have a thickness less than or equal to 28 millimetres. The cavity may have a thickness less than or equal to 22 millimetres. The cavity may have a thickness less than or equal to 18 millimetres.

The cavity may have a length between 14 millimetres and 40 millimetres. The cavity may have a length between 14 millimetres and 34 millimetres. . The cavity may have a length between 24 millimetres and 28 millimetres.

The cavity may have a width greater than or equal to 4.5 millimetres. The cavity may have a width greater than or equal to 7 millimetres. The cavity may have a width greater than or equal to 11 millimetres.

The cavity may have a width less than or equal to 13 millimetres. The cavity may have a width less than or equal to 11 millimetres. The cavity may have a width less than or equal to 7 millimetres. The cavity may have a width less than or equal to 5 millimetres.

The cavity may have a width between 4.5 millimetres and 13 millimetres. The cavity may have a width between 7 millimetres and 10 millimetres. The cavity may have a width between 7.5 millimetres and 8.5 millimetres.

The cavity may have a length between 14 millimetres and 40 millimetres, a width between 4.5 millimetres and 13 millimetres, and a thickness between 0.5 millimetres and 4.5 millimetres.

Preferably, the cavity may have a length between 20 millimetres and 30 millimetres, a width between 7 millimetres and 10 millimetres, and a thickness between 2.5 millimetres and 4 millimetres.

Most preferably, the cavity may have a length of 26 millimetres, a width of 8 millimetres, and a thickness of 3.1 millimetres.

The cavity may have a volume of greater than or equal to 30 cubic millimetres, greater than or equal to 100 cubic millimetres, greater than or equal to 300 cubic millimetres, greater than or equal to 500 cubic millimetres, greater than or equal to 700 cubic millimetres, greater than or equal

to 900 cubic millimetres, greater than or equal to 1000 cubic millimetres, greater than or equal to 2000 cubic millimetres, or greater than or equal to 30 cubic millimetres.

The cavity may have a volume of less than or equal to 3500 cubic millimetres, less than or equal to 2500 cubic millimetres, less than or equal to 1500 cubic millimetres, less than or equal to 1000 cubic millimetres, less than or equal to 800 cubic millimetres, less than or equal to 600 cubic millimetres, less than or equal to 500 cubic millimetres, less than or equal to 400 cubic millimetres, or less than or equal to 300 cubic millimetres.

The cavity may have a volume between 30 cubic millimetres and 3500 cubic millimetres. The cavity may have a volume between 30 cubic millimetres and 2500 cubic millimetres. The cavity may have a volume between 100 cubic millimetres and 1500 cubic millimetres. The cavity may have a volume between 100 cubic millimetres and 1000 cubic millimetres.

The cavity may be substantially empty.

The one or more aerosol-generating substrates may comprise an aerosol-generating substrate positioned within the cavity. The aerosol-generating substrate positioned within the cavity may fill the cavity.

The aerosol-generating substrate positioned within the cavity may comprise an aerosol-generating material. The aerosol-generating material may be any aerosol-generating material described herein. For example, the aerosol-generating material may be in the form of shredded aerosol-generating material.

The aerosol-generating material may be in the form of a sheet of aerosol-generating material. The sheet of aerosol-generating material may be any sheet of aerosol-generating material described herein. For example, the sheet of aerosol-generating material may be a sheet of homogenised tobacco material.

The sheet of aerosol-generating material may extend the entire length of the cavity. The sheet of aerosol-generating material may extend the entire width of the cavity.

The sheet of aerosol-generating material may be a gathered sheet of aerosol-generating material. That is, the sheet of aerosol-generating material may be convoluted, folded, or otherwise compressed or constricted substantially perpendicular to the transverse direction of the aerosol-generating article.

The sheet of aerosol-generating material may be a crimped sheet of aerosol-generating material. The sheet of aerosol-generating material may be a corrugated sheet of aerosol-generating material. The crimped sheet of aerosol-generating material or the corrugated sheet of aerosol-generating material may comprise a plurality of parallel corrugations. For example, the crimped sheet of aerosol-generating material may comprise a plurality of substantially parallel peaks and troughs.

The plurality of parallel corrugations may be defined by a corrugation profile, in which the corrugation profile is sinusoidal, or triangular, or rectangular, or trapezoidal, or toroidal, or parabolic.

The plurality of parallel corrugations may define, or form, a plurality of channels between the sheet of aerosol-generating material and one or more walls of the cavity. The plurality of channels may be a plurality of longitudinally extending channels. The plurality of channels may be a plurality of laterally extending channels. The plurality of channels may defined, or form, at least a portion of the airflow passage extending between the air inlet and air outlet of the aerosol-generating article.

The aerosol-generating material may comprise one or more organic materials such as tobacco, mint, tea and cloves. The aerosol-generating material may comprise one or more of: herb leaf, tobacco leaf, fragments of tobacco ribs, reconstituted tobacco, homogenised tobacco such as cast leaf, extruded tobacco, expanded tobacco, aerosol-generating films and gel compositions.

The aerosol-generating material may be in the form of shredded aerosol-generating material. The shredded aerosol-generating material may comprise one or more of: strips and strands of aerosol-generating material, such as strips and strands of tobacco or homogenised tobacco material. The shredded aerosol-generating material may be in the form of a shredded sheet of homogenised tobacco material.

The aerosol-generating material may be cut filler. The aerosol-generating material may be tobacco cut filler. The cut filler may comprise one or more of bright tobacco, dark tobacco, aromatic tobacco and filler tobacco. Examples of bright tobaccos are Flue-Cured Brazil, Indian Flue-Cured, Chinese Flue-Cured, US Flue-Cured such as Virginia tobacco, and Flue-Cured from Tanzania. Examples of aromatic tobaccos are Oriental Turkey, Greek Oriental, semi-oriental tobacco but also Fire Cured, US Burley, such as Perique, and Rustica. Examples of dark tobacco are Dark Cured Brazil Galpao, Burley Malawi or other African Burley, Sun Cured or Air Cured Indonesian Kasturi. As used herein, the term “cut filler” is used to describe to a blend of shredded plant material, such as tobacco plant material, including, in particular, one or more of leaf lamina, processed stems and ribs, homogenised plant material.

The aerosol-generating material may be in the form of a sheet of aerosol-generating material. As used herein, the term “sheet” describes a laminar element having a width and length substantially greater than the thickness thereof. The sheet of aerosol-generating material may be a sheet of plant material. The sheet of aerosol-generating material may be a sheet of tobacco material. The sheet of aerosol-generating material may be a sheet of homogenised tobacco material, such as a cast leaf sheet.

The aerosol-generating material may comprise one or more aerosol-formers. Suitable aerosol-formers are well known in the art and include, but are not limited to, one or more aerosol-formers selected from: polyhydric alcohols, such as propylene glycol, polyethylene glycol, triethylene glycol, 1, 3-butanediol and glycerine; esters of polyhydric alcohols, such as glycerol mono-, di- or triacetate; and aliphatic esters of mono-, di- or polycarboxylic acids, such as dimethyl dodecanedioate and dimethyl tetradecanedioate. It may be particularly preferable for the aerosol-

former to be or comprise one or both of glycerine and propylene glycol. The aerosol former may consist of glycerine or propylene glycol or of a combination of glycerine and propylene glycol.

The aerosol-generating material may have an aerosol-former content greater than or equal to 15 percent by weight on a dry weight basis, for example greater than 20 by weight on a dry weight basis, or greater than 25 by weight on a dry weight basis, or greater than 30 by weight on a dry weight basis, or greater than 40 by weight on a dry weight basis, or greater than 50 by weight on a dry weight basis.

The aerosol-generating material may have an aerosol-former content less than or equal to 30 percent by weight on a dry weight basis, less than or equal to 25 percent by weight on a dry weight basis, or less than or equal to 20 percent by weight on a dry weight basis.

The aerosol-generating material may have an aerosol-former content between 5 percent and 30 percent by weight on a dry weight basis, between 5 percent and 25 percent by weight on a dry weight basis, or between 5 percent and 20 percent by weight on a dry weight basis.

The aerosol-generating material may have an aerosol-former content between 10 percent and 30 percent by weight on a dry weight basis, between 10 percent and 25 percent by weight on a dry weight basis, or between 10 percent and 20 percent by weight on a dry weight basis.

The aerosol-generating material may comprise nicotine. The aerosol-generating material may comprise natural nicotine, or synthetic nicotine, or a combination of natural nicotine and synthetic nicotine.

The aerosol-generating material may comprise at least 0.5 percent by weight of nicotine, at least 1 percent by weight of nicotine, at least 1.5 percent by weight of nicotine, or at least 2 percent by weight of nicotine. That is, the aerosol-generating material may have a nicotine content of at least 0.5 percent by weight, at least 1 percent by weight, at least 1.5 percent by weight, or at least 2 percent by weight.

The aerosol-generating material may comprise one or more flavourants. The one or more flavourants may comprise one or more of: one or more essential oils such as eugenol, peppermint oil and spearmint oil; one or both of menthol and eugenol; one or both of anethole and linalool; and a herbaceous material. Suitable herbaceous material includes herb leaf or other herbaceous material from herbaceous plants including, but not limited to, mints, such as peppermint and spearmint, lemon balm, basil, cinnamon, lemon basil, chive, coriander, lavender, sage, tea, thyme, and caraway. The one or more flavourants may comprise a tobacco material.

The aerosol-generating material may comprise one or more botanicals. For example, the aerosol-generating material may comprise about 15 to 55 %, preferably of about 20 to 35 %, of botanicals such as Clove, Echinacea sp., Fennel, Ginger, Hawthorn berry, Elderberry, Monarda, Mullein leaves, Nettle, Plantain, Turmeric, Yarrow, and compounds of those.

The air inlet may be defined by a front wall of the aerosol-generating article. The air inlet may be defined by, and may extend through, the frame. The air inlet may be defined by the peripheral wall of the frame. The air inlet may extend through the peripheral wall of the frame. The

air outlet may be defined by a back wall of the aerosol-generating article. The air outlet may be defined by, and may extend through, the frame. The air outlet may be defined by the peripheral wall of the frame. The outlet may extend though the peripheral wall of the frame.

The air inlet may have a round cross-section, a circular cross-section, an oval cross-section, a square cross-section, or a rectangular cross-section. The air outlet may have a round cross-section, a circular cross-section, an oval cross-section, a square cross-section, or a rectangular cross-section.

The air inlet may be defined by, and may extend through, the first planar external surface. The air inlet may be defined by, and may extend through, the outer wrapper. The air inlet may be defined by, and may extend through, the outer wrapper and the aerosol-generating substrate layer. The air inlet may be defined by, and may extend through, the outer wrapper and the first aerosol-generating substrate layer. The air inlet may be defined by, and may extend through, the first planar external layer and the aerosol-generating substrate layer. The air inlet may be defined by, and may extend through, the first planar external layer and the first aerosol-generating substrate layer.

The air inlet may be defined by, and may extend through, the second planar external surface. The air inlet may be defined by, and may extend through, the outer wrapper and the second aerosol-generating substrate layer. The air inlet may be defined by, and may extend through, the second planar external layer and the aerosol-generating substrate layer. The air inlet may be defined by, and may extend through, the second planar external layer and the second aerosol-generating substrate layer.

The air outlet may be defined by, and may extend through, the first planar external surface. The air outlet may be defined by, and may extend through, the outer wrapper. The air outlet may be defined by, and may extend through, the outer wrapper and the aerosol-generating substrate layer. The air outlet may be defined by, and may extend through, the outer wrapper and the first aerosol-generating substrate layer. The air outlet may be defined by, and may extend through, the first planar external layer and the aerosol-generating substrate layer. The air outlet may be defined by, and may extend through, the first planar external layer and the first aerosol-generating substrate layer.

The air outlet may be defined by, and may extend through, the second planar external surface. The air outlet may be defined by, and may extend through, the outer wrapper and the second aerosol-generating substrate layer. The air outlet may be defined by, and may extend through, the second planar external layer and the aerosol-generating substrate layer. The air outlet may be defined by, and may extend through, the second planar external layer and the second aerosol-generating substrate layer.

One or both of the air inlet and the air outlet may have an equivalent diameter greater than or equal to 0.1 millimetres, greater than or equal to 0.4 millimetres, greater than or equal to 0.7 millimetres, or greater than or equal to 1.0 millimetres.

One or both of the air inlet and the air outlet may have an equivalent diameter less than or equal to 3 millimetres, less than or equal to 2.7 millimetres, less than or equal to 2.4 millimetres, less than or equal to 2.1 millimetres. The air inlet may have an equivalent diameter less than or equal to 2.7 millimetres, less than or equal to 1.8 millimetres, or less than or equal to 1.5 millimetres.

One or both of the air inlet and the air outlet may have an equivalent diameter between 0.1 millimetres and 3 millimetres, between 0.1 millimetres and 2.4 millimetres, between 0.4 millimetres and 2.1 millimetres, between 0.4 millimetres and 1.8 millimetres, between 0.7 millimetres and 1.5 millimetres, or between 1.0 millimetres and 1.5 millimetres.

The air inlet may have a width less than a width of the cavity. The air outlet may have a width less than a width of the cavity. The air inlet may have a thickness less than a thickness of the cavity. The air outlet may have a thickness less than a thickness of the cavity.

One or both of the air inlet and the air outlet may a width of between 0.3 millimetres and 3 millimetres or between 0.5 millimetres and 2 millimetres.

One or both of the air inlet and the air outlet may have a thickness of between 0.3 millimetres and 3 millimetres or between 0.5 millimetres and 2 millimetres.

Preferably, the air inlet may have a width of between 0.3 millimetres and 3 millimetres, and a thickness of between 0.3 millimetres and 3 millimetres.

Preferably, the air outlet may have a width of between 0.3 millimetres and 3 millimetres, and a thickness of between 0.3 millimetres and 3 millimetres.

