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(54) **AEROSOL-GENERATING ARTICLE WITH TUBULAR ELEMENT**

(57) An aerosol-generating article (100) comprising: a first element (10) comprising an aerosol-generating substrate (110); and a tubular element (20) comprising a tubular body (120), the tubular body (120) having a first end, a second end and an intermediate portion (122) between the first end and the second end, the tubular body (120) defining a cavity (124) extending from the first end of the tubular body (120) to the second end of the tubular body (120); wherein the intermediate portion (122) comprises a plurality of corrugations (130) formed in the tubular body (120).

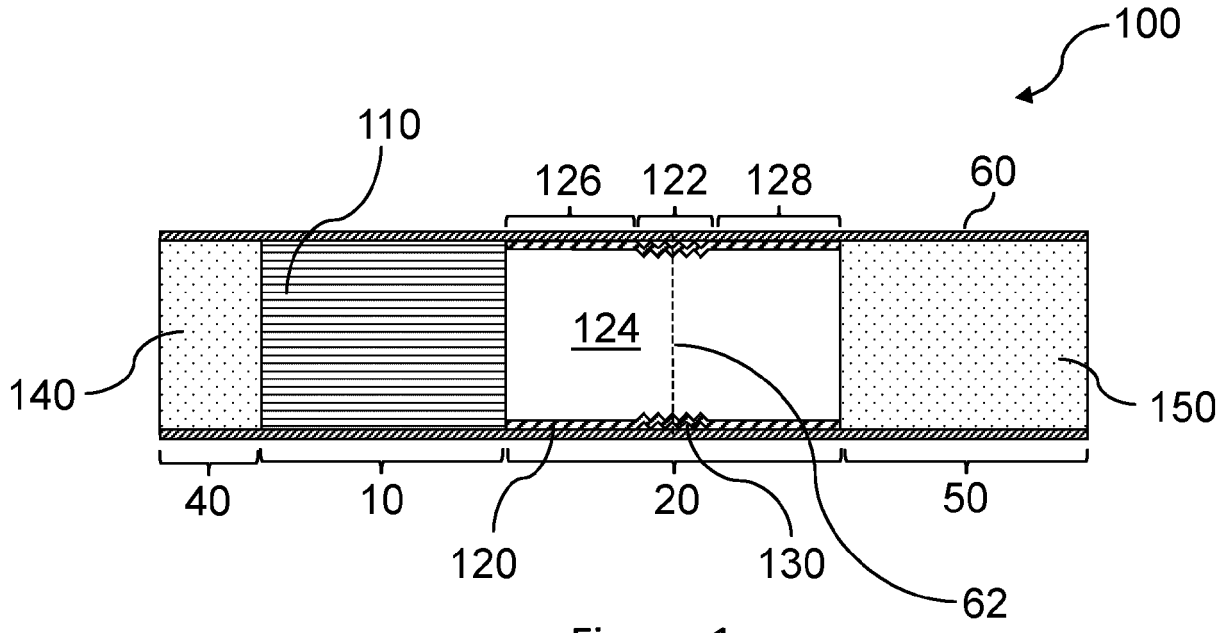

Figure 1

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Description

[0001] The present invention relates to an aerosol-generating article comprising an aerosol-generating substrate for generating an inhalable aerosol, for example, upon heating. The invention also relates to an aerosol-generating system comprising the aerosol-generating article and an aerosol-generating device.

[0002] Aerosol-generating articles in which an aerosol-generating substrate comprising aerosol-generating material, such as a tobacco-containing material, is heated rather than combusted are known in the art. An aim of such 'heated' aerosol-generating articles is to reduce known harmful smoke constituents of the type produced by the combustion and pyrolytic degradation of tobacco in conventional cigarettes.

[0003] Typically, in heated aerosol-generating articles an aerosol is generated by the transfer of heat from a heat source to a physically separate aerosol-generating substrate. In use, volatile compounds are released from the aerosol-generating substrate by heat transfer from the heat source to the aerosol-generating substrate and are entrained in air drawn through the aerosol-generating article. As the released compounds cool, they condense to form an aerosol that is inhaled by the user.

[0004] One known type of heated aerosol-generating article, commonly referred to as a heat-not-burn tobacco product or heated tobacco product, comprises a solid aerosol-generating substrate comprising tobacco material, which is heated to produce an inhalable aerosol.

[0005] A number of handheld aerosol-generating devices configured to heat aerosol-generating substrates of heated aerosol-generating articles are known in the art. These include electrically-operated aerosol-generating devices in which an aerosol is generated by the transfer of heat from one or more electrical heating elements of the aerosol-generating device to the aerosol-generating substrate of the heated aerosol-generating article. Known handheld electrically operated aerosol-generating devices typically comprise a battery, control electronics and one or more electrical heating elements for heating the aerosol-generating substrate of a heated aerosol-generating article designed specifically for use with the aerosol-generating device.

[0006] Some known electrically heated aerosol-generating devices that comprise an internal heating element that is configured to be inserted into the aerosol-generating substrate of a heated aerosol-generating article. For example, WO 2013/098410 A2 discloses an aerosol-generating system comprising an aerosol-generating article and an electrically-operated aerosol-generating device comprising a heating element in the form of a blade that is inserted into the aerosol-generating substrate of the aerosol-generating article.

[0007] Other known electrically-operated aerosol-generating devices comprise one or more external heating elements. For example, WO 2020/115151 A1 discloses an aerosol-generating system comprising an aerosol-generating article and an electrically-operated aerosol-generating device comprising an external heating element that circumscribes the periphery of the aerosol-generating article.

[0008] Electrically-operated aerosol-generating devices comprising an inductor configured to inductively heat aerosol-generating substrates of heated aerosol-generating articles are also known. For example, WO 2015/176898 A1 discloses an aerosol-generating system comprising an aerosol-generating article comprising an elongate susceptor in thermal contact with the aerosol-generating substrate and an electrically-operated aerosol-generating device having an inductor for heating the aerosol-generating substrate. In use, the fluctuating or alternating electromagnetic field produced by the inductor induces eddy currents in the susceptor, causing the susceptor to heat up as a result of one or both of resistive losses (Joule heating) and, where the susceptor is magnetic, hysteresis loses. Heat generated in the susceptor is transferred to the aerosol-generating substrate by conduction.

[0009] Aerosol-generating articles in the form of inhaler articles, such as dry powder inhalers, are known in the art. Some dry powder inhalers have a component for storing the dry powder, such as a capsule. The capsule may be activated by being pierced by a separate piercing element, such as a piercing element of a holder. Once the capsule has been activated, a consumer may draw on the mouth end of the inhaler to generate an air flow through the inhaler. Each air flow from each inhalation may carry a portion of the dry powder from the capsule to the lungs of the user. Such aerosol-generating articles may generate an aerosol without heating.

[0010] Typically, an aerosol-generating article is configured to generate and deliver a plurality of puffs of aerosol to a user. Each puff may provide a user with a similar sensory experience. This may become repetitive to a user.

[0011] After use of an aerosol-generating article, a user may not be able to tell whether the aerosol-generating article has already been heated to generate an aerosol or otherwise used. Subsequent use of the same aerosol-generating article may result in aerosol being delivered to the user that is of poorer quality than aerosol generated by an aerosol-generating article that has not previously been used. A user may inadvertently use an already spent aerosol-generating article, for example, when the user places the spent aerosol-generating article back into its pack for disposal later and then picks out an aerosol-generating article from the same pack.

[0012] It would be desirable to provide an aerosol-generating article that creates an exciting and stimulating sensory experience for the user. It would also be desirable to provide a visual sign to a user that the aerosol-generating article has been used.

[0013] The present disclosure relates to an aerosol-generating article comprising a first element comprising an aerosol-generating substrate. The aerosol-generat-

ing article may comprise a tubular element. The tubular element may comprise a tubular body. The tubular body may have a first end and second end. The tubular body may have an intermediate portion between the first end and the second end. The tubular body may define a cavity. The cavity may extend from the first end of the tubular body to the second end of the tubular body. The intermediate portion may comprise a plurality of corrugations. The plurality of corrugations may be formed in the tubular body.

[0014] According to a first aspect of the invention, there is provided an aerosol-generating article comprising a first element comprising an aerosol-generating substrate; and a tubular element comprising a tubular body, the tubular body having a first end, a second end and an intermediate portion between the first end and the second end, the tubular body defining a cavity extending from the first end of the tubular body to the second end of the tubular body; wherein the intermediate portion comprises a plurality of corrugations formed in the tubular body.

[0015] The present disclosure also relates to an aerosol-generating system. The aerosol-generating system may comprise an aerosol-generating article as described above. The aerosol-generating system may comprise an aerosol-generating device.. The aerosol-generating device may comprise a housing. The housing may define a cavity. The cavity may be configured to receive the aerosol-generating article.

[0016] According to a second aspect of the invention, there is provided an aerosol-generating system comprising: an aerosol-generating article according to the first aspect of the invention; and an aerosol-generating device, wherein the aerosol-generating device comprises a housing defining a cavity configured to receive the aerosol-generating article.

[0017] As used herein with reference to the invention, the term "aerosol-generating article" is used to describe an article comprising an aerosol-generating substrate that is configured to generate an inhalable aerosol for delivery to a user. For example, the aerosol-generating substrate may be heated to generate an inhalable aerosol for delivery to a user.

[0018] As used herein with reference to the invention, the term "aerosol" is used to describe a dispersion of solid particles, or liquid droplets, or a combination of solid particles and liquid droplets, in a gas. The aerosol may be visible or invisible. The aerosol may include vapours of substances that are ordinarily liquid or solid at room temperature as well as solid particles, or liquid droplets, or a combination of solid particles and liquid droplets. The solid particles may be particles of the aerosol-generating substrate. For example, the aerosol-generating substrate may comprise powder particles and the aerosol formed by the aerosol-generating substrate may comprise the powder particles dispersed in a gas.

[0019] As used herein with reference to the invention, the term "aerosol-generating substrate" is used to describe a substrate from which an aerosol can be formed. The aerosol-generating material may be capable of releasing upon heating volatile compounds that can generate an aerosol.

[0020] As used herein with reference to the invention, the term "aerosol-generating device" is used to describe a device that interacts with the aerosol-generating article. For example, the aerosol-generating device may interact with the aerosol-generating substrate of the aerosol-generating article to generate an aerosol.

[0021] Aerosol-generating articles according to the invention have a proximal end through which, in use, an aerosol exits the aerosol-generating article for delivery to a user. The proximal end of the aerosol-generating article may also be referred to as the downstream end or mouth end of the aerosol-generating article. In use, a user draws directly or indirectly on the proximal end of the aerosol-generating article in order to inhale an aerosol generated by the aerosol-generating article.

[0022] Aerosol-generating articles according to the invention have a distal end. The distal end is opposite the proximal end. The distal end of the aerosol-generating article may also be referred to as the upstream end of the aerosol-generating article.

[0023] Components of aerosol-generating articles according to the invention may be described as being upstream or downstream of one another based on their relative positions between the proximal end of the aerosol-generating article and the distal end of the aerosol-generating article.

[0024] As used herein with reference to the invention, the term "longitudinal" is used to describe the direction between the upstream end and the downstream end of the aerosol-generating article. During use, air is drawn through the aerosol-generating article in the longitudinal direction.

[0025] As used herein with reference to the invention, the term "length" is used to describe the maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in the longitudinal direction.

[0026] As used herein with reference to the invention, the term "transverse" is used to describe the direction perpendicular to the longitudinal direction. Unless otherwise stated, references to the "cross-section" of the aerosol-generating article or a component of the aerosol-generating article refer to the transverse cross-section.

[0027] As used herein with reference to the invention, the term "width" denotes the maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in a transverse direction. Where the aerosol-generating article has a substantially circular cross-section, the width of the aerosol-generating article corresponds to the diameter of the aerosol-generating article. Where a component of the aerosol-generating article has a substantially circular cross-section, the width of the component of the aerosol-generating article corresponds to the diameter of the component of the aerosol-generating article.

[0028] As used herein with reference to the invention, the term "tubular element" is used to describe a generally cylindrical element having a lumen along a longitudinal axis thereof. The tubular element may have a substantially circular, oval or elliptical cross-section. The cavity of the tubular body corresponds to the lumen of the tubular element. The lumen may have a substantially circular, oval or elliptical cross-section.

[0029] Aerosol-generating articles according to the first aspect of the invention comprise a tubular element having a tubular body with an intermediate portion, wherein the intermediate portion comprises a plurality of corrugations formed in the tubular body. The plurality of corrugations may help to reduce or prevent movement of the first element. The plurality of corrugations may help to reduce or prevent aerosol-generating material from being dislodged from the first element. The plurality of corrugations may help to reduce or prevent any dislodged aerosol-generating material from travelling through the tubular element.

[0030] The plurality of corrugations may be configured to facilitate a change of state of the intermediate portion between: a first state, in which the first end of the tubular body is placed in a first position with respect to the second end of the tubular body; and a second state, in which the first end of the tubular body is placed in a second position with respect to the second end of the tubular body. The first state is different from the second state.

[0031] A change of state of the intermediate portion may result in a corresponding change of state of the tubular body and of the tubular element.

[0032] The change of state of the intermediate portion may affect the resistance to draw (RTD) of the tubular element and thus the overall resistance to draw of the aerosol-generating article. The provision of the plurality of corrugations may provide the user with the ability to change the resistance to draw of the aerosol-generating article as desired. This may provide a user with one or both of an exciting and stimulating sensory experience.

[0033] The change of state of the intermediate portion may act as a visual sign to a user that the aerosol-generating article has been used. Accordingly, a user may be able to clearly distinguish between a spent aerosol-generating article and an aerosol-generating article that has not yet been used.

[0034] The change of state of the intermediate portion may help to reduce or prevent movement of the first element. The change of state of the intermediate portion may reduce the internal diameter of the intermediate portion to reduce or prevent movement of the first element.

[0035] The change of state of the intermediate portion may help to reduce or prevent aerosol-generating material from being dislodged from the first element. The change of state of the intermediate portion may reduce the cross-sectional area of empty space in the tubular element that aerosol-generating material may be dislodged into. This may help to reduce or prevent aerosol-generating material being dislodged into and traveling through the tubular element. For example, between successive puffs during an inhalation experience, the intermediate portion may change state to reduce or prevent aerosol-generating material from being dislodged into the tubular element and from travelling through the tubular element. This may help to avoid aerosol-generating material from exiting the aerosol-generating article, for example during an interruption in the use of the aerosol-generating article. The plurality of corrugations may be configured such that when the aerosol-generating article is inserted into a cavity of an aerosol-generating device, the intermediate portion changes state from the first state to the second state.

[0036] The plurality of corrugations may be configured such that a user is able to manipulate the intermediate portion from the first state to the second state, or from the second state to the first state. The plurality of corrugations may be configured such that a user is able to manipulate the intermediate portion from the first state to the second state and then from the second state to the first state, and vice versa.

[0037] The change of state of the intermediate portion may be a change in the length of the intermediate portion. That is, the plurality of corrugations may be configured to facilitate a change in length of the intermediate portion. This may result in a corresponding change in length of the tubular body. The plurality of corrugations may be configured to facilitate a change in length of the tubular body.

[0038] When the intermediate portion is in the first state, the tubular body has a first length. When the intermediate portion is in the second state, the tubular body has a second length. The first length of the tubular body may be greater than the second length of the tubular body. Where this is the case, the first state may be referred to as an expanded state and the second state may be referred to as a compressed state.

[0039] The intermediate portion may be extendable. The intermediate portion may be compressible.

[0040] The tubular body may be extendable. The tubular body may be compressible.

[0041] The tubular element may be extendable. The tubular element may be compressible.

[0042] Increasing the length of the tubular body may increase the resistance to draw (RTD) of the tubular body and thus increase the overall resistance to draw of the aerosol-generating article. Decreasing the length of the tubular body may decrease the resistance to draw of the tubular body and thus decrease the overall resistance to draw of the aerosol-generating article. The provision of a tubular body having a plurality of corrugations may enable the user to alter the resistance to draw of the aerosol-generating article as desired.

[0043] Changing the length of the tubular body may result in a corresponding change in the overall length of the aerosol-generating article. This may signal to a user that the aerosol-generating article has been used. For example, the aerosol-generating article may be provided

with the intermediate portion of the tubular body in the first state. On insertion of the aerosol-generating article into a cavity of an aerosol-generating device, the intermediate portion may change state from the first state to the second state such that the overall length of the aerosol-generating article decreases. The change in the overall length of the aerosol-generating article may signal to a user that the aerosol-generating article has previously been inserted into an aerosol-generating device. The change in the overall length of the aerosol-generating article may signal to a user that the aerosol-generating article has been used, for example, that the aerosol-generating article has been heated to generate an aerosol.

[0044] Increasing the length of the tubular body may help to improve cooling of aerosol generated by the aerosol-generating substrate.

[0045] The tubular body may be extendable by less than or equal to about 3L, where L is the length of the tubular body. This means that the tubular body may be able to increase its length by less than or equal to about 3 times. For example, the first length of the tubular body when the intermediate portion is in the first state may be up to about four times greater than the second length of the tubular body when the intermediate portion is in the second state. L may be the length of the tubular body when the intermediate portion is in the second state or compressed state.

[0046] The tubular body may be extendable by less than or equal to about 2L, or less than or equal to about 1.5L.

[0047] The tubular body may be extendable by at least about 0.1L. This means that the tubular body may be extendable by at least about 10 percent.

[0048] The tubular body may be extendable by at least about 0.3L, or at least about 0.5L.

[0049] The tubular body may be extendable by between about 0.1L and about 3L, between about 0.1L and about 2L, or between about 0.1L and about 1.5L.

[0050] The tubular body may be extendable by between about 0.3L and about 3L, between about 0.3L and about 2L, or between about 0.3L and about 1.5L.

[0051] The tubular body may be extendable by between about 0.5L and about 3L, between about 0.5L and about 2L, or between about 0.5L and about 1.5L.

[0052] The tubular body may be extendable by about 1L. This means that the tubular body may be able to double its length. For example, the first length of the tubular body when the intermediate portion is in the first state may be about double the second length of the tubular body when the intermediate portion is in the second state.

[0053] The amount by which the tubular body may be extended may also be applicable to the tubular element.

[0054] The amount by which the tubular body may be extended may also be applicable to the intermediate portion. This may be the case where the intermediate portion extends from the first end of the tubular body to the second end of the tubular body.

[0055] The intermediate portion may be extendable by a greater amount relative to its length than the tubular body is extendable relative to its length. This may be the case, for example, when the tubular body comprises at least one additional portion.

[0056] The intermediate portion may be extendable by less than or equal to about 100X, where X is the length of the intermediate portion. For example, X may be the length of the intermediate portion when the intermediate portion is in the second state or compressed state.

[0057] The intermediate portion may be extendable by less than or equal to about 50X, or less than or equal to about 20X.

[0058] The intermediate portion may be extendable by at least about 0.5X, at least about 3X, or at least about 5X.

[0059] The intermediate portion may be extendable by between about 0.5X and about 100X, between about 0.5X and about 50X, or between about 0.5X and about 20X.

[0060] The intermediate portion may be extendable by between about 3X and about 100X, between about 3X and about 50X, or between about 3X and about 20X.

[0061] The intermediate portion may be extendable by between about 5X and about 100X, between about 5X and about 50X, or between about 5X and about 20X.

[0062] The intermediate portion may be extendable by about 10X. The internal diameter of the intermediate portion in a first state may be substantially the same as the internal diameter of the intermediate portion in a second state. For example, on a change of state of the intermediate portion from the first state to the second state, the length of the intermediate portion may decrease, while the internal diameter of the intermediate portion may remain substantially the same. This may reduce the RTD of the intermediate portion. On a change of state of the intermediate portion from the second state to the first state, the length of the intermediate portion may increase, while the internal diameter of the intermediate portion may remain substantially the same. Where the intermediate portion is downstream of the first element, this may help to improve cooling of aerosol generated by the aerosol-generating substrate.

[0063] When the intermediate portion is in the first state, the intermediate portion has a first internal diameter and when the intermediate portion is in the second state, the intermediate portion has a second internal diameter. The first internal diameter may be substantially the same as the second internal diameter.

[0064] The change of state of the intermediate portion may change the external diameter of the intermediate portion. For example, on compression of the intermediate portion, the plurality of corrugations may extend outwards and the external diameter of the intermediate portion may increase. The internal diameter of the intermediate portion in an expanded state may be substantially the same as the internal diameter of the intermediate portion in a compressed state.

[0065] Each corrugation of the plurality of corrugations may comprise a peak and a corresponding trough, and the internal diameter of the intermediate portion at a trough of a corrugation may not substantially change on a change of state of the intermediate portion from the second state to the first state.

