Innovation, Sciences et Développement économique Canada
Office de la Propriété Intellectuelle du Canada

Innovation, Science and Economic Development Canada
Canadian Intellectual Property Office

CA 3168160 A1 2021/08/26

(21) 3 168 160

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) **Date de dépôt PCT/PCT Filing Date:** 2021/02/19
(87) **Date publication PCT/PCT Publication Date:** 2021/08/26
(85) **Entrée phase nationale/National Entry:** 2022/08/16
(86) **N° demande PCT/PCT Application No.:** EP 2021/054229
(87) **N° publication PCT/PCT Publication No.:** 2021/165509
(30) **Priorité/Priority:** 2020/02/20 (EP20158535.3)

(51) **Cl.Int./Int.Cl.** ***A24D 1/20*** (2020.01), ***A24C 5/56*** (2006.01), ***A24D 1/02*** (2006.01)

(71) **Demandeur/Applicant:**
PHILIP MORRIS PRODUCTS S.A., CH

(72) **Inventeurs/Inventors:**
CAMUS, ALEXANDRE, CH;
CIFTCIOGLU, YALIN, CH;
LEKILI, LEVENT, CH

(74) **Agent:** RIDOUT & MAYBEE LLP

(54) **Titre : ARTICLE DE GENERATION D'AEROSOL DOTE D'UN ELEMENT DE LIAISON AYANT UN POIDS DE BASE**
(54) **Title: AEROSOL-GENERATING ARTICLE HAVING BRIDGING ELEMENT WITH BASIS WEIGHT**

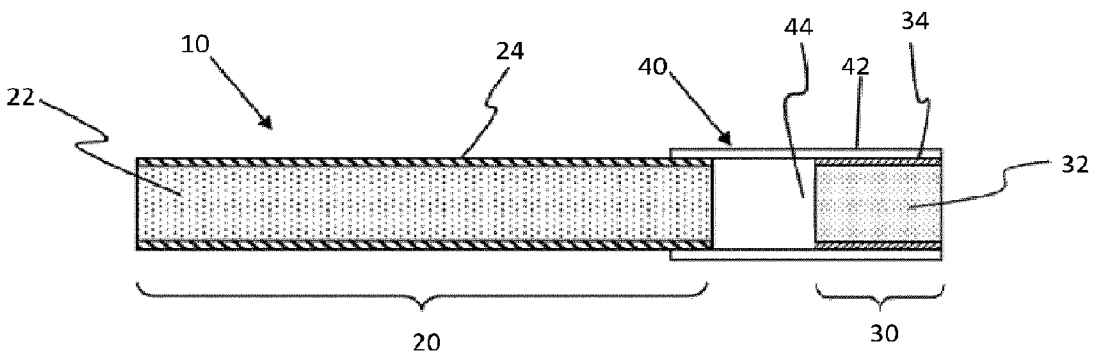

Figure 1

(57) **Abrégé/Abstract:**
An aerosol-generating article (10) comprising a rod (20) comprising an aerosol-generating substrate (22); a filter (30) in axial alignment with the rod (20); a bridging element (40) comprising a first wrapper (42), the first wrapper circumscribing the rod (20) and the filter and securing the filter to the rod; and a cavity (44) located between the rod and the filter, the cavity (44) being partially delimited by the inner surface of the first wrapper (42) in a first portion of the bridging element (40), wherein the first portion of the bridging element (40) has a basis weight of 50 grams per square meter or greater.

Date Submitted: 2022/08/16

CA App. No.: 3168160

Abstract:

An aerosol-generating article (10) comprising a rod (20) comprising an aerosol-generating substrate (22); a filter (30) in axial alignment with the rod (20); a bridging element (40) comprising a first wrapper (42), the first wrapper circumscribing the rod (20) and the filter and securing the filter to the rod; and a cavity (44) located between the rod and the filter, the cavity (44) being partially delimited by the inner surface of the first wrapper (42) in a first portion of the bridging element (40), wherein the first portion of the bridging element (40) has a basis weight of 50 grams per square meter or greater.

AEROSOL-GENERATING ARTICLE HAVING BRIDGING ELEMENT WITH BASIS WEIGHT

The present disclosure relates to aerosol-generating articles, for example cigarettes or heated aerosol-generating articles.

Filter cigarettes typically comprise a rod of aerosol-generating substrate in the form of tobacco cut filler surrounded by a paper wrapper and a cylindrical filter aligned in an end-to-end relationship with the wrapped tobacco rod, with the filter attached to the tobacco rod by tipping paper. In conventional filter cigarettes, the filter may consist of a plug of cellulose acetate tow wrapped in porous plug wrap. Filter cigarettes with multi-component filters that comprise two or more segments of filtration material for the removal of particulate and gaseous components of the mainstream smoke are also known.

Generally, a consumer smokes a cigarette until the burning area of the tobacco rod (the lit end) reaches the edge of the tipping paper. At this point, the proximity of the burning area to the filter can result in burning or excessive heating of the filter which can negatively affect the taste and flavour of the mainstream smoke produced by the cigarette.

Aerosol-generating articles for the generation of an aerosol by heating rather than burning are known in the art. One example of such aerosol-generating articles comprises an aerosol-generating substrate penetrable by a heating element of an aerosol-generating device. The aerosol-generating substrate is, preferably, a solid substrate and comprises tobacco. The heating element heats the aerosol-generating substrate to generate an aerosol that a user can draw through a filter at the mouth end of the aerosol-generating article. Alternatively or additionally, the aerosol-generating substrate may be heatable by a susceptor. In such cases, the aerosol-generating device may comprise an inductor coil through which an alternating current is passed to generate an alternating magnetic field. This induces a voltage in the susceptor such that the susceptor is heated which, in turn, heats the aerosol-generating substrate. The susceptor may be a part of the aerosol-generating article or a part of the aerosol-generating device. In each of these arrangements, the aerosol-generating substrate may be heated to temperatures of around 300 degrees Celsius or more. As a result, in such arrangements, it may also be desirable to avoid excessive heating of the filter.

It would therefore by desirable to provide an aerosol-generating article in which unwanted heating or burning of elements of the aerosol-generating article downstream of the aerosol-generating substrate is avoided.

In this disclosure there is provided an aerosol-generating article. The aerosol-generating article may comprise a rod. The rod may comprise an aerosol-generating substrate. The aerosol-generating article may also comprise a filter. The filter may be in axial alignment with the rod. The aerosol-generating article may also comprise a bridging element.

The bridging element may comprise a first wrapper. The first wrapper may circumscribe the rod. The first wrapper may circumscribed the filter. The first wrapper may circumscribe the rod and the filter. The first wrapper may secure the filter to the rod. The first wrapper may permanently secure the filter to the rod. The aerosol-generating article may comprise a cavity. The cavity may be located between the rod and the filter. The cavity may be being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element. The first portion of the bridging element may have a basis weight of 50 grams per square meter or greater.

In one example, the aerosol-generating article comprises a rod comprising an aerosol-generating substrate; a filter in axial alignment with the rod; a bridging element comprising a first wrapper, the first wrapper circumscribing the rod and the filter and securing the filter to the rod; and a cavity located between the rod and the filter, the cavity being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element, wherein the first portion of the bridging element has a basis weight of 50 grams per square meter or greater.

The provision of a cavity between the rod and filter advantageously reduces the risk of excessive heating or burning of the filter when the aerosol-generating article is consumed.