Advantageously, an aerosol-generating article having an air outlet or air inlet with a width of between 0.3 millimetres and 3 millimetres and a thickness of between 0.3 millimetres and 3 millimetres may provide for a relatively large inlet or outlet opening while allowing for improved retention of the aerosol-generating substrate within the aerosol-generating article. Improved retention of the aerosol-generating substrate within the aerosol-generating article may reduce the risk of aerosol-generating substrate falling out of the aerosol-generating article.

A ratio of the width of the air inlet to the thickness of the air inlet may be between 0.33 and 3. A ratio of the width of the air inlet to the thickness of the air inlet may be between 0.5 and 1.5. A ratio of the width of the air inlet to the thickness of the air inlet may be between 0.75 and 1.25.

A ratio of the width of the air outlet to the thickness of the air outlet may be between 0.33 and 3. A ratio of the width of the air outlet to the thickness of the air outlet may be between 0.5 and 1.5. A ratio of the width of the air outlet to the thickness of the air outlet may be between 0.75 and 1.25.

The aerosol-generating article may comprise a plurality of air inlets. One or each of the air inlets may have one or more of the features of the air inlet described herein.

The aerosol-generating article may comprise a plurality of air outlets. One or each of the air outlets may have one or more of the features of the air outlet described herein.

The aerosol-generating article may comprise a filter element positioned downstream of the aerosol-forming substrate. The aerosol-generating article may comprise a filter element positioned downstream of the cavity. The aerosol-generating article may comprise a filter element at least partially positioned within the air outlet. The aerosol-generating article may comprise a filter element positioned within, and may be positioned at a downstream end of, the cavity.

The aerosol-generating article may comprise a filter element positioned upstream of the aerosol-forming substrate. The aerosol-generating article may comprise a filter element positioned upstream of the cavity. The aerosol-generating article may comprise a filter element at least partially positioned within the air inlet. The aerosol-generating article may comprise a filter element positioned within, and may be positioned at an upstream end of, the cavity.

The filter element may comprise one or more segments of a fibrous filtration material. Suitable fibrous filtration materials would be known to the skilled person. The filter element may comprise a cellulose acetate.

A ratio between the length and the thickness of the aerosol-generating article, and between the width and the thickness of the aerosol-generating article may be greater than 2:1, greater than 5:1, greater than 10:1, greater than 12:1, or greater than 15:1.

A ratio between the length and the thickness of the aerosol-generating article, and between the width and the thickness of the aerosol-generating article may be less than 15:1, less than 12:1, less than 10:1, less than 5:1, or less than 2.5:1

A ratio between the length and the thickness of the aerosol-generating article, and between the width and the thickness of the aerosol-generating article may be between 2:1 and 15:1, between 2:1 and 12:1, between 2:1 and 10:1, or between 5:1 and 10:1.

A ratio between the length and the width of the aerosol-generating article may be greater than 1:1, greater than 2:1, greater than 3:1, greater than 4:1, or greater than 5:1.

A ratio between the length and the width of the aerosol-generating article may be less than 10:1, less than 8:1, less than 5:1, less than 4:1, less than 3:1, or less than 2:1.

A ratio between the length and the width of the aerosol-generating article may be between 1:1 and 10:1, between 1:1 and 5:1, between 1:1 and 4:1, between 1:1 and 3:1, between 2:1 and 4:1, or between 2:1 and 3:1.

The aerosol-generating article may have a length greater than or equal to 15 millimetres, greater than or equal to 20 millimetres, greater than or equal to 25 millimetres, greater than or equal to 30 millimetres, greater than or equal to 35 millimetres, or greater than or equal to 40 millimetres.

The aerosol-generating article may have a length less than or equal to 45 millimetres, less than or equal to 40 millimetres, less than or equal to 35 millimetres, or less than or equal to 30 millimetres.

The aerosol-generating article may have a length between 15 millimetres and 45 millimetres, between 20 millimetres and 40 millimetres, between 20 millimetres and 35 millimetres, or between 25 millimetres and 30 millimetres.

The aerosol-generating article may have a width equal to greater than 3 millimetres, greater than 5 millimetres, greater than 7.5 millimetres, greater than 9 millimetres, greater than 11 millimetres, or greater than 13 millimetres.

The aerosol-generating article may have a width less than or equal to 17 millimetres, less than or equal to 15 millimetres, less than or equal to 12.5 millimetres, less than or equal to 11 millimetres, or less than or equal to 9 millimetres.

The aerosol-generating article may have a width between 3 millimetres and 17 millimetres, between 5 millimetres and 15 millimetres, between 7.5 millimetres and 12.5 millimetres, or between 9 millimetres and 11 millimetres.

The aerosol-generating article may have a thickness equal to greater than 1 millimetre, greater than or equal to 1.5 millimetres, greater than or equal to 2 millimetres, greater than or equal to 2.5 millimetres, greater than or equal to 3 millimetres, greater than or equal to 3.5 millimetres, greater than or equal to 4 millimetres, or greater than or equal to 4.5 millimetres.

The aerosol-generating article may have a thickness less than or equal to 5.5 millimetres, less than or equal to 5 millimetres, less than or equal to 4.5 millimetres, less than or equal to 4 millimetres, less than or equal to 3.5 millimetres, less than or equal to 3 millimetres, less than or equal to 2.5 millimetres, or less than or equal to 2 millimetres.

The aerosol-generating article may have a thickness between 1 millimetres and 5 millimetres, between 1.5 millimetres and 5 millimetres, between 2 millimetres and 4.5 millimetres, between 2.5 millimetres and 4 millimetres, or between 3 millimetres and 3.5 millimetres.

According to the present disclosure, there is provided an aerosol-generating device for receiving an aerosol-generating article as disclosed herein. The aerosol-generating device comprises a cavity dimensioned to receive at least a portion of the aerosol-generating article. The aerosol-generating device comprises a heater or heating means, a power source for supplying power to the heater or heating means, and a controller to control a supply of power to the heater or heating means. The aerosol-generating device is configured to heat at least one of the one or more aerosol-generating substrates to form an aerosol, for example an inhalable aerosol. The aerosol-generating device may be configured to heat each of the one or more aerosol-generating substrates to form an aerosol, for example an inhalable aerosol.

According to the present disclosure, an aerosol-generating system comprises an aerosol-generating device as disclosed herein and an aerosol-generating article as disclosed herein. The system may comprise a plurality of such articles for use with the aerosol-generating device.

As used herein, the term “aerosol-generating article” refers to an article comprising an aerosol-generating substrate. The article may be heated in use to produce and deliver an inhalable aerosol to a consumer.

As used herein, the term “aerosol-generating substrate” refers to a substrate capable of releasing volatile compounds upon heating, for example compounds which, in use, cool and condense to generate an aerosol.

As used herein, the term “aerosol-generating device” refers to a device that, in use, interacts with, for example heats, an aerosol-generating substrate of an aerosol-generating article to generate an aerosol.

As used herein, the term “planar” refers to a feature generally formed in a single Euclidean plane and not wrapped around or otherwise conformed to fit a curved or other non-planar shape. A planar surface may extend in two dimensions in a single Euclidean plane. A planar object may extend in two dimensions in a single Euclidean plane substantially more than in a third dimension perpendicular to the plane. More specifically, a planar object may extend in a first dimension and a second dimension perpendicular to the first dimension at least two, five or ten times further than the object extends in a third dimension perpendicular to the first and second dimensions.

As used herein, the term “transverse” refers to a direction extending between the first planar external surface and the second planar external surface. The transverse direction may also be referred to as the “z-direction”.

As used herein, the term “longitudinal” refers to a direction that is perpendicular to the transverse direction. For example, a direction between a front wall and a back wall of the aerosol-generating article. The longitudinal direction may also be referred to as the “x-direction”.

As used herein, the term “lateral” refers to a direction that is perpendicular to the transverse direction and the longitudinal direction. For example, a direction from a first side wall to a second side wall of the aerosol-generating article. The lateral direction may also be referred to as the “y-direction”.

As used herein, the term “thickness” refers to a maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in the transverse direction.

As used herein, the term “length” refers to a maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in the longitudinal direction.

As used herein, the term “width” refers to a maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in the lateral direction.

As used herein, the terms “upstream” and “downstream” refer to the relative positions of components, or portions of components, of the aerosol-generating article in relation to the direction in which the air or aerosol is transported through the aerosol-generating article during use.

As used herein, the term “bulk density” may refer to the total weight of the aerosol-generating substrate divided by the bulk volume of the aerosol-generating substrate.

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

As used herein, the term “aerosol former content” may refer to aerosol former content in percent on a dry weight basis, unless otherwise specified.

As used herein, a "susceptor" refers to a conductive element that heats up when subjected to a changing magnetic field. This may be the result of eddy currents induced in the susceptor element and/or hysteresis losses.

As used herein, the term “hydrophobic” refers to a surface exhibiting water repelling properties. One useful way to determine this is to measure the water contact angle. The “water contact angle” is the angle, conventionally measured through the liquid, where a liquid/vapour interface meets a solid surface. It quantifies the wettability of a solid surface by a liquid via the Young equation.

As used herein, the term “equivalent diameter” of an opening or an aperture is used herein to denote the diameter of a circular opening or aperture having the same cross-sectional area as the opening or aperture.

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

Ex1. An aerosol-generating article for use with an aerosol-generating device to generate an aerosol, the aerosol-generating article comprising:

a first planar external surface;

a second planar external surface;

a frame positioned between the first planar external surface and the second planar external surface; and

an air inlet and an air outlet,

wherein the frame comprises a first side portion and a second side portion, the first side portion and the second side portion at least partially defining the cavity and extending from the air inlet to the air outlet along the longitudinal axis of the aerosol-generating article,

wherein the first side portion is a support element and the second side portion is a support element.

Ex2. An aerosol-generating article according to Ex1, wherein the first side portion is a rigid support element and the second side portion is a rigid support element.

Ex3. An aerosol-generating article according to Ex1 or Ex2, wherein at least one of the first side portion and the second side portion has a length of greater than or equal to 20 millimetres.

Ex4. An aerosol-generating article according to Ex3, wherein the first side portion and the second side portion each have a length of greater than or equal to 20 millimetres.

Ex5. An aerosol-generating article according to any one of Ex1 to Ex4, wherein at least one of the first side portion and the second side portion has a length of less than 40 millimetres.

Ex6. An aerosol-generating article according to Ex5, wherein the first side portion and the second side portion each have a length of less than 40 millimetres.

Ex7. An aerosol-generating article according to any one of Ex1 to Ex5, wherein at least one of the first side portion and the second side portion has a length of between 25 millimetres and 35 millimetres.

Ex8. An aerosol-generating article according to any one of Ex1 to Ex7, wherein the first side portion and the second side portion each have a length of between 25 millimetres and 35 millimetres.

Ex9. An aerosol-generating article according to any one of Ex1 to Ex8, wherein at least one of the first side portion and the second side portion has a width of greater than or equal to 1.5 millimetres.

Ex10. An aerosol-generating article according to Ex9, wherein the first side portion and the second side portion each have a width of greater than or equal to 1.5 millimetres.

Ex11. An aerosol-generating article according to any one of Ex1 to Ex6, wherein at least one of the first side portion and the second side portion has a width of less than or equal to 3.5 millimetres.

Ex12. An aerosol-generating article according to Ex11, wherein the first side portion and the second side portion each have a width of less than or equal to 3.5 millimetres.

Ex13. An aerosol-generating article according to any one of claims 1 to 7, wherein at least one of the first side portion and the second side portion has a width of between 2 millimetres and 3 millimetres.

Ex14. An aerosol-generating article according to Ex13, wherein the first side portion and the second side portion each have a width of between 2 millimetres and 3 millimetres.

Ex15. An aerosol-generating article according to any one of Ex1 to Ex14, wherein at least one of the first side portion and the second side portion has a thickness of greater than or equal to 1.5 millimetres.

Ex16. An aerosol-generating article according to Ex15, wherein the first side portion and the second side portion each have a thickness of greater than or equal to 1.5 millimetres.

Ex17. An aerosol-generating article according to any one of Ex1 to Ex16, wherein at least one of the first side portion and the second side portion has a thickness of less than or equal to 3.5 millimetres.

Ex18. An aerosol-generating article according to Ex17, wherein the first side portion and the second side portion each have a thickness of less than or equal to 3.5 millimetres.

Ex19. An aerosol-generating article according to any one of Ex1 to Ex18, wherein at least one of the first side portion and the second side portion has a thickness of between 2 millimetres and 3 millimetres.

Ex20. An aerosol-generating article according to any one of Ex1 to Ex19, wherein the first side portion and the second side portion each have a thickness of between 2 millimetres and 3 millimetres.

Ex21. An aerosol-generating article according to any one of Ex1 to Ex20, wherein the first side portion is a first side wall.

Ex22. An aerosol-generating article according to any one of Ex1 to Ex21, wherein the second side portion is a second side wall.

Ex23. An aerosol-generating article according to any one of Ex1 to Ex22, comprising one or more aerosol-generating substrates.

Ex24. An aerosol-generating article according to Ex23, wherein at least one of the one or more aerosol-generating substrates is positioned within the cavity.

Ex25. An aerosol-generating article according to Ex24, wherein the aerosol-generating substrate is positioned within the cavity comprises tobacco cut filler.

Ex26. An aerosol-generating article according to any one of Ex1 to Ex25, wherein at least one of the first side portion and the second side portion comprises at least one corrugation.

Ex27. An aerosol-generating article according to Ex26, wherein the first side portion comprises at least one corrugation and the second side portion comprises at least one corrugation.

Ex28. An aerosol-generating article according to Ex26 or Ex27, wherein the at least one corrugation comprises a plurality of corrugations.

Ex29. An aerosol-generating article according to any one of Ex1 to Ex28, wherein at least one of the first side portion and the second side portion comprises one or more aerosol-generating substrates.

Ex30. An aerosol-generating article according to Ex29, wherein the first side portion comprises one or more aerosol-generating substrates and the second side portion comprises one or more aerosol-generating substrates.

Ex31. An aerosol-generating article according to Ex29 or Ex30, wherein the one or more aerosol-generating substrates comprises aerosol-generating material comprising homogenised tobacco material.