[0066] The internal diameter of the intermediate portion in a first state may not be the same as the internal diameter of the intermediate portion in a second state. For example, on a change of state of the intermediate portion from the first state to the second state, the length of the intermediate portion and the internal diameter of the intermediate portion may both decrease. This may increase the velocity of air flowing through the intermediate portion. This may provide a user with an exciting and stimulating sensory experience.

[0067] The balance between the decrease in the length of the intermediate portion and the decrease in the internal diameter of the intermediate portion may be selected based on one or both of a desired change in the RTD of the tubular element on the change of state of the intermediate portion and cooling of aerosol generated.

[0068] When the intermediate portion is in the first state, the intermediate portion has a first internal diameter and when the intermediate portion is in the second state, the intermediate portion has a second internal diameter. The first internal diameter may greater than the second internal diameter.

[0069] The change of state of the intermediate portion from the second state to the first state may not substantially change the external diameter of the intermediate portion. For example, on compression of the intermediate portion, the plurality of corrugations may extend inwards such that the external diameter of the intermediate portion does not substantially change. On compression of the intermediate portion, the internal diameter of the intermediate portion may change. The internal diameter of the intermediate portion in an expanded state may be greater than the internal diameter of the intermediate portion in a compressed state.

[0070] Each corrugation of the plurality of corrugations may comprise a peak and a corresponding trough, and the internal diameter of the intermediate portion at a trough of a corrugation may change on a change of state of the intermediate portion from the second state to the first state.

[0071] The internal diameter of the intermediate portion at a peak of a corrugation may change on a change of state of the intermediate portion from the second state to the first state.

[0072] The change of state of the intermediate portion may be a change in shape of the intermediate portion.

[0073] The plurality of corrugations may be configured to facilitate bending of the intermediate portion. Thus, the plurality of corrugations may be configured to facilitate bending of the tubular body. The plurality of corrugations may be configured to facilitate bending of the tubular element. Bending of the intermediate portion may result in a change in the overall curvature of the tubular element.

[0074] The intermediate portion may be bendable. The tubular body may be bendable. The tubular element may be bendable.

[0075] Bending of the intermediate portion may increase a level of turbulence in the air flow through the intermediate portion. For example, where the intermediate portion is upstream of the first element, bending of the intermediate portion may affect the air flow drawn into the first element from the upstream end of the first element. This may affect the release of aerosol-generating components from the aerosol-generating substrate. Where the intermediate portion is downstream of the first element, bending of the intermediate portion may enhance mixing of air and aerosol-generating components that are released from the aerosol-generating substrate, thereby improving aerosol generation. The intermediate portion may be bent between puffs by a user to provide a different sensory experience between the puffs.

[0076] Bending of the intermediate portion may enable the user to use the aerosol-generating article and the corresponding aerosol-generating system in different configurations. For example, when the aerosol-generating article is inserted into an aerosol-generating device and the intermediate portion is in the first state, the aerosol-generating device may be held substantially horizontally when a user draws on the aerosol-generating article; and when the intermediate portion is in the second state, the aerosol-generating device may be held at an angle with respect to horizontal when the user draws on the aerosol-generating device. Bending of the intermediate portion may decrease the amount of space needed to comfortably use the aerosol-generating system. This may enable the user to use the aerosol-generating system more discretely and in situations where there may be limited space available in front of the mouth of the user.

[0077] When the intermediate portion is in the first state, the intermediate portion may be substantially straight. When the intermediate portion is in the second state, the intermediate portion may be substantially curved.

[0078] The plurality of corrugations may be configured to facilitate bending of the intermediate portion, by less than or equal to about 180 degrees, less than or equal to about 120 degrees, or less than or equal to about 90 degrees. When the intermediate portion is bent by about 90 degrees, an aerosol-generating device with the aerosol-generating article inserted therein may be held substantially vertically during use of the aerosol-generating article.

[0079] The angles by which the intermediate portion may be bent may also applicable to the tubular body and the tubular element. For example, the tubular body may be bendable by less than or equal to about 180 degrees, less than or equal to about 120 degrees, or less than or equal to about 90 degrees.

[0080] Bending of the intermediate portion may result in the upstream end face of the aerosol-generating article

not being parallel with downstream end face of the aerosol-generating article. For example, where the aerosol-generating article comprises a mouthpiece element at the downstream end of the aerosol-generating article and the tubular element is located between the first element and the mouthpiece element, bending of the intermediate portion may be such that the first element is not parallel to the mouthpiece element. For example, bending of the intermediate portion by about 90 degrees may be such that the first element is substantially perpendicular to the mouthpiece element. That is, the longitudinal axis of the first element may be substantially perpendicular to the longitudinal axis of the mouthpiece element.

[0081] The plurality of corrugations may be configured to facilitate both a change in length of the intermediate portion and bending of the intermediate portion. For example, the plurality of corrugations may be configured to facilitate a change of state of the intermediate portion between: a first state, in which the first end of the tubular body is placed in a first position with respect to the second end of the tubular body; a second state, in which the first end of the tubular body is placed in a second position with respect to the second end of the tubular body; and a third state, in which the first end of the tubular body is placed in a third position with respect to the second end of the tubular body; the tubular body having a different length in the first state than the second state, and the tubular body having a different curvature in the first state than the third state.

[0082] Bending of the intermediate portion may or may not result in a change in length of the intermediate portion.

[0083] The length of the intermediate portion is measured along the central axis of the tubular element in the direction in which air flows through the intermediate portion. Where the intermediate portion is bent, the central axis of the tubular element is also bent.

[0084] The intermediate portion may also be referred to as any of the extendable portion, bendable portion and flexible portion of the tubular body.

[0085] The corrugations may be located along the length of the tubular body from a first corrugation to a second corrugation, with any other corrugation located between the first corrugation and the second corrugation. The intermediate portion may be defined as the portion of the tubular body that extends from the first corrugation to the second corrugation.

[0086] The plurality of corrugations may extend along a length of the tubular body.

[0087] The plurality of corrugations may extend along the entire length of the tubular body. The plurality of corrugations may comprise a first corrugation located at the first end of the tubular body and a second corrugation located at the second end of the tubular body, with any other corrugation located between the first corrugation and the second corrugation.

[0088] The intermediate portion may extend along the entire length of the tubular body. Where this is the case, all features of the intermediate portion may simply be referred to as features of the tubular body. That is, the tubular body may comprise one or more of the features of the intermediate portion described herein. It may not be necessary to specify that the tubular body comprises an intermediate portion.

[0089] At least one corrugation of the plurality of corrugations may extend at least partially around the circumference of the tubular body. At least one corrugation of the plurality of corrugations may extend around the entire circumference of the tubular body.

[0090] Each corrugation of the plurality of corrugations may extend at least partially around a circumference of the tubular body. Each corrugation of the plurality of corrugations may extend around the entire circumference of the tubular body.

[0091] The plurality of corrugations may be substantially parallel with one another.

[0092] Each corrugation of the plurality of corrugations comprises a peak and a corresponding trough.

[0093] The distance between a peak of a corrugation and a trough of the same corrugation may at least about 0.5 millimetres, at least about 1 millimetre, or at least about 1.5 millimetres

[0094] The distance between a peak of a corrugation and a trough of the same corrugation may be less than or about 4 millimetres, less than or equal to about 3 millimetres, or less than or equal to about 2.5 millimetres.

[0095] The distance between a peak of a corrugation and a trough of the same corrugation may be between about 0.5 millimetres and about 4 millimetres, between about 0.5 millimetres and about 3 millimetres, or between about 0.5 millimetres and about 2.5 millimetres.

[0096] The distance between a peak of a corrugation and a trough of the same corrugation may be between about 1 millimetre and about 4 millimetres, between about 1 millimetre and about 3 millimetres, or between about 1 millimetre and about 2.5 millimetres.

[0097] The distance between a peak of a corrugation and a trough of the same corrugation may be between about 1.5 millimetres and about 4 millimetres, between about 1.5 millimetres and about 3 millimetres, or between about 1.5 millimetres and about 2.5 millimetres.

[0098] The distance between a peak of a corrugation and a trough of the same corrugation may be about 2 millimetres.

[0099] The distance between a peak of a corrugation and a trough of the same corrugation may be at least about 0.05 times the external diameter of the aerosol-generating article, at least about 0.1 times the external diameter of the aerosol-generating article, or at least about 0.2 times the external diameter of the aerosol-generating article.

[0100] The distance between a peak of a corrugation and a trough of the same corrugation may be less than or equal to about 0.5 times the external diameter of the aerosol-generating article, less than or equal to about 0.4 times the external diameter of the aerosol-generating article, or less than or equal to about 0.3 times the exter-

nal diameter of the aerosol-generating article.

[0101] The distance between a peak of a corrugation and a trough of the same corrugation may be between about 0.05 times and about 0.5 times the external diameter of the aerosol-generating article, between about 0.05 times and about 0.4 times the external diameter of the aerosol-generating article, or between about 0.05 times and about 0.3 times the external diameter of the aerosol-generating article.

[0102] The distance between a peak of a corrugation and a trough of the same corrugation may be between about 0.1 times and about 0.5 times the external diameter of the aerosol-generating article, between about 0.1 times and about 0.4 times the external diameter of the aerosol-generating article, or between about 0.1 times and about 0.3 times the external diameter of the aerosol-generating article.

[0103] The distance between a peak of a corrugation and a trough of the same corrugation may be between about 0.2 times and about 0.5 times the external diameter of the aerosol-generating article, between about 0.2 times and about 0.4 times the external diameter of the aerosol-generating article, or between about 0.2 times and about 0.3 times the external diameter of the aerosol-generating article.

[0104] The distance between a peak of a corrugation and a trough of the same corrugation may be the same for each corrugation. The plurality of corrugations may be substantially identical to one another.

[0105] Increasing the distance between a peak of a corrugation and a trough of the same corrugation may increase one or both of the extendibility and bendability of the intermediate portion. Increasing the distance between a peak of a corrugation and a trough of the same corrugation may result in a greater change in length of the intermediate portion on a change of state of the intermediate portion.

[0106] Increasing the distance between a peak of a corrugation and a trough of the same corrugation may result in a decrease in the internal diameter of the tubular body at the trough of the corrugation. This may decrease the RTD of the tubular body and thus may decrease the overall RTD of the aerosol-generating article.

[0107] Decreasing an internal diameter of the tubular body may increase the velocity of one or both of air and aerosol flowing through the tubular element. Where the tubular element is downstream of the first element, decreasing the internal diameter of the tubular element may help to improve cooling and nucleation of aerosol.

[0108] Where the internal diameter of the tubular element at a trough of a corrugation changes on a change of state of the intermediate portion, increasing the distance between a peak of the corrugation and the trough of the corrugation may increase the change in the internal diameter of the tubular element at the trough of the corrugation on a change of state of the intermediate portion. This may enhance any change in the resistance to draw of the aerosol-generating article on a change of state of the intermediate portion. This may provide a user with an even more exciting and stimulating sensory experience.

[0109] The distance between a peak of a corrugation and a trough of the same corrugation may be selected based a suitable RTD of the aerosol-generating article in all states and configurations and the ease and effect of a change of state of the intermediate portion.

[0110] The plurality of corrugations may comprise at least 3 corrugations, at least 5 corrugations, or at least 7 corrugations.

[0111] The plurality of corrugation may comprise up to 20 corrugations, up to 15 corrugations, or up to 10 corrugations.

[0112] The plurality of corrugations may comprise between 3 corrugations and 20 corrugations, between 3 corrugations and 15 corrugations, or between 3 corrugations and 10 corrugations.

[0113] The plurality of corrugations may comprise between 5 corrugations and 20 corrugations, between 5 corrugations and 15 corrugations, or between 5 corrugations and 10 corrugations.

[0114] The plurality of corrugations may comprise between 7 corrugations and 20 corrugations, between 7 corrugations and 15 corrugations, or between 7 corrugations and 10 corrugations.

[0115] The number of corrugations may be selected based on a balance between the extendibility and bendability of the intermediate portion and the integrity of the intermediate portion.

[0116] The intermediate portion may have a length of at least about 1 millimetre, at least about 2 millimetres, at least about 3 millimetres.

[0117] The intermediate portion may have a length of less than or equal to about 20 millimetres, less than or equal to about 15 millimetres, or less than or equal to about 10 millimetres.

[0118] The intermediate portion may have a length of between about 1 millimetre and about 20 millimetres, between about 1 millimetre and about 15 millimetres, or between about 1 millimetre and about 10 millimetres.

[0119] The intermediate portion may have a length of between about 2 millimetres and about 20 millimetres, between about 2 millimetres and about 15 millimetres, or between about 2 millimetres and about 10 millimetres.

[0120] The intermediate portion may have a length of between about 3 millimetres and about 20 millimetres, between about 3 millimetres and about 15 millimetres, or between about 3 millimetres and about 10 millimetres.

[0121] The length of the intermediate portion may be measured when the intermediate portion is in any state. For example, the length of the intermediate portion may be measured when the intermediate portion is in an extended state or in a compressed state.

[0122] The intermediate portion may have a substantially circular cross-section.

[0123] The intermediate portion may have an external diameter substantially the same as the external diameter

of the aerosol-generating article. Where the aerosol-generating article has a substantially circular cross-section, the external diameter of the aerosol-generating article corresponds to the maximum dimension of the aerosol-generating article in a transverse direction, and this may be at the location of the intermediate portion. For example, the intermediate portion may have an external diameter greater than the external diameter of any other component of the aerosol-generating article, and thus, the external diameter of the intermediate portion may substantially define the external diameter of the aerosol-generating article. Where the aerosol-generating article comprises a wrapper circumscribing the intermediate portion, the external diameter of the aerosol-generating article at the intermediate portion takes into account the thicknesses of the wrapper seen in a cross-section of the aerosol-generating article at the intermediate portion.

[0124] The intermediate portion may have an external diameter less than the external diameter of the aerosol-generating article. For example, when the intermediate portion is in a compressed state, the external diameter of the intermediate portion may be less than the external diameter of the aerosol-generating article. The external diameter of the intermediate portion may be less than the external diameter of the aerosol-generating article even when taking into account thicknesses of any wrapper circumscribing the intermediate portion.

[0125] The intermediate portion may have an external diameter of at least about 5 millimetres, about 6 millimetres, or about 7 millimetres.

[0126] The intermediate portion may have an external diameter of less than or equal to 12 millimetres, less than or equal to about 10 millimetres, or less than or equal to about 8 millimetres.

[0127] The intermediate portion may have an external diameter of between about 5 millimetres and about 12 millimetres, between about 5 millimetres and about 10 millimetres, or between about 5 millimetres and about 8 millimetres.

[0128] The intermediate portion may have an external diameter of between about 6 millimetres and about 12 millimetres, between about 6 millimetres and about 10 millimetres, or between about 6 millimetres and about 8 millimetres.

[0129] The intermediate portion may have an external diameter of between about 7 millimetres and about 12 millimetres, between about 7 millimetres and about 10 millimetres, or between about 7 millimetres and about 8 millimetres.

[0130] For example, the intermediate may have an external diameter of about 7.2 millimetres.

[0131] The tubular body may comprise one or more additional portions in longitudinal alignment with the intermediate portion. Where this is the case, the tubular body has a length greater than the intermediate portion.

[0132] Where the intermediate portion extends along the entire length of the tubular body, the length of tubular body is the same as the length of the intermediate portion.

[0133] The tubular element may comprise a plurality of ventilation holes. The plurality of ventilation holes forming a ventilation zone of the tubular element.

[0134] Providing a plurality of ventilations holes downstream of the first element may achieve a satisfactory cooling of the stream of aerosol generated and drawn through the tubular element. This may be particularly advantageous where the aerosol is generated upon heating of the aerosol-generating substrate. Without wishing to be bound by theory, the temperature drop caused by the admission of cooler, external air into the tubular element via the ventilation zone may have an advantageous effect on the nucleation and growth of aerosol particles.

[0135] The plurality of ventilation holes may extend through the wall of the tubular body.

[0136] The plurality of ventilation holes may be provided at a position away from the intermediate portion. This may be such that air may be drawn through the tubular element regardless of the state of the intermediate portion. For example, this may avoid the need to align any ventilation holes provided through a wrapper circumscribing the tubular body with the ventilation holes extending through the wall of the tubular body when the intermediate portion is in both the first state and the second state.

[0137] Where the tubular body comprises a first section, the plurality of ventilation holes may be provided at a position along the first section. Where the tubular body comprises a second section, the plurality of ventilation holes may be provided at a position along the second section.

[0138] The plurality of ventilation holes may be downstream of the intermediate portion. This may have an advantageous effect on the nucleation and growth of aerosol particles.

[0139] The plurality of ventilation holes may be provided at a position along the intermediate portion. The intermediate portion may comprise a plurality of ventilation holes.

[0140] Where the tubular element is downstream of the first element, a plurality of ventilation holes provided at a position along the intermediate portion may enable the user to control the degree of cooling of the stream of generated aerosol. For example, when the intermediate portion is in a compressed state, air may not be drawn through the plurality of ventilation holes, on extension of the intermediate portion to an extended state, air may be drawn through the plurality of ventilation holes. The user may change the state of the intermediate portion based on a desired ventilation level and thus cooling of generating aerosol.

[0141] As used herein with reference to the invention, the term "ventilation level" is used to denote a volume ratio between the airflow admitting into the aerosol-generating article via the ventilation zone (ventilation airflow) and the sum of the aerosol airflow and an airflow exiting the aerosol-generating article via the downstream end of the aerosol-generating article.

[0142] When the intermediate portion is in a first state or an expanded state, the aerosol-generating article may have a ventilation level of at least about 10 percent, at least about 15 percent, at least about 20 percent, at least about 25 percent, or at least about 30 percent.

[0143] When the intermediate portion is in a second state or a compressed state, the aerosol-generating article may have a ventilation level of less than or equal to about 10 percent, less than or equal to about 5 percent, or less than or equal to about 2 percent.

[0144] When the intermediate portion is in a second state or a compressed state, air may be substantially prevented from entering the aerosol-generating article through the plurality of ventilation holes. When the intermediate portion is in a second state or a compressed state, the aerosol-generating article may have a ventilation level of about 0 percent.

[0145] When the intermediate portion is in the first state, the aerosol-generating article may have a first ventilation level. When the intermediate portion is in the second state, the aerosol-generating article may have a second ventilation level. The first ventilation level may be different from the second ventilation level.

[0146] The first ventilation level may be greater than the second ventilation level by at least about 5 percent, at least about 10 percent, at least about 15 percent, or at least about 20 percent.

[0147] The plurality of ventilation holes may be provided one or both of in the vicinity of the troughs of the corrugations and in the vicinity of the peaks of the corrugations.

[0148] The plurality of ventilation holes may comprise at least one circumferential row of holes. The plurality of ventilation holes may comprise two circumferential rows of holes. Each circumferential row of holes may comprise between 8 and 30 holes.

[0149] The aerosol-generating article may comprise a wrapper circumscribing at least the intermediate portion of the tubular body. That is, the wrapper may be wrapped around at least the intermediate portion of the tubular body.

[0150] The wrapper may be an outer wrapper. The wrapper may be the outermost wrapper. The outer surface of the wrapper may form the outer surface of the aerosol-generating article.

[0151] An inner surface of the wrapper may be adjacent to an outer surface of the intermediate portion of the tubular body. An inner surface of the wrapper may be in contact with an outer surface of the intermediate portion of the tubular body.

[0152] The wrapper may extend along the entire length of the intermediate portion.

[0153] The wrapper may circumscribe the intermediate portion of the tubular body and at least one other portion or component of the aerosol-generating article.

[0154] The wrapper may circumscribe the intermediate portion of the tubular body and at least one other portion of the tubular body. The wrapper may be attached to a portion of the tubular body other than the intermediate portion. For example, as described below, the tubular body may comprise a first portion, the intermediate portion and a second portion; the wrapper may circumscribe the first portion, the intermediate portion and the second portion, and be attached to one or both of the first portion and the second portion.

[0155] The wrapper may extend along the entire length of the tubular body.

[0156] The wrapper may circumscribe the tubular body and at least a part of a component of the aerosol-generating article upstream of the tubular body. The wrapper may be attached to a component of the aerosol-generating article upstream of the tubular body. For example, the wrapper may be adhered to a component of the aerosol-generating article upstream of the tubular body. For instance, where the tubular element is downstream of the first element, the wrapper may be adhered to the first element.

[0157] The wrapper may circumscribe the tubular body and at least a part of a component of the aerosol-generating article downstream of the tubular body. The wrapper may be attached to a component of the aerosol-generating article downstream of the tubular body. For example, the wrapper may be adhered to a component of the aerosol-generating article downstream of the tubular body. For instance, where the tubular element is upstream of the first element, the wrapper may be adhered to the first element.