The aerosol-generating article may be consumed as a result of ignition of the aerosol-generating substrate. The provision of a cavity between the rod comprising the aerosol-generating substrate and the filter reduces the proximity of the burning area of the aerosol-generating substrate to the filter, even when the burning area reaches the end of the rod.

The aerosol-generating article may be consumed by heating, rather than burning, the aerosol-generating substrate. The provision of a cavity between the rod comprising the aerosol-generating substrate and the filter ensures that the filter is not excessively heated.

The provision of a bridging element comprising a first wrapper that secures the filter and the rod and which has an inner surface that partially delimits the cavity may result in an aerosol-generating article that is simple and cheap to manufacture.

The aerosol-generating article may experience forces, for example compressive or shear forces, during use or during the manufacturing process. For the cavity to remain intact and not collapse, the bridging element preferably has the strength to withstand such forces.

Longitudinal forces being applied along the length of the aerosol-generating article may be a particular problem when inserting aerosol-generating articles into packaging during the manufacture process. Longitudinal forces being applied along the length of the aerosol-generating article may also be a particular problem for aerosol-generating articles configured to be consumed by heating rather than burning. Such aerosol-generating articles may be inserted into an aerosol-generating device. This may result in longitudinal forces being applied

along the length of the aerosol-generating article on insertion into an aerosol-generating device.

The first portion of the bridging element is a portion having a basis weight of 50 grams per square meter or greater. The bridging element may comprise a first wrapper. In some embodiments, the first wrapper may have a portion having a basis weight of 50 grams per square meter or greater. This portion of the first wrapper may correspond to the first portion of the wrapper. In some embodiments the bridging element may comprise more than one wrapper. For example, the bridging element may comprise a portion of a first wrapper and a portion of a second wrapper. The second wrapper may circumscribe the first wrapper. In that case, the portion having a basis weight of 50 grams per square meter or greater may be a result of the combined basis weight of two or more layers. In any case, the cavity may be partially delimited by the inner surface of the first wrapper in the first portion of the bridging element.

Providing a first portion of the bridging element having a basis weight of 50 grams per square meter or greater can provide strength to the aerosol-generating article in the region of the cavity. Such a basis weight may advantageously be high enough to prevent the cavity from collapsing in normal use of the aerosol-generating article and during the manufacturing process. Preferably, the inner surface of first wrapper in the first portion of the bridging element may extend around extend around the some or all of the circumference of the cavity to prevent collapse of the cavity during normal use of the aerosol-generating article and during the manufacturing process.

As used herein, the term “basis weight” is a measure of mass, in grams per square meter. In other words, basis weight is a measure of areal density. Basis weight may also be referred to grammage.

Preferably, the first portion of bridging element has a basis weight of between 50 to 110 grams per square meter. Preferably, the first portion of bridging element may have a basis weight of 70 grams per square meter or greater. The bridging element may have a basis weight of 80, 90 or even 100 grams per square meter or greater. The bridging element may have a basis weight of between 70 to 110 grams per square meter, between 80 to 110 grams per square meter, between 90 to 110 grams per square meter or between 100 and 110 grams per square meter.

As used herein, the terms ‘upstream’ and ‘downstream’ are used to describe the relative positions of elements, or portions of elements, of the aerosol-generating article in relation to the direction in which a user draws on the aerosol-generating article during use thereof.

As used herein, the term "inner surface of the bridging element" is used to describe the surface of the bridging element that faces towards the inside of aerosol-generating article.

The first portion of the bridging element may have a thickness of between 50 micrometres and 140 micrometres. The first portion of the bridging element may have a thickness of between 70 micrometres and 140 micrometres. Preferably, the thickness is 80 micrometres.

The downstream end of the cavity may be delimited by the rod. The upstream end of the cavity may be delimited by the filter. The cavity may have a length of at least 1 millimetre. Such a length of cavity can reduce the transfer of heat produced upstream of the cavity to the filter, whether such heat is produced by the ignited aerosol-generating substrate or by the heater of an aerosol-generating device. The cavity may reduce heat transfer such that excessive heating of the filter is avoided. The cavity may have a length of between 1 millimetre and 7 millimetres. The cavity may have a length of at least 2 millimetres. Preferably, the cavity may have a length of between 2 millimetres and 5 millimetres. Even more preferably, the cavity may have a length of 3 millimetres. The cavity may have a length of at least 3 millimetres.

The bridging element may have a length of greater than 25 millimetres. Such a bridging element may be sufficiently long to span the cavity and to circumscribe at least a sufficient portion of each of the rod and the filter. The bridging element may circumscribe the filter along the entire length of the filter. The bridging element may have a length of between 25 millimetres and 40 millimetres. The bridging element may have a length of between 25 millimetres and 30 millimetres.

The first portion of the bridging element may extend along the length of the bridging element by a distance of at least 1.2 times the length of the cavity. The first portion of the bridging element may extend along the length of the bridging element by a distance of at least 1.5 times the length of the cavity. There may be some variability in the position of the first portion of the bridging element with respect to the cavity. This variability may result from manufacturing tolerances. Having the first portion of the bridging element extend along a length of the bridging element by a distance of at least 1.2 or 1.5 times the length of the cavity can help to account for this variability. The inner surface of the first wrapper partially delimits the cavity regardless of the position of the first portion of the bridging element relative to the cavity.

The first portion the bridging element may extend a distance of between 4 millimetres and 10 millimetres along the length of the bridging element. The rod may be circumscribed by the first portion of the bridging element. The first portion of the bridging element may extend along at least 2 millimetres of the length of the rod. The first portion of the bridging element

may extend along between 2 millimetres and 7 millimetres of the length of the rod. The first portion of the bridging element may extend along the entire length of the rod.

The first wrapper may permanently secure the rod to the filter. The first wrapper of the bridging element may comprise an adhesive to permanently secure the filter to the rod. In particular, the inner surface of the first wrapper of the bridging element may comprise adhesive to permanently secure the first wrapper to the filter. Alternatively or additionally, the inner surface of the first wrapper of the bridging element may comprise adhesive to permanently secure the first wrapper to the rod. The first wrapper may be glued to the rod. The first wrapper may be glued to the filter.

The filter may be circumscribed by the first portion of the bridging element. In other words, the first portion of the bridging element extends beyond the cavity, along the length of the aerosol-generating article, to circumscribe the filter. As such, the portion of bridging element having a basis weight of 50 grams per square meter or greater extends beyond the cavity. Such an arrangement can advantageously further improve the strength of the aerosol-generating article. The first portion of the bridging element may extend along at least 1 millimetre of the length of the filter. The first portion of the bridging element may extend along the entire length of the filter.

The rod may be circumscribed by the first portion of the bridging element. In other words, the first portion of the bridging element may extend beyond the cavity, along the length of the aerosol-generating article, to circumscribe the rod. As such, the portion of bridging element having a basis weight of 50 grams per square meter or greater extends beyond the cavity. Such an arrangement can advantageously further improve the strength of the aerosol-generating article. The first portion of the bridging element may extend along the length of the rod by a distance of at least 2 millimetres. The first portion of the bridging element may extend along the length of the rod by a distance of between 2 millimetres and 7 millimetres. The first portion of the bridging element may extend along the entire length of the rod.