Ex32. An aerosol-generating article according to Ex31, wherein the homogenised tobacco material comprises one or more strips of homogenised tobacco material.

Ex33. An aerosol-generating article according to Ex31 or Ex32, wherein the homogenised tobacco material comprises a plurality of strips of homogenised tobacco material.

Ex34. An aerosol-generating article according to any one of Ex1 to Ex33, wherein at least one of the first side portion and the second side portion extend from one end of the aerosol-generating article to the other end of the aerosol-generating article.

Ex35. An aerosol-generating article according to any one of Ex1 to Ex34, wherein first side portion is identical to the second side portion.

Ex36. An aerosol-generating article according to any one of Ex1 to Ex35, wherein the frame comprises one or more elongate channels extending through it.

Ex37. An aerosol-generating article according to Ex36, wherein the first side portion comprises a first elongate channel extending longitudinally through it.

Ex38. An aerosol-generating article according to Ex36 or Ex37, wherein the second side portion comprises a second elongate channel extending through it.

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

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

Figure 2 shows an exploded perspective view of the aerosol-generating article of Figure 1;

Figure 3 shows an exploded perspective view of an aerosol-generating article according to the present disclosure;

Figure 4 shows a perspective view of an aerosol-generating article according to the present disclosure;

Figure 5 shows a perspective view of an aerosol-generating article according to the present disclosure;

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

Figure 7 shows a perspective view of an aerosol-generating article according to the present disclosure;

Figure 8 shows a perspective view of an aerosol-generating article according to the present disclosure;

Figure 9 shows an exploded perspective view of the aerosol-generating article of Figure 8;

Figure 10 shows a perspective view of an aerosol-generating article according to the present disclosure;

Figure 11 shows an exploded perspective view of the aerosol-generating article of Figure 10;

Figure 12 shows a perspective view of an aerosol-generating article according to the present disclosure in a first stage of a manufacturing process;

Figure 13 shows a perspective view of the aerosol-generating article of Figure 12 in a second stage of a manufacturing process;

Figure 14 shows a perspective view of an aerosol-generating article of Figure 12 in a third stage of a manufacturing process;

Figure 15 shows a perspective view of an aerosol-generating article of Figure 12 in a fourth stage of a manufacturing process;

Figure 16 shows a perspective view of an aerosol-generating article according to the present disclosure in a first stage of a manufacturing process;

Figure 17 shows a perspective view of the aerosol-generating article of Figure 16 in a second stage of a manufacturing process;

Figure 18 shows a perspective view of an aerosol-generating article according to the present disclosure in a first stage of a manufacturing process;

Figure 19 shows a perspective view of the aerosol-generating article of Figure 18 in a second stage of a manufacturing process;

Figure 20 shows a perspective view of an aerosol-generating article of Figure 18 in a third stage of a manufacturing process;

Figure 21 shows a perspective view of an aerosol-generating article of Figure 18 in a fourth stage of a manufacturing process;

Figure 22 shows a cross-sectional view of the aerosol-generating article shown in Figure 21;

Figure 23 shows a schematic cross-sectional view of an aerosol-generating device according to the present disclosure; and

Figure 24 shows a schematic cross-sectional view of the aerosol-generating device of Figure 23 in engagement with an aerosol-generating article of the present disclosure.

Figure 1 shows an aerosol-generating article 10 comprising a first planar external layer 24 forming a first planar external surface 21, a second planar external layer 25 forming a second planar external surface 22, and a frame 50 positioned between the first planar external layer 24 and the second planar external layer 25. The first planar external layer 24 and the second planar external layer 25 both comprise an aerosol-generating substrate comprising an aerosol-generating material, namely tobacco. However, it will be understood that in some embodiments only one of the first planar external layer 24 and the second planar external layer 25 may comprise an aerosol-generating substrate. Alternatively, or additionally, the aerosol-generating substrate may be positioned elsewhere within the aerosol-generating article 10.

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

The aerosol-generating article 10 is substantially flat aerosol-generating article or substantially planar aerosol-generating article. In particular, the thickness of the aerosol-generating article 10 is less than 50 percent of both the length and the width of the aerosol-generating article. The aerosol-generating article 10 has a generally rectangular cuboid shape and a laminated structure formed by the first planar external layer 24, the frame 50 and the second planar external layer 25. The first planar external layer 24, the frame 50 and the second planar external layer 25 are bonded together with an adhesive, in particular guar gum, as discussed in more detail below in relation to Figure 2.

Figure 2 shows an exploded view of the aerosol-generating article 10 of Figure 1.

The frame 50 has a length of 30 millimetres, a width of 10 millimetres, and a thickness of 2.7 millimetres. The frame 50 is made from cardboard and defines a frame aperture extending through the thickness of the frame 50. The frame aperture at least partially forms a cavity 30. The cavity 30 has length of 26 millimetres, a width of 6 millimetres, and a thickness of 2.7 millimetres.

Therefore, the cavity 30 has a volume of about 421.2 cubic millimetres. In this embodiment, the cavity 30 is substantially empty.

The frame 50 has a frame inner surface 52 extending in the z-direction or the transverse direction between the first planar external surface 21 and the second planar external surface 22. The frame inner surface 52 defines a cavity outer wall. The frame 50 has a frame outer surface 53 extending in the z-direction or the transverse direction between the first planar external surface 21 and the second planar external surface 22. The frame outer surface 53 at least partially defines one or more external surfaces of the aerosol-generating article, such as the front wall 13 and the back wall 14.

The frame 50 comprises a peripheral wall 51 that circumscribes the cavity 30. In more detail, the peripheral wall 51 is defined by the frame inner surface 52 and the frame outer surface 52. The peripheral wall 51 has a radial thickness, as measured between the frame inner surface 52 and the frame outer surface 53 in the x/y plane, of about 2 millimetres.

The first planar external layer 24 and the second planar external layer 25 have a thickness of 200 micrometres and are in physical contact with the frame 50. The first planar external layer 24 and the second planar external layer 25 are bonded to the frame with an adhesive 15. The first planar external layer 24 defines at least a portion of the cavity 30. The second planar external layer 25 defines at least a portion of the cavity 30.

The aerosol-generating article 10 comprises an air inlet 11 and an air outlet 12. The air inlet 11 and the air outlet 12 are defined by, and extend through, the peripheral wall 51 of the frame 50. The air inlet 11 and the air outlet 12 each have a rectangular cross-section, a width of 2 millimetres, and a thickness of 0.9 millimetres. An airflow passage extends between the air inlet 11 and the air outlet 12 through the cavity 30.

Figure 3 shows an exploded view of an aerosol-generating article that is similar to the aerosol-generating article 10 of Figure 1 except that the first planar external layer 24 and the second planar external layer 25 do not comprise an aerosol-generating substrate. Instead, an aerosol-generating substrate 40 is positioned within the cavity 30. The aerosol-generating substrate 40 comprises an aerosol-generating material in the form of tobacco cut filler and has an aerosol-former content of 5 percent by weight on a dry weight basis. As shown, the aerosol-generating substrate 40 fills the entire volume of the cavity 30. In the example of Figure 3, the aerosol-generating substrate 40 has a packing density of about 0.87, a density of about 0.3 grams per cubic centimetre, and a mass of about 110 milligrams. In another example, the aerosol-generating substrate 40 may have a different packing density, a different density and a different mass. For example, aerosol-generating substrate may have a packing density of 0.64, a density of 0.35 grams per cubic centimetre, and a mass of about 95 milligrams.

Figure 4 shows an aerosol-generating article 10 similar to the aerosol-generating article 10 of Figures 1 and 3 except that the aerosol-generating article 10 of Figure 4 comprises an outer

wrapper 23 defining the first planar external surface 21 and the second planar external surface 22 instead of the first planar external layer 24 and the second planar external layer 25.

Figure 5 shows an aerosol-generating article 10 similar to the aerosol-generating article 10 of Figure 1 except that the aerosol-generating article 10 of Figure 5 further comprises a first aerosol-generating substrate layer 41 and a second aerosol-generating substrate layer 42. The first aerosol-generating substrate layer 41 and the second aerosol-generating substrate layer 42 are formed from a sheet of aerosol-generating material. In particular, a sheet of homogenised tobacco material having an aerosol-former content of 5 percent by weight on a dry weight basis. The first aerosol-generating substrate layer 41 and the second aerosol-generating substrate layer 42 each have a length equal to the length of the aerosol-generating article 10, a width equal to the width of the aerosol-generating article 10 and a thickness of 200 micrometres. That is, the aerosol-generating article 10 has a length of 30 millimetres, a width of 10 millimetres, and a thickness of 3.5 millimetres.

The first aerosol-generating substrate layer 41 and the second aerosol-generating substrate layer 42 are in physical contact with the frame 50 and are bonded to the frame with an adhesive 15. The first aerosol-generating substrate layer 41 defines at least a portion of the cavity 30. The second aerosol-generating layer 42 defines at least a portion of the cavity 30.

The first planar external layer 24 is in physical contact with the first aerosol-generating substrate layer 41 and are bonded together with an adhesive 15. The second planar external layer 25 is in physical contact with the second aerosol-generating substrate layer 42 and are bonded together with an adhesive 15.

Figure 6 shows an exploded view of an aerosol-generating article 10 that is similar to the aerosol-generating article 10 of Figure 5 except that an aerosol-generating substrate 40 is positioned within the cavity 30 as described in relation to Figure 3. The aerosol-generating substrate 40 comprises an aerosol-generating material in the form of tobacco cut filler and has an aerosol-former content of 5 percent by weight on a dry weight basis. As shown, the aerosol-generating substrate 40 fills the entire volume of the cavity 30.

Figure 7 shows an aerosol-generating article 10 similar to the aerosol-generating article 10 of Figure 5 except that the aerosol-generating article 10 of Figure 7 comprises an outer wrapper 23 defining the first planar external surface 21 and the second planar external surface 22 instead of the first planar external layer 24 and the second planar external layer 25.

Figure 8 shows an aerosol-generating article 10 similar to the aerosol-generating article 10 of Figures 1 and 3 except that the frame 50 is formed from multiple portions. In the aerosol-generating article 10 of Figure 8, the frame 50 comprises a first side portion 54 and a second side portion 56. The frame 50 also comprises a first end portion 58 and a second end portion 60.

The first side portion 54 and the second side portion 56 extend along the longitudinal axis of the aerosol-generating article 10 from the air inlet 11 to the air outlet 12. In the example of Figure 8, the first side portion 54 and the second side portion 56 extend from one end of the aerosol-

generating article 10 to the other end of the aerosol-generating article 10. In other words, the first side portion 54 and the second side portion 56 extend from an upstream end of the aerosol-generating article 10 to a downstream end of the aerosol-generating article 10.

In the example of Figure 8, the first side portion 54 and the second side portion 56 have a length of 30 millimetres, a width of 2 millimetres and a thickness of 2.7 millimetres.

The first side portion 54 and the second side portion 56 are rigid. In the aerosol-generating article 10 of Figure 8, the first side portion 54 and the second side portion 56 are support elements providing strength to the structure of the aerosol-generating article and are formed from a rigid material, specifically corrugated cardboard.

The first end portion 58 and the second end portion 60 extend transversely to the longitudinal axis of the of the aerosol-generating article 10. The first end portion 58 and the second end portion 60 extend between inner surfaces of the first side portion 54 and the second side portion 56 so as to form the frame 50.

The air inlet 11 is defined as an aperture extending through the first end portion 58. The air outlet 12 is defined as an aperture extending through the second end portion 60.

Figure 9 shows an exploded view of the aerosol-generating article 10 of Figure 8.

Figure 10 shows an aerosol-generating article 10 similar to the aerosol-generating article 10 of Figures 1 and 3 except that the frame 50 is formed from multiple portions. In the aerosol-generating article 10 of Figure 8, the frame 50 comprises a first side portion 54 and a second side portion 56. The frame 50 also comprises a first end portion 58 and a second end portion 60.

The first end portion 58 and the second end portion 60 extend transversely to the longitudinal axis of the of the aerosol-generating article 10. In the example of Figure 10, the first end portion 58 and the second end portion 60 extend from one lateral edge of the aerosol-generating article 10 to the other lateral edge of the aerosol-generating article 10. The air inlet 11 is defined as an aperture extending through the first end portion 58. The air outlet 12 is defined as an aperture extending through the second end portion 60.

The first side portion 54 and the second side portion 56 extend along the longitudinal axis of the aerosol-generating article 10 from the air inlet 11 to the air outlet 12. In the example of Figure 10, the first side portion 54 and the second side portion 56 extend between inner surfaces of the first end portion 58 and the second end portion 60 so as to form the frame 50.

The first side portion 54 and the second side portion 56 are rigid. In the aerosol-generating article 10 of Figure 10, the first side portion 54 and the second side portion 56 are support elements providing strength to the structure of the aerosol-generating article 10.

Figure 11 shows an exploded view of the aerosol-generating article 10 of Figure 10.

Figures 12 to 15 show the manufacture of an aerosol-generating article 10 according to the present disclosure.

Figure 12 shows a part of the aerosol-generating article 10. The aerosol-generating article 10 comprises an aerosol-generating substrate 40, a first side portion 54 and a second side portion

56. The first side portion 54 and the second side portion 56 act as support elements for the aerosol-generating substrate 40. The first side portion 54 and the second side portion 56 are elongate members located at lateral edges of the aerosol-generating substrate 40 and both extend along the longitudinal axis of the aerosol-generating article 10.

The aerosol-generating substrate 40 comprises an aerosol-generating material in the form of tobacco cut filler and has an aerosol-former content of 5 percent by weight on a dry weight basis.

Figure 13 shows the part of the aerosol-generating article 10 of Figure 12 comprising a substrate wrapper 62 wrapped around the aerosol-generating substrate 40, the first side portion 54 and the second side portion 56.

Figure 14 shows the part of the aerosol-generating article 10 of Figure 13 together with a first end portion 58 and a second end portion 60.