[0158] The wrapper may extend along the entire length of the aerosol-generating article.

[0159] The wrapper may be attached to a component of the aerosol-generating article at a location away from the intermediate portion of the tubular body.

[0160] The wrapper may comprise a line of weakness. The line of weakness may be a transverse line of weakness. The line of weakness may be a circumferential line of weakness. As used herein with reference to the invention, the term "circumferential line of weakness" is used to describe a transverse line of weakness that circumscribes an underlying component of the aerosol-generating article.

[0161] The wrapper may be breakable along the line of weakness. The wrapper may be breakable along the line of weakness to separate the wrapper into two portions, such as an upstream portion and a downstream portion. The wrapper may be breakable along the line of weakness to facilitate a change of state of the intermediate portion of the tubular body. For example, breaking the wrapper may facilitate one or both of a change in length and bending of the intermediate portion. The line of weakness may act as a visual indication of whether the aerosol-generating article has been used. For example, an intact line of weakness may indicate to a user that the aerosol-generating article has not been used; and a broken line of weakness may indicate to a user that the aerosol-generating article has been used.

[0162] Breaking of the wrapper may expose an under-

lying component of the aerosol-generating article, such as the tubular element. At least a portion of the tubular element may be a different colour from the wrapper. This may be such that on breaking of the wrapper, the differently coloured portion of the tubular element is visible to a user. This may clearly indicate to a user that the aerosol-generating article has been used.

[0163] The wrapper may comprise one or more lines of weakness. Each line of weakness may have the same features as the line of weakness discussed above.

[0164] Where the tubular element comprises a plurality of ventilation holes, breaking of the wrapper may facilitate drawing of air through the ventilation holes.

[0165] The line of weakness may be located between the first end of the tubular body and the second end of the tubular body.

[0166] The line of weakness may extend around the intermediate portion of the tubular body.

[0167] Locating the line of weakness in the vicinity of the intermediate portion may facilitate a change of state of the intermediate portion.

[0168] Suitable types of lines of weakness are known in the art and include, but are not limited to, embossed lines, debossed lines, creases, scored lines, lines of perforations, and combinations thereof.

[0169] Preferably, the line of weakness is a line of perforations. The perforations may act as ventilation holes.

[0170] At least a portion of the tubular element may be free to move with respect to the wrapper in the longitudinal direction of the aerosol-generating article.

[0171] The first end of the tubular body may be free to move with respect to the wrapper in the longitudinal direction of the aerosol-generating article.

[0172] The second end of the tubular body may be free to move with respect to the wrapper in the longitudinal direction of the aerosol-generating article.

[0173] The tubular body may comprise a first portion located upstream of the intermediate portion.

[0174] The tubular body may comprise a first portion extending from the first end of the tubular body. The first portion may extend from the first end of the tubular body to the intermediate portion.

[0175] The intermediate portion may be integrally formed with the first portion of the tubular body.

[0176] The first portion of the tubular body may not comprise a corrugation. The first portion of the tubular body may be non-corrugated.

[0177] The first portion of the tubular body may have a length substantially the same as a length of the intermediate portion.

[0178] The first portion of the tubular body may have a length of at least about 1 millimetre, at least about 2 millimetres, or at least about 3 millimetres.

[0179] The first portion of the tubular body may have a length of less than or equal to about 10 millimetres, less than or equal to about 7 millimetres, or less than or equal to about 5 millimetres.

[0180] The first portion of the tubular body may have a length of between about 1 millimetre and about 10 millimetres, between 1 millimetre and about 7 millimetres, or between 1 millimetre and 5 millimetres.

[0181] The first portion of the tubular body may have a length of between about 2 millimetres and about 10 millimetres, between 2 millimetres and about 7 millimetres, or between 2 millimetres and 5 millimetres.

[0182] The first portion of the tubular body may have a length of between about 3 millimetres and about 10 millimetres, between 3 millimetres and about 7 millimetres, or between 3 millimetres and 5 millimetres.

[0183] The first portion of the tubular body may have an external diameter substantially the same as an external diameter of the intermediate portion.

[0184] The first portion of the tubular body may have an external diameter less than the external diameter of the intermediate portion.

[0185] The first portion of the tubular body may have an external diameter substantially the same as an external diameter of the aerosol-generating article.

[0186] The first portion of the tubular body may have an external diameter less than the external diameter of the aerosol-generating article.

[0187] The first portion may have an external diameter of at least about 5 millimetres, about 6 millimetres, or about 7 millimetres.

[0188] The first portion may have an external diameter of less than or equal to 12 millimetres, less than or equal to about 10 millimetres, or less than or equal to about 8 millimetres.

[0189] The first portion may have an external diameter of between about 5 millimetres and about 12 millimetres, between about 5 millimetres and about 10 millimetres, or between about 5 millimetres and about 8 millimetres.

[0190] The first portion may have an external diameter of between about 6 millimetres and about 12 millimetres, between about 6 millimetres and about 10 millimetres, or between about 6 millimetres and about 8 millimetres.

[0191] The first portion may have an external diameter of between about 7 millimetres and about 12 millimetres, between about 7 millimetres and about 10 millimetres, or between about 7 millimetres and about 8 millimetres.

[0192] For example, the first portion may have an external diameter of about 7.2 millimetres.

[0193] The tubular body may comprise a second portion located downstream of the intermediate portion.

[0194] The tubular body may comprise a second portion extending from the second end of the tubular body. The second portion may extend from the second end of the tubular body to the intermediate portion

[0195] The intermediate portion may be integrally formed with the second portion of the tubular body.

[0196] The second portion of the tubular body may not comprise a corrugation. The second portion of the tubular body may be non-corrugated.

[0197] The second portion of the tubular body may have a length substantially the same as a length of the intermediate portion.

[0198] The second portion of the tubular body may have a length substantially the same as a length of the first portion.

[0199] The second portion of the tubular body may have a length of at least about 1 millimetre, at least about 2 millimetres, or at least about 3 millimetres.

[0200] The second portion of the tubular body may have a length of less than or equal to about 10 millimetres, less than or equal to about 7 millimetres, or less than or equal to about 5 millimetres.

[0201] The second portion of the tubular body may have a length of between about 1 millimetre and about 10 millimetres, between 1 millimetre and about 7 millimetres, or between 1 millimetre and 5 millimetres.

[0202] The second portion of the tubular body may have a length of between about 2 millimetres and about 10 millimetres, between 2 millimetres and about 7 millimetres, or between 2 millimetres and 5 millimetres.

[0203] The second portion of the tubular body may have a length of between about 3 millimetres and about 10 millimetres, between 3 millimetres and about 7 millimetres, or between 3 millimetres and 5 millimetres.

[0204] The second portion of the tubular body may have an external diameter substantially the same as an external diameter of the intermediate portion.

[0205] The second portion of the tubular body may have an external diameter less than the external diameter of the intermediate portion.

[0206] The second portion of the tubular body may have an external diameter substantially the same as an external diameter of the aerosol-generating article.

[0207] The second portion of the tubular body may have an external diameter less than the external diameter of the aerosol-generating article.

[0208] The second portion of the tubular body may have an external diameter substantially the same as an external diameter of the first portion.

[0209] The second portion may have an external diameter of at least about 5 millimetres, about 6 millimetres, or about 7 millimetres.

[0210] The second portion may have an external diameter of less than or equal to 12 millimetres, less than or equal to about 10 millimetres, or less than or equal to about 8 millimetres.

[0211] The second portion may have an external diameter of between about 5 millimetres and about 12 millimetres, between about 5 millimetres and about 10 millimetres, or between about 5 millimetres and about 8 millimetres.

[0212] The second portion may have an external diameter of between about 6 millimetres and about 12 millimetres, between about 6 millimetres and about 10 millimetres, or between about 6 millimetres and about 8 millimetres.

[0213] The second portion may have an external diameter of between about 7 millimetres and about 12 millimetres, between about 7 millimetres and about 10 millimetres, or between about 7 millimetres and about 8 millimetres.

[0214] For example, the second portion may have an external diameter of about 7.2 millimetres.

[0215] The first portion and the second portion may have substantially the same shape and size. The first portion and the second portion may be substantially identical. This may simplify manufacturing of the tubular body.

[0216] The tubular body may comprise the intermediate portion, the first portion and the second portion, wherein the intermediate portion is located between the first portion and the second portion. The intermediate portion may connect the first portion and the second portion.

[0217] The first portion, the intermediate portion and the second portion may be in longitudinal alignment. The first portion, the intermediate portion and the second portion may be longitudinally aligned in an abutting end to end relationship with each other. The tubular body may not comprise any other portions in longitudinal alignment with the first portion, the intermediate portion and the second portion.

[0218] The tubular body may comprise one or more additional portions in addition to the first portion, the second portion and the intermediate portion.

[0219] The tubular body may comprise a transverse plane of symmetry. This may simplify assembling of the aerosol-generating article, since the orientation in which the tubular body is assembled in the aerosol-generating article may be immaterial. The transverse plane of symmetry may mean that the tubular body is able to distribute load evenly, for example, to the intermediate portion. This may facilitate a change of state of the intermediate portion when load is being applied to the intermediate portion.

[0220] The tubular element may comprise a folded end portion forming a first end wall at the first end of the tubular body. The first end wall may delimit an opening for airflow between the cavity and the exterior of the tubular element.

[0221] By providing the tubular element with a folded end portion forming a first end wall at the first end of the tubular body, the tubular element may be configured to have a desired RTD through configuration of the size and shape of the first end wall. In particular, the tubular element and its first end wall can be manufactured efficiently and at high speed, with a satisfactory RTD and low RTD variability from one aerosol-generating article to another. Furthermore, the configuration of the tubular element and its first end wall may mean that RTD can be localised at a specific longitudinal position of the tubular element, rather than being continuously distributed along the length of the tubular element.

[0222] The first end wall of the tubular element may be adjacent to the first element. The first end wall of the tubular element may be in contact with the first element.

[0223] The first end wall of the tubular element may be adjacent to the aerosol-generating substrate. The first end wall of the tubular element may be in contact with the aerosol-generating substrate.

[0224] Where the first end wall is adjacent to the aer-

osol-generating substrate, the first end wall may provide a barrier which may restrict movement of the aerosol-generating substrate. This arrangement can also advantageously enable one or both of air and aerosol to flow through the opening into the cavity.

[0225] The barrier provided by the first end wall of the tubular element may be more effective than a barrier provided by an end of a hollow acetate tube, since the first end wall may be less deformable than the end of the hollow acetate tube. The construction of the tubular element may also be better suited to withstanding the temperatures generated by a heating blade or susceptor element.

[0226] As used herein with reference to the invention, the term "adjacent to" is used in respect of the tubular element and the first element to indicate that the tubular element is longitudinally positioned next to the first element. In particular, this term indicates that there are no other elements of the aerosol-generating article disposed between the first element and the tubular element in the longitudinal direction.

[0227] The first end wall may extend partially into the cavity of the tubular body and form an angle of less than 90 degrees with the inner surface of the tubular body, more preferably an angle of less than 80 degrees with the inner surface of the tubular body, even more preferably an angle of less than 70 degrees with the inner surface of the tubular body. This may be achieved by ensuring that, during manufacture of the tubular element, a folding force is applied to the tubular element such that at least part of the first end portion of the tubular element is pushed into the cavity of the tubular body. Such arrangements may advantageously increase the likelihood of the first end wall remaining stationary with respect to the tubular body after the tubular element has been manufactured. In particular, such arrangements may help to overcome any natural resilience in the material forming the tubular element, such that the folded end portion of the tubular element is less likely to revert towards its pre-folded condition after manufacture.

[0228] The opening delimited by the first end wall may be the only opening in the first end wall. The opening may be disposed in a generally radially central position of the tubular element. The first end wall may be generally annular shaped.

[0229] The first end wall may extend from a fold point on the tubular element and towards a radially central position of the tubular element. The fold point may generally correspond to the first end of the tubular body of the tubular element.

[0230] Preferably, at least the first portion of the tubular element forming the first end wall is substantially air impermeable. Put another way, preferably the first end wall is substantially nonporous. Preferably the first end wall does not comprise any perforations. The material forming the first end wall may have a porosity of less than 2000 Coresta units. The material forming the first end wall may have a porosity of less than 1000 Coresta units. The material forming the first end wall may have a porosity of less than 500 Coresta units.

[0231] The tubular element may have a wall thickness of at least about 0.1 millimetres, or at least about 0.2 millimetres.

[0232] The tubular element may have a wall thickness of less than or equal to about 1.5 millimetres, less than or equal to about 1.25 millimetres, or less than or equal to about 1 millimetre.

[0233] The tubular element may have a wall thickness of between about 0.1 millimetres and about 1.5 millimetres, between about 0.1 millimetres and about 1.25 millimetres, or between about 0.1 millimetres and about 1 millimetre.

[0234] The tubular element may have a wall thickness of between about 0.2 millimetres and about 1.5 millimetres, between about 0.2 millimetres and about 1.25 millimetres, or between about 0.2 millimetres and about 1 millimetre.

[0235] Providing the tubular element with such wall thickness may help to improve the tubular body's resistance to collapse or deformation, whilst still enabling the plurality of corrugations to be formed in the intermediate portion and the first end wall to be formed by a folded end portion of the tubular element, where present.

[0236] The wall thickness of the tubular element may be the same as the wall thickness of one or both of the tubular body and the first end wall.

[0237] The length of the tubular element may be substantially the same as the length of the tubular body. That is, the tubular body may extend the entire length of the tubular element. The tubular element may consist of the tubular body.

[0238] The tubular element may have a length of at least about 10 millimetres, or at least about 15 millimetres.

[0239] The tubular element may have a length of less than or equal to about 30 millimetres, less than or equal to about 25 millimetres, or less than or equal to about 20 millimetres.

[0240] The tubular element may have a length of between about 10 millimetres and about 30 millimetres, between about 10 millimetres and about 25 millimetres, or between 10 millimetres and about 20 millimetres.

[0241] The tubular element may have a length of between about 15 millimetres and about 30 millimetres, between about 15 millimetres and about 25 millimetres, or between 15 millimetres and about 20 millimetres.

[0242] For example, the tubular element may have a length of about 18 millimetres.

[0243] Such lengths may be particularly preferred where the tubular element is located downstream of the first element.

[0244] The tubular element may have a length of at least about 5 millimetres, at least about 8 millimetres, or at least about 10 millimetres.

[0245] The tubular element may have a length of less than or equal to about 20 millimetres, less than or equal

to about 15 millimetres, or less than or equal to about 13 millimetres.

[0246] The tubular element may have a length of between about 5 millimetres and about 20 millimetres, between about 5 millimetres and about 15 millimetres, or between about 5 millimetres and about 13 millimetres.

[0247] The tubular element may have a length of between about 8 millimetres and about 20 millimetres, between about 8 millimetres and about 15 millimetres, or between about 8 millimetres and about 13 millimetres.

[0248] The tubular element may have a length of between about 10 millimetres and about 20 millimetres, between about 10 millimetres and about 15 millimetres, or between about 10 millimetres and about 13 millimetres.

[0249] Such lengths may be particularly preferred where the tubular element is located upstream of the first element.

[0250] The tubular element may be adapted to generate a RTD between about 0 millimetres H_2O (about 0 Pa) and about 20 millimetres H_2O (about 100 Pa), or between about 0 millimetres H_2O (about 0 Pa) and about 10 millimetres H_2O (about 100 Pa).

[0251] The tubular element may have a negligible level of resistance to draw when the intermediate portion is in one or both of the first state and the second state.

[0252] Preferably, the cavity of the tubular body is substantially empty.

[0253] The tubular element is preferably formed from a paper material, such as paper, paperboard or cardboard. The tubular element may be formed from a plurality of overlapping paper layers, such as a plurality of parallel wound paper layers or a plurality of spirally wound paper layers. Forming the tubular element from a plurality of overlapping paper layers may help to improve the tubular body's resistance to collapse or deformation, whilst still enabling a plurality of corrugations to be formed in the intermediate portion and the first end wall to be formed by a folded end portion of the tubular element, where present.

[0254] The tubular element may comprise at least two paper layers. The tubular element may comprise fewer than eleven paper layers.

[0255] Where the tubular element is formed from a paper material, the paper material may have a basis weight of at least about 90 grams per square metre. The paper material may have a basis weight of less than about 300 grams per square metre. The paper material may have a basis weight of from about 100 to about 200 grams per square metre. Providing the tubular element with such wall basis weight can help to improve the tubular body's resistance to collapse or deformation, whilst still enabling a plurality of corrugations to be formed in the intermediate portion and the first end wall to be formed by a folded end portion of the tubular element, where present.

[0256] The first end wall of the tubular element may be integrally formed with the intermediate portion of the tubular body. Where the tubular body comprises a first portion extending from the first end of the tubular element, the first end wall of the tubular element may be integrally formed with the first portion of the tubular body. Where the tubular body comprises a second portion extending from the second end of the tubular body, the first end wall of the tubular element may be integrally formed with the second portion of the tubular body.

[0257] The tubular element may be longitudinally aligned with the first element.

[0258] The tubular element may be adjacent to the first element. The tubular element may be adjacent to the aerosol-generating substrate.

[0259] The tubular element may abut the first element. The tubular element may abut the aerosol-generating substrate.

[0260] The tubular element may be adjacent to the first element but may not be in contact with the first element because a gap of empty space separates the first element form the tubular element in the longitudinal direction of the aerosol-generating article.

[0261] The intermediate portion of the tubular body may not extend over the first element. The intermediate portion of the tubular body may not extend over the aerosol-generating substrate.

[0262] The intermediate portion of the tubular body may be upstream or downstream of the first element. The intermediate portion of the tubular body may be upstream or downstream of the aerosol-generating substrate.

[0263] Where the intermediate portion is located downstream of the first element, a change of state of the intermediate portion may help to improve cooling of the aerosol generated.

[0264] The tubular element may not extend over the first element. The tubular element may not extend over the aerosol-generating substrate.

[0265] The tubular element may be upstream or downstream of the first element. The tubular element may be upstream or downstream of the aerosol-generating substrate.

[0266] The tubular element may be located downstream of the first element. Where this is the case, the tubular element may be referred to as a downstream tubular element.

[0267] The tubular element may be downstream of and abut the first element. The first end of the tubular body may abut the downstream end of the first element.

[0268] The first end of the tubular body may be referred to as the upstream end of the tubular body. The first end of the tubular body may be the upstream end of the tubular element.

[0269] The second end of the tubular body may be referred to as the downstream end of the tubular body. The second end of the tubular body may be the downstream end of the tubular element.

[0270] The tubular element may be at the downstream end of the aerosol-generating article. The tubular element may be the most downstream component of the aerosol-generating article.

[0271] The tubular element may be located upstream

of the first element. Where this is the case, the tubular element may be referred to as an upstream tubular element.

[0272] The tubular element may be upstream of and abut the first element. The second end of the tubular body may abut the upstream end of the first element.

[0273] The tubular element may be at the upstream end of the aerosol-generating article. The tubular element may be the most upstream component of the aerosol-generating article.

[0274] The first element may be located in the cavity of the tubular body of the tubular element. For example, the first element may be located in the cavity of the tubular body of the tubular element and upstream of the intermediate portion of the tubular body.

[0275] The aerosol-generating article may comprise two or more tubular elements. For example, the aerosol-generating article may comprise two tubular elements, each comprising a tubular body having a first end, a second end, and an intermediate portion located between the first end and the second end, wherein the tubular body defines a cavity extending from the first end to the second end, and wherein the intermediate portion comprises a plurality of corrugations formed in the tubular body. The two tubular elements may be referred to as a first tubular element and a second tubular element.

[0276] The first and second tubular elements may each have any feature or combination of features, which are described above or below in respect of the tubular element of the invention.

[0277] The aerosol-generating article may comprise a first tubular element located upstream of the first element.

[0278] The aerosol-generating article may comprise a second tubular element located downstream of the first element.

[0279] For example, the aerosol-generating article may comprise a first element comprising an aerosol-generating substrate; a first tubular element and a second tubular element, each of the first tubular element and the second tubular element comprising: a tubular body having a first end, a second end and an intermediate portion between the first end and the second end, the tubular body defining a cavity extending from the first end of the tubular body to the second end of the tubular body, wherein the intermediate portion comprises a plurality of corrugations formed in the tubular body; and wherein the first tubular element is upstream of the first element and the second tubular element is downstream of the first element.

[0280] The first tubular element may comprise a folded end portion forming a first end wall at the first end of the tubular body of the first tubular element. The first end wall may delimit an opening for airflow between the cavity and the exterior of the first tubular element.

[0281] The first tubular element may comprise a folded end portion forming a second end wall at the second end of the tubular body of the first tubular element. The second end may delimit an opening for airflow between the cavity and the exterior of the first tubular element.