The first wrapper may comprise at least one of a cellulose based material, paper, cardboard, reconstituted tobacco or a cellulose based film. Such materials having a basis weight of 50 grams per square meter or greater have a suitable stiffness so as to prevent the cavity from collapsing during normal use of the aerosol-generating article and during the manufacture of the aerosol-generating article. Preferably, the first wrapper comprises paper.

The bridging element may comprise a single wrapper. In other words, first wrapper may be the only wrapper forming the bridging element.

Alternatively, the bridging element may comprise a second wrapper circumscribing the first wrapper. The basis weight of the first portion of the bridging may be a combination of the basis weight of both the first wrapper and the second wrapper. By providing two wrappers, the

basis weight of the first wrapper as part of the first portion can be much lower than 50 grams per square meter. For example, the first wrapper and the second wrapper may both be formed of tipping paper. Tipping paper typically has a basis weight of around 30 grams per square meter. By providing two wrappers, one circumscribing the other, a basis weight of 50 grams per square meter or greater can be achieved using standard and readily available materials.

The second wrapper may comprise at least one of a cellulose based material, paper, cardboard, reconstituted tobacco or a cellulose based film. The second wrapper may be a tipping paper.

The inner surface of the first wrapper in the first portion of the bridging element may extend circumferentially around the cavity by a distance of greater than 5 millimetres. The inner surface of the first wrapper in the first portion of the bridging element may extend circumferentially around the cavity by a distance of greater than 10 millimetres. The inner surface of the first wrapper in the first portion of the bridging element may extend circumferentially around the cavity by a distance of greater than 15 millimetres. Preferably, the inner surface of the first wrapper in the first portion of the bridging element may extend circumferentially around the entire circumference of the cavity. Similarly, the first portion of the bridging element may extend circumferentially around the cavity by a distance of greater than 5 millimeters, greater than 10 millimeters or greater than 15 millimeters. Preferably, the first portion of the bridging element may extend around the entire circumference of the cavity.

The inner surface of the first wrapper in the first portion of the bridging element may be curved to define an arc subtending an angle of greater than 45 degrees. The inner surface of the first wrapper in the first portion of the bridging element may be curved to define an arc subtending an angle of greater than 90 degrees. The inner surface of the first wrapper in the first portion of the bridging element may be curved to define an arc subtending an angle of greater than 180 degrees. The inner surface of the first wrapper of the first portion in the bridging element may be curved to define an arc subtending an angle of greater than 270 degrees. Similarly, the first portion of the bridging element may be curved to define an arc subtending an angle of greater than 45 degrees, greater than 90 degrees, greater than 180 degrees or greater than 270 degrees.

The inner surface of the first wrapper in the first portion of the bridging element may have a surface area of greater than 25 millimetres squared. The inner surface of the first wrapper in the first portion of the bridging element may have a surface area of greater than 50 millimetres squared. Similarly, the first portion of the bridging element may have a surface area of greater than 25 millimeters squared or greater than 50 millimeters squared.

The rod comprising an aerosol-generating substrate may further comprise a wrapper circumscribing the aerosol-generating substrate.

As used herein, the term 'aerosol-generating substrate' is used to describe a substrate capable of releasing upon heating or burning volatile compounds, which can form an aerosol. The aerosol generated from aerosol-generating substrates of aerosol-generating articles described herein may be visible or invisible and may include vapours (for example, fine particles of substances, which are in a gaseous state, that are ordinarily liquid or solid at room temperature) as well as gases and liquid droplets of condensed vapours.

The aerosol-generating article may be of the type that is consumed by ignition of the rod and the aerosol-generating substrate. The aerosol-generating article may be a smoking article. The aerosol-generating article may be a cigarette. In aerosol-generating articles consumed by ignition, the aerosol-generating substrate may comprise any suitable tobacco material. For example, the tobacco material may comprise tobacco cut filler.

The aerosol-generating article may be of the type in which an aerosol is generated by heating, rather than burning, the aerosol-generating substrate. During consumption, volatile compounds are released from the aerosol-generating substrate by heat transfer from a heat source and 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 consumer. The heat source may be provided by an aerosol-generating device having a heater for heating the aerosol-generating article. The aerosol-generating article may be heated aerosol-generating article.

As used herein, the term 'aerosol-generating device' is used to describe a device that interacts with an aerosol-generating substrate of an aerosol-generating article to generate an aerosol. Preferably, the aerosol-generating device is a smoking device that interacts with the aerosol-generating substrate of an aerosol-generating article to generate an aerosol that is directly inhalable into a user's lungs thorough the user's mouth.

In aerosol-generating articles consumed by heating of the aerosol-generating substrate, the aerosol-generating substrate is preferably a solid aerosol-generating substrate. The aerosol-generating substrate may comprise both solid and liquid components. The aerosol-generating substrate may comprise tobacco material.

Alternatively or in addition, the aerosol-generating substrate may comprise a non-tobacco containing aerosol-generating material.

If the aerosol-generating substrate is a solid aerosol-generating substrate, the solid aerosol-generating substrate may comprise, for example, one or more of: powder, granules, pellets, shreds, strands, strips or sheets containing one or more of: herb leaf, tobacco leaf, tobacco ribs, expanded tobacco and homogenised tobacco.

Optionally, the solid aerosol-generating substrate may contain tobacco or non-tobacco volatile flavour compounds, which are released upon heating of the solid aerosol-generating

substrate. The solid aerosol-generating substrate may also contain one or more capsules that, for example, include additional tobacco volatile flavour compounds or non-tobacco volatile flavour compounds and such capsules may melt during heating of the solid aerosol-generating substrate.

Optionally, the solid aerosol-generating substrate may be provided on or embedded in a thermally stable carrier. The carrier may take the form of powder, granules, pellets, shreds, strands, strips or sheets. The solid aerosol-generating substrate may be deposited on the surface of the carrier in the form of, for example, a sheet, foam, gel or slurry. The solid aerosol-generating substrate may be deposited on the entire surface of the carrier, or alternatively, may be deposited in a pattern in order to provide a non-uniform flavour delivery during use.

In a preferred embodiment, the aerosol-generating substrate comprises homogenised tobacco material.

As used herein, the term 'homogenised tobacco material' denotes a material formed by agglomerating particulate tobacco.

Preferably, the aerosol-generating substrate comprises a gathered sheet of homogenised tobacco material.

As used herein, the term 'sheet' denotes a laminar element having a width and length substantially greater than the thickness thereof.

As used herein, the term 'gathered' is used to describe a sheet that is convoluted, folded, or otherwise compressed or constricted substantially transversely to the longitudinal axis of the aerosol-generating article.

Use of an aerosol-generating substrate comprising a gathered sheet of homogenised tobacco material advantageously significantly reduces the risk of 'loose ends' compared to an aerosol-generating substrate comprising shreds of tobacco material, that is the loss of shreds of tobacco material from the ends of the rod. Loose ends may disadvantageously lead to the need for more frequent cleaning of an aerosol-generating device for use with the aerosol-generating article and manufacturing equipment.

The filter may delimit one side of the cavity. The filter may comprise a segment of filtration material. The filter may also comprise a filter wrapper circumscribing the segment of filtration material. The segment of filtration material may extend along the whole length of the filter. The filtration material may comprise at least one of cellulose acetate, cellulose, reconstituted cellulose, polylactic acid, polyvinyl alcohol, nylon, polyhydroxybutyrate, thermoplastic material, starch, non-woven materials, longitudinally orientate fibres and randomly orientated fibres, crepe, PLA fibres and combinations thereof.