The first end portion 58 is located at an upstream end of the first side portion 54 and the second side portion 56. The first end portion 58 is attached to the first side portion 54 and the second side portion 56. In this example, the first end portion 58 is bonded to the first side portion 54 and the second side portion 56 using an adhesive. The air inlet 11 is defined through the first end portion 58.

The second end portion 60 is located at a downstream end of the first side portion 54 and the second side portion 56. The second end portion 60 is attached to the first side portion 54 and the second side portion 56. In this example, the second end portion 60 is bonded to the first side portion 54 and the second side portion 56 using an adhesive. The air outlet 12 is defined through the second end portion 60.

Figure 15 shows an aerosol-generating article 10 comprising the part of the aerosol-generating article 10 of Figure 14 wrapped in an outer wrapper 64. The outer wrapper 64 defines the first planar external surface 21 and the second planar external surface 22.

Figure 16 shows a part of an aerosol-generating article 10. The part of the aerosol-generating article 10 is similar to the part of the aerosol-generating article 10 shown in Figure 12, except that first side portion 54 and the second side portion 56 are formed from an aerosol-generating substrate, in particular homogenised tobacco material. The first side

Figure 17 shows the part of the aerosol-generating article 10 of Figure 16 comprising a substrate wrapper 62 wrapped around the aerosol-generating substrate 40, the first side portion 54 and the second side portion 56.

An aerosol-generating article 10 may be provided by bonding a first end portion 58 and a second end portion 60 to the part of the aerosol-generating article 10 of Figure 17, as discussed above with respect to Figure 14, and then wrapping the resulting structure with an outer wrapper 62, as discussed above with respect to Figure 15.

Figures 18 to 21 show the manufacture of an aerosol-generating article 10 according to the present disclosure.

Figure 18 shows a part of the aerosol-generating article 10. The part of the aerosol-generating article 10 is similar to the part of the aerosol-generating article 10 in Figure 12, except that an elongate channel extends longitudinally through each of the first side portion 54 and the second side portion 56.

In the example of Figure 18, the first side portion 54 comprises a first elongate channel 66. The first elongate channel 66 extends longitudinally through the first side portion 54 from an upstream end of the first side portion 54 to a downstream end of the first side portion 54. The second side portion 56 comprises a second elongate channel 68. The second elongate channel 68 extends longitudinally through the second side portion 56 from an upstream end of the second side portion 56 to a downstream end of the second side portion 56.

Figure 19 shows the part of the aerosol-generating article 10 of Figure 18 comprising a substrate wrapper 62 wrapped around the aerosol-generating substrate 40, the first side portion 54 and the second side portion 56.

Figure 20 shows the part of the aerosol-generating article 10 of Figure 19 together with a first end portion 58 and a second end portion 60. The part of the aerosol-generating article in Figure 20 is similar to the part of the aerosol-generating article 10 shown in Figure 14 except that an elongate channel extends longitudinally through each of the first side portion 54 and the second side portion 56, as discussed above.

In addition, the first end portion 58 comprises a first channel 70 and a second channel 72 extending longitudinally from an upstream end of the first end portion 58 to a downstream end of the first end portion 58. The first channel 70 and the first elongate channel 54 are positioned such that they are fluidly connected with one another, allowing, for example, air to flow between the first channel 70 and the first elongate channel 54. The second channel 72 and the second elongate channel 56 are positioned such that they are fluidly connected with one another, allowing, for example, air to flow between the second channel 72 and the second elongate channel 56.

The air outlet 12 is defined through the second end portion 60. In the aerosol-generating article of Figure 20, the air outlet 12 is wider than the air outlet 12 of the aerosol-generating article of Figure 14. A wider air outlet 12 provides for the fluid connection between the air outlet 12 and the first elongate channel 66 and the second elongate channel 68. Fluid connection between the air outlet 12 and the first elongate channel 66 and the second elongate channel 68 allows, for example, air to flow between the air outlet 12 and the first elongate channel 66, and air to flow between the air outlet 12 and the second elongate channel 68.

Figure 21 shows an aerosol-generating article 10 comprising the part of the aerosol-generating article 10 of Figure 18 wrapped in an outer wrapper 64. The outer wrapper 64 defines the first planar external surface 21 and the second planar external surface 22.

Figure 22 shows a cross-sectional view of the aerosol-generating article 10 of Figure 21, taken along the longitudinal axis of the aerosol-generating article 10.

Figure 23 shows a schematic cross-sectional view of an aerosol-generating device 90 configured for use with an aerosol-generating article 10 described herein. The aerosol-generating device 90 is an elongate aerosol-generating device extending between a proximal end 91 and a distal end 92. The aerosol-generating device 90 comprises a battery 93, a controller 94, a first heater 95 and a second heater 96 located within a housing 97. The controller 94 controls supply of power from the battery 93 to the first heater 95 and the second heater 96. A cavity 1000 is defined in the device 90, the cavity 1000 having an opening 1010 defined in the proximal end 91 of the device 90. The opening 1010 is rectangular in shape and is dimensioned to accommodate the transverse cross-section of the aerosol-generating article 10. The cavity 1000 comprises an upper planar surface 1020 and a lower planar surface 1030. The first heater 95 is located in the upper planar surface 1020 to heat the first planar external surface 21 of an aerosol-generating article 10 inserted into the cavity 1000, and the second heater 96 is located in the lower planar surface 1030 to heat the second planar external surface 22 of an aerosol-generating article 10 inserted into the cavity 1000. The device 90 comprises an air inlet 98 defining an air-flow path configured to allow air to flow into the cavity 1000 from outside the device.

Figure 24 shows a schematic cross-sectional view of the aerosol-generating device 90 of Figure 23 in engagement with the aerosol-generating article 10 of Figure 1. There is little tolerance between the first planar external surface 21 and the second planar external surface 22 of the aerosol-generating article 10 and the internal surfaces 1020, 1030 of the cavity 1000. Thus, there is a snug fit between the aerosol-generating article 10 and the aerosol-generating device 90. When a consumer has inserted the aerosol-generating article 10 into the cavity 1000, the device can be operated. The first heater 95 heats the first planar external surface 21 of the aerosol-generating article 10 and the second heater 96 heats the second planar external surface 22 of the aerosol-generating article, and as a result the aerosol-generating substrate is heated. Volatile components of the aerosol-generating substrate are evaporated and condense in the cavity 30 of the aerosol-generating article 10 to form an aerosol. The consumer inhales the aerosol by drawing on the end of the aerosol-generating article 10 comprising the air outlet 12. Once the aerosol-generating substrate has been depleted of volatile components, the aerosol-generating article 10 is removed from the cavity 1000 and disposed of.

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

affect the basic and novel characteristic(s) of the claimed invention. Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein.

5

CLAIMS

1. An aerosol-generating article for use with an aerosol-generating device to generate an aerosol, the aerosol-generating article comprising:

a first planar external surface;

a second planar external surface;

a frame positioned between the first planar external surface and the second planar external surface; and

an air inlet and an air outlet,

wherein the frame comprises a first side portion and a second side portion, the first side portion and the second side portion at least partially defining the cavity and extending from the air inlet to the air outlet along the longitudinal axis of the aerosol-generating article,

wherein the first side portion is a support element and the second side portion is a support element.

2. An aerosol-generating article according to claim 1, wherein the first side portion is a rigid support element and the second side portion is a rigid support element.

3. An aerosol-generating article according to claim 1 or claim 2, wherein at least one of the first side portion and the second side portion has a length of greater than or equal to 20 millimetres.

4. An aerosol-generating article according to any one of claims 1 to 3, wherein at least one of the first side portion and the second side portion has a length of less than 40 millimetres.

5. An aerosol-generating article according to any one of claims 1 to 4, wherein at least one of the first side portion and the second side portion has a length of between 25 millimetres and 35 millimetres.

6. An aerosol-generating article according to any one of claims 1 to 5, wherein at least one of the first side portion and the second side portion has a width of greater than or equal to 1.5 millimetres.

7. An aerosol-generating article according to any one of claims 1 to 6, wherein at least one of the first side portion and the second side portion has a width of less than or equal to 3.5 millimetres.

8. An aerosol-generating article according to any one of claims 1 to 7, wherein at least one of the first side portion and the second side portion has a thickness of greater than or equal to 1.5 millimetres.

9. An aerosol-generating article according to any one of claims 1 to 8, wherein at least one of the first side portion and the second side portion has a thickness of less than or equal to 3.5 millimetres.

10. An aerosol-generating article according to any one of claims 1 to 9, wherein at least one of the first side portion and the second side portion comprises at least one corrugation.

11. An aerosol-generating article according to any one of claims 1 to 10, wherein at least one of the first side portion and the second side portion comprises one or more aerosol-generating substrates.

12. An aerosol-generating article according to claim 11, wherein the one or more aerosol-generating substrates comprises aerosol-generating material comprising homogenised tobacco material.

13. An aerosol-generating article according to any one of claim 1 to claim 12, wherein the frame comprises one or more elongate channels extending through it.

14. An aerosol-generating article according to claim 13, wherein the first side portion comprises a first elongate channel extending longitudinally through it.

15. An aerosol-generating article according to claim 13 or claim 14, wherein the second side portion comprises a second elongate channel extending through it.