[0282] The second tubular element may comprise a folded end portion forming a first end wall at the first end of the tubular body of the second tubular element. The first end wall may delimit an opening for airflow between the cavity and the exterior of the second tubular element.

[0283] The second tubular element may comprise a folded end portion forming a second end wall at the second end of the tubular body of the second tubular element. The second end wall may delimit an opening for airflow between the cavity and the exterior of the second tubular element.

[0284] The aerosol-generating article may comprise an aerosol-generating substrate for generating an inhalable aerosol upon heating. The aerosol-generating article may be referred to as a heated aerosol-generating article.

[0285] The first element may be referred to as an aerosol-generating element. The first element may be in the form of a rod.

[0286] The aerosol-generating substrate may be in the form of a rod.

[0287] As used herein with reference to the invention, the term "rod" is used to denote a generally cylindrical element having a substantially circular, oval or elliptical cross-section.

[0288] The aerosol-generating substrate may substantially define the structure and dimensions of the first element.

[0289] The aerosol-generating substrate may comprise aerosol-generating material circumscribed by a wrapper, such as a plug wrap. For example, the aerosol-generating substrate may comprise aerosol-generating material circumscribed by a wrapper to form a rod.

[0290] The aerosol-generating substrate may have a length of at least about 8 millimetres, at least about 9 millimetres, or at least about 10 millimetres.

[0291] The aerosol-generating substrate may have a length of less than or equal to about 16 millimetres, less than or equal to about 15 millimetres, or less than or equal to about 14 millimetres.

[0292] The aerosol-generating substrate may have a length of between about 8 millimetres and about 16 millimetres, between about 8 millimetres and about 15 millimetres, or between about 8 millimetres and about 14 millimetres.

[0293] The aerosol-generating substrate may have a length of between about 9 millimetres and about 16 millimetres, between about 9 millimetres and about 15 millimetres, or between about 9 millimetres and about 14 millimetres.

[0294] The aerosol-generating substrate may have a length of between about 10 millimetres and about 16 millimetres, between about 10 millimetres and about 15 millimetres, or between about 10 millimetres and about 14 millimetres.

[0295] For example, the aerosol-generating substrate may have a length of about 12 millimetres.

[0296] Preferably, the aerosol-generating substrate has a substantially circular cross-section.

[0297] The aerosol-generating substrate may have an external diameter of at least about 5 millimetres, about 6 millimetres, or about 7 millimetres.

[0298] The aerosol-generating substrate may have an external diameter of less than or equal to 12 millimetres, less than or equal to about 10 millimetres, or less than or equal to about 8 millimetres.

[0299] The aerosol-generating substrate may have an external diameter of between about 5 millimetres and about 12 millimetres, between about 5 millimetres and about 10 millimetres, or between about 5 millimetres and about 8 millimetres.

[0300] The aerosol-generating substrate may have an external diameter of between about 6 millimetres and about 12 millimetres, between about 6 millimetres and about 10 millimetres, or between about 6 millimetres and about 8 millimetres.

[0301] The aerosol-generating substrate may have an external diameter of between about 7 millimetres and about 12 millimetres, between about 7 millimetres and about 10 millimetres, or between about 7 millimetres and about 8 millimetres.

[0302] For example, the aerosol-generating substrate may have an external diameter of about 7.2 millimetres.

[0303] The aerosol-generating substrate may have a density of at least about 150 milligrams per cubic centimetre, at least about 175 milligrams per cubic centimetre, at least about 200 milligrams per cubic centimetre, or at least about 250 milligrams per cubic centimetre.

[0304] The aerosol-generating substrate may have a density of less than or equal to about 500 milligrams per cubic centimetre, less than or equal to about 450 milligrams per cubic centimetre, less than or equal to about 400 milligrams per cubic centimetre, or less than or equal to about 350 milligrams per cubic centimetre.

[0305] The RTD of the aerosol-generating substrate may be at least about 4 millimetres H_2O, at least about 5 millimetres H_2O, or at least about 6 millimetres H_2O.

[0306] The RTD of the aerosol-generating substrate may be less than or equal to about 10 millimetres H_2O, less than or equal to about 9 millimetres H_2O, or less than or equal to about 8 millimetres H_2O.

[0307] The RTD of the aerosol-generating substrate may be between about 4 millimetres H_2O and about 10 millimetres H_2O, between about 4 millimetres H_2O and about 9 millimetres H_2O, or between about 4 millimetres H_2O and about 8 millimetres H_2O.

[0308] The RTD of the aerosol-generating substrate may be between about 5 millimetres H_2O and about 10 millimetres H_2O, between about 5 millimetres H_2O and about 9 millimetres H_2O, or between about 5 millimetres H_2O and about 8 millimetres H_2O.

[0309] The RTD of the aerosol-generating substrate may be between about 6 millimetres H_2O and about 10 millimetres H_2O, between about 6 millimetres H_2O and about 9 millimetres H_2O, or between about 6 millimetres H_2O and about 8 millimetres H_2O.

[0310] The aerosol-generating substrate may be a solid aerosol-generating substrate.

[0311] The aerosol-generating substrate preferably comprises an aerosol former.

[0312] The aerosol former may be any suitable known compound or mixture of compounds that, in use, facilitates formation of a dense and stable aerosol. The aerosol former may be facilitating that the aerosol is substantially resistant to thermal degradation at temperatures typically applied during use of the aerosol-generating article. Suitable aerosol formers are for example: polyhydric alcohols such as, for example, triethylene glycol, 1,3-butanediol, propylene glycol and glycerine; esters of polyhydric alcohols such as, for example, glycerol mono-, di- or triacetate; aliphatic esters of mono-, di- or polycarboxylic acids such as, for example, dimethyl dodecanedioate and dimethyl tetradecanedioate; and combinations thereof.

[0313] Preferably, the aerosol former comprises one or more of glycerine and propylene glycol. The aerosol former may consist of glycerine or propylene glycol or of a combination of glycerine and propylene glycol.

[0314] The aerosol-generating substrate may comprise at least about 5 percent, at least about 10 percent, or at least about 12 percent by weight of aerosol former on a dry weight basis of the aerosol-generating substrate.

[0315] The aerosol-generating substrate may comprise less than or equal to about 30 percent, less than or equal to about 25 percent, or less than or equal to about 20 percent by weight of aerosol former on a dry weight basis of the aerosol-generating substrate.

[0316] The aerosol-generating substrate may comprise between about 5 percent and about 30 percent, between about 5 percent and about 25 percent, or between about 5 percent and about 20 percent by weight of aerosol former on a dry weight basis of the aerosol-generating substrate.

[0317] The aerosol-generating substrate may comprise between about 10 percent and about 30 percent, between about 10 percent and about 25 percent, or between about 10 percent and about 20 percent by weight of aerosol former on a dry weight basis of the aerosol-generating substrate.

[0318] The aerosol-generating substrate may comprise between about 12 percent and about 30 percent, between about 12 percent and about 25 percent, or between about 12 percent and about 20 percent by weight of aerosol former on a dry weight basis of the aerosol-generating substrate.

[0319] The aerosol-generating substrate may comprise a plurality of shreds of tobacco material. The aerosol-generating substrate may comprise a plurality of shreds of homogenised tobacco material.

[0320] As used herein with reference to the invention, the term "shred" denotes an element having a length substantially greater than a width and a thickness thereof.

[0321] As used herein with reference to the invention,

the term "homogenised tobacco material" is used to describe material formed by agglomerating particulate tobacco material.

[0322] Shreds of homogenised tobacco material may be formed from a sheet of homogenised tobacco material, for example, by cutting or shredding. Shreds of homogenised tobacco material may be formed by other methods, for example, by extrusion.

[0323] The shreds of tobacco material may have a width of at least about 0.3 millimetres, at least about 0.5 millimetres, or at least about 0.6 millimetres.

[0324] The shreds of tobacco material may have a width of less than or equal to about 2 millimetres, less than or equal to about 1.2 millimetres, or less than about 0.9 millimetres.

[0325] The shreds of tobacco material may have a width of between about 0.3 millimetres and about 2 millimetres, between about 0.3 millimetres and about 1.2 millimetres, or between about 0.3 millimetres and about 0.9 millimetres.

[0326] The shreds of tobacco material may have a width of between about 0.5 millimetres and about 2 millimetres, between about 0.5 millimetres and about 1.2 millimetres, or between about 0.5 millimetres and about 0.9 millimetres.

[0327] The shreds of tobacco material may have a width of between about 0.6 millimetres and about 2 millimetres, between about 0.6 millimetres and about 1.2 millimetres, or between about 0.6 millimetres and about 0.9 millimetres.

[0328] The shreds of tobacco material may have a length of at least about 10 millimetres.

[0329] The shreds of tobacco material may have a length of less than or equal to about 40 millimetres.

[0330] The shreds of tobacco material may have a length of between about 10 millimetres and about 40 millimetres.

[0331] At least about 20 percent by weight of the plurality of shreds of tobacco material on a dry weight basis may extend along the entire length of the aerosol-generating substrate. At least about 20 percent by weight of the plurality of shreds of tobacco material on a dry weight basis may have a length substantially the same as the length of the aerosol-generating substrate.

[0332] Less than or equal to about 60 percent by weight of the plurality of shreds of tobacco material on a dry weight basis may extend along the entire length of the aerosol-generating substrate. Less than or equal to about 60 percent by weight of the plurality of shreds of tobacco material on a dry weight basis may have a length substantially the same as the length of the aerosol-generating substrate.

[0333] Between about 20 percent and 60 percent by weight of the plurality of shreds of tobacco material on a dry weight basis may extend along the entire length of the aerosol-generating substrate. Between about 20 percent and 60 percent by weight of the plurality of shreds of tobacco material on a dry weight basis may have a length substantially the same as the length of the aerosol-generating substrate.

[0334] The size of the aerosol-generating material of the aerosol-generating substrate, such as a plurality of shreds of tobacco material, may play a role in the distribution of heat inside the aerosol-generating substrate. Also, the size of the aerosol-generating material may play a role in the resistance to draw of the article.

[0335] The aerosol-generating substrate may comprise a plurality of pellets or granules of tobacco material. The aerosol-generating substrate may comprise a plurality of pellets or granules of homogenised tobacco material.

[0336] The aerosol-generating substrate may comprise one or more sheets of tobacco material.

[0337] The aerosol-generating substrate may comprise one or more sheets of homogenised tobacco material.

[0338] The one or sheets of tobacco material may each individually have a thickness of at least about 100 micrometres, at least about 150 micrometres, or at least about 300 micrometres.

[0339] As used herein with reference to the invention, individual thickness refers to the thickness of the individual sheet of tobacco material, whereas combined thickness refers to the total thickness of all sheets of tobacco material that make up the aerosol-generating substrate. For example, if the aerosol-generating substrate is formed from two individual sheets of tobacco material, then the combined thickness is the sum of the thickness of the two individual sheets of tobacco material or the measured thickness of the two sheets of tobacco material where the two sheets of tobacco material are stacked in the aerosol-generating substrate.

[0340] The one or more sheets of tobacco material may each individually have a thickness of less than or equal to about 600 micrometres, less than or equal to about 300 micrometres, or less than or equal to about 250 micrometres.

[0341] The one or more sheets of tobacco material may each individually have a thickness of between about 100 micrometres and about 600 micrometres, between about 100 micrometres and about 300 micrometres, or between about 100 micrometres and about 250 micrometres.

[0342] The one or more sheets of tobacco material may each individually have a thickness of between about 150 micrometres and about 600 micrometres, between about 150 micrometres and about 300 micrometres, or between about 150 micrometres and about 250 micrometres.

[0343] The one or more sheets of tobacco material may each individually have a thickness of between about 250 micrometres and about 600 micrometres, between about 250 micrometres and about 300 micrometres, or between about 250 micrometres and about 250 micrometres.

[0344] The one or more sheets of tobacco material may each individually have a length substantially the same as the length of the aerosol-generating substrate.

[0345] The one or more sheets of tobacco material may

have been one or more of crimped, folded, gathered, and pleated.

[0346] Crimping, folding, gathering, or pleating of the one or more sheets of tobacco material may cause splitting of the one or more sheets of tobacco material to form shreds of tobacco material. For example, the one or more sheets of tobacco material may be crimped to such an extent that the integrity of the one or more sheets of tobacco material becomes disrupted at the plurality of parallel ridges or corrugations causing separation of the material, and results in the formation of shreds of tobacco material.

[0347] The aerosol-generating article may comprise a susceptor arranged within the aerosol-generating substrate. The first element may comprise a susceptor arranged within the aerosol-generating substrate.

[0348] As used herein with reference to the present invention, the term "susceptor" refers to a material that can convert electromagnetic energy into heat. When located within a fluctuating electromagnetic field, eddy currents induced in the susceptor cause heating of the susceptor.

[0349] The susceptor is arranged in thermal contact with the aerosol-generating substrate. Thus, when the susceptor heats up, the aerosol-generating substrate is heated by the susceptor to generate an aerosol. The susceptor may be arranged in direct physical contact with the aerosol-generating substrate.

[0350] The susceptor may be an elongate susceptor.

[0351] As used herein with reference to the invention, the term "elongate" is used to describe a component of the aerosol-generating article having a length greater than the width and thickness thereof.

[0352] The elongate susceptor may be arranged substantially longitudinally within the aerosol-generating substrate. That is, the longitudinal axis of the elongate susceptor may be approximately parallel to the longitudinal axis of the aerosol-generating substrate. For example, the longitudinal axis of the elongate susceptor may be within plus or minus 10 degrees of parallel to the longitudinal axis of the aerosol-generating substrate. The elongate susceptor may be located in a radially central position within the aerosol-generating substrate, and extend along the longitudinal axis of the aerosol-generating substrate.

[0353] The susceptor may extend from the downstream end of the aerosol-generating substrate towards the upstream end of the aerosol-generating substrate.

[0354] The susceptor may extend from the upstream end of the aerosol-generating substrate towards the downstream end of the aerosol-generating substrate.

[0355] The susceptor may extends from the upstream end of the aerosol-generating substrate to the downstream end of the aerosol-generating substrate. That is, the susceptor may extend along the entire length of the aerosol-generating substrate.

[0356] The length of the susceptor may be substantially the same as the length of the aerosol-generating substrate.

[0357] The susceptor may extend part way along the length of the aerosol-generating substrate.

[0358] The susceptor may be spaced apart from the downstream end of the aerosol-generating substrate.

[0359] The susceptor may be spaced apart from the upstream end of the aerosol-generating substrate.

[0360] The susceptor may be spaced apart from both a downstream end and an upstream end of the aerosol-generating substrate.

[0361] The length of the susceptor may be less than the length of the aerosol-generating substrate.

[0362] The susceptor may be entirely enclosed within the aerosol-generating substrate. That is, the aerosol-generating substrate may completely surround the susceptor.

[0363] The susceptor may be in the form of a pin, rod, strip or blade.

[0364] The susceptor may have a length of at least about 5 millimetres, at least about 6 millimetres, or at least about 8 millimetres.

[0365] The susceptor may have a length of less than or equal to about 15 millimetres, less than or equal to about 12 millimetres, or less than or equal to about 10 millimetres.

[0366] The susceptor may have a length of between about 5 millimetres and about 15 millimetres, between about 5 millimetres and about 12 millimetres, or between about 5 millimetres and about 10 millimetres.

[0367] The susceptor may have a length of between about 6 millimetres and about 15 millimetres, between about 6 millimetres and about 12 millimetres, or between about 6 millimetres and about 10 millimetres.

[0368] The susceptor may have a length of between about 8 millimetres and about 15 millimetres, between about 8 millimetres and about 12 millimetres, or between about 8 millimetres and about 10 millimetres.

[0369] The susceptor may have a width of at least about 1 millimetre.

[0370] The susceptor may have width of less than or equal to about 5 millimetres.

[0371] The susceptor may have a width of between about 1 millimetre and about 5 millimetres.

[0372] The susceptor may have a thickness of at least about 0.01 millimetres, or at least about 0.5 millimetres.

[0373] The susceptor may have a thickness of less than or equal to about 2 millimetres, less than or equal to about 500 micrometres, or less than or equal to about 100 micrometres.

[0374] The susceptor may have a thickness of between about 10 micrometres and about 2 millimetres, between about 10 micrometres and about 500 micrometres, or between about 10 micrometres and about 100 micrometres.

[0375] The susceptor may have a thickness of between about 0.5 millimetres and about 2 millimetres.

[0376] The susceptor may have a substantially circular cross-section.

[0377] The susceptor may have a substantially constant cross-section along the length of the susceptor.

[0378] If the susceptor has the form of a strip or blade, the strip or blade may have a rectangular shape having a width of between about 2 millimetres to about 8 millimetres, or between about 3 millimetres to about 5 millimetres. By way of example, a susceptor in the form of a strip of blade may have a width of about 4 millimetres.

[0379] If the susceptor has the form of a strip or blade, the strip or blade may have a rectangular shape and a thickness of between about 0.03 millimetres to about 0.15 millimetres, or between about 0.05 millimetres to about 0.09 millimetres. By way of example, a susceptor in the form of a strip of blade may have a thickness of about 0.07 millimetres, or about 0.06 millimetres.

[0380] The susceptor may be formed from any material that can be inductively heated to a temperature sufficient to generate an aerosol from the aerosol-generating substrate. For example, the susceptor may comprise a metal or carbon.

[0381] The susceptor may comprise or consist of a ferromagnetic material, for example a ferromagnetic alloy, ferritic iron, or a ferromagnetic steel or stainless steel. A suitable susceptor may be, or comprise, aluminium. The susceptor may be formed from 400 series stainless steels, for example grade 410, or grade 420, or grade 430 stainless steel. Different materials will dissipate different amounts of energy when positioned within electromagnetic fields having similar values of frequency and field strength.

[0382] Thus, parameters of the susceptor such as material type, length, width, and thickness may all be altered to provide a desired power dissipation within a known electromagnetic field. The susceptor may be heated to a temperature in excess of 250 degrees Celsius.

[0383] Suitable susceptors may comprise a non-metallic core with a metal layer disposed on the non-metallic core, for example metallic tracks formed on a surface of a ceramic core. A susceptor may have a protective external layer, for example a protective ceramic layer or protective glass layer encapsulating the susceptor. The susceptor may comprise a protective coating formed by a glass, a ceramic, or an inert metal, formed over a core of susceptor material.

[0384] The susceptor may be a multi-material susceptor and may comprise a first susceptor material and a second susceptor material.

[0385] The aerosol-generating article may comprise a mouthpiece element located downstream of the first element. The aerosol-generating article may comprise a mouthpiece element located downstream of the aerosol-generating substrate.

[0386] For example, where the tubular element is located downstream of the first element, the aerosol-generating article may comprise a mouthpiece element located downstream of the tubular element. The mouthpiece element may be adjacent to the tubular element. The mouthpiece element may abut the tubular element.

[0387] The mouthpiece element may be located at the downstream end or mouth end of the aerosol-generating article. That is, the mouthpiece element may be the most downstream element of the aerosol-generating article.

[0388] The mouthpiece element may be a mouthpiece filter element. The mouthpiece element may comprises at least one filter segment for filtering aerosol generated, for example, aerosol generated upon heating the aerosol-generating substrate. For example, the mouthpiece element may comprise one or more segments of a fibrous filtration material. Suitable fibrous filtration materials are known in the art. For example, the at least one mouthpiece filter segment may comprise a cellulose acetate filter segment formed of cellulose acetate tow.

[0389] The mouthpiece element may consist of a single filter segment. The mouthpiece element may include two or more filter segments axially aligned in an abutting end to end relationship with each other.

[0390] The mouthpiece element may comprise a flavourant, which may be provided in any suitable form. For example, the mouthpiece element may comprise one or more capsules, beads or granules of a flavourant, or one or more flavour loaded threads or filaments.

[0391] Parameters or characteristics described herein in relation to the mouthpiece element as a whole may equally be applied to a filter segment of the mouthpiece element.

[0392] The mouthpiece element may have a low particulate filtration efficiency.

[0393] The mouthpiece element may have an RTD of less than or equal to about 25 millimetres H_2O, less than or equal to about 20 millimetres H_2O, or less than or equal to about 15 millimetres H_2O.

[0394] The mouthpiece element may have an RTD of at least about 10 millimetres H_2O.

[0395] The mouthpiece element may have an RTD of between about 10 millimetres H_2O and to about 25 millimetres H_2O, between about 10 millimetres H_2O and to about 20 millimetres H_2O, or of between about 10 millimetres H_2O and to about 15 millimetres H_2O.

[0396] Preferably, the mouthpiece element has a substantially circular cross-section.

[0397] Preferably, the mouthpiece element has an external diameter that is substantially the same as the external diameter of the aerosol-generating article.