The filter of heated aerosol-generating articles may comprise components in addition to the segment of filtration material. Each of these components may be assembled within the

filter wrapper. Each of the components may be in axial alignment.

The filter of a heated aerosol-generating article may comprise an aerosol-cooling element located upstream of the segment of filtration material. The cavity of the aerosol-generating article may be located immediately upstream of the aerosol-cooling element.

As used herein, the term 'aerosol-cooling element' is used to describe an element having a large surface area and a low resistance to draw. In use, an aerosol formed by volatile compounds released from the aerosol-generating substrate passes over and is cooled by the aerosol-cooling element before being inhaled by a user.

The aerosol-cooling element may have a total surface area of between approximately 300 square millimetres per millimetre length and approximately 1000 square millimetres per millimetre length. In a preferred embodiment, the aerosol-cooling element has a total surface area of approximately 500 square millimetres per millimetre length.

In the disclosure there is also provided a container comprising a plurality of aerosol-generating articles, wherein at least 50 percent of the aerosol-generating articles comprise a rod comprising an aerosol-generating substrate; a filter in axial alignment with the rod; a bridging element comprising a first wrapper, the first wrapper circumscribing the rod and the filter and securing the filter to the rod; and a cavity located between the rod and the filter, the cavity being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element, wherein the first portion of the bridging element has a basis weight of 50 grams per square meter or greater. Said aerosol-generating article may have any of the features described above. Said aerosol-generating articles may make up at least 60 percent of the aerosol-generating articles, at least 70 percent, at least 80 percent, or at least 90 percent of the plurality of aerosol-generating articles.

The container may comprise at least 5 aerosol-generating articles. The container may comprise at least 10 aerosol-generating articles.

The container may be a box. The container may be a lidded box. The lid may be a hinged lid.

In the disclosure there is also provided a method of manufacturing an aerosol-generating-article. The method may comprise providing a rod comprising an aerosol-generating substrate. The method may also comprise providing a filter. The method may also comprise providing a bridging element. The bridging element may comprise a first wrapper. The method may also comprise securing the filter to the rod using the bridging element such that the first wrapper circumscribes the rod and the filter in a spaced-apart relationship to form a cavity between the rod and the filter. The cavity may be partially delimited by the inner surface of the first wrapper in a first portion of the bridging element. The first portion of the bridging element may have a basis weight of 50 grams per square meter or higher.

In one example, the method of manufacturing an aerosol-generating article comprises: providing a rod comprising an aerosol-generating substrate; providing a filter; providing a bridging element comprising a first wrapper; and securing the filter to the rod using the bridging element such that the first wrapper circumscribes the rod and the filter in a spaced-apart relationship to form a cavity between the rod and the filter, the cavity being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element, wherein the first portion of the bridging element has a basis weight of 50 grams per square meter or higher.

The step of securing the filter to the rod may comprise wrapping the bridging element around the rod. The step of securing the filter to the rod may comprise wrapping the bridging element around the filter. The step of securing the filter to the rod may comprise permanently securing the filter to the rod. The step of securing the filter to the rod may comprise gluing the inner surface of the wrapper to the rod. The step of securing the filter to the rod may comprise gluing the inner surface of the wrapper to the filter. The inner surface of the first wrapper of the bridging element may comprise adhesive. The adhesive may permanently secure the bridging element to the rod. The adhesive may permanently secure the bridging element to the filter.

Below, there is provided a non-exhaustive list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein.

EX1. An aerosol-generating article comprising:

a rod comprising an aerosol-generating substrate;

a filter in axial alignment with the rod;

a bridging element comprising a first wrapper, the first wrapper circumscribing the rod and the filter and securing the filter to the rod; and

a cavity located between the rod and the filter, the cavity being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element,

wherein the first portion of the bridging element has a basis weight of 50 grams per square meter or greater.

EX2. An aerosol-generating according to example EX1, wherein the portion of bridging element delimiting the cavity has a basis weight of between 50 to 110 grams per square meter.

EX3. An aerosol-generating article according to example EX1 or EX2, wherein the first portion of the bridging element has a thickness of between 50 micrometres and 140 micrometres.

EX4. An aerosol-generating article according to any one of examples EX1 to EX3, wherein the first portion of the bridging element has a thickness of 80 micrometres.

EX5. An aerosol-generating article according to any one of examples EX1 to EX4, wherein the downstream end of the cavity is delimited by the rod and the upstream end of the cavity is delimited by the filter.

EX6. An aerosol-generating article according to any one of examples EX1 to EX5, wherein the cavity has a length of at least 1 millimetre.

EX7. An aerosol-generating article according to any one of examples EX1 to EX6, wherein the cavity has a length of between 1 millimetre and 7 millimetres.

EX8. An aerosol-generating article according to any one of examples EX1 to EX7, wherein the cavity has a length of between 2 millimetres and 5 millimetres.

EX9. An aerosol-generating article according to any one of examples EX1 to EX8, wherein the cavity has a length of 3 millimetres.

EX10. An aerosol-generating article according to any one of examples EX1 to EX9, wherein the first portion of the bridging element of the bridging element extends along the length of the bridging element by a distance of at least 1.2 times the length of the cavity.

EX11. An aerosol-generating article according to any one of examples EX1 to EX10, wherein the first portion of the bridging element extends a distance of between 4 millimetres and 10 millimetres along the length of the bridging element.

EX12. An aerosol-generating article according to any one of examples EX1 to EX11, wherein the filter is circumscribed by the first portion of the bridging element.

EX13. An aerosol-generating article according to any one of examples EX1 to EX12, wherein the first portion of the bridging element extends along at least 2 millimetres of the length of the filter.

EX14. An aerosol-generating article according to any one of examples EX1 to EX13, wherein the first portion of the bridging element extends along the entire length of the filter.

EX15. An aerosol-generating article according to any one of examples EX1 to EX14, wherein the inner surface of the first wrapper of the bridging element comprises adhesive to permanently secure the first wrapper to the filter.

EX16. An aerosol-generating article according to any one of examples EX1 to EX15, wherein the rod is circumscribed by the first portion of the bridging element.

EX17. An aerosol-generating article according to any one of examples EX1 to EX16, wherein the first portion of the bridging element extends along at least 2 millimetres of the length of the rod.

EX18. An aerosol-generating article according to any one of examples EX1 to EX17, wherein the first portion of the bridging element extends along between 2 millimetres and 7 millimetres of the length of the rod.

EX19. An aerosol-generating article according to any one of examples EX1 to EX18, wherein the first portion of the bridging element extends along the entire length of the rod.

EX20. An aerosol-generating article according to any one of examples EX1 to EX19, wherein the first wrapper permanently secures the filter to the rod.

EX21. An aerosol-generating article according to any one of examples EX1 to EX20, wherein the inner surface of the first wrapper of the bridging element comprises adhesive to permanently secure the first wrapper to the rod.

EX22. An aerosol-generating article according to any one of examples EX1 to EX21, wherein the first wrapper comprises at least one of a cellulose based material, paper, cardboard, reconstituted tobacco or a cellulose based film.

EX23. An aerosol-generating article according to any one of examples EX1 to EX22, wherein the bridging element comprises a single wrapper.

EX24. An aerosol-generating article according to any one of examples EX1 to EX23, wherein the bridging element comprises a second wrapper circumscribing the first wrapper.