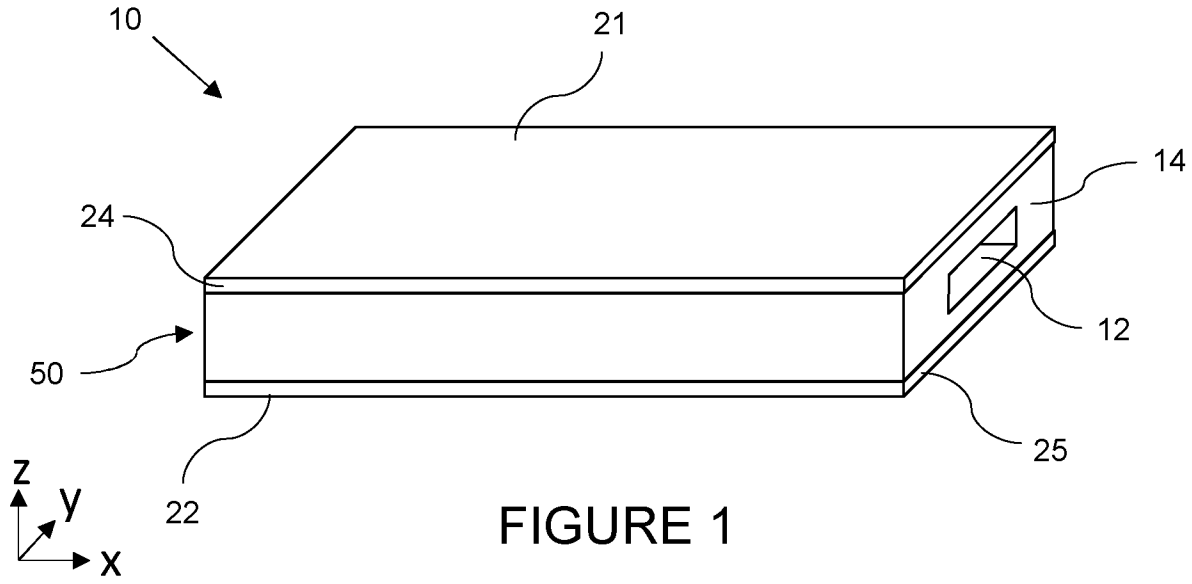

FIGURE 1

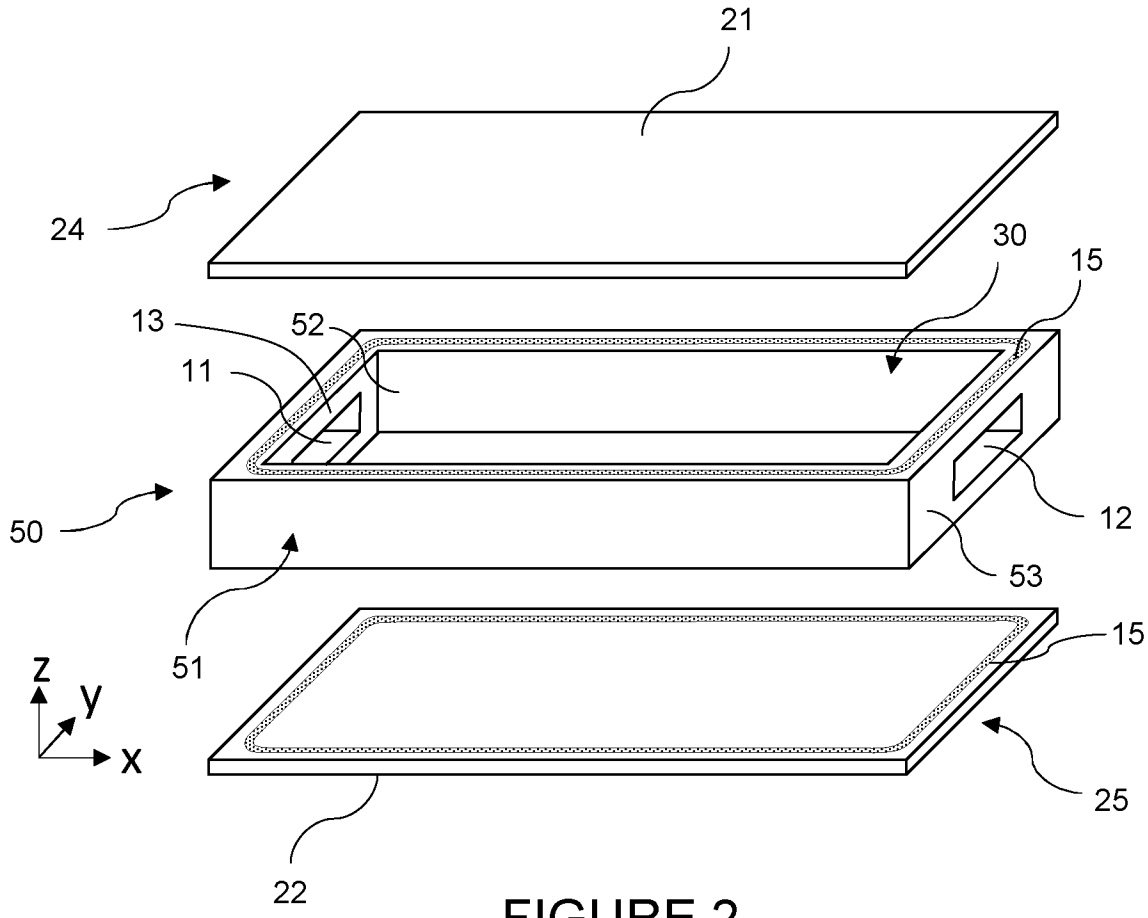

FIGURE 2

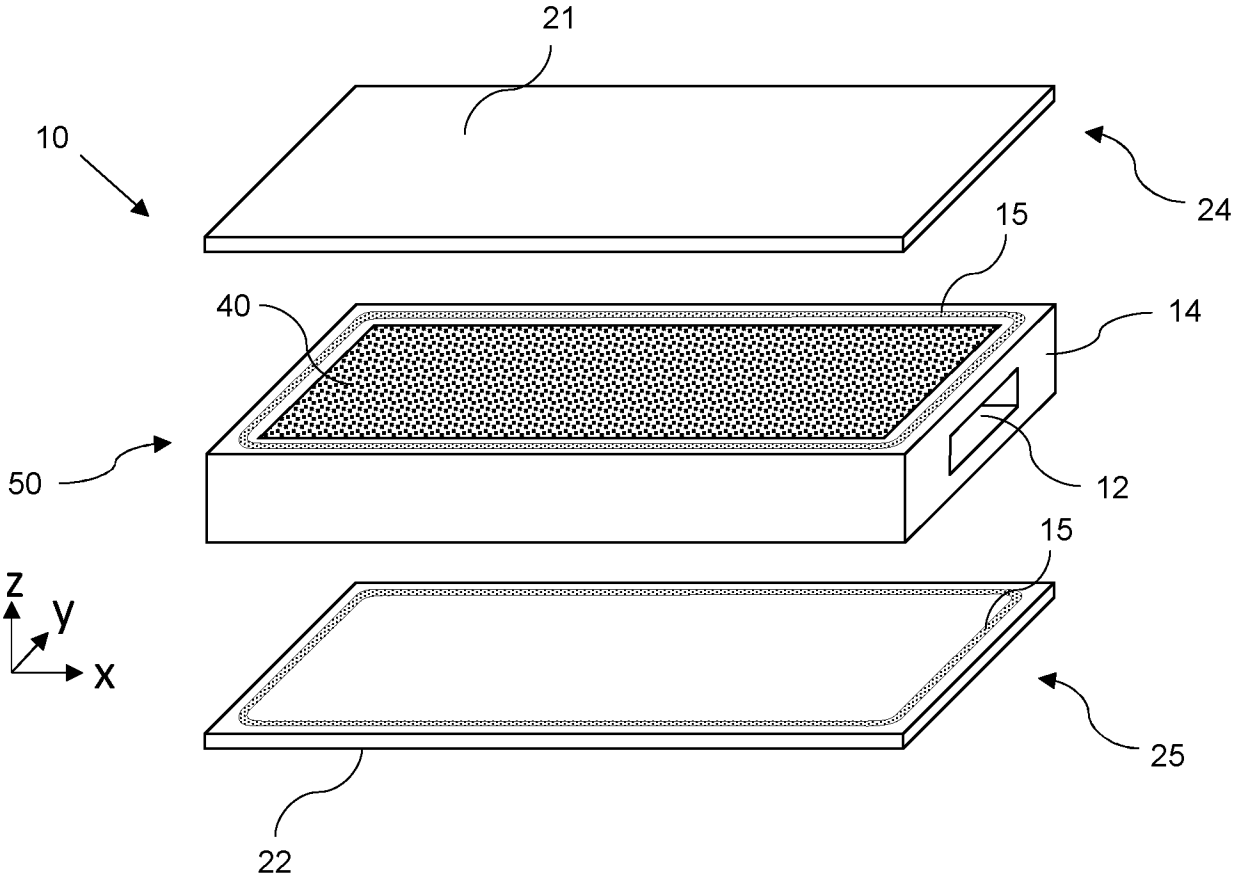

FIGURE 3

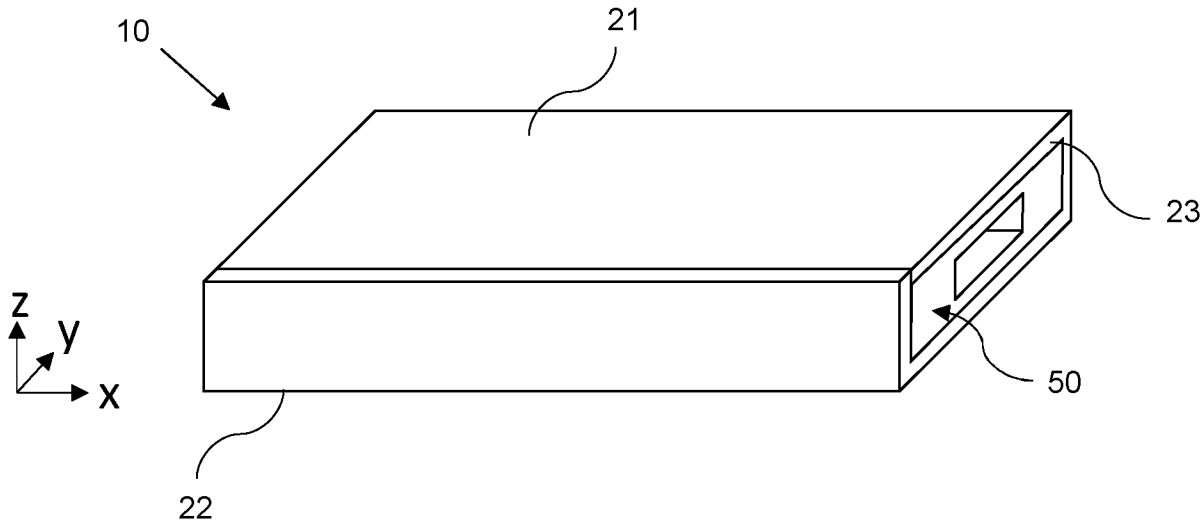

FIGURE 4

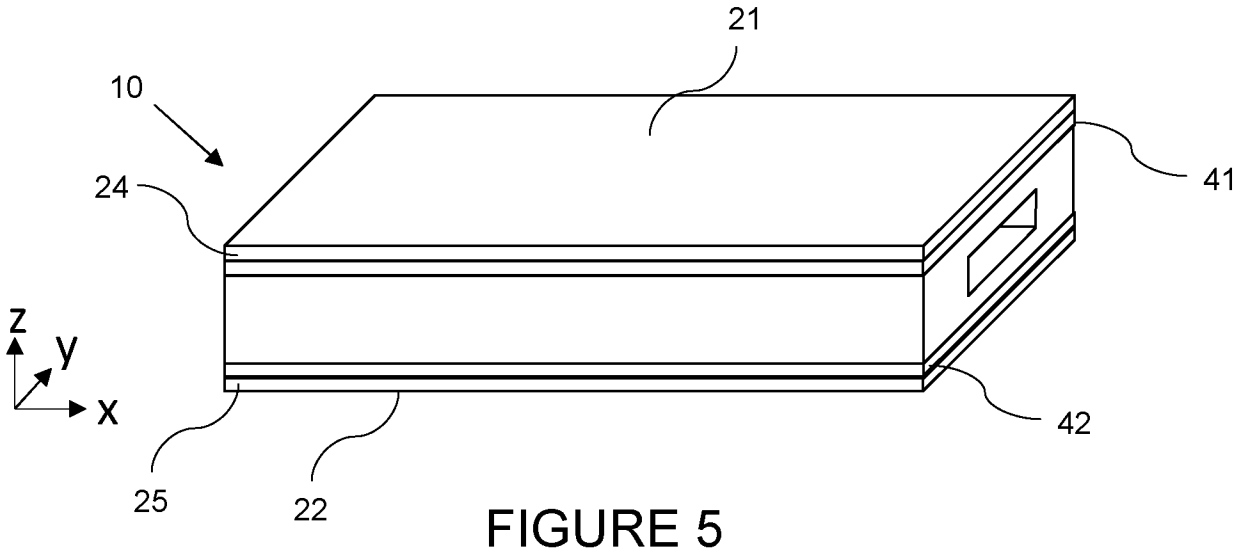

FIGURE 5

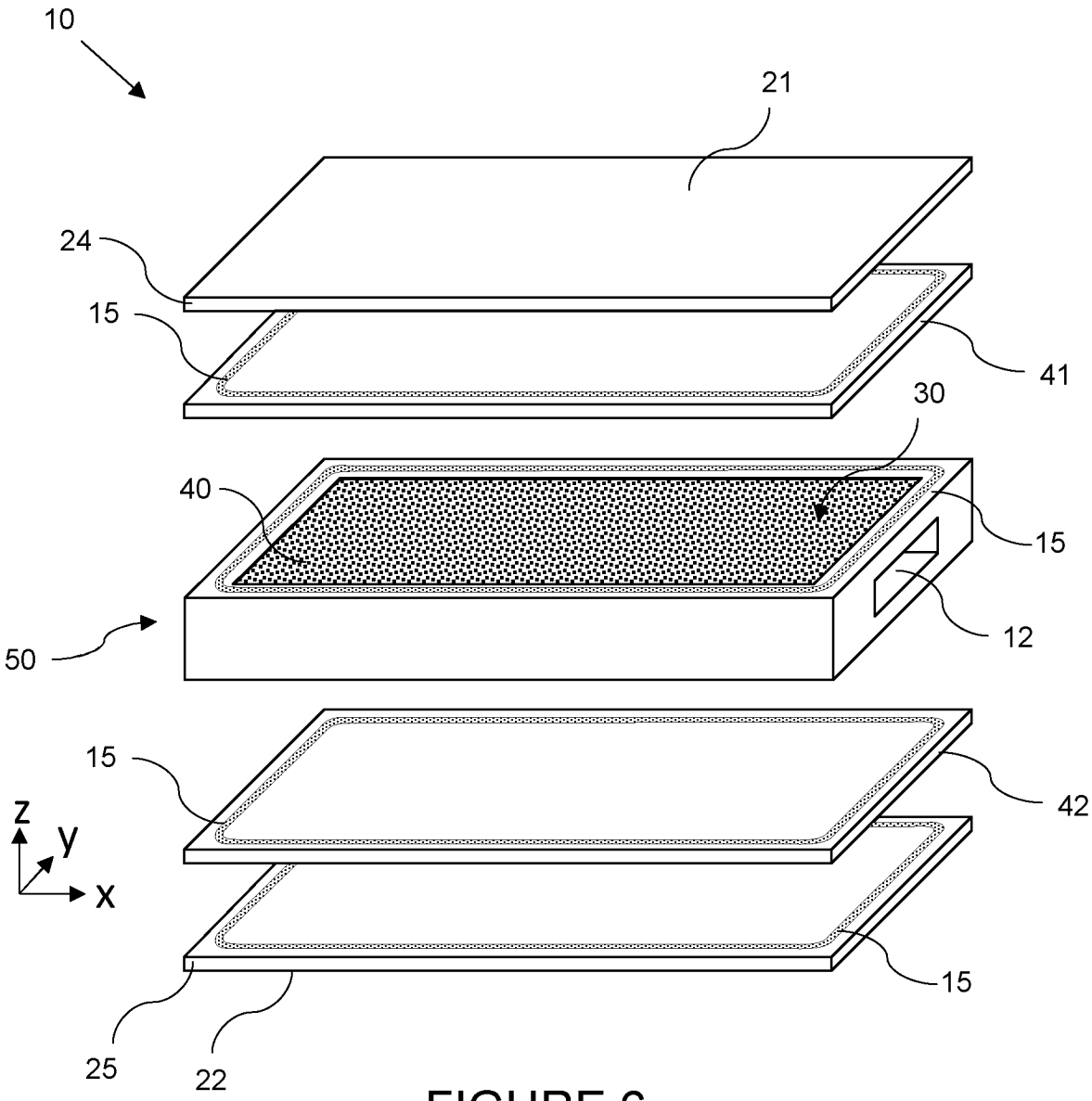

FIGURE 6

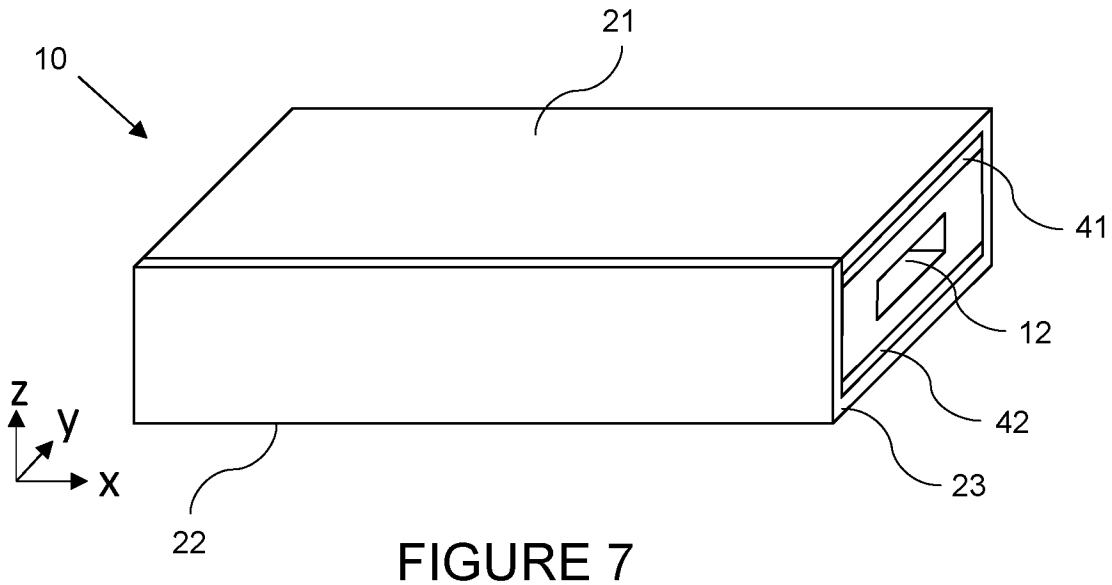

FIGURE 7

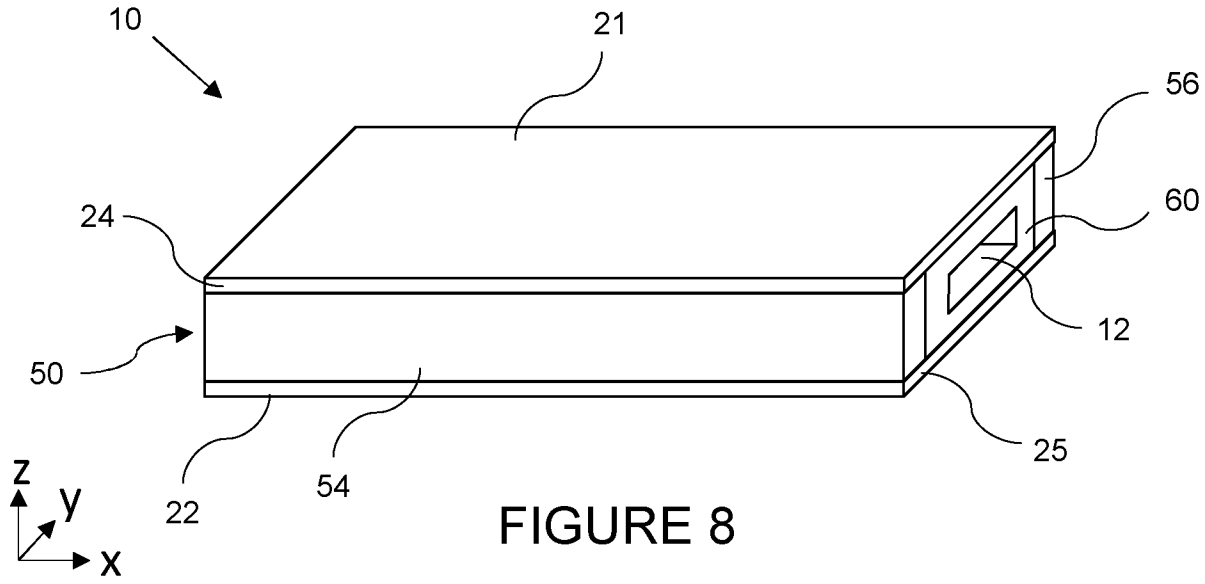

FIGURE 8

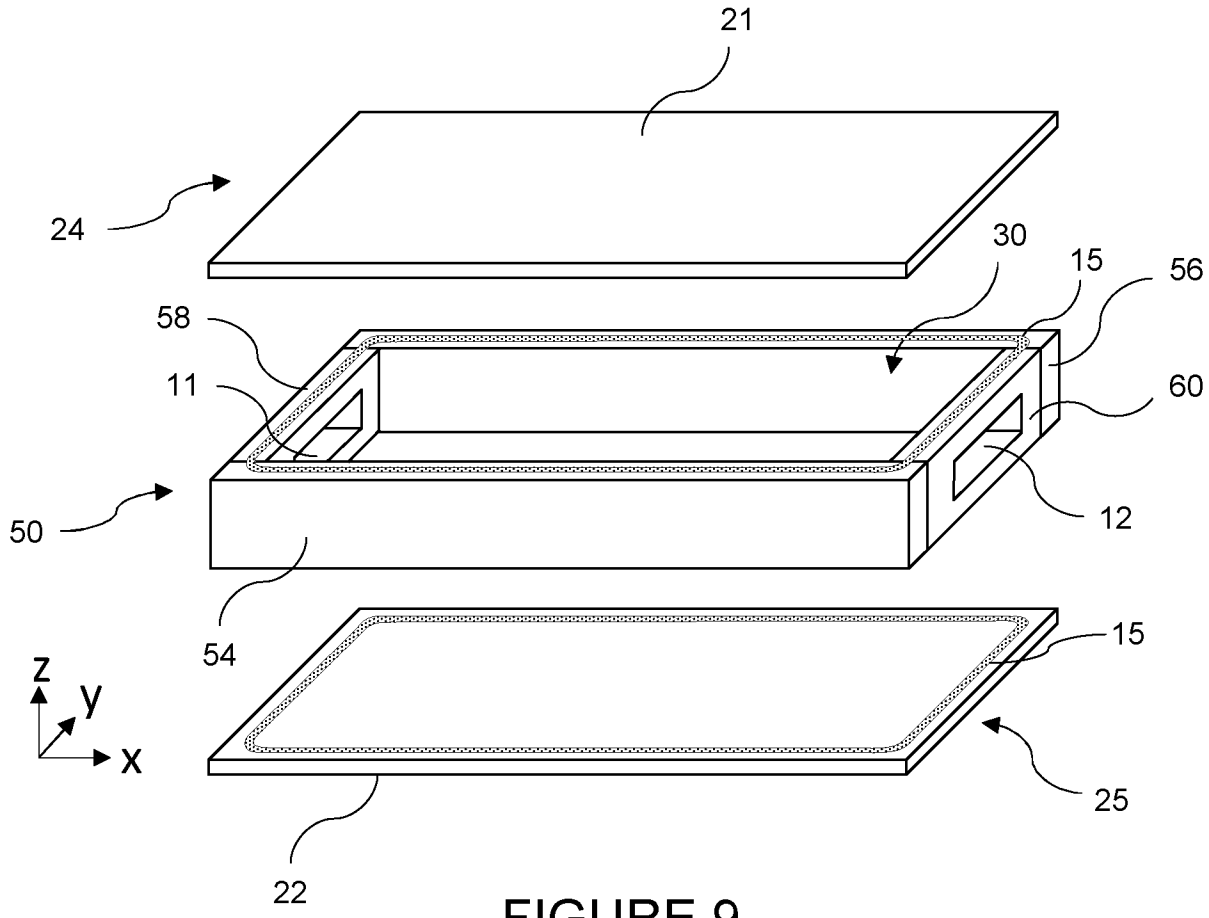

FIGURE 9

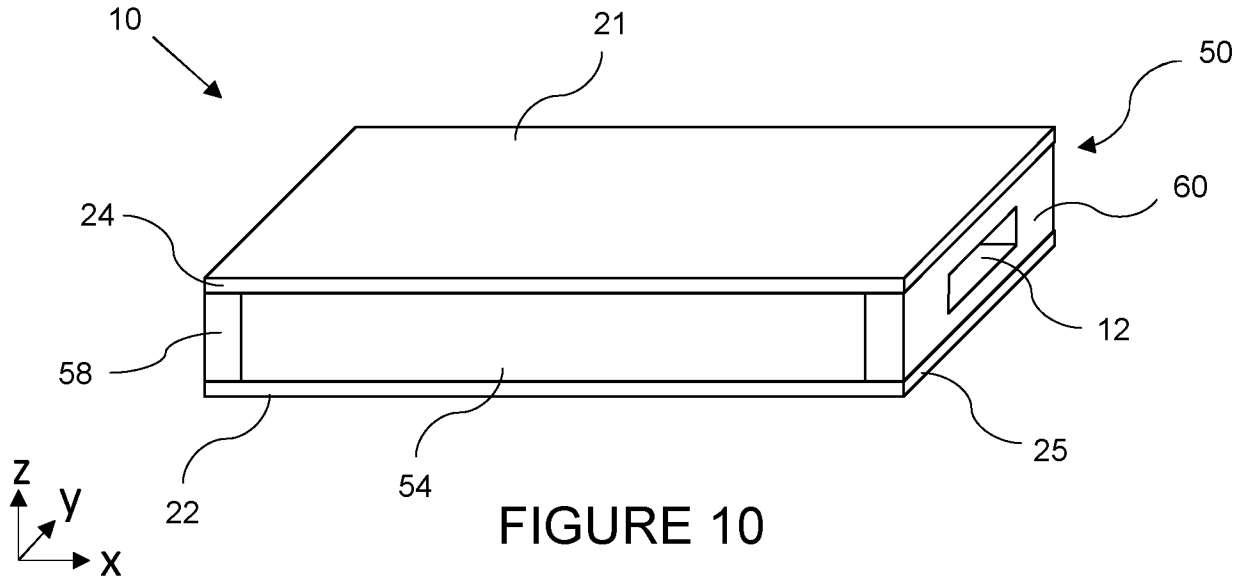

FIGURE 10