[0398] The mouthpiece element may have a length of at least about 3 millimetres, or at least about 5 millimetres.

[0399] The length of the mouthpiece element may be less than or equal to about 11 millimetres, or less than or equal to about 9 millimetres.

[0400] The length of the mouthpiece element may be between about 3 millimetres and about 11 millimetres, or between about 3 millimetres and about 9 millimetres.

[0401] The length of the mouthpiece element may be between about 5 millimetres and about 11 millimetres, or between about 5 millimetres and about 9 millimetres.

[0402] For example, the length of the mouthpiece element may be about 7 millimetres.

[0403] The length of the mouthpiece element may be selected based on a desired total length of the aerosol-generating article.

[0404] The mouthpiece element may be circumscribed by a plug wrap.

[0405] The mouthpiece element may be unventilated such that air does not enter the aerosol-generating article along the mouthpiece element.

[0406] The mouthpiece element may be connected to one or more adjacent components of the aerosol-generating article by means of a tipping wrapper.

[0407] The aerosol-generating article may comprise a mouth end cavity at the downstream end of the aerosol-generating article. The mouth end cavity may be downstream of the mouthpiece element, where present.

[0408] The mouth end cavity may be defined by a hollow tubular element provided at the downstream end of the mouthpiece. Alternatively, the mouth end cavity may be defined by an outer wrapper of the mouthpiece element, wherein the outer wrapper extends in a downstream direction from the mouthpiece element.

[0409] The aerosol-generating article may comprise one or more intermediate elements between the first element and the mouthpiece element.

[0410] The aerosol-generating article may comprise one or more intermediate elements between the aerosol-generating substrate and the mouthpiece element. The one or more intermediate elements may be in an abutting end to end relationship with each other.

[0411] The intermediate element may be the tubular element of the first aspect of the invention. The one or more intermediate elements may comprise the tubular element of the first aspect of the invention.

[0412] Where the tubular element of the first aspect of the invention is located upstream of the first element, the one or more of the intermediate elements may not comprise a plurality of corrugations. The one or more intermediate elements may be non-corrugated.

[0413] One of the one or more intermediate elements may abut the downstream end of the aerosol-generating substrate. One of the one or more intermediate elements may abut the upstream end of the mouthpiece element. For example, where there is a single intermediate element, the single intermediate element may abut both the downstream end of the aerosol-generating substrate and the upstream end of the mouthpiece element. For example, where there are a plurality of intermediate elements, one intermediate element may abut the downstream end of the aerosol-generating substrate and another intermediate element may abut the upstream end of the mouthpiece element.

[0414] At least one of the one or more intermediate elements may be a hollow tubular element. The one or more intermediate elements may be one or more hollow tubular elements.

[0415] As used herein with reference to the invention, the term "hollow tubular element" is used to denote a generally cylindrical element having a lumen along a longitudinal axis thereof. The tubular portion may have a substantially circular, oval or elliptical cross-section. The lumen may have a substantially circular, oval or elliptical cross-section. In particular, the term "hollow tubular element" is used to denote an element defining at least one airflow conduit establishing an uninterrupted fluid communication between an upstream end of the hollow tubular element and a downstream end of the tubular element.

[0416] In the context of the present invention, a hollow tubular element provides an unrestricted flow channel. This means that the hollow tubular element provides a negligible level of resistance to draw (RTD). As used herein with reference to the invention, the term "negligible level of RTD" is used to describe an RTD of less than 1 mm H_2O per 10 millimetres of length of the hollow tubular substrate element, less than 0.4 mm H_2O per 10 millimetres of length of the hollow tubular substrate element, or less than 0.1 mm H_2O per 10 millimetres of length of the hollow tubular substrate element. The flow channel should therefore be free from any components that would obstruct the flow of air in a longitudinal direction. Preferably, the flow channel is substantially empty.

[0417] Where the tubular element of the first aspect of the invention is located upstream of the first element, the aerosol-generating article may comprise two hollow tubular elements downstream of the first element. The two hollow tubular elements downstream of the first element may be non-corrugated.

[0418] The one or more intermediate elements may have a total length of at least about 10 millimetres, at least about 12 millimetres, or at least about 15 millimetres.

[0419] The one or more intermediate elements may have a total length of less than or equal to about 30 millimetres, less than or equal to about 25 millimetres, or less than or equal to about 23 millimetres.

[0420] The one or more intermediate elements may have a total length of between about 10 millimetres and about 30 millimetres, between about 10 millimetres and about 25 millimetres, or between about 10 millimetres and about 23 millimetres.

[0421] The one or more intermediate elements may have a total length of between about 12 millimetres and about 30 millimetres, between about 12 millimetres and about 25 millimetres, or between about 12 millimetres and about 23 millimetres.

[0422] The one or more intermediate elements may have a total length of between about 12 millimetres and about 30 millimetres, between about 12 millimetres and about 25 millimetres, or between about 12 millimetres and about 23 millimetres.

[0423] The total length of the one or more intermediate elements may be selected based on a desired total length of the aerosol-generating article.

[0424] Where the aerosol-generating article comprises a single intermediate element, the total length of the one or more intermediate elements is the length of the

single intermediate element. Where the aerosol-generating article comprises a plurality of intermediate elements, the total length of the one or more intermediate elements is the sum of the lengths of each of the plurality of intermediate elements.

[0425] Where the aerosol-generating article comprises a plurality of intermediate elements, the length of each of the plurality of intermediate elements may be substantially the same.

[0426] Preferably, each of the one or more intermediate elements has a substantially circular cross-section.

[0427] Preferably, the external diameter of each of the one or more intermediate elements is substantially the same as the external diameter of the aerosol-generating article.

[0428] The one or more intermediate elements may be formed from any suitable material or combination of materials. For example, at least one of the one or more intermediate elements may be formed from one or more materials selected from the group consisting of: cellulose acetate; a paper based material such as paper or cardboard; and polymeric materials, such as low density polyethylene (LDPE). Other suitable materials include polyhydroxyalkanoate (PHA) fibres.

[0429] A ventilation zone may be provided at a location along the one or more intermediate elements. A satisfactory cooling of the stream of aerosol generated may be achieved by providing a ventilation zone at a location along the one or more intermediate elements. This may be particularly advantageous where the aerosol is generated upon heating of the aerosol-generating substrate. Without wishing to be bound by theory, the temperature drop caused by the admission of cooler, external air into the one or more intermediate elements via the ventilation zone may have an advantageous effect on the nucleation and growth of aerosol particles.

[0430] The ventilation zone may be provided at a location along at least one of the one or more intermediate elements.

[0431] Where the intermediate elements are hollow tubular elements, the ventilation zone may comprise a plurality of perforations through a tubular wall of at least one of the one or more hollow tubular elements. The ventilation zone may comprise at least one circumferential row of perforations. The ventilation zone may comprise two circumferential rows of perforations. For example, the perforations may be formed online during manufacturing of the aerosol-generating article. Each circumferential row of perforations may comprise from 8 to 30 perforations.

[0432] The aerosol-generating article may comprise an upstream element located upstream of the first element. For example, the upstream element may be the tubular element of the first aspect of the invention. As another example, the upstream element may be a plug of cellulose acetate tow.

[0433] Where the tubular element is located upstream of the first element, the aerosol-generating article may comprise an upstream element located upstream of the tubular element. The upstream element may be adjacent to the tubular element. The upstream element may abut the tubular element.

[0434] The upstream element may be at the upstream end of the aerosol-generating article. That is, the upstream element may be the most upstream element of the aerosol-generating article.

[0435] The upstream element may help to avoid damage to the first element.

[0436] The upstream element may abut the first element. The upstream element may abut the aerosol-generating substrate.

[0437] The upstream element may have a length of at least about 2 millimetres, at least about 3 millimetres, or at least about 4 millimetres.

[0438] The upstream element may have a length of less than or equal to about 10 millimetres, less than or equal to about 8 millimetres, or less than or equal to about 6 millimetres.

[0439] The upstream element may have a length of between about 2 millimetres and about 10 millimetres, between about 2 millimetres and about 8 millimetres, or between about 2 millimetres and about 6 millimetres.

[0440] The upstream element may have a length of between about 3 millimetres and about 10 millimetres, between about 3 millimetres and about 8 millimetres, or between about 3 millimetres and about 6 millimetres.

[0441] The upstream element may have a length of between about 4 millimetres and about 10 millimetres, between about 4 millimetres and about 8 millimetres, or between about 4 millimetres and about 6 millimetres.

[0442] For example, the upstream element may have a length of about 5 millimetres.

[0443] The length of the upstream element may be selected based on a desired total length of the aerosol-generating article.

[0444] Preferably, the upstream element has a substantially circular cross-section.

[0445] The upstream element may have an external diameter of at least about 5 millimetres, about 6 millimetres, or about 7 millimetres.

[0446] The upstream element may have an external diameter of less than or equal to 12 millimetres, less than or equal to about 10 millimetres, or less than or equal to about 8 millimetres.

[0447] The upstream element may have an external diameter of between about 5 millimetres and about 12 millimetres, between about 5 millimetres and about 10 millimetres, or between about 5 millimetres and about 8 millimetres.

[0448] The upstream element may have an external diameter of between about 6 millimetres and about 12 millimetres, between about 6 millimetres and about 10 millimetres, or between about 6 millimetres and about 8 millimetres.

[0449] The upstream element may have an external diameter of between about 7 millimetres and about 12

millimetres, between about 7 millimetres and about 10 millimetres, or between about 7 millimetres and about 8 millimetres.

[0450] For example, the upstream element may have an external diameter of about 7.2 millimetres.

[0451] Preferably, the external diameter of the upstream element is substantially the same as the external diameter of the aerosol-generating substrate.

[0452] Preferably, the external diameter of the upstream element is substantially the same as the external diameter of the aerosol-generating article.

[0453] The aerosol-generating article may have a total length of at least about 35 millimetres, at least about 38 millimetres, at least about 40 millimetres, or at least about 42 millimetres.

[0454] The aerosol-generating article may have a total length of less than or equal to about 100 millimetres, less than or equal to about 70 millimetres, less than or equal to about 60 millimetres, or less than or equal to 50 millimetres.

[0455] The aerosol-generating article may have a total length of between about 35 millimetres and about 100 millimetres, between about 35 millimetres and about 70 millimetres, between about 35 millimetres and about 60 millimetres, or between about 35 millimetres and about 50 millimetres.

[0456] The aerosol-generating article may have a total length of between about 38 millimetres and about 100 millimetres, between about 38 millimetres and about 70 millimetres, between about 38 millimetres and about 60 millimetres, or between about 38 millimetres and about 50 millimetres.

[0457] The aerosol-generating article may have a total length of between about 40 millimetres and about 100 millimetres, between about 40 millimetres and about 70 millimetres, between about 40 millimetres and about 60 millimetres, or between about 40 millimetres and about 50 millimetres.

[0458] The aerosol-generating article may have a total length of between about 42 millimetres and about 100 millimetres, between about 42 millimetres and about 70 millimetres, between about 42 millimetres and about 60 millimetres, or between about 42 millimetres and about 50 millimetres.

[0459] For example, the aerosol-generating article may have a total length of about 45 millimetres.

[0460] Preferably, the aerosol-generating article has a substantially circular cross-section.

[0461] The aerosol-generating article may have an external diameter of at least about 5 millimetres, at least about 6 millimetres, or at least about 7 millimetres.

[0462] The aerosol-generating article may have an external diameter of less than or equal to about 12 millimetres, less than or equal to about 10 millimetres, or less than or equal to about 8 millimetres.

[0463] The aerosol-generating article may have an external diameter of between about 5 millimetres and about 12 millimetres, between about 5 millimetres and about 10 millimetres, or between about 5 millimetres and about 8 millimetres.

[0464] The aerosol-generating article may have an external diameter of between about 6 millimetres and about 12 millimetres, between about 6 millimetres and about 10 millimetres, or between about 6 millimetres and about 8 millimetres.

[0465] The aerosol-generating article may have an external diameter of between about 7 millimetres and about 12 millimetres, between about 7 millimetres and about 10 millimetres, or between about 7 millimetres and about 8 millimetres.

[0466] For example, the aerosol-generating article may have an external diameter of about 7.2 millimetres.

[0467] The aerosol-generating article may be an inhaler article. The first element may be a capsule. The aerosol-generating substrate may be dry powder.

[0468] The aerosol-generating article may be an inhaler article comprising: a capsule containing dry powder; and a tubular element comprising a tubular body, the tubular body having a first end, a second end and an intermediate portion between the first end and the second end, the tubular body defining a cavity extending from the first end of the tubular body to the second end of the tubular body; wherein the intermediate portion comprises a plurality of corrugations formed in the tubular body.

[0469] The advantages of the tubular element discussed above are also applicable when the aerosol-generating article is an inhaler article.

[0470] As discussed above, the tubular element may be configured to facilitate a change of state of the tubular element from a first state to a second state and vice versa. The change of state of the tubular element may involve one or both of a change in length and bending of the tubular element. The tubular element may be one or both of extendable and bendable.

[0471] To activate the capsule of the inhaler article, the inhaler article may be engaged with a holder, for example, the inhaler article may be inserted into the holder. Engaging the inhaler article with the holder may result in a change of state of the intermediate portion of the tubular element. The change of state of the intermediate portion may act as a visual sign to a user that the inhaler article has been activated. For example, on insertion of the inhaler article into the holder to pierce the capsule, the intermediate portion of the tubular element may compress. The reduction in the change in length of the tubular element may indicate to a user that the capsule has been pierced.

[0472] The tubular element may be bent. This may enable the user to use the inhaler article discretely.

[0473] The capsule may be located in the cavity of the tubular body of the tubular element. For example, the capsule may be located in the cavity of the tubular body and upstream of the intermediate portion of the tubular body.

[0474] Where the capsule is located in the cavity of the tubular body of the tubular element, preferably the tubular

element extends to the upstream end of the aerosol-generating article. This may help to facilitate activation of the capsule by a holder.

[0475] The tubular element may extend to the downstream end of the aerosol-generating article. For example, the capsule may be located in the cavity of the tubular body of the tubular element, and the tubular element may extend from the upstream end of the aerosol-generating article to the downstream end of the aerosol-generating article.

[0476] The tubular element may be located downstream of the capsule. The tubular element may be located at the downstream end of the aerosol-generating article.

[0477] As discussed above, the tubular element may comprise a folded end portion forming a first end wall at the first end of the tubular body. The folded end portion forming a first end wall at the first end of the tubular body may be referred to as a first folded end portion. The first end of the tubular body may be the upstream end of the tubular body.

[0478] The first end wall may delimit an opening for airflow between the cavity and the exterior of the tubular element.

[0479] Where the capsule is located in the cavity of the tubular element, a first end wall at the first end of the tubular body may help to prevent upstream movement of the capsule out of the tubular element.

[0480] A width of the first end wall may be measured in a direction transverse to the longitudinal direction of the aerosol-generating article. Where the capsule is located in the cavity of the tubular element, the width of the first end wall may be between about 0.5 millimetres and about 2.5 millimetres, between about 1 millimetre and about 2 millimetres, between about 1.2 millimetres and about 1.8 millimetres, or between about 1.4 millimetres and about 1.6 millimetres. The width of the first end wall may be about 1.5 millimetres.

[0481] For example, the external diameter of the aerosol-generating article may be about 7.2 millimetres and the opening delimited by the first end wall may have a width of about 4.2 millimetres such that the width of the first end wall is about 1.5 millimetres.

[0482] The first end wall of the tubular element may be curved or curled. The first end wall of the upstream hollow tubular element may have a convex curvature.

[0483] A radius of curvature of the convex curvature may be between about 1.3 millimetres and about 2.3 millimetres, between about 1.6 millimetres and about 2.0 millimetres, or between about 1.7 millimetres and about 1.9 millimetres. The radius of curvature of the convex curvature may be about 1.8 millimetres.

[0484] Activation of the inhaler article may involve a piercing element passing through the opening defined by the first end wall of the tubular element.

[0485] Where the tubular element is located downstream of the capsule, a first end wall at the first end of the tubular body may help to prevent downstream movement of the capsule into the cavity of the tubular body.

[0486] As discussed above, tubular element may comprise a folded end portion forming a second end wall at the second end of the tubular body. The folded end portion forming a second end wall at the second end of the tubular body may be referred to as a second folded end portion. The second end of the tubular body may be the downstream end of the tubular body.

[0487] The second end wall may delimit an opening for airflow between the cavity and the exterior of the tubular element.

[0488] Where the capsule is located in the cavity of the tubular element, a second end wall at the second end of the tubular body may help to prevent downstream movement of the capsule out of the tubular element.

[0489] As discussed above, the aerosol-generating article may comprise an upstream element located upstream of the tubular element. The upstream element may be located at the upstream end of the aerosol-generating article. The upstream element may abut the tubular element.

[0490] The upstream element may be a hollow tubular element defining a cavity. Such an upstream element may be referred to as an upstream hollow tubular element.

[0491] Where the inhaler article comprises an upstream hollow tubular element, the capsule may be located in a cavity of the upstream hollow tubular element.

[0492] The upstream hollow tubular element may comprise a folded end portion forming a first end wall at a first end of the upstream hollow tubular element. The first end may be the upstream end of the upstream hollow tubular element. The folded end portion may act as a support barrier to prevent upstream movement of the capsule out of the aerosol-generating article. The folded end portion at the first end of the upstream hollow tubular element may be referred to as a first folded end portion of the upstream hollow tubular element.

[0493] The first end wall may delimit an opening. Air flow through the inhaler article may enter the inhaler article through the upstream end of the inhaler article via the opening at the upstream end of the upstream hollow tubular element.

[0494] The width of the first end wall of the upstream hollow tubular element may be between about 0.5 millimetres and about 2.5 millimetres, between about 1 millimetre and about 2 millimetres, between about 1.2 millimetres and about 1.8 millimetres, or between about 1.4 millimetres and about 1.6 millimetres. The width of the first end wall may be about 1.5 millimetres.

[0495] For example, the external diameter of the aerosol-generating article may be about 7.2 millimetres and the opening delimited by the first end wall of the upstream hollow tubular element may have a width of about 4.2 millimetres such that the width of the first end wall is about 1.5 millimetres.

[0496] The first end wall of the upstream hollow tubular element may be curved or curled. The first end wall of

the upstream hollow tubular element may have a convex curvature.

[0497] A radius of curvature of the convex curvature may be between about 1.3 millimetres and about 2.3 millimetres, between about 1.6 millimetres and about 2.0 millimetres, or between about 1.7 millimetres and about 1.9 millimetres. The radius of curvature of the convex curvature may be about 1.8 millimetres.

[0498] Activation of the inhaler article may involve a piercing element passing through the opening defined by the first end wall of the upstream hollow tubular element.

[0499] The upstream hollow tubular element may comprise a folded end portion forming a second end wall at a second end of the upstream hollow tubular element. The second end may be the downstream end of the upstream hollow tubular element. Where the capsule is located in the cavity of the upstream hollow tubular element, the folded end portion may act as a support barrier to prevent downstream movement of the capsule. The folded end portion at the second end of the upstream hollow tubular element may be referred to as a second folded end portion of the upstream hollow tubular element.

[0500] The second end wall at the second end of the upstream hollow tubular element may delimit an opening. One or both of air and aerosol may flow through the opening at the downstream end of the upstream hollow tubular element.

[0501] Properties of the first end wall of the upstream hollow tubular element may be applicable to the second end wall of the upstream hollow tubular element.

[0502] Properties of the opening at the first end of the upstream hollow tubular element may be applicable to the opening at the second end of the upstream hollow tubular element.

[0503] The wall of the upstream hollow tubular element may have a thickness of between about 100 micrometres and about 150 micrometres, between about 110 micrometres and about 140 micrometres, or between about 120 micrometres and about 130 micrometres.

[0504] The upstream hollow tubular element may be formed from a paper material, such as paper, paperboard or cardboard.

[0505] The capsule may contain dry powder.

[0506] The capsule may hold or contain at least about 5 milligrams of a dry powder (also referred to as a powder system) or at least about 10 milligrams of a dry powder. The capsule may hold or contain less than or equal to about 900 milligrams of a dry powder, less than or equal to about 30 300 milligrams of a dry powder, or less than or equal to about 150 milligrams of a dry powder. The capsule may hold or contain between about 5 milligrams and about 300 milligrams of dry powder, between about 10 milligrams and about 200 milligrams of dry powder, or between about 25 milligrams and about 100 milligrams of dry powder.

[0507] The capsule may contain pharmaceutically active particles, such as nicotine particles. As used herein with reference to the invention, the term "nicotine" may refer to nicotine and nicotine derivatives such as free-base nicotine, nicotine salts and the like.

[0508] The capsule may comprise one or more nicotine salts.