EX25. An aerosol-generating article according to any one of examples EX1 to EX24, wherein the second wrapper comprises at least one of a cellulose based material, paper, cardboard, reconstituted tobacco or a cellulose based film.

EX26. An aerosol-generating article according to any one of examples EX1 to EX25, wherein the inner surface of the first wrapper in the first portion of the bridging element extends circumferentially around the cavity by a distance of greater than 5 millimetres.

EX27. An aerosol-generating article according to any one of examples EX1 to EX26, wherein the inner surface of the first wrapper in the first portion of the bridging element extends circumferentially around the cavity by a distance of greater than 10 millimetres.

EX28. An aerosol-generating article according to any one of examples EX1 to EX27, wherein the inner surface of the first wrapper in the first portion of the bridging element extends circumferentially around the cavity by a distance of greater than 15 millimetres.

EX29. An aerosol-generating article according to any one of examples EX1 to EX28, wherein the inner surface of the first wrapper in the first portion of the bridging element extends around the entire circumference of the cavity.

EX30. An aerosol-generating article according to any one of examples EX1 to EX29, wherein the inner surface of the first wrapper of the first portion of the bridging element is curved to define an arc subtending an angle of greater than 45 degrees.

EX31. An aerosol-generating article according to any one of examples EX1 to EX30, wherein the inner surface of the first wrapper of the first portion of the bridging element is curved to define an arc subtending an angle of greater than 90 degrees.

EX32. An aerosol-generating article according to any one of examples EX1 to EX31, wherein the inner surface of the first wrapper of the first portion of the bridging element is curved to define an arc subtending an angle of greater than 180 degrees.

EX33. An aerosol-generating article according to any one of examples EX1 to EX32, wherein the inner surface of the first wrapper of the first portion of the bridging element is curved to define an arc subtending an angle of greater than 270 degrees.

EX34. An aerosol-generating article according to any one of examples EX1 to EX33, wherein the inner surface of the first wrapper of the first portion of the bridging element has a surface area of greater than 25 millimetres squared.

EX35. An aerosol-generating article according to any one of examples EX1 to EX34, wherein the first portion of the bridging element extends circumferentially around the cavity by a distance of greater than 5 millimetres.

EX36. An aerosol-generating article according to any one of examples EX1 to EX35, wherein the first portion of the bridging element extends circumferentially around the cavity by a distance of greater than 10 millimetres.

EX37. An aerosol-generating article according to any one of examples EX1 to EX36, wherein the first portion of the bridging element extends circumferentially around the cavity by a distance of greater than 15 millimetres.

EX38. An aerosol-generating article according to any one of examples EX1 to EX37, wherein the first portion of the bridging element extends around the entire circumference of the cavity.

EX39. An aerosol-generating article according to any one of examples EX1 to EX38, wherein the first portion of the bridging element is curved to define an arc subtending an angle of greater than 45 degrees.

EX40. An aerosol-generating article according to any one of examples EX1 to EX39, wherein the first portion of the bridging element is curved to define an arc subtending an angle of greater than 90 degrees.

EX41. An aerosol-generating article according to any one of examples EX1 to EX40, wherein the first portion of the bridging element is curved to define an arc subtending an angle of greater than 180 degrees.

EX42. An aerosol-generating article according to any one of examples EX1 to EX41, wherein the first portion of the bridging element is curved to define an arc subtending an angle of greater than 270 degrees.

EX43. An aerosol-generating article according to any one of examples EX1 to EX42, wherein the first portion of the bridging element has a surface area of greater than 25 millimetres squared.

EX44. A container comprising a plurality of aerosol-generating articles, comprising a plurality of aerosol-generating articles, wherein at least 50 percent of the aerosol-generating articles are aerosol-generating articles according to any one of examples EX1 to EX43.

EX45. A container according to example EX44 comprises at least 5 aerosol-generating articles.

EX46. A container according to example EX44 or EX45, wherein the container comprises at least 10 aerosol-generating articles.

EX47. A container according to any one of examples EX44 to EX46, wherein at least 90 percent of the aerosol-generating article may be aerosol-generating articles according to examples EX1 to EX43.

EX48. A container according to any one of examples EX44 to EX47, wherein the container is a box.

EX49. A container according to any one of examples EX44 to EX48, wherein the container is a lidded box.

EX50. A container according to example EX49, wherein the lid may is a hinged lid.

EX51. A method of manufacturing an aerosol-generating article comprising:

providing a rod comprising an aerosol-generating substrate;

providing a filter;

providing a bridging element comprising a first wrapper; and

securing the filter to the rod using the bridging element such that the first wrapper circumscribes the rod and the filter in a spaced-apart relationship to form a cavity between the rod and the filter, the cavity being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element,

wherein the first portion of the bridging element has a basis weight of 50 grams per square meter or higher.

EX52. A method of manufacturing an aerosol-generating article according to example EX51, wherein the step of permanently securing the filter to the rod comprises wrapping the bridging element around the rod.

EX53. A method of manufacturing an aerosol-generating article according to example EX51 or EX52, wherein the step of permanently securing the filter to the rod comprises wrapping the bridging element around the filter.

EX54. A method of manufacturing an aerosol-generating article according to any one of examples EX51 to EX53, wherein the step of securing the filter to the rod comprises permanently securing the filter to the rod.

EX55. A method of manufacturing an aerosol-generating article according to any one of examples EX51 to EX54, wherein the step of securing the filter to the rod comprises gluing the inner surface of the wrapper to the rod.

EX56. A method of manufacturing an aerosol-generating article according to any one of examples EX51 to EX55, wherein the step of securing the filter to the rod comprises gluing the inner surface of the wrapper to the filter.

EX57. A method of manufacturing an aerosol-generating article according to any one of examples EX51 to EX56, wherein the inner surface of the first wrapper in the first portion of bridging element comprises adhesive.

EX58. A method of manufacturing an aerosol-generating article according to example EX57, wherein the adhesive permanently secures the bridging element to the rod.

EX59. A method of manufacturing an aerosol-generating article according to example EX57 or EX58, wherein the adhesive permanently secures the bridging element to the filter.

Features described in relation to one example or embodiment may also be applicable to other examples and embodiments. In particular, features of the rod, filter, bridging element and cavity described in relation to the aerosol-generating article may also be applicable to the rod, filter, bridging element and cavity described in relation to the method of manufacturing the aerosol-generating article.

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

Figure 1 shows an aerosol-generating article in accordance with the disclosure, the aerosol-generating article comprising a bridging element comprising a single wrapper;

Figure 2 shows another aerosol-generating article in accordance with the disclosure, the aerosol-generating article comprising a bridging element comprising a first wrapper and a second wrapper;

Figure 3 shows the inner surface of a bridging element in an unwrapped state;

Figure 4 shows a bridging element as part of an aerosol-generating article, in accordance with the disclosure, but with the bridging element unwrapped to show the inner surface of the bridging element with respect to the other features of the aerosol-generating article; and

Figure 5 shows an aerosol-generating article in accordance with the invention, configured to generate an aerosol by heating rather than burning the aerosol-generating substrate.

Figure 1 shows an aerosol-generating article 10 having an upstream end and a downstream end and comprising a tobacco rod 20 which is attached at its downstream end to

an axially aligned filter 30. Aerosol-generating article 10 is a cigarette which is configured to be consumed by ignition of the tobacco rod 30.

The tobacco rod 20 comprises a charge of cut filler 22 that is circumscribed by a tobacco rod wrapper 24. The filter 30 comprises a single segment of cellulose acetate tow 32 circumscribed by a filter wrapper 34.