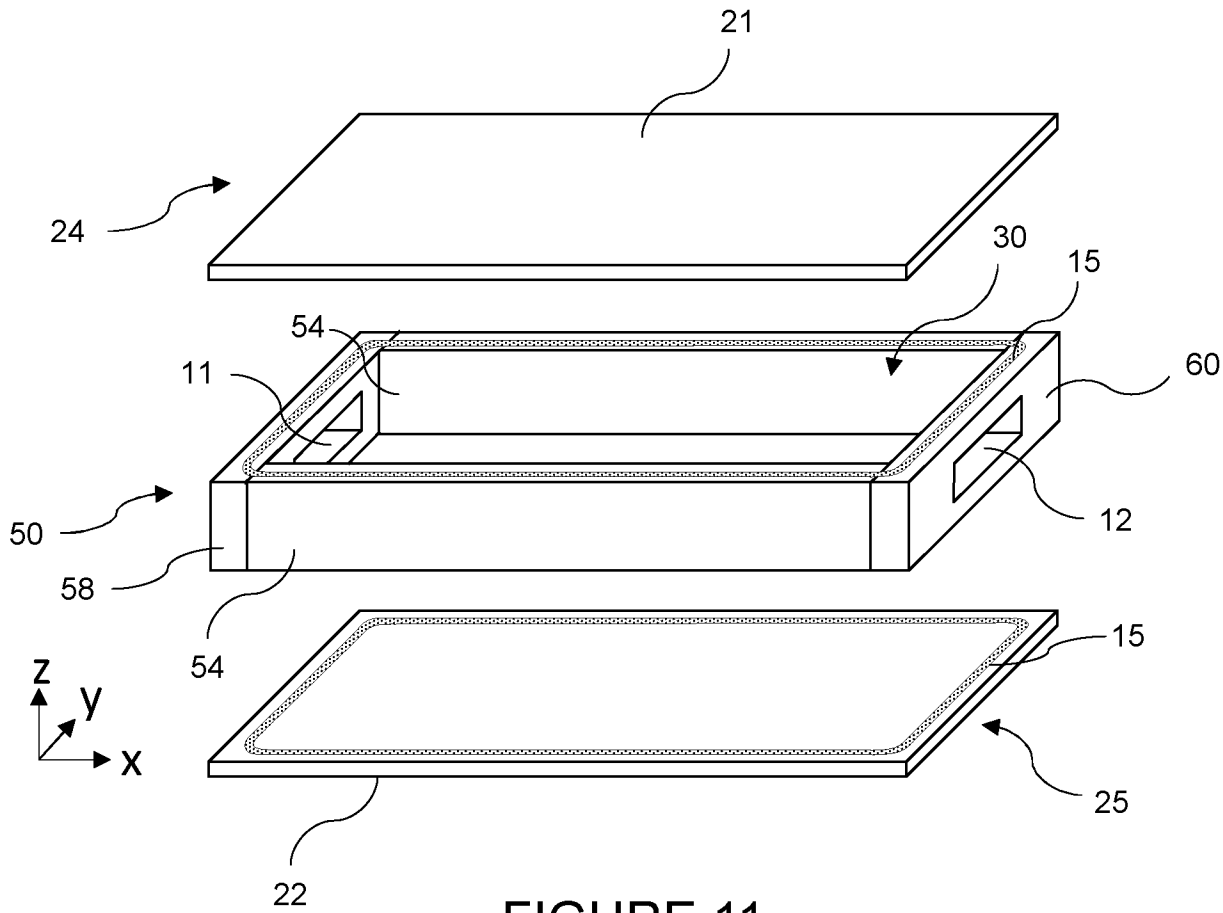

FIGURE 11

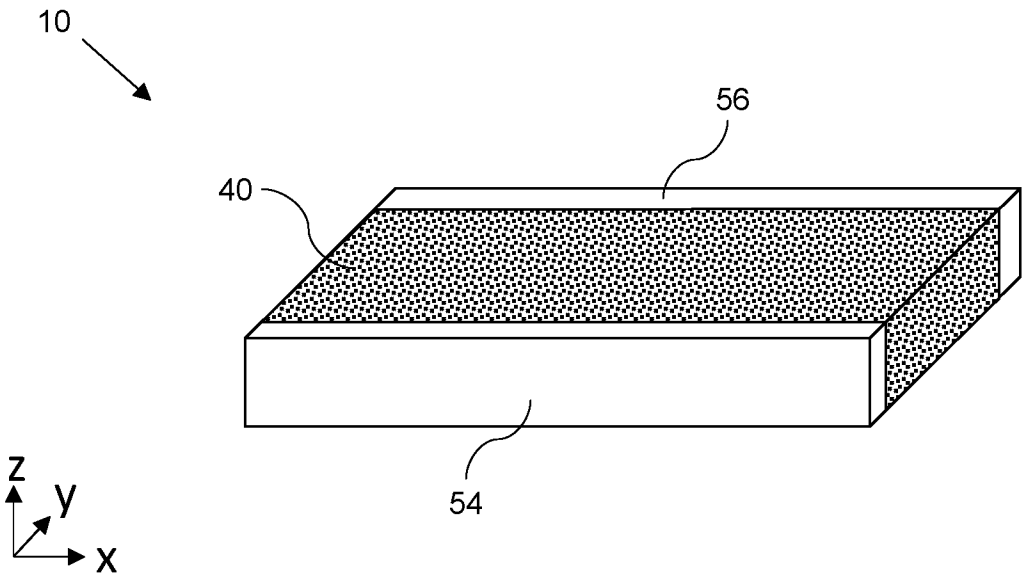

FIGURE 12

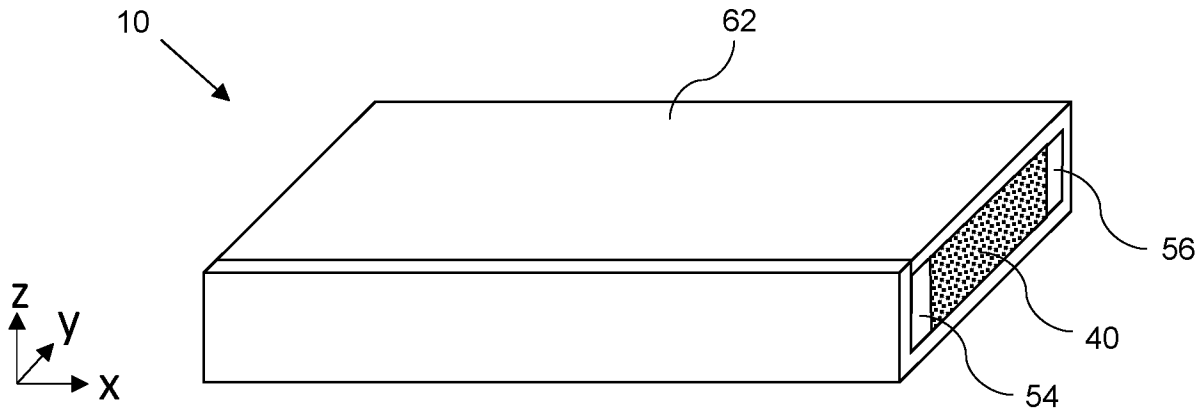

FIGURE 13

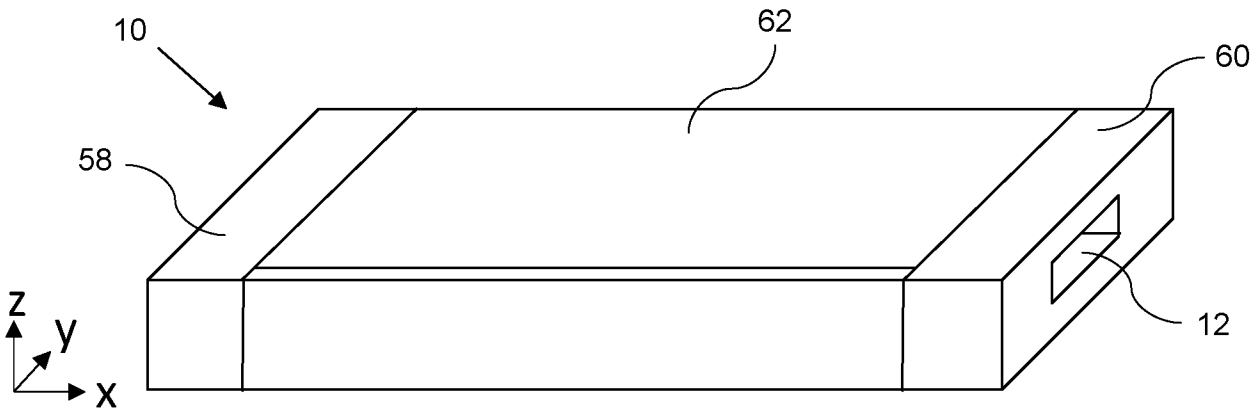

FIGURE 14

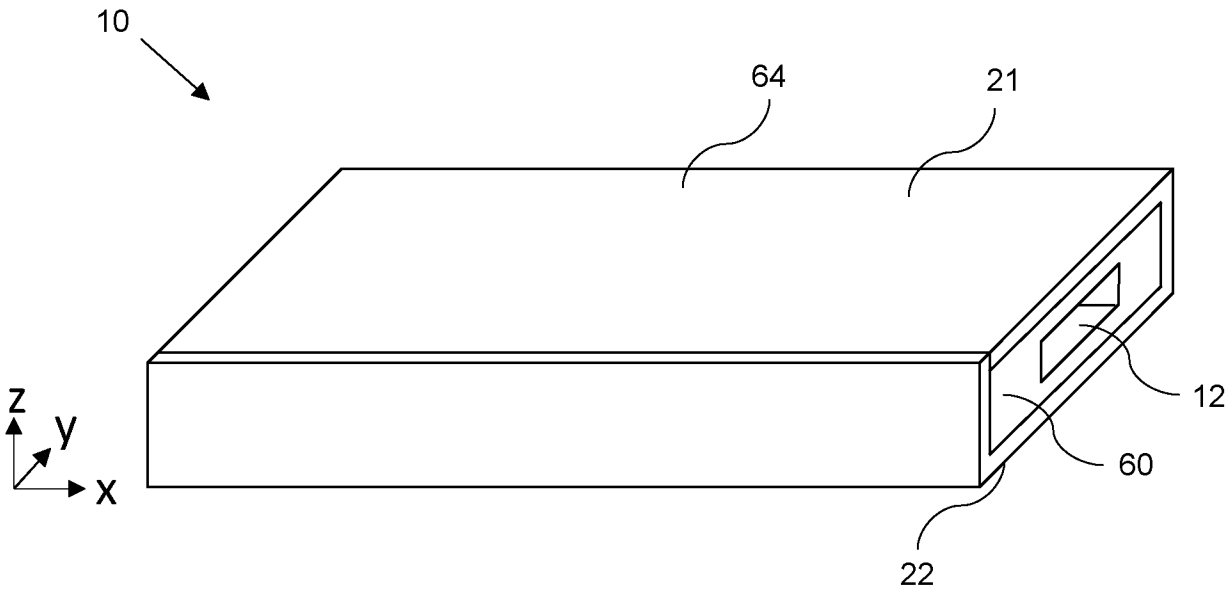

FIGURE 15

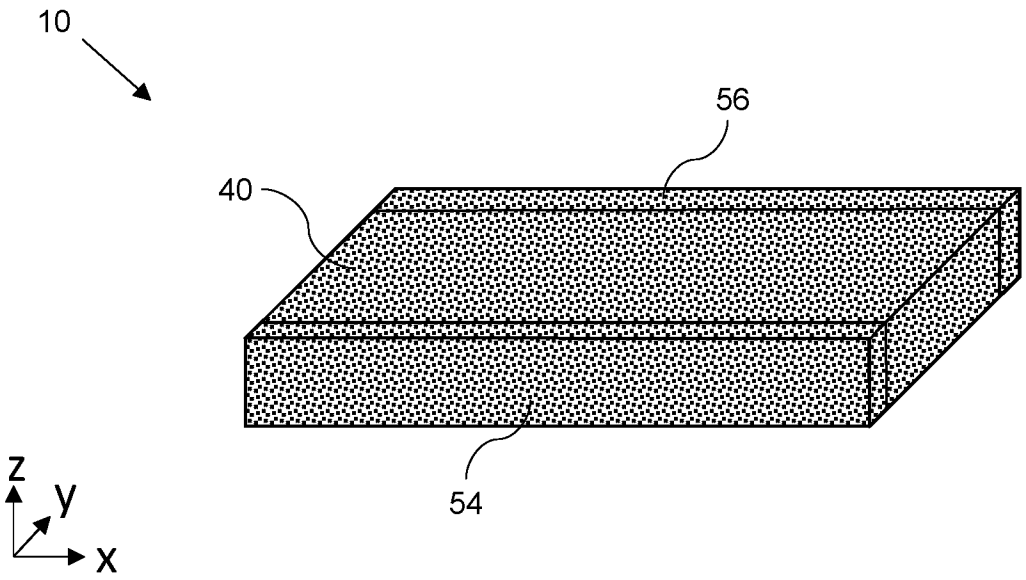

FIGURE 16

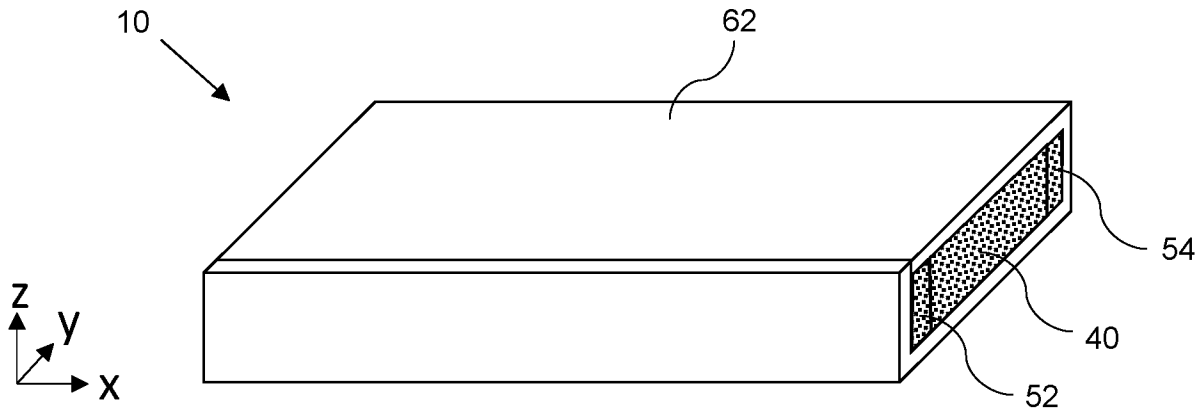

FIGURE 17

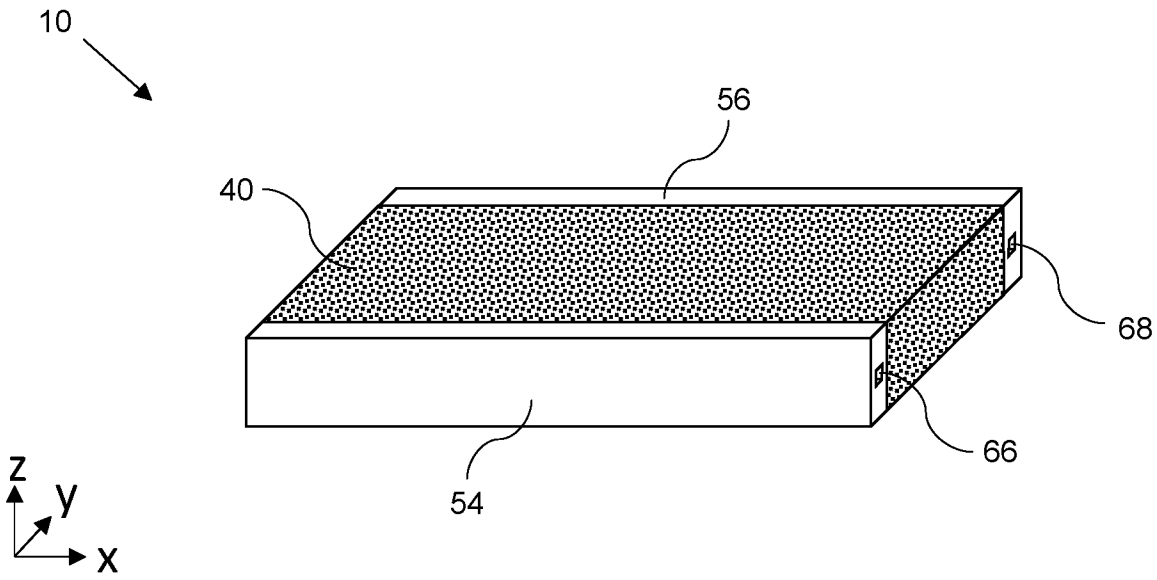

FIGURE 18

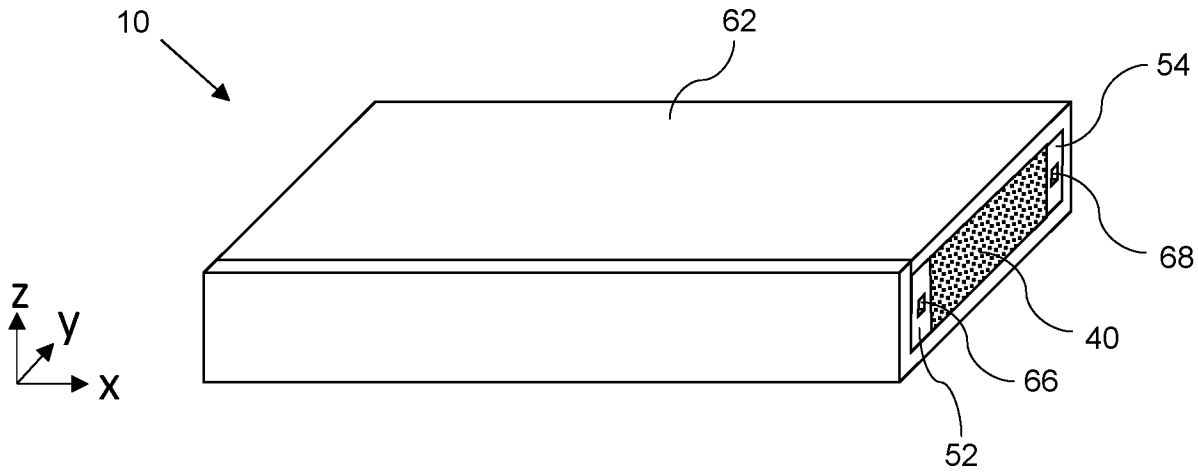

FIGURE 19

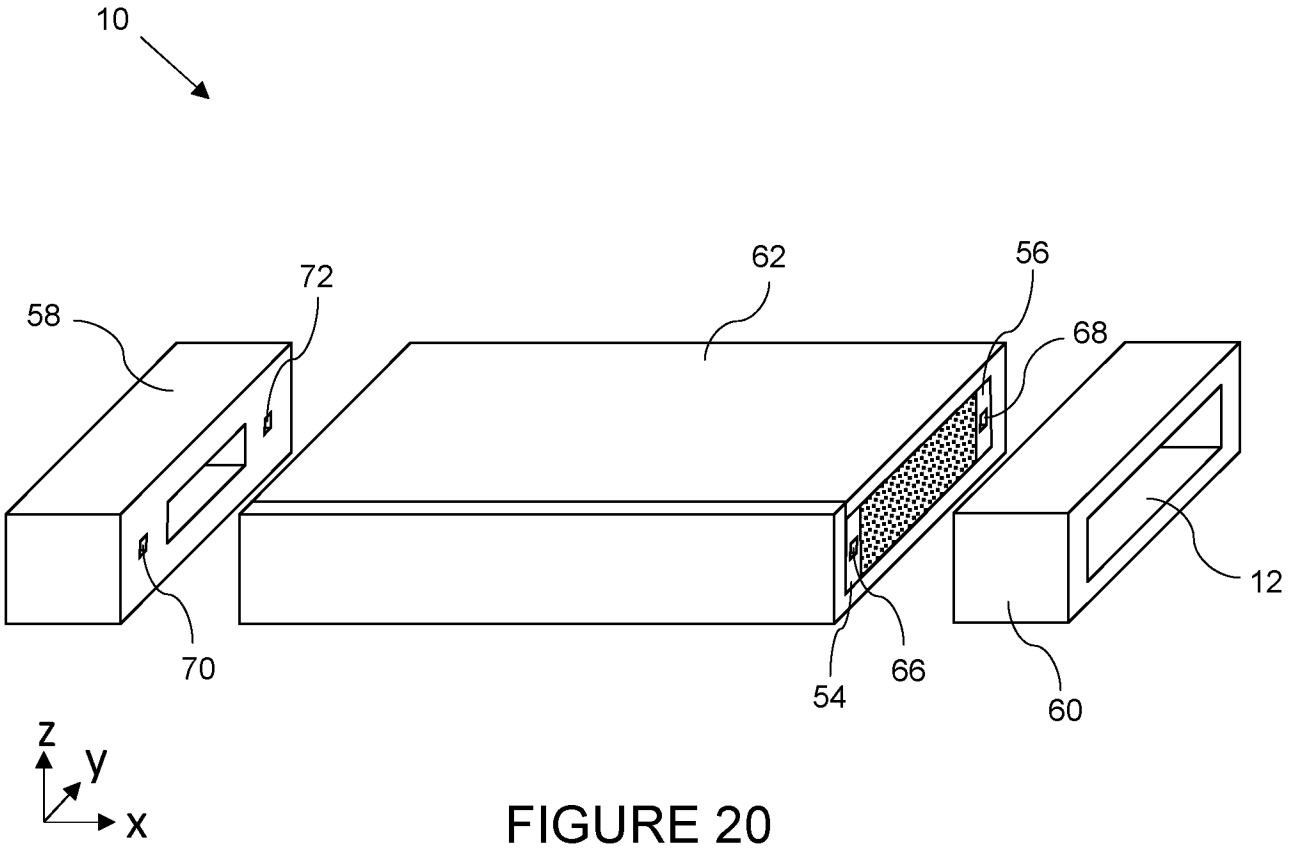

FIGURE 20