[0509] The pharmaceutically active particles may have a mass median aerodynamic diameter of less than or equal to about 5 micrometres, or less than or equal to about 4 micrometres.

[0510] The pharmaceutically active particles may have a mass median aerodynamic diameter of at least about 0.5 micrometres, or at least about 1 micrometre.

[0511] The pharmaceutically active particles may have a mass median aerodynamic diameter of between about 0.5 micrometres and about 4 micrometres.

[0512] The capsule may contain enough nicotine particles to provide at least 2 inhalations or "puffs", at least 5 inhalations or "puffs", or at least 10 inhalations or "puffs".

[0513] Each inhalation or "puff" may deliver from about 0.1 milligrams to about 3 milligrams of nicotine particles to the lungs of the user, from about 0.2 milligrams to about 2 milligrams of nicotine particles to the lungs of the user, or about 1 milligram of nicotine particles to the lungs of the user.

[0514] The capsule may hold or contain at least about 5 milligrams of nicotine particles, or at least about 10 milligrams of nicotine particles.

[0515] The capsule may hold or contain less than or equal to about 900 milligrams of nicotine particles, less than or equal to about 300 milligrams of nicotine particles, or less than or equal to about 150 milligrams of nicotine particles.

[0516] The capsule may contain flavour particles.

[0517] According to a second aspect of the invention, there is provided an aerosol-generating system comprising: an aerosol-generating article in accordance with the first aspect of the invention; and an aerosol-generating device , wherein the aerosol-generating device comprises a housing defining a cavity configured to receive the aerosol-generating article.

[0518] The aerosol-generating device may be configured to heat the aerosol-generating substrate of the aerosol-generating article.

[0519] The aerosol-generating device may be a hand-held aerosol-generating device.

[0520] The aerosol-generating device may be an electrically-operated aerosol-generating device.

[0521] The aerosol-generating device may comprise a power supply and control electronics.

[0522] The aerosol-generating device may comprise a battery and control electronics.

[0523] The aerosol-generating device may be configured to externally heat the aerosol-generating substrate of the aerosol-generating article. That is, the aerosol-generating device may be configured to heat the aerosol-generating substrate of the aerosol-generating article

from an exterior of the aerosol-generating substrate of the aerosol-generating article.

[0524] The aerosol-generating article may comprise a heating element, for example an external heating element.

[0525] The heating element may be located about a perimeter of the cavity.

[0526] The heating element may be one or both of a resistive heating element and an inductive heating element.

[0527] The aerosol-generating device may comprise a mouthpiece.

[0528] Where the aerosol-generating article is an inhaler article, the aerosol-generating device may not be configured to heat the inhaler article.

[0529] The aerosol-generating device may be a holder for the inhaler article.

[0530] The holder may be configured to engage with the inhaler article.

[0531] The holder may comprise an activation means for activating the inhaler article. The activation means may activate the capsule.

[0532] The holder may comprise a piercing element for piercing the capsule.

[0533] The holder may comprise a mouthpiece.

[0534] 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, or embodiment, or aspect described herein.

[0535] EX1: An aerosol-generating article comprising a first element comprising an aerosol-forming substrate; and a tubular element comprising a tubular body, the tubular body having a first end and a second end, the tubular body defining a cavity extending from the first end of the tubular body to the second end of the tubular body.

[0536] EX2: An aerosol-generating article according to EX1, wherein the tubular body comprises an intermediate portion between the first end and the second end.

[0537] EX3: An aerosol-generating article according to EX2, wherein the intermediate portion comprises a plurality of corrugations formed in the tubular body.

[0538] EX4: An aerosol-generating article according to EX3, wherein the plurality of corrugations are configured to facilitate a change of state of the intermediate portion between: a first state, in which the first end of the tubular body is placed in a first position with respect to the second end of the tubular body; and a second state, in which the first end of the tubular body is placed in a second position with respect to the second end of the tubular body.

[0539] EX5: An aerosol-generating article according to EX3, wherein the plurality of corrugations are configured to facilitate a change in length of the intermediate portion.

[0540] EX6: An aerosol-generating article according to any one of EX1 to EX5, wherein the tubular body is extendable.

[0541] EX7: An aerosol-generating article according to any one of EX1 to EX6, wherein the tubular body is compressible.

[0542] EX8: An aerosol-generating article according to any one of EX3 to EX7, wherein the plurality of corrugations are configured to facilitate bending of the intermediate portion.

[0543] EX9: An aerosol-generating article according to any one of EX1 to EX8, wherein the tubular body is bendable.

[0544] EX10: An aerosol-generating article according to any one of EX1 to EX9, wherein the tubular body is extendable by less than or equal to about 3L, where L is the length of the tubular body.

[0545] EX11: An aerosol-generating article according to any one of EX1 to EX10, wherein the tubular body is extendable by at least about 0.1L, where L is the length of the tubular body.

[0546] EX12: An aerosol-generating article according to any one of EX4 to EX11, wherein when the intermediate portion is in the first state, the intermediate portion has a first internal diameter; and when the intermediate portion is in a second state, the intermediate portion has a second internal diameter; and wherein the first internal diameter is substantially the same as the second internal diameter.

[0547] EX13: An aerosol-generating article according to any one of EX4 to EX12, wherein when the intermediate portion is in the first state, the intermediate portion has a first internal diameter; and when the intermediate portion is in the second state, the intermediate portion has a second internal diameter; and wherein the first internal diameter is greater than the second internal diameter.

[0548] EX14: An aerosol-generating article according to any one of EX1 to EX13, wherein the tubular body is bendable by less than or equal to about 180 degrees.

[0549] EX15: An aerosol-generating article according to any one of EX3 to EX14, wherein the plurality of corrugations extend along a length of the tubular body.

[0550] EX16: An aerosol-generating article according to any one of EX3 to EX15, wherein at least one of the plurality of corrugations extend at least partially around the circumference of the tubular body.

[0551] EX17: An aerosol-generating article according to any one of EX3 to EX16, wherein the plurality of corrugations are substantially parallel with one another.

[0552] EX18: An aerosol-generating article according to any one of EX3 to EX17, wherein the distance between a peak of a corrugation and a trough of the same corrugation is at least about0.5 millimetres.

[0553] EX19: An aerosol-generating article according to any one of EX3 to EX18, wherein the distance between a peak of a corrugation and a trough of the same corrugation is less than or equal to about 4 millimetres.

[0554] EX20: An aerosol-generating article according to any one of EX3 to EX19, wherein the plurality of corrugations comprise at least 3 corrugations.

[0555] EX21: An aerosol-generating article according to any one of EX3 to EX20, wherein the plurality of cor-

rugations comprise up to 20 corrugations.

[0556] EX22: An aerosol-generating article according to any one of EX2 to EX21, wherein the intermediate portion has a length of at least 1 millimetre.

[0557] EX23: An aerosol-generating article according to any one of EX2 to EX22, wherein the intermediate portion has a length of less than or equal to about 20 millimetres.

[0558] EX24: An aerosol-generating article according to any one of EX2 to EX23, wherein the intermediate portion has an external diameter substantially the same as the external diameter of the aerosol-generating article.

[0559] EX25: An aerosol-generating article according to any one of EX2 to EX23, wherein the intermediate portion has an external diameter less than the external diameter of the aerosol-generating article.

[0560] EX26: An aerosol-generating article according to any one of EX2 to EX25, wherein the intermediate portion has an external diameter of at least 5 millimetres.

[0561] EX27: An aerosol-generating article according to any one of EX2 to EX26, wherein the intermediate portion has an external diameter of less than or equal to about 12 millimetres.

[0562] EX28: An aerosol-generating article according to any one of EX1 to EX27, wherein the tubular element comprises a plurality of ventilation holes.

[0563] EX29: An aerosol-generating article according to any one of EX2 to EX28, wherein the tubular element comprises a plurality of ventilation holes provided at a position along the intermediate portion.

[0564] EX30: An aerosol-generating article according to EX28 or EX29, wherein the plurality of ventilation holes comprise at least one circumferential row of holes.

[0565] EX31: An aerosol-generating article according to any one of EX2 to EX30 further comprising a wrapper circumscribing at least the intermediate portion of the tubular body.

[0566] EX32: An aerosol-generating article according to EX31, wherein an inner surface of the wrapper is in contact with an outer surface of the intermediate portion of the tubular body.

[0567] EX33: An aerosol-generating article according to EX31 or EX32, wherein the wrapper circumscribes the intermediate portion of the tubular body and at least one other portion of the tubular body.

[0568] EX34: An aerosol-generating article according to any one of EX31 to EX33, wherein the wrapper circumscribes the intermediate portion of the tubular body and at least one other component of the aerosol-generating article.

[0569] EX35: An aerosol-generating article according to any one of EX31 to EX34, wherein the wrapper is attached to a component of the aerosol-generating article at a location away from the intermediate portion of the tubular body.

[0570] EX36: An aerosol-generating article according to any one of EX31 to EX34, wherein the wrapper comprises a line of weakness.

[0571] EX37: An aerosol-generating article according to EX36, wherein the wrapper is breakable along the line of weakness.

[0572] EX38: An aerosol-generating article according to EX36 or EX37, wherein the line of weakness is located between the first end of the tubular body and the second end of the tubular body.

[0573] EX39: An aerosol-generating article according to any one of EX36 to EX38, wherein the line of weakness extend around the intermediate portion of the tubular body.

[0574] EX40: An aerosol-generating article according to any one of EX2 to EX39, wherein the tubular body comprises one or more additional portions in longitudinal alignment with the intermediate portion.

[0575] EX41: An aerosol-generating article according to any one of EX2 to EX40, wherein the tubular body comprises a first portion upstream of the intermediate portion.

[0576] EX42: An aerosol-generating article according to EX41, wherein the first portion is non-corrugated.

[0577] EX43: An aerosol-generating article according to EX41 or EX42, wherein the first portion has a length of at least about 1 millimetre.

[0578] EX44: An aerosol-generating article according to any one of EX41 to EX43, wherein the first portion has a length of less than or equal to about 10 millimetres.

[0579] EX45: An aerosol-generating article according to any one of EX41 to EX44, wherein the first portion has an external diameter substantially the same as the external diameter of the aerosol-generating article.

[0580] EX46: An aerosol-generating article according to any one of EX41 to EX45, wherein the first portion has an external diameter less than the external diameter of the aerosol-generating article.

[0581] EX47: An aerosol-generating article according to any one of EX2 to EX46, wherein the tubular body comprises a second portion downstream of the intermediate portion.

[0582] EX48: An aerosol-generating article according to EX47, wherein the second portion is non-corrugated.

[0583] EX49: An aerosol-generating article according to EX47 or EX48, wherein the second portion has a length of at least about 1 millimetre.

[0584] EX50: An aerosol-generating article according to any one of EX47 to EX49, wherein the second portion has a length of less than or equal to about 10 millimetres.

[0585] EX51: An aerosol-generating article according to any one of EX47 to EX50, wherein the second portion has an external diameter substantially the same as the external diameter of the aerosol-generating article.

[0586] EX52: An aerosol-generating article according to any one of EX47 to EX51, wherein the second portion has an external diameter less than the external diameter of the aerosol-generating article.

[0587] EX53: An aerosol-generating article according to any one of EX47 to EX52, wherein the second portion has an external diameter substantially the same as the

external diameter of the first portion.

[0588] EX54: an aerosol-generating article according to any one of EX47 to EX53, wherein the tubular body comprises one or more additional portions in addition to the first portion, the second portion and the intermediate portion.

[0589] EX55: An aerosol-generating article according to any one of EX1 to EX54, wherein the tubular body comprises a transverse plane of symmetry.

[0590] EX56: An aerosol-generating article according to any one of EX1 to EX55, wherein the tubular element comprises a folded end portion forming a first end wall the first end of the tubular body.

[0591] EX57: An aerosol-generating article according to EX56, wherein the first end wall delimits an opening for airflow between the cavity and the exterior of the tubular element.

[0592] EX58: An aerosol-generating article according to any one of EX1 to EX56, wherein the tubular element comprises a folded end portion forming a second end wall at the second end of the tubular body.

[0593] EX59: An aerosol-generating article according to EX58, wherein the second end wall delimits an opening for airflow between the cavity and the exterior of the tubular element.

[0594] EX60: An aerosol-generating article according to any one of EX1 to EX59, wherein the tubular element has a wall thickness of at least about 0.1 millimetres.

[0595] EX61: An aerosol-generating article according to any one of EX1 to EX60, wherein the tubular element has a wall thickness of less than or equal to about 1.5 millimetres.

[0596] EX62: An aerosol-generating article according to any one of EX1 to EX61, wherein the tubular body extends the entire length of the tubular element.

[0597] EX63: An aerosol-generating article according to any one of EX1 to EX62, wherein the tubular element may have a length of at least about 5 millimetres.

[0598] EX64: An aerosol-generating article according to any one of EX1 to EX63, wherein the tubular element has a length of at least about 10 millimetres.

[0599] EX65: An aerosol-generating article according to any one of EX1 to EX64, wherein the tubular element has a length of less than or equal to about 30 millimetres.

[0600] EX66: An aerosol-generating article according to any one of EX1 to EX65, wherein the tubular element has a length of less than or equal to about 20 millimetres.

[0601] EX67: An aerosol-generating article according to any one of EX1 to EX66, wherein the tubular element is adapted to generate an RTD between about 0 millimetres H_2O and about 20 millimetres H_2O.

[0602] EX68: An aerosol-generating article according to any one of EX1 to EX67, wherein the cavity of the tubular body is empty.

[0603] EX69: An aerosol-generating article according to any one of EX1 to EX68, wherein the tubular element is formed from a paper material.

[0604] EX70: An aerosol-generating article according to any one of EX1 to EX69, wherein the tubular element is adjacent to the first element.

[0605] EX71: An aerosol-generating article according to any one of EX1 to EX70, wherein the intermediate portion is located upstream or downstream of the first element.

[0606] EX72: An aerosol-generating article according to any one of EX1 to EX71, wherein the tubular element is located upstream or downstream of the first element.

[0607] EX73: An aerosol-generating article according to any one of EX1 to EX72, wherein the tubular element is a first tubular element, and the aerosol-generating article further comprises a second tubular element comprising: a tubular body having a first end, a second end and an intermediate portion between the first end and the second end, the tubular body defining a cavity extending from the first end of the tubular body to the second end of the tubular body.

[0608] EX74: An aerosol-generating article according to EX73, wherein the intermediate portion of the second tubular element comprises a plurality of corrugations formed in the tubular body of the second tubular element.

[0609] EX75: An aerosol-generating article according to EX73 or EX74, wherein the second tubular element comprises a folded end portion forming a first end wall at the first end of the tubular body of the second tubular element, and wherein the first end wall delimits an opening for airflow between the cavity and the exterior of the second tubular element.

[0610] EX76: An aerosol-generating article according to any one of EX73 to EX75, wherein the second tubular element comprises a folded end portion forming a second end wall at the second end of the tubular body of the second tubular element, and wherein the second end wall delimits an opening for airflow between the cavity and the exterior of the second tubular element.

[0611] EX77: An aerosol-generating article according to any one of EX1 to EX76, wherein aerosol-generating substrate comprises an aerosol former.

[0612] EX78: An aerosol-generating article according to any one of EX1 to EX77, wherein the aerosol-generating substrate comprises a plurality of shreds of tobacco material.

[0613] EX79: An aerosol-generating article according to any one of EX1 to EX78, wherein the aerosol-generating substrate comprises a plurality of pellets or granules of tobacco material.

[0614] EX80: An aerosol-generating article according to any one of EX1 to EX79, wherein the aerosol-generating substrate comprises one or more sheets of tobacco material.

[0615] EX81: An aerosol-generating article according to any one of EX1 to EX80 further comprising a susceptor arranged within the aerosol-generating substrate.

[0616] EX82: An aerosol-generating article according to any one of EX1 to EX81 further comprising a mouthpiece element.

[0617] EX83: An aerosol-generating article according

to EX82, wherein the mouthpiece element comprises one or more segments of a fibrous filtration material.

[0618] EX84: An aerosol-generating article according to any one of EX1 to EX83 further comprising a mouth end cavity at the downstream end of the aerosol-generating article.

[0619] EX85: An aerosol-generating article according to any one of EX1 to EX84 further comprising one or more intermediate elements between the first element and the mouthpiece element.

[0620] EX86: An aerosol-generating article according to EX85, wherein the one or more intermediate elements is a hollow tubular element.

[0621] EX87: An aerosol-generating article according to EX85 or EX86, wherein the one or more intermediate elements are non-corrugated.

[0622] EX88: An aerosol-generating article according to any one of EX1 to EX87 further comprising an upstream element upstream of the first element.

[0623] EX89: An aerosol-generating article according to EX88, wherein the upstream element is a plug of cellulose acetate tow.

[0624] EX90: An aerosol-generating article according to any one of EX1 to EX89, wherein the aerosol-generating article has a total length of at least about 35 millimetres.

[0625] EX91: An aerosol-generating article according to any one of EX1 to EX90, wherein the aerosol-generating article has a total length of less than or equal toa bout 100 millimetres.

[0626] EX92: An aerosol-generating article according to any one of EX1 to EX91, wherein the aerosol-generating article has an external diameter of at least about 5 millimetres.

[0627] EX93 An aerosol-generating article according to any one of EX1 to EX92, wherein the aerosol-generating article has an external diameter of less than or equal to about 12 millimetres.

[0628] EX94: An aerosol-generating article according to any one of EX1 to EX93, wherein the intermediate portion is extendable by less than or equal to about 100X, where X is the length of the intermediate portion.

[0629] EX95: An aerosol-generating article according to any one of EX1 to EX94, wherein the intermediate portion is extendable by at least about 0.5X, where X is the length of the intermediate portion.

[0630] EX96: An aerosol-generating article according to any one of EX1 to EX95, wherein the aerosol-generating article is an inhaler article.

[0631] EX97: An aerosol-generating article according to EX96, wherein the first element is a capsule comprising dry powder.

[0632] EX98: An aerosol-generating article according to EX97, wherein the capsule is located upstream of the intermediate portion.

[0633] EX99: An aerosol-generating article according to EX97 or EX98, comprising an upstream hollow tubular element located upstream of the tubular element, and the capsule is located in the upstream hollow tubular element.

[0634] EX100: An aerosol-generating article according to EX99, wherein the upstream hollow tubular element comprises a folded end portion forming a first end wall at the upstream end of the upstream hollow tubular element.

[0635] EX101: An aerosol-generating article according to EX99 or EX100, wherein the first end wall delimits an opening.

[0636] EX102: An aerosol-generating article according to EX97 or EX98, wherein the capsule is located in the cavity of the tubular body of the tubular element.

[0637] EX103: An aerosol-generating article according to EX97, EX98, or EX102 wherein the tubular element extends from the upstream end of the inhaler article to the downstream end of the inhaler article.

[0638] EX104: An aerosol-generating system comprising: an aerosol-generating article according to any one of EX1 to EX103; and an aerosol-generating device.

[0639] EX105: An aerosol-generating system according to EX104, wherein the aerosol-generating device comprises a housing defining a cavity configured to receive the aerosol-generating article.

[0640] EX106: An aerosol-generating system according to EX104 or EX105, wherein the aerosol-generating device is configured to heat the aerosol-generating substrate of the aerosol-generating article.

[0641] EX107: An aerosol-generating system according to any one of EX104 to EX106, wherein the aerosol-generating device comprises a resistive heating element.

[0642] EX108: An aerosol-generating system according to any one of EX104 to EX107, wherein the aerosol-generating device comprises an inductive heating element.

[0643] EX109: An aerosol-generating system according to any one of EX104 to EX108, wherein the aerosol-generating device comprises an activation means for activating the first element of the aerosol-generating article.

[0644] EX110: An aerosol-generating system according to EX109, wherein the activation means is a piercing element.

[0645] The present invention will be further described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a schematic side sectional view of an aerosol-generating article in accordance with a first embodiment of the first aspect of the invention;

Figure 2 shows a schematic side sectional view of the aerosol-generating article shown in Figure 1 following a change in state of the tubular element;

Figure 3 shows a schematic side sectional view of an aerosol-generating article in accordance with a second embodiment of the first aspect of the invention;

Figure 4 shows a schematic side sectional view of an aerosol-generating article in accordance with a

third embodiment of the first aspect of the invention;

Figure 5 shows a schematic side sectional view of an aerosol-generating article in accordance with a fourth embodiment of the first aspect of the invention;

Figure 6 shows a schematic side sectional view of an aerosol-generating article in accordance with a fifth embodiment of the first aspect of the invention; and

Figure 7 shows a schematic side sectional view of an aerosol-generating system in accordance with a first embodiment of the second aspect of the invention comprising the aerosol-generating article in accordance with the first embodiment of the first aspect of the invention.