The aerosol-generating article 10 also comprises a bridging element 40 comprising a single wrapper 42. The single wrapper 42 circumscribes the tobacco rod 20 and the filter 30. The single wrapper comprises adhesive (not shown in Figure 1) to permanently secure the filter 30 to the tobacco rod 20. The bridging element 40 has a basis weight of greater 50 grams per square meter. The bridging element has a thickness of 80 micrometres.

A cavity 44 is located between the tobacco rod 20 and the filter 30. The cavity 44 is delimited by the ends of the tobacco rod 20 and the filter 30 and by the inner surface of the single wrapper 42 of the bridging element 40. The inner surface of the single wrapper extends circumferentially around the cavity 44, extending around the complete circumference of the cavity 44. The cavity 44 being partially delimited by the single wrapper 42 of the bridging element 40 having a basis weight of 50 grams per square meter or greater provides strength to the aerosol-generating article in the region of the cavity. This can reduce the risk of the cavity 44 collapsing, particularly when the aerosol-generating article experiences longitudinal forces, for example, when being inserted into a cigarette pack.

The cavity 44 has a length of 3 millimeters. In other words, the separation between the tobacco rod 20 and the filter 30 is 3 millimeters.

Figure 2 shows an aerosol-generating article 100. The aerosol-generating article 100 comprises a bridging element 50 comprising a first wrapper 52 and a second wrapper 53. In all other respects, the aerosol-generating article 100 is the same as the aerosol-generating article 10 of Figure 1.

The first wrapper 52 of the bridging element 50 circumscribes the tobacco rod 20 and the filter 30. The first wrapper 52 comprises adhesive (not shown in Figure 2) to permanently secure the filter 30 to the tobacco rod 20. The second wrapper 53 circumscribes the first wrapper 52.

The bridging element 50 has a basis weight of 50 grams per square meter or higher. Both the first wrapper 52 and the second wrapper 53 contribute to the basis weight of bridging element 50. For example, the first wrapper 52 may have a basis weight of 25 grams per square meter or higher, and the second wrapper 53 may have a basis weight of 25 grams per square meter or higher. The cavity located between the tobacco rod 20 and the filter 30 is delimited by the ends of the tobacco rod 20 and the filter 30 and by the inner surface of the first wrapper 52.

It is not necessary for the entire length of each bridging element 40, 50 of the aerosol-generating articles shown respectively in Figures 1 and 2 to have a basis weight of 50 grams per square meter or higher. Figure 3 shows an example of a bridging element where the portion of the bridging element having a basis weight of 50 grams per square meter or higher does not extend along the full length of the bridging element.

Figure 3 shows a bridging element 60 comprising a first wrapper 62 and a second wrapper 64. The bridging element 60 is shown separately to any aerosol-generating article and from the perspective of the inner surface of the bridging element. The bridging element 60 comprises a first portion 65 having basis weight of 50 grams per square meter or higher. This first portion 65 is made up of both the first wrapper 62 and the second wrapper 64. Therefore, this region or portion has a higher basis weight than the basis weight of either of the wrappers on their own.

The bridging element 60 also comprises lines of adhesive 66. The inner surface of the first wrapper 62 comprises two lines of adhesive 66. One of these line of adhesive 66 is used to secure the bridging element to the filter 20, the other 66 is used to secure the bridging element 60 to the rod 30. The inner surface of the second wrapper 64 comprises one line of adhesive 66 to secure the bridging element to the filter. This is shown more clearly in Figure 4.

Figure 4 shows the bridging element 60 as part of an aerosol-generating article 200 but unwrapped to show the inner surface of the first wrapper 62 and second wrapper 64 with respect to the other features of the aerosol-generating article 200. Figure 4 shows how the first portion 65 is aligned with cavity so that the cavity 44 is delimited by the first portion 65 when the aerosol-generating article 200 is fully assembled.

The cavity 44 has a length of 3 millimeters. The first portion 65 extends along the length of the single wrapper 62 by a distance of 7 millimetres. Therefore, the first portion extends along the bridging element 60 by a distance, which is greater than the length of the cavity 44. This ensures that cavity 44 is delimited by the first portion 65 of the bridging element 60 along the entire length of the cavity 44, even if manufacturing tolerances cause the bridging element 60 and the cavity 44 to not be centrally aligned. As a result, the first portion 65 of the bridging element 60 circumscribes a portion of the tobacco rod 20 and a portion of the filter 30. The first portion 65 of the bridging element 60 extends a distance of 2 millimetres along the length of the filter and 2 millimetres along the length of the rod and is secured to both the rod and filter by the line of adhesive 68.

Figure 5 shows an aerosol-generating article 300 configured to generate an aerosol by heating rather than burning the aerosol-generating substrate. The aerosol-generating article 300 comprises a rod 70 at an upstream end. The rod 70 comprises an aerosol-generating

substrate 72.The aerosol-generating article 300 also comprises a filter 80 at a downstream end. The filter 80 comprises an aerosol-cooling element 76 and a segment of filtration material 78 downstream of the aerosol-cooling element 76. The filter 80 and rod 70 are in axial alignment with one another and each of the components of the filter 70 are in axial alignment.

The aerosol-generating article 300 also comprises a bridging element 82 comprising a single wrapper. The single wrapper comprises adhesive (not shown in Figure 5) to permanently secure the filter 80 to the rod 70. The bridging element 82 has a basis weight of 50 grams per square meter or higher.

A cavity 84 is located between the rod 70 and the filter 80. The cavity 84 is delimited by the ends of the rod 70 and the filter 80 and by the inner surface of the single wrapper of the bridging element 80. The inner surface of the single wrapper extends circumferentially around the cavity 84, extending around the complete circumference of the cavity 84. The cavity 84 being partially delimited by the single wrapper of the bridging element 80 having a basis weight of 50 grams per square meter or greater provides strength to the aerosol-generating article in the region of the cavity and so prevents the cavity 84 from collapsing, particularly when the aerosol-generating article experiences longitudinal forces, for example, when being inserted into packaging or when being inserted into an aerosol-generating device.

It should be clear to the skilled person that the bridging element 40, 50 and 60, as described above in relation to Figures 1, 2 and 4, can be applied to the heated aerosol-generating article of Figure 5.

CLAIMS

1. An aerosol-generating article comprising:

a rod comprising an aerosol-generating substrate;

a filter in axial alignment with the rod;

a bridging element comprising a first wrapper, the first wrapper circumscribing the rod and the filter and securing the filter to the rod; and

a cavity located between the rod and the filter, the cavity being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element,

wherein the first portion of the bridging element has a basis weight of 50 grams per square meter or greater.

2. An aerosol-generating article according to claim 1, wherein the cavity has a length of at least 2 millimetres.

3. An aerosol-generating article according to claim 1 or 2, wherein the first portion of bridging element has a basis weight of 70 grams per square meter or greater.

4. An aerosol-generating article according to any one of the preceding claims, wherein the first portion of the bridging element has a thickness of between 50 micrometres and 140 micrometres.

5. An aerosol-generating article according to any one of the preceding claims, wherein the downstream end of the cavity is delimited by the rod and the upstream end of the cavity is delimited by the filter.

6. An aerosol-generating article according to any one of the preceding claims, wherein the first portion of the bridging element extends along the length of the bridging element by a distance of at least 1.2 times the length of the cavity.