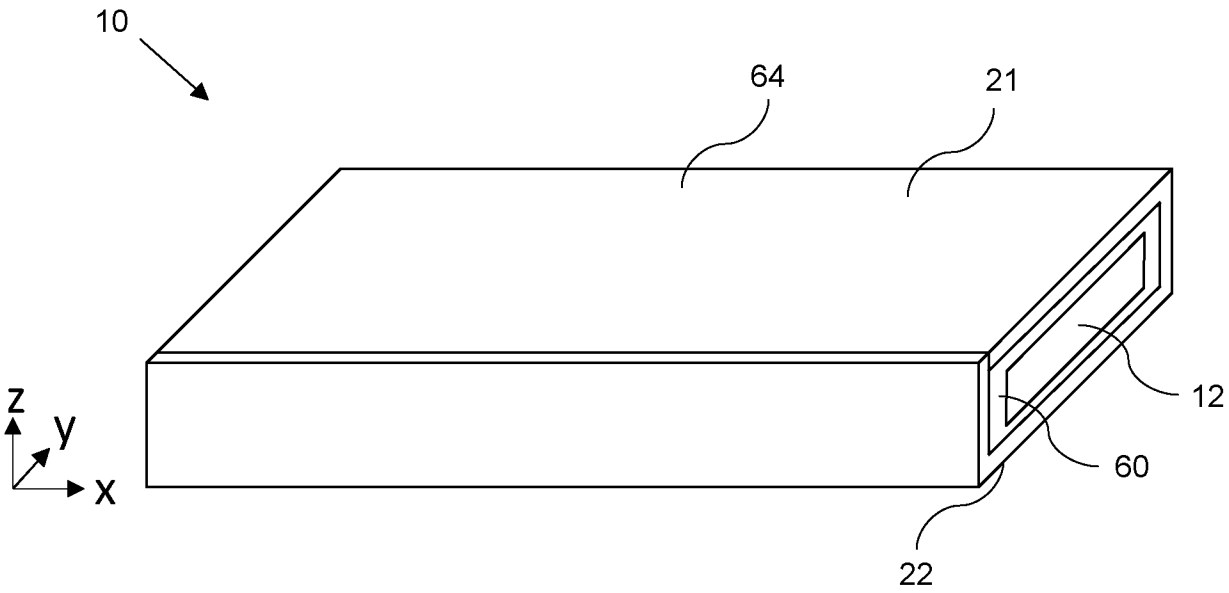

FIGURE 21

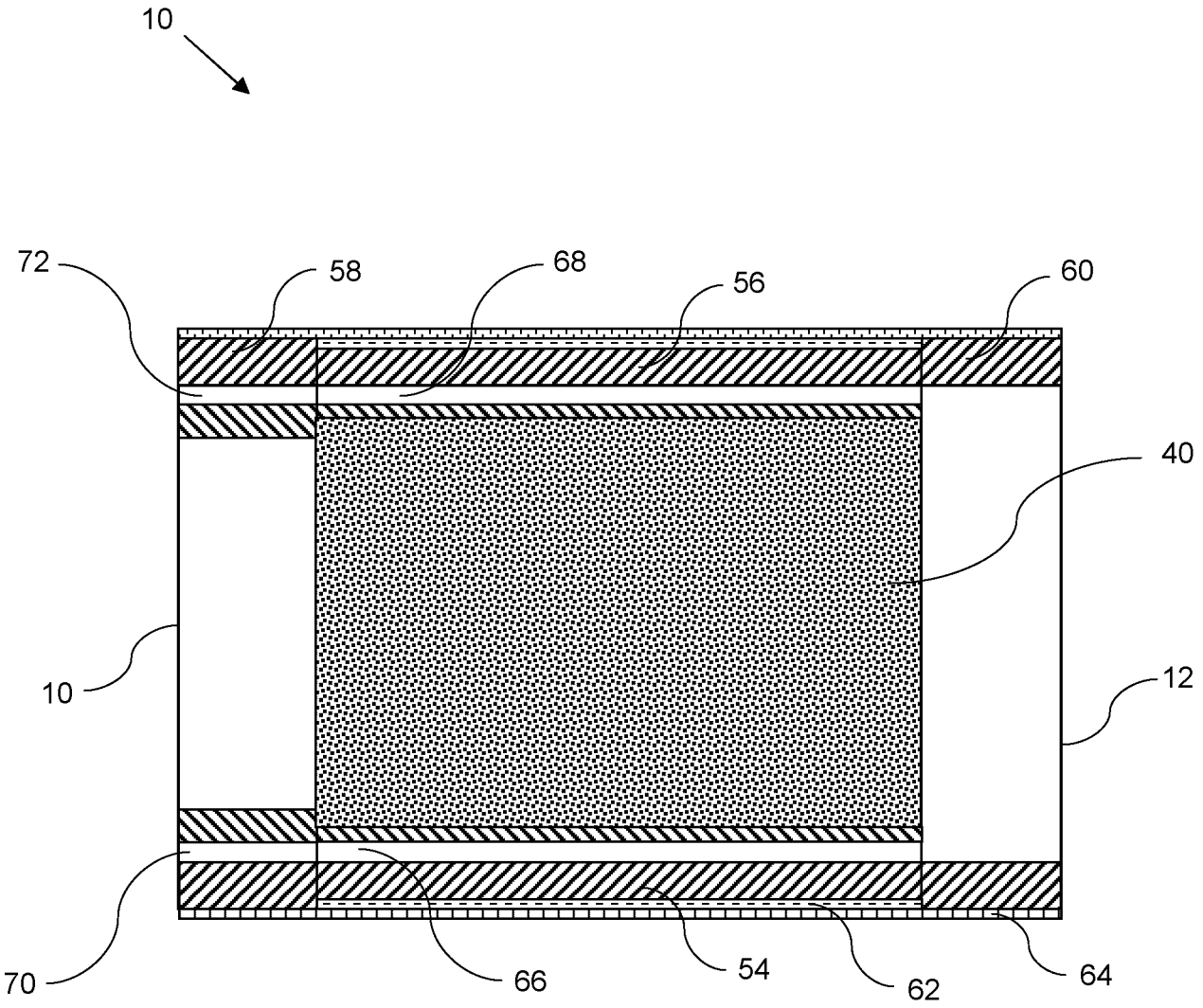

FIGURE 22

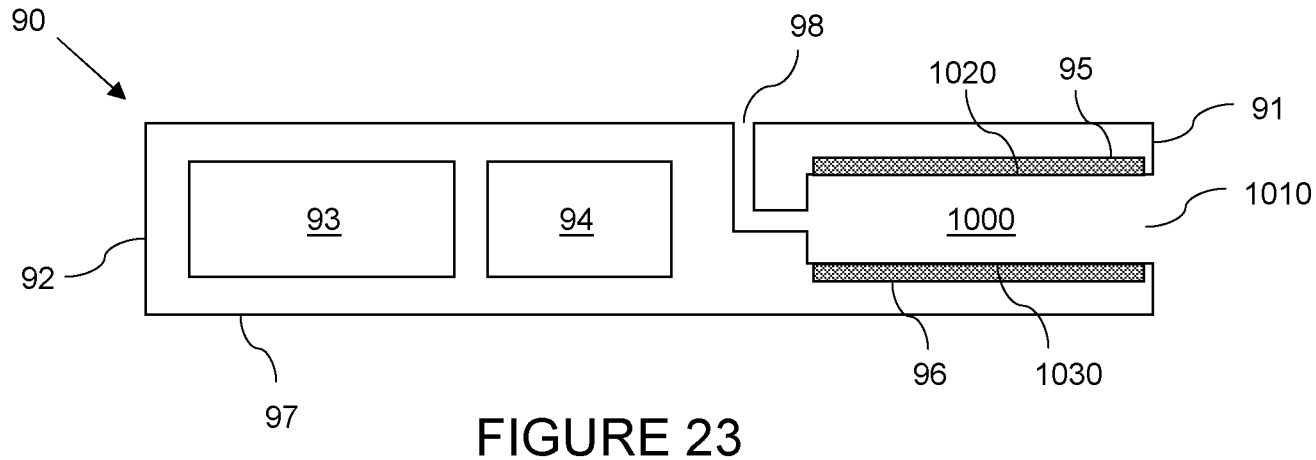

FIGURE 23

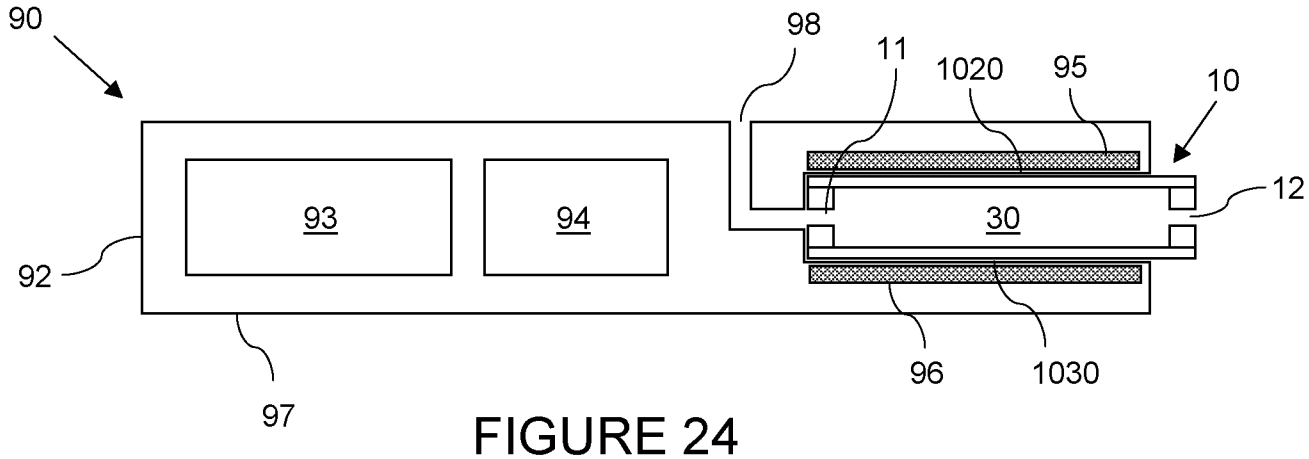

FIGURE 24

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/086894

A. CLASSIFICATION OF SUBJECT MATTER

INV. A24F40/42
ADD. A24D1/20 A24F40/20 A24F40/485

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A24F A24D

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2021/392954 A1 (BLACKMON ZACK [US] ET AL) 23 December 2021 (2021-12-23)	1-3,6,8, 10,11, 13-15
Y	figures 7-9 paragraph [0055] paragraph [0062]	4,5,7,9, 12
Y	WO 2023/194532 A1 (JT INT SA [CH]) 12 October 2023 (2023-10-12) figure 3 page 8, line 28 - line 36	4,5,7,9
Y	US 2018/014575 A1 (FURSA OLEG [CH]) 18 January 2018 (2018-01-18) paragraph [0053] - paragraph [0055] paragraph [0063]	12

-/--

[x] Further documents are listed in the continuation of Box C.

[x] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 April 2025	29/04/2025

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