Figure 8 shows a schematic side sectional view of an aerosol-generating article in accordance with a sixth embodiment of the first aspect of the invention.

[0646] Figure 1 shows an aerosol-generating article 100 in accordance with a first embodiment of the first aspect of the invention. The aerosol-generating article 100 comprises a first element 10 comprising an aerosol-generating substrate 110; and a tubular element 20 located downstream of the first element 10, the tubular element 20 comprising: a tubular body 120 having a first end, a second end, and an intermediate portion 122 located between the first end and the second end, the tubular body 120 defining a cavity 124 extending from the first end of the tubular body 120 to the second end of the tubular body 120; wherein the intermediate portion 122 comprises a plurality of corrugations 130 formed in the tubular body 120.

[0647] The first element 10 is in the form of a rod comprising the aerosol-generating substrate 110. The aerosol-generating substate 110 may substantially define the structure and dimensions of the rod 10. The rod 10 may further comprise a wrapper (not shown) circumscribing the aerosol-generating substrate 110. The rod 10 comprising the aerosol-generating substrate 110 has an external diameter of about 7.2 millimetres and a length of about 12 millimetres.

[0648] The first element 10 may comprise a susceptor (not shown) arranged within the aerosol-generating substrate 110.

[0649] The aerosol-generating article 100 also comprises an upstream element 40 located upstream of and abutting the first element 10. The upstream element 40 is at the upstream end of the aerosol-generating article 100. The upstream element 40 comprises a plug of cellulose acetate tow 140. The upstream element 40 has a length of about 5 millimetres.

[0650] The aerosol-generating article 100 also comprises a mouthpiece element 50 located downstream of and abutting the tubular element 20. The mouthpiece element 50 is at the downstream end of the aerosol-generating article 100. The mouthpiece element comprises a filter segment 150 formed of cellulose acetate tow.

[0651] The tubular body 120 also comprises a first portion 126 adjacent to and located upstream of the intermediate portion 122 and extending to the first end of the tubular body 120. The tubular body 120 also comprises a second portion 128 adjacent to and located downstream of the intermediate portion 122 and extending to the second end of the tubular body 120.

[0652] The first portion 126, the intermediate portion 122, and the second portion 128 of the tubular body 120 are integrally formed with each other.

[0653] The first portion 126, the intermediate portion 122, the second portion 126 of the tubular body 120 have an external diameter substantially the same as the external diameter of the aerosol-generating substrate 110.

[0654] The first portion 126 does not comprise any corrugations. The second portion 128 does not comprise any corrugations.

[0655] The aerosol-generating article 100 further comprises a wrapper 60 circumscribing at least the tubular element 20. As shown in Figure 1, the wrapper 60 also circumscribes the first element 10, the upstream element 40 and the mouthpiece element 50. The wrapper 60 extends from the upstream or distal end of the aerosol-generating article 100 to the downstream or mouth end of the aerosol-generating article 100.

[0656] The wrapper is adhered to the tubular body 120 at locations away from the intermediate portion 122. Namely, the wrapper is adhered to the tubular body 120 at the first portion 126 of the tubular body 120 and at the second portion 128 of the tubular body 120.

[0657] The wrapper 60 comprises a circumferential line of weakness 62 extending around the intermediate portion 122. The line of weakness 62 is in the form of a line of perforations 62. The wrapper 60 is breakable along the circumferential line of weakness 62.

[0658] The plurality of corrugations 130 are configured to facilitate a change of state of the intermediate portion 20 between: a first state, in which the first end of the tubular body 120 is placed in a first position with respect to the second end of the tubular body 120; and a second state, in which the first end of the tubular body 120 is placed in a second position with respect to the second end of the tubular body 120.

[0659] Figure 2 shows the intermediate portion 120 in the first state, which may also be referred to as an extended state. Figure 1 shows the intermediate portion 120 in the second state, which may also be referred to as a compressed state.

[0660] The tubular body 120 is extendable such that when the intermediate portion 122 is in the first state (as shown in Figure 2), the tubular body 120 has a first length; and when the intermediate portion 122 is in the second state (as shown in Figure 1), the tubular body 120 has a second length; the first length being greater than the second length.

[0661] During use of the aerosol-generating article 100, a user may wish to extend the intermediate portion 122 of the tubular body 120 to alter properties of the airflow through the tubular body 120, such as the resistance

to draw of the tubular body. A user may apply a longitudinal force to the aerosol-generating article 100 when in the second state (as shown in Figure 1) to change the state of the aerosol-generating article 100 to the first state (as shown in Figure 2).

[0662] As shown in Figures 1 and 2, the intermediate portion 122 of the tubular body 120 is extendable by at least about 20 percent in length.

[0663] As shown in Figure 2, on extension of the intermediate portion 122, the internal diameter of the intermediate portion 20 at a trough of a corrugation increases.

[0664] On extension of the intermediate portion 122, the wrapper breaks along the line of weakness 62 and is separated into an upstream wrapper portion 64 and a downstream wrapper portion 66.

[0665] As shown in Figure 2, the tubular body 120 comprises a plurality of ventilation holes 132 extending through the wall of the tubular body 120. The plurality of ventilation holes 132 are arranged as a circumferential row of ventilation holes 132 extending around the intermediate portion 122.

[0666] On extension of the intermediate portion 122, the plurality of ventilation holes 132 are exposed and air may be drawn through the ventilation holes 132. This may achieve a satisfactory cooling of the stream of aerosol generated upon heating of the aerosol-generating substrate 110 and drawn through the tubular element 20.

[0667] Prior to breaking of the wrapper 60 along the line of weakness 62, and when the intermediate portion 122 is in the second state as shown in Figure 1, the row of ventilation holes 132 of the tubular body 120 may be substantially aligned with the line of weakness 62 of the wrapper.

[0668] When the intermediate portion 122 is in the second state, the plurality of corrugations may be arranged such as to substantially prevent air from being drawn into the tubular element 20 through the row of ventilation holes 132.

[0669] Figure 3 shows an aerosol-generating article 300 in accordance with a second embodiment of the first aspect of the invention. The aerosol-generating article 300 shown in Figure 3 is similar to the aerosol-generating article 100 shown in Figure 1 and like reference numerals are used to designate like parts.

[0670] The aerosol-generating article 300 differs from the aerosol-generating article 100 shown in Figure 1 in that first portion 326 of the tubular body 320 has a smaller external diameter than the first portion 126 of the aerosol-generating article 100, in that the second portion 328 of the tubular body 320 has a smaller external diameter than the second portion 128 of the aerosol-generating article 100; and in the configuration of the plurality of corrugations 330 when the intermediate portion 322 is in the second state.

[0671] The first portion 326 and the second portion 328 of the tubular body 320 each have an external diameter less than the external diameter of the aerosol-generating substrate 110.

[0672] In the second state, the intermediate portion 322 has an external diameter which is substantially the same as the external diameter of the aerosol-generating substrate 110 and thus greater than the external diameter of each of the first portion 326 and the second portion 328 of the tubular body 320. On extension of the aerosol-generating article 300 by extending the intermediate portion 322, the internal diameter of the tubular body 320 at a trough of a corrugation remains substantially the same. On extension of the intermediate portion 322, the external diameter of the intermediate portion 322 decreases towards the external diameter of the first portion 326 and the second portion 328.

[0673] Figure 4 shows an aerosol-generating article 400 in accordance with a third embodiment of the first aspect of the invention. The aerosol-generating article 400 shown in Figure 4 is similar to the aerosol-generating article 100 shown in Figure 1 and like reference numerals are used to designate like parts.

[0674] The aerosol-generating article 400 differs from the aerosol-generating article 100 shown in Figure 1 in that the tubular element 24 further comprises a folded end portion forming a first end wall 422 at the first end of the tubular body 420. The first end wall 422 delimits an opening 424, which permits airflow between the cavity 124 and the exterior of the tubular element 24. In particular, the embodiment of Figure 4 is configured so that aerosol may flow from the first element 10 through the opening 424 into the cavity 124.

[0675] As shown in Figure 4, the first end wall 422 extends substantially transverse of the longitudinal direction of the aerosol-generating article 400 and the longitudinal direction of the tubular element 24. The opening 424 is the only opening in the first end wall 422 and the opening 424 is positioned in a generally radially central position of the tubular element 24. Consequently, the first end wall 422 is generally annular shaped.

[0676] The combination of the first end wall 422 and its corresponding opening 424 may provide an effective barrier arrangement which may restrict movement of the aerosol-generating substrate 110, whilst also enabling one or both of air and aerosol to flow from the first element 10 and through the opening 424 into the cavity 124.

[0677] The first end wall 422 is formed by folding an end portion of the tubular element 24 about a fold point. The fold point generally correspond to the first end of the tubular body 420 of the tubular element.

[0678] Figure 5 shows an aerosol-generating article 500 in accordance with a fourth embodiment of the first aspect of the invention. The aerosol-generating article 500 shown in Figure 5 share similarities with the aerosol-generating article 100 shown in Figure 1, and like reference numerals are used to designate like parts.

[0679] The aerosol-generating article 100 comprises a hollow tubular element 25 downstream of and abutting the first element 10. The hollow tubular element 25 is upstream of and abuts the mouthpiece element 50.

[0680] The hollow tubular element 25 does not com-

prise any corrugations. The hollow tubular element 25 has an external diameter of about 7.2 millimetres and a length of about 16 millimetres.

[0681] The aerosol-generating article 500 further comprises a tubular element 45 having a tubular body 520, the tubular body 520 comprising an intermediate portion extending from the first end of the tubular body 520 to the second end of the tubular body 520.

[0682] The tubular element 45 is located adjacent to and upstream of the first element 10. In particular, the tubular element 45 is the most upstream element of the aerosol-generating article 500 and is at the upstream end of the aerosol-generating article 500.

[0683] The intermediate portion comprises a plurality of corrugations 530 extending along the entire length of the tubular body 520. Each corrugation of the plurality of corrugations 530 extend around the entire circumference of the tubular body 520.

[0684] The plurality of corrugations 530 are configured to facilitate a change in length of the intermediate portion 520.

[0685] The intermediate portion of the tubular body 520 may also be referred to as the extendable portion of the tubular body 520.

[0686] The extendable portion of the tubular body 520 and thus the entirety of the tubular body 520 shown in Figure 5 is similar to the intermediate portion 122 of the tubular body 120 shown in Figure 1. The tubular body 520 shown in Figure 5 differs from the intermediate portion 122 of the tubular body 120 shown in Figure 1 in that the tubular body 520 does not comprise any ventilation holes.

[0687] Figure 5 shows the tubular body 520 in a first state or an extended state similar to that of the intermediate portion 122 shown in Figure 2.

[0688] When the tubular body 520 is in the first state as shown in Figure 5, on insertion of the aerosol-generating article 500 into a cavity of an aerosol-generating device (not shown), the tubular body 520 may change state to a second state or a compressed state. On this change of state, the tubular body 520 decreases in length and thus the aerosol-generating article 500 also decreases in length.

[0689] When the tubular body 520 is in the compressed state, the tubular body 520 has the shape and configuration similar to the intermediate portion 122 of the tubular body 120 shown in Figure 1.

[0690] The length of the tubular body 520 in the compressed state may be selected based on the arrangement of heaters in an aerosol-generating device. For example, the length of the tubular body 520 may be selected such that the heaters of an aerosol-generating device are substantially aligned with the aerosol-generating substrate 110 when the aerosol-generating article 500 is inserted in the aerosol-generating device.

[0691] The decrease in length of the aerosol-generating article 500 signals to a user that the aerosol-generating article 500 has previously been inserted into an aerosol-generating device and it can therefore be inferred that the aerosol-generating article 500 has been heated to generate an aerosol.

[0692] Figure 6 shows an aerosol-generating article 600 in accordance with a fifth embodiment of the first aspect of the invention. The aerosol-generating article 600 shown in Figure 6 is similar to the aerosol-generating article 100 shown in Figure 1 and like reference numerals are used to designate like parts.

[0693] The aerosol-generating article 600 differs from the aerosol-generating article 100 shown in Figure 1 in that the aerosol-generating article 600 comprises a tubular element 45 in place of the upstream element 40 shown in Figure 1.

[0694] The tubular element 45 of the aerosol-generating article 600 is the same as the tubular element 45 shown in Figure 5.

[0695] The tubular element 45 may be referred to as the first tubular element 45.

[0696] Similarly to the aerosol-generating article 100 shown in Figure 1, the aerosol-generating article 600 comprises a tubular element 20 downstream of the first element 10. The tubular element 20 may be referred to as the second tubular element 20.

[0697] As such, the aerosol-generating article comprises a first tubular element 45 located upstream of the first element 10 and a second tubular element 20 located downstream of the first element 10.

[0698] The first tubular element 45 comprises a tubular body 520 defining a cavity extending from the first end of the tubular body 520 the second end of the tubular body 520, the tubular body 520 comprising a plurality of corrugations 530 formed in the tubular body 520 and extending substantially the entire length of the tubular body 520.

[0699] The second tubular element 45 comprises a tubular body 120 defining a cavity 124 extending from the first end of the tubular body 120 and the second end of the tubular body 120, the tubular body 120 comprising a first portion 126 at the first end of the tubular body 120, an intermediate portion 122 adjacent to and downstream of the first portion 126, and a second portion 128 adjacent to and downstream of the intermediate portion 122 and at the downstream end of the tubular body 120. The intermediate portion 122 comprises a plurality of corrugations 130 formed in the tubular body 120, wherein each of the plurality of corrugations 130 extend around the tubular body 120.

[0700] As discussed above in relation to the aerosol-generating article shown in Figure 5, the first tubular element 25 of the aerosol-generating article 600 shown in Figure 6 may change state from the first or extended state (as shown in Figure 6) to the second or compressed state on insertion in an aerosol-generating device.

[0701] As discussed above in relation to the aerosol-generating article 100 shown in Figure 1, during use of the aerosol-generating article 600 shown in Figure 6, a user may extend the length of the second tubular element

20 by changing state of the intermediate portion 122 of the second tubular element 20 from the second state (as shown in Figures 1 and 6) to the first state (as shown in Figure 2). Extension of the second tubular element 20 may involve breaking of the wrapper 60 along the line of weakness 62.

[0702] The change in state of one or both of the first tubular element 45 and the second tubular element 20 may indicate to a user that the aerosol-generating article 600 has been used.

[0703] Figure 7 shows a schematic side sectional view of an aerosol-generating system 700 comprising the aerosol-generating article 100 shown in Figure 1 in a third state and inserted in an aerosol-generating device 200.

[0704] The aerosol-generating device 200 comprises a housing defining a cavity 205 configured to receive the aerosol-generating article 100, and a heater 210 located around a perimeter of the cavity 205. The aerosol-generating device 200 further comprises a power supply in the form of a battery (not shown), such as a rechargeable lithium ion battery, and control circuity (not shown). The control circuitry controls the supply of electrical power from the battery to the heater 210.

[0705] In addition to being extendable, the aerosol-generating article 100 is bendable. The plurality of corrugations 130 of the tubular body 120 are configured to facilitate bending of the tubular body 130.

[0706] As shown in Figure 7, the tubular element 20 comprises the intermediate portion 122 of the tubular body 120 in a third state. In the third state, the intermediate portion 122 is bent by about 90 degrees such that the first element 10 is substantially perpendicular to the mouthpiece element 50.

[0707] Bending of the intermediate portion 122 may enable a user to use the aerosol-generating article 100 in various different configurations. For example, a user may comfortably use the aerosol-generating article 100 when the aerosol-generating device 200 is substantially vertical when the intermediate portion 122 of the aerosol-generating article 100 is bent by about 90 degrees.

[0708] Figure 8 shows a schematic side sectional view of an aerosol-generating article 800 in accordance with a sixth embodiment of the first aspect of the invention. The aerosol-generating article 800 is an inhaler article 800.

[0709] The inhaler article 800 comprises a tubular element having a tubular body 820 at the downstream end of the inhaler article 820. The inhaler article 800 comprises an upstream hollow tubular element 840 at the upstream end of the inhaler article 800. The upstream hollow tubular element 840 abuts the tubular element 820.

[0710] The inhaler article comprises a capsule 810 containing nicotine particles.

[0711] The tubular body 820 shown in Figure 8 is similar to the tubular body 420 shown in Figure 4. The tubular body 820 comprises a first portion, an intermediate portion, and a second portion. The intermediate portion comprises a plurality of corrugations 830 formed in the tubular body 820. The plurality of corrugations 830 are configured to facilitate a change in state of the intermediate portion.

[0712] The tubular element is both extendable and bendable.

[0713] The tubular element further comprises a folded end portion forming a first end wall 822 at the first end of the tubular body 820. The first end wall 822 delimits an opening 824 which permits airflow between the cavity of the tubular body 820 and the exterior of the tubular element.

[0714] As shown in Figure 8, the first end wall 822 extends substantially transverse of the longitudinal direction of the inhaler article 800 and the longitudinal direction of the tubular element. The opening 824 is the only opening in the first end wall 822 and the opening 824 is positioned in a generally radially central position of the tubular element. Consequently, the first end wall 822 is generally annular shaped.

[0715] The combination of the first end wall 822 and its corresponding opening 824 may provide an effective barrier arrangement which may restrict downstream movement of the capsule 810, whilst also enabling one or both of air and aerosol to flow through the opening 824 into the cavity of the tubular body.

[0716] The first end wall 822 is formed by folding an end portion of the tubular element about a fold point. The fold point generally correspond to the first end of the tubular body 820 of the tubular element.

[0717] The upstream hollow tubular element 840 defines a cavity in which the capsule 810 is located.

[0718] The upstream hollow tubular element 840 comprises a folded end portion forming a first end wall 842 at the first end of the upstream hollow tubular element. The first end wall 842 of the upstream hollow tubular element 840 may provide an effective barrier arrangement which may restrict upstream movement of the capsule 810 out of the inhaler article 800.

[0719] The first end wall 842 delimits an opening 844 which permits airflow between the cavity of the upstream hollow tubular element 840 and the exterior of the inhaler article 800. The opening 844 also provides access for a piercing element 801, for example, a piercing element 801 of a holder for the inhaler article 800. Such a piercing element 801 is configured to pierce or puncture the capsule 810 in order to activate it for consumption.

[0720] As shown in Figure 8, the diameter of the opening 844 of the upstream hollow tubular element 840 may be smaller than the opening 822 of the tubular body 820 of the tubular element.

[0721] The inhaler article 800 also comprises a wrapper 860 circumscribing both the upstream hollow tubular element 840 and the tubular element.

[0722] The wrapper 860 comprises a circumferential line of weakness 862 extending around the intermediate portion of the tubular body 820. The line of weakness 862 is in the form of a line of perforations 862. The wrapper 860 is breakable along the line of weakness 862 to

facilitate a change of state of the tubular body 820. For example, the wrapper 860 may break along the line of weakness 862 to facilitate one or both of an extension and bending of the intermediate portion of the tubular body 820. A user may one or both of extend and bend the intermediate portion so as to change the configuration of the inhaler article 800 as desired.

[0723] The specific embodiments and examples described above illustrate, but do not limit, the invention. It is to be understood that other embodiments of the invention may be made and the specific embodiments and examples described herein are not exhaustive.

Claims

1. An aerosol-generating article comprising:

a first element comprising an aerosol-generating substrate; and
a tubular element comprising a tubular body, the tubular body having a first end, a second end and an intermediate portion between the first end and the second end, the tubular body defining a cavity extending from the first end of the tubular body to the second end of the tubular body;
wherein the intermediate portion comprises a plurality of corrugations formed in the tubular body.

2. An aerosol-generating article according to claim 1, wherein the plurality of corrugations are configured to facilitate a change of state of the intermediate portion between:

a first state, in which the first end of the tubular body is placed in a first position with respect to the second end of the tubular body; and
a second state, in which the first end of the tubular body is placed in a second position with respect to the second end of the tubular body.

3. An aerosol-generating article according to claim 2, wherein the plurality of corrugations are configured to facilitate one or both of a change in length of the intermediate portion and bending of the intermediate portion.

4. An aerosol-generating article according to claim 2 or 3, wherein the tubular body is extendable by at least about 0.1L, where L is the length of the tubular body.

5. An aerosol-generating article according to any one of claims 2 to 4, wherein when the intermediate portion is in the first state, the intermediate portion has a first internal diameter; and when the intermediate portion is in the second state, the intermediate portion has a second internal diameter; and wherein the first internal diameter is substantially the same as the second internal diameter.

6. An aerosol-generating article according to any one of claims 2 to 4, wherein when the intermediate portion is in the first state, the intermediate portion has a first internal diameter; and when the intermediate portion is in the second state, the intermediate portion has a second internal diameter; and wherein the first internal diameter is greater than the second internal diameter.