7. An aerosol-generating article according to any one of the preceding claims, wherein the first portion of the bridging element extends a distance of between 4 millimetres and 10 millimetres along the length of the bridging element.

8. An aerosol-generating article according to any one of the preceding claims, wherein the filter is circumscribed by the first portion of the bridging element.

9. An aerosol-generating article according to any one of the preceding claims, wherein the rod is circumscribed by the first portion of the bridging element.

10. An aerosol-generating article according to any one of the preceding claims, wherein the bridging element comprises a single wrapper.

11. An aerosol-generating article according to any one of claims 1 to 9, wherein the bridging element comprises a second wrapper circumscribing the first wrapper.

12. An aerosol-generating article according to any one of the preceding claims, wherein the inner surface of the first wrapper in the first portion of the bridging element extends circumferentially around the cavity by a distance of greater than 5 millimetres.

13. An aerosol-generating article according to any one of the preceding claims, wherein the inner surface of the first wrapper in the first portion of the bridging element has a surface area of greater than 25 millimetres squared.

14. A container comprising a plurality of aerosol-generating articles, wherein at least 50 percent of the aerosol-generating articles in the container are aerosol-generating articles according to claims 1 to 13.

15. A method of manufacturing an aerosol-generating article comprising:

providing a rod comprising an aerosol-generating substrate;

providing a filter;

providing a bridging element comprising a first wrapper; and

securing the filter to the rod using the bridging element such that the first wrapper circumscribes the rod and the filter in a spaced-apart relationship to form a cavity between the rod and the filter, the cavity being partially delimited by the inner surface of the first wrapper in a first portion of the bridging element,

wherein the first portion of the bridging element has a basis weight of 50 grams per square meter or higher.