7. An aerosol-generating article according to any one of claims 1 to 6, wherein each of the plurality of corrugations comprise a peak and a corresponding trough, and wherein the distance between a peak of a corrugation and a trough of the same corrugation is at least about 0.5 millimetres.

8. An aerosol-generating article according to any one of claims 1 to 7, wherein each of the plurality of corrugations comprise a peak and a corresponding trough, and wherein the distance between a peak of a corrugation and a trough of the same corrugation is less than or equal to about 4 millimetres.

9. An aerosol-generating article according to any one of claims 1 to 8, wherein the intermediate portion is located upstream or downstream of the first element.

10. An aerosol-generating article according to any one of claims 1 to 9, wherein the tubular body comprises a first portion extending from the first end of the tubular body, and wherein the first portion is non-corrugated.

11. An aerosol-generating article according to any one of claims 1 to 10, wherein the tubular body comprises a second portion extending from the second end of the tubular body, and wherein the second portion is non-corrugated.

12. An aerosol-generating article according to any one of claims 1 to 11, wherein the tubular element further comprises a plurality of ventilation holes provided at a position along the intermediate portion.

13. An aerosol-generating article according to any one of claims 1 to 12 further comprising a wrapper circumscribing at least the intermediate portion of the tubular body, and wherein the wrapper comprises a line of weakness extending around the intermediate portion of the tubular body.

14. An aerosol-generating article according to any one of claims 1 to 13, wherein the tubular element further comprises a folded end portion forming a first end

wall at the first end of the tubular body, the first end wall delimiting an opening for airflow between the cavity and the exterior of the tubular element.

15. An aerosol-generating article according to any one of claims 1 to 14, wherein the tubular element is a first tubular element and is located upstream of the first element, and wherein the aerosol-generating article comprises a second tubular element comprising: a tubular body having a first end, a second end and an intermediate portion between the first end and the second end, the tubular body defining a cavity extending from the first end of the tubular body to the second end of the tubular body; wherein the intermediate portion of the second tubular element comprises a plurality of corrugations formed in the tubular body.

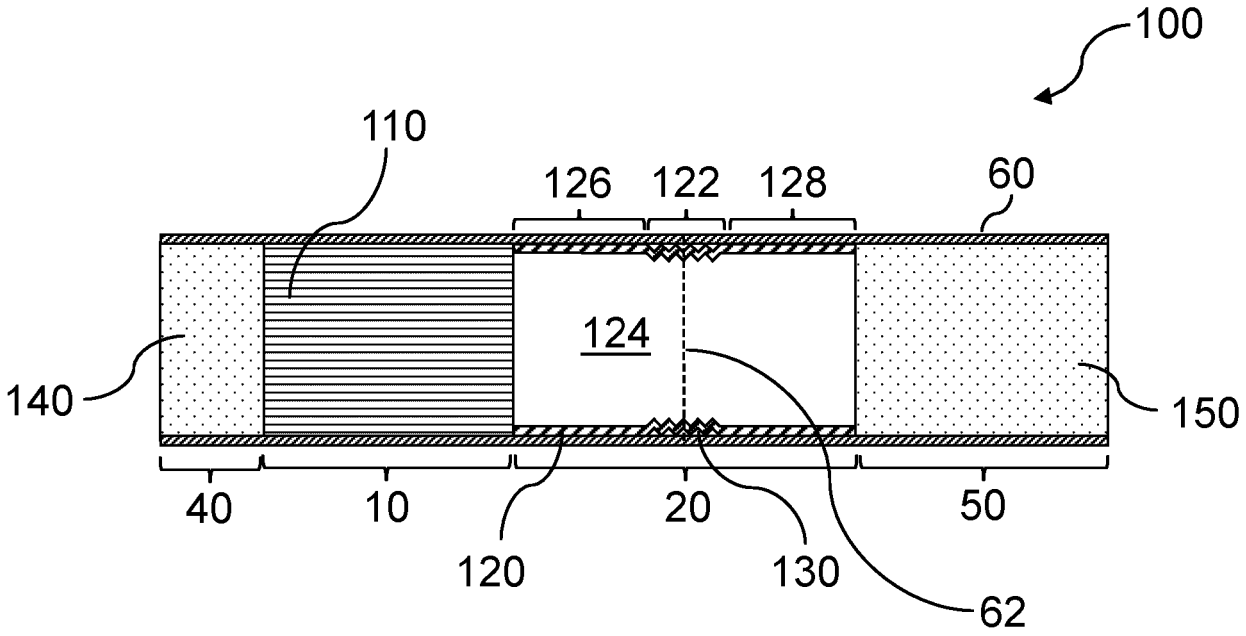

Figure 1

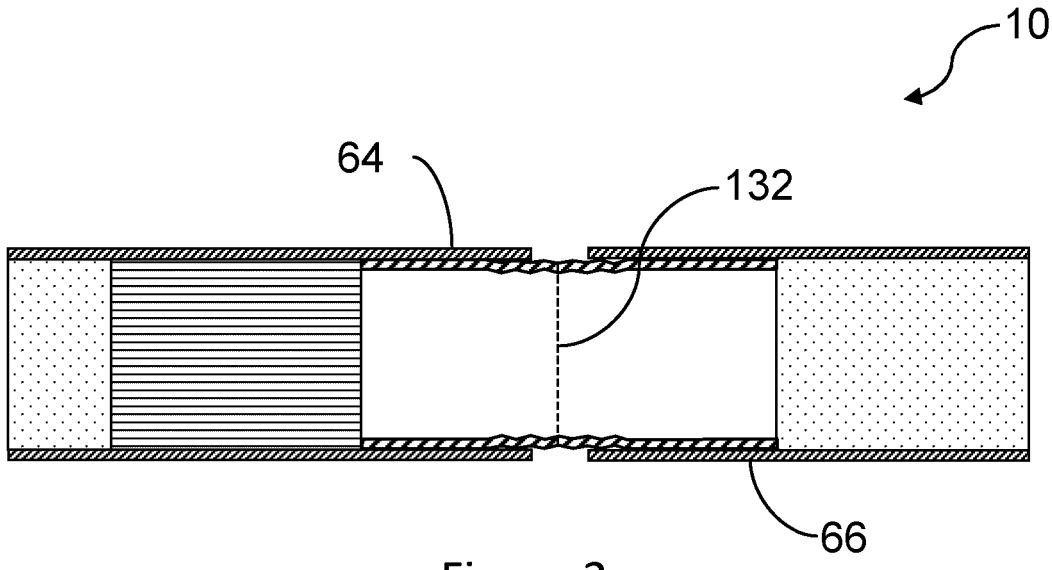

Figure 2

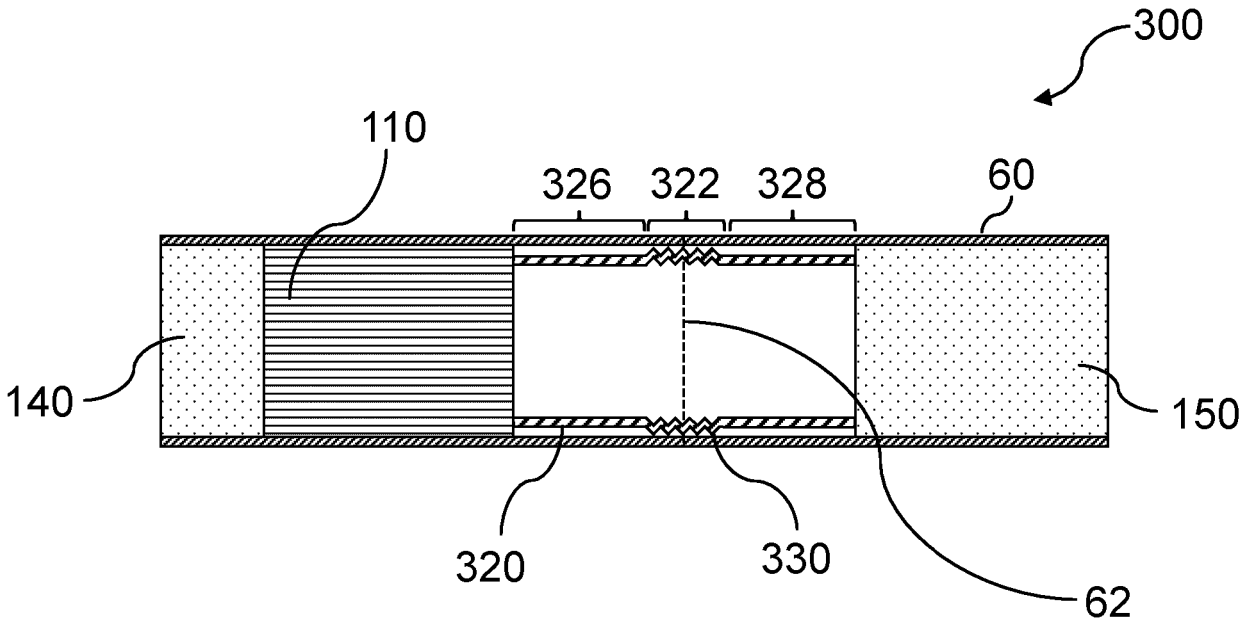

Figure 3

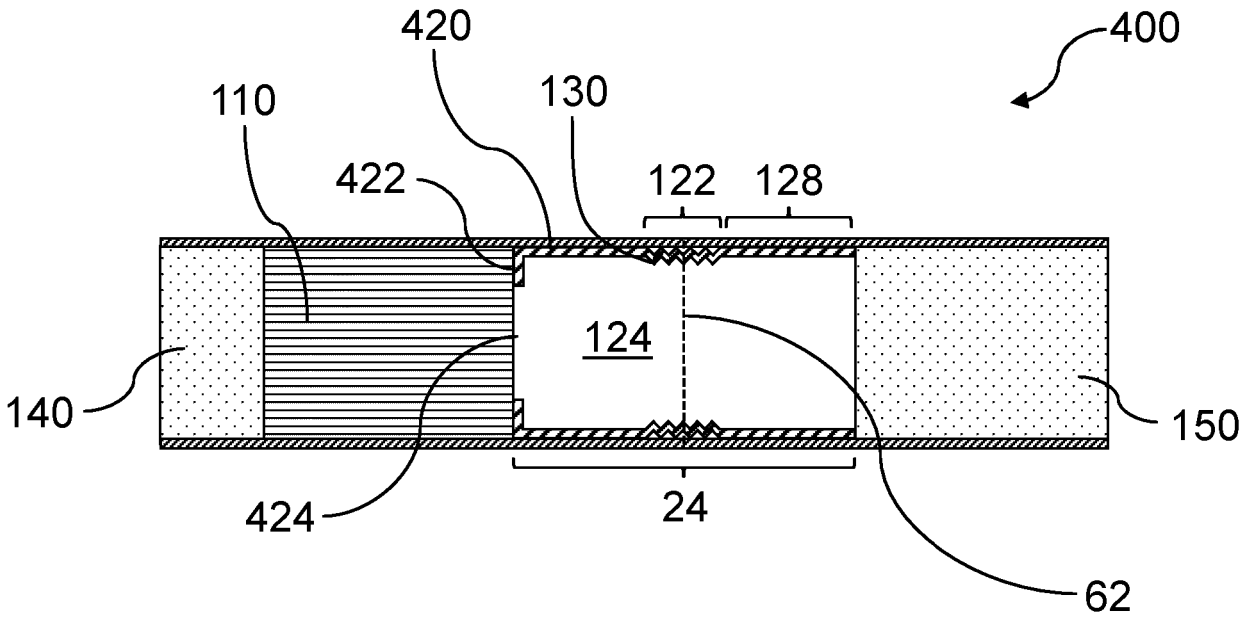

Figure 4

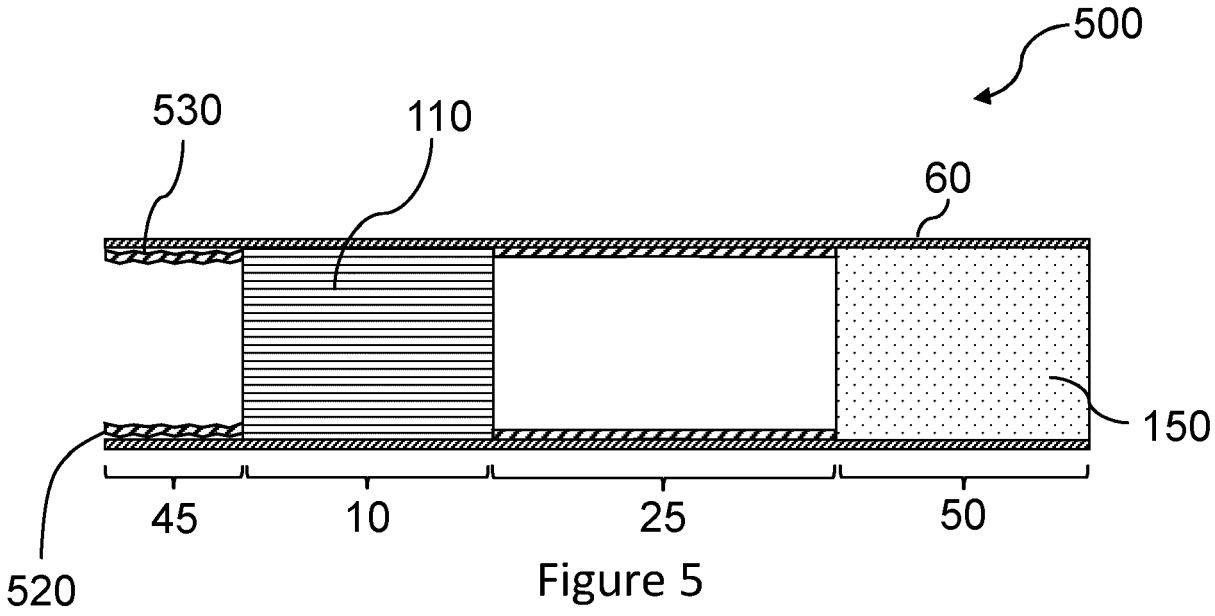

Figure 5

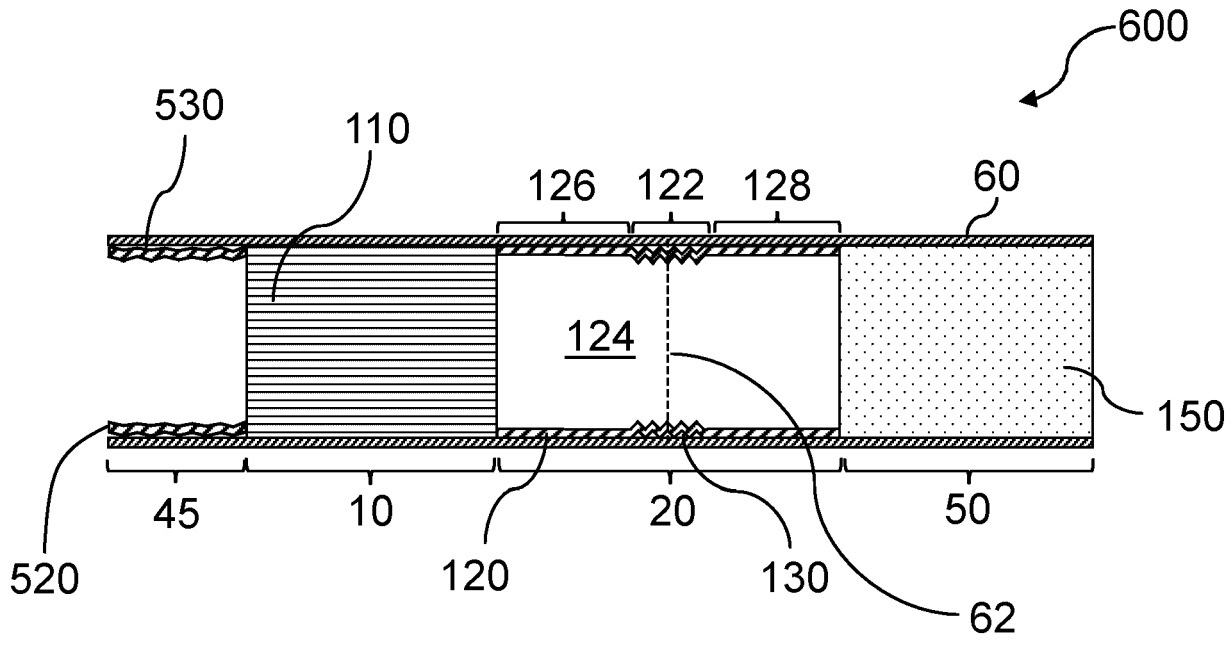

Figure 6

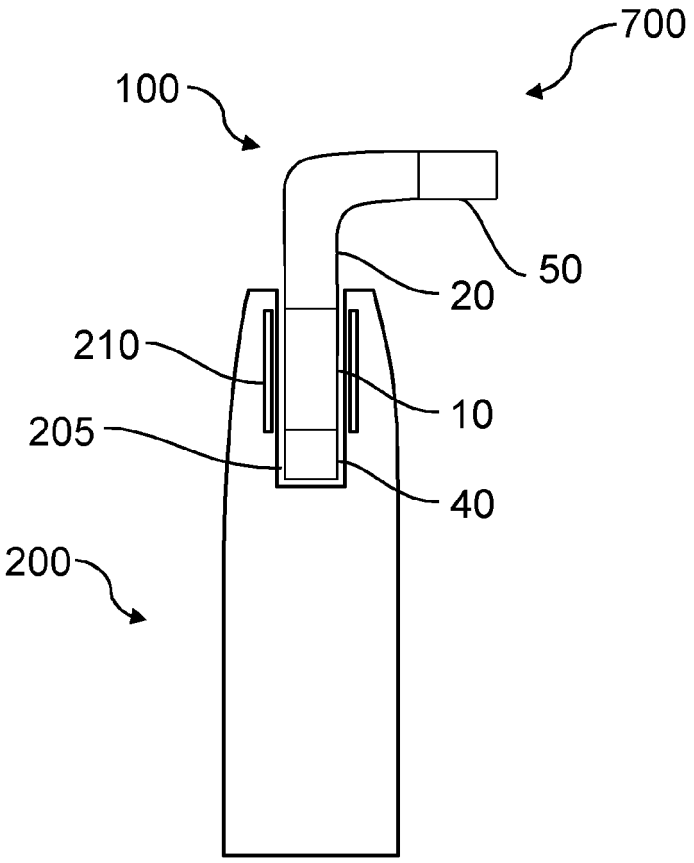

Figure 7

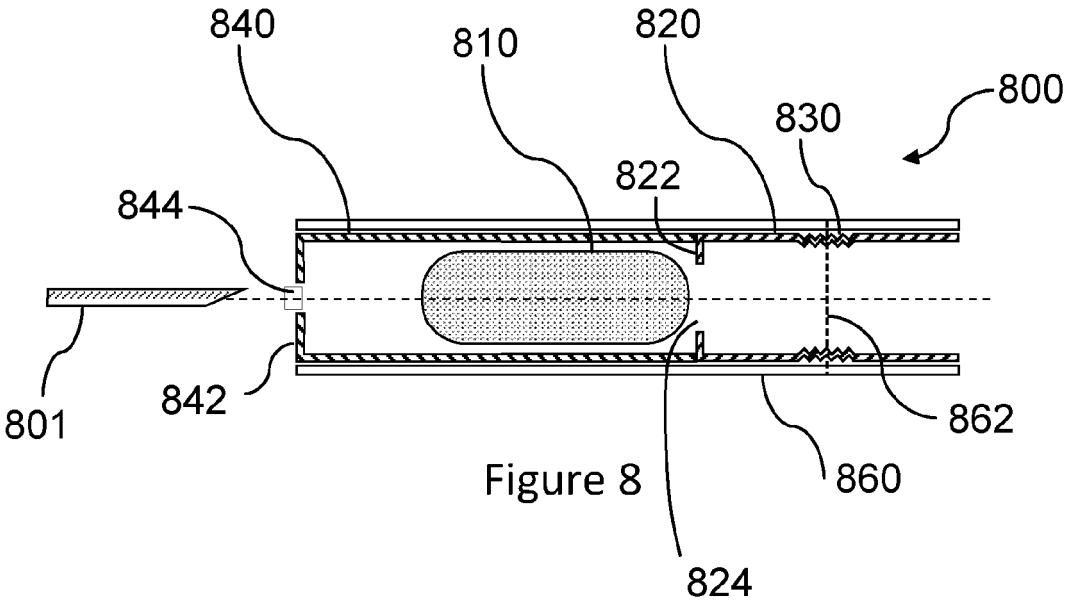

Figure 8

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EUROPEAN SEARCH REPORT

Application Number
EP 22 21 1821

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 May 2023	Espla, Alexandre

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