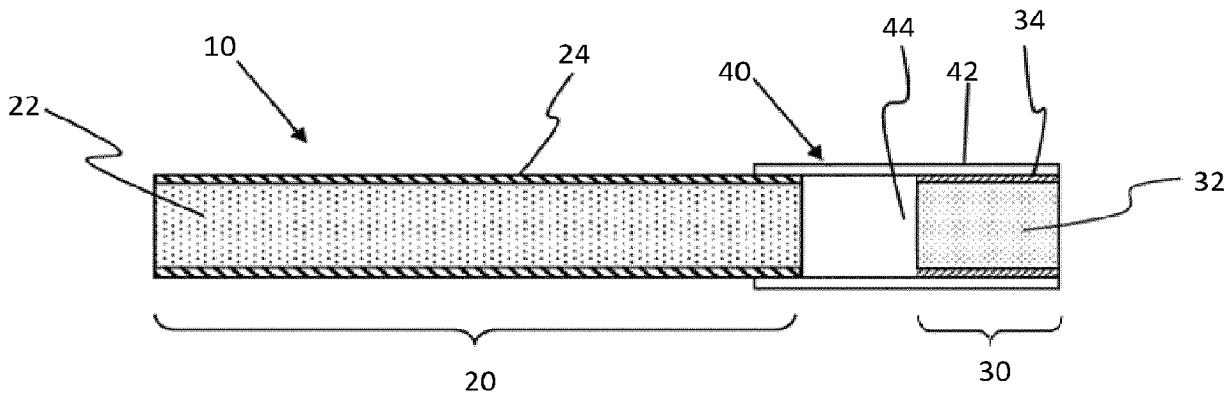

Figure 1

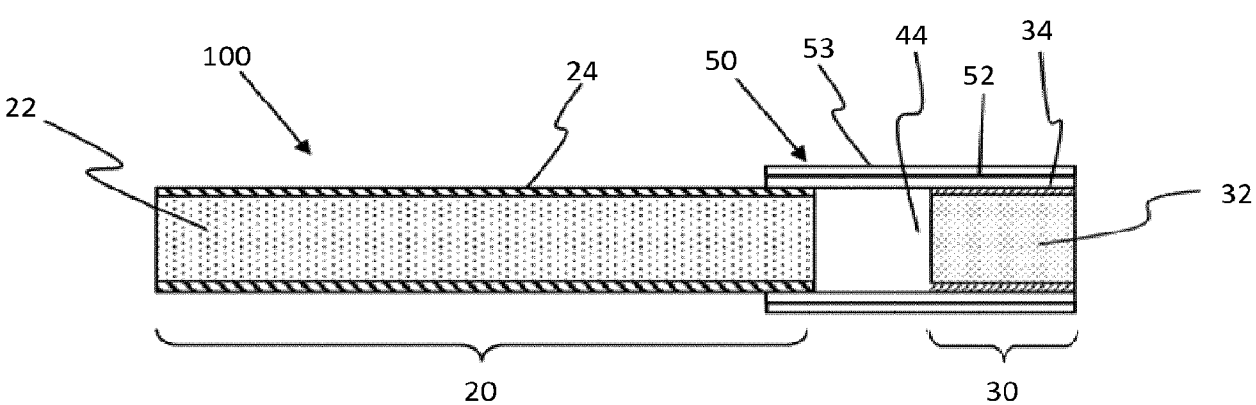

Figure 2

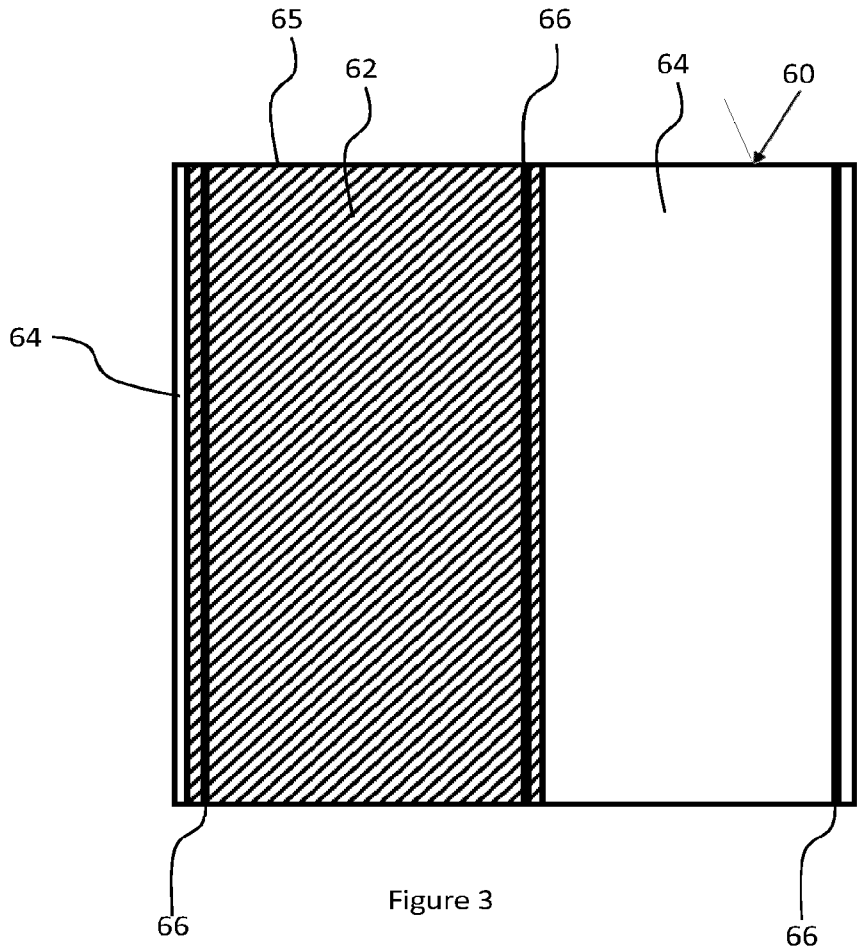

Figure 3

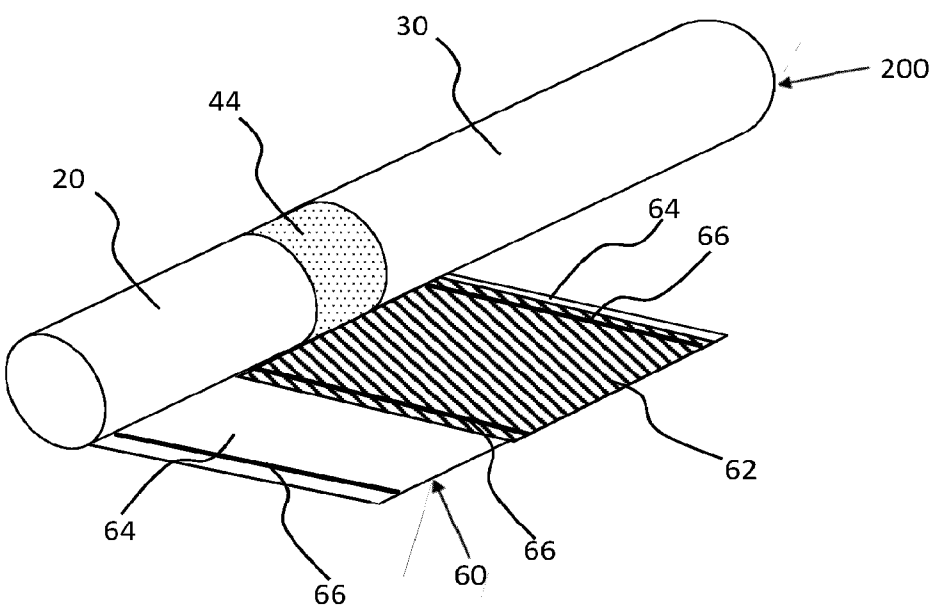

Figure 4

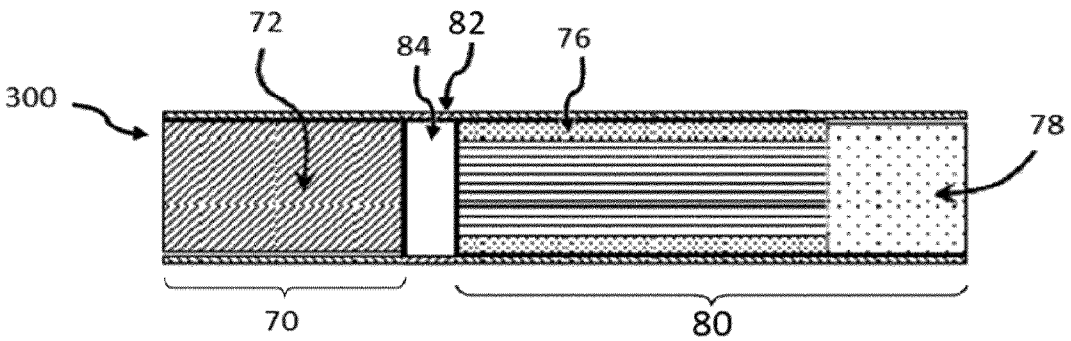

Figure 5

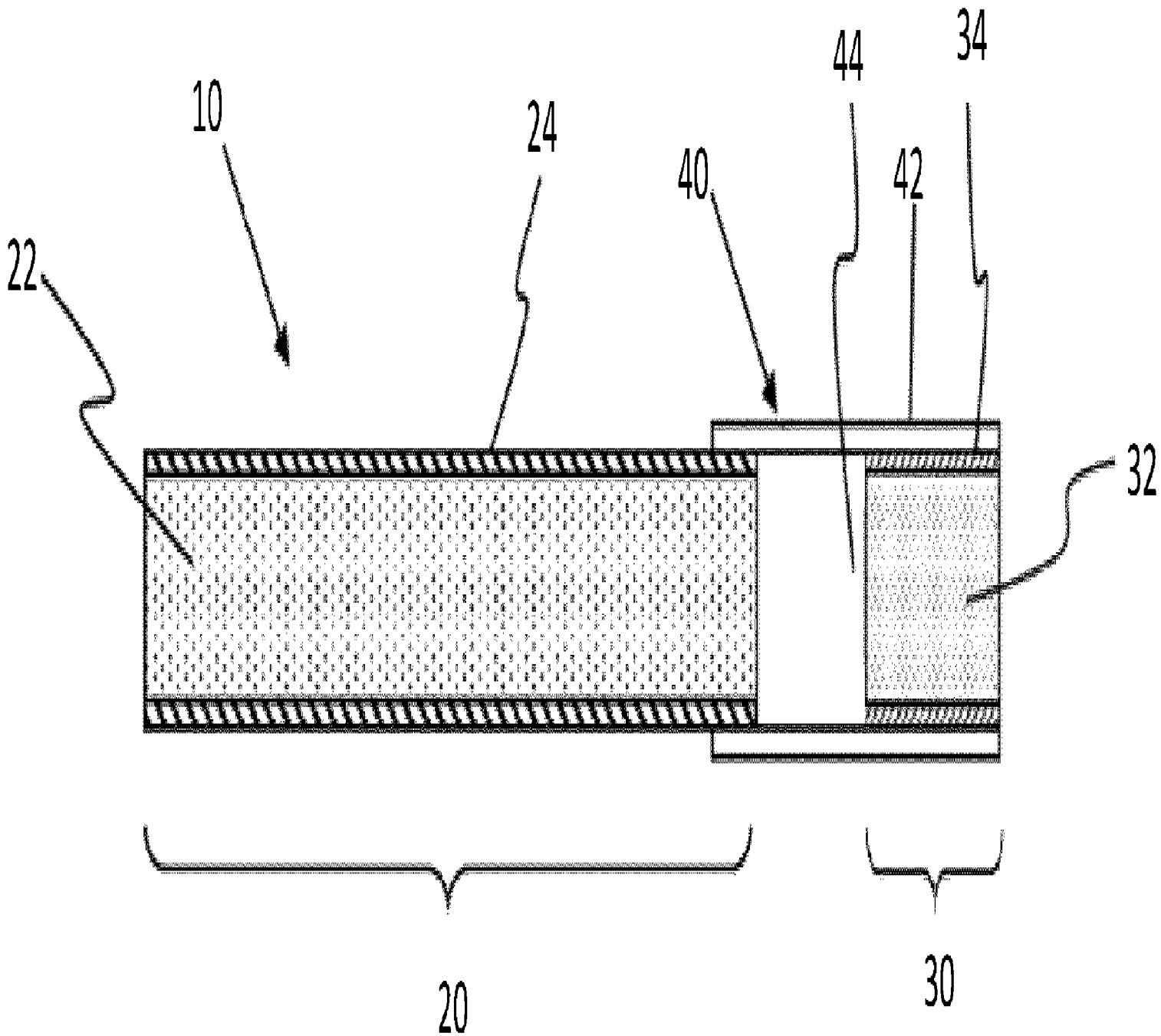

Figure 1