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(54) **AEROSOL DELIVERY DEVICE
COMPRISING MULTIPLE OUTER BODIES
AND RELATED ASSEMBLY METHOD**

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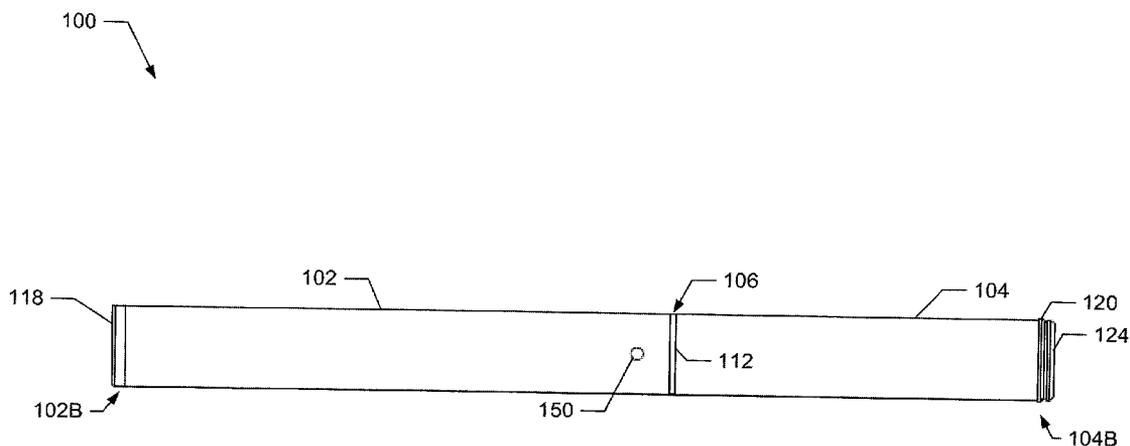
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(57) **ABSTRACT**

The present disclosure relates to an aerosol delivery device. The aerosol delivery device may include a first outer body, a second outer body, and a coupler received therebetween. A securing mechanism may couple the outer bodies together to retain the aerosol delivery device in an assembled configuration. Related assembly methods are also provided.

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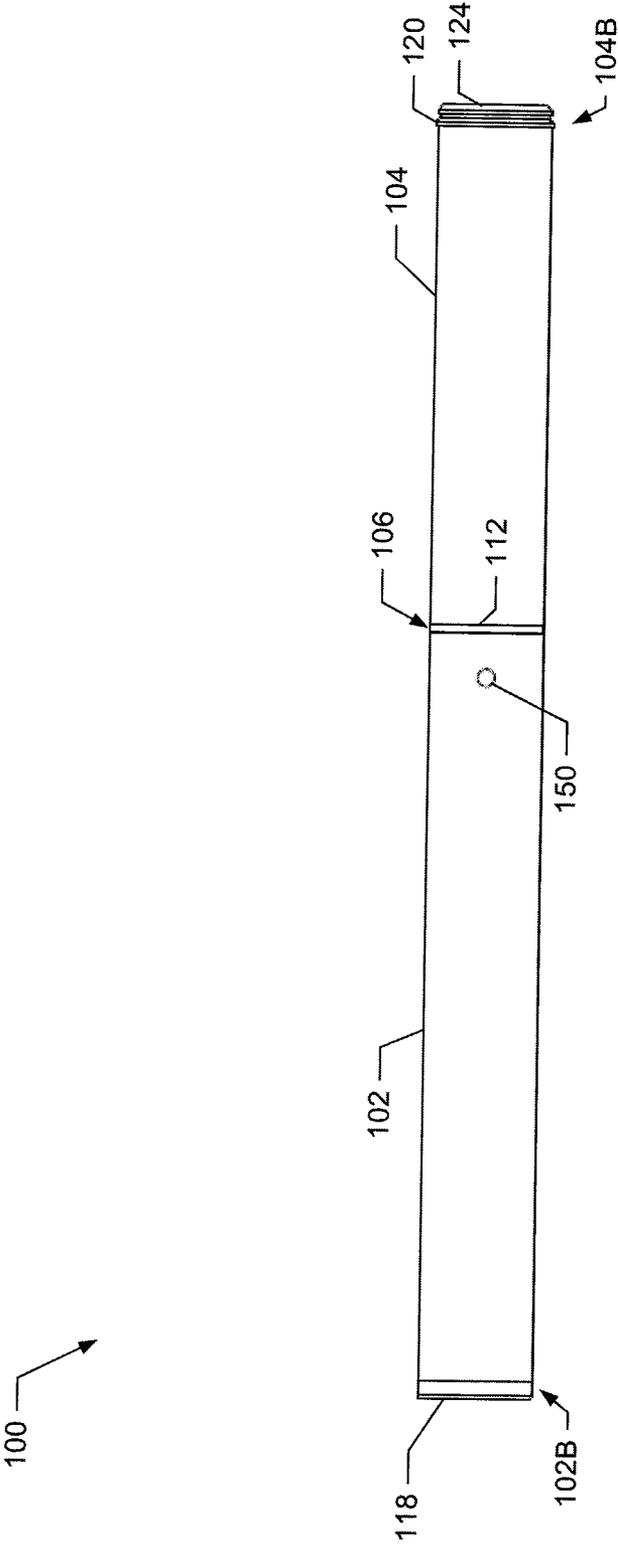


FIG. 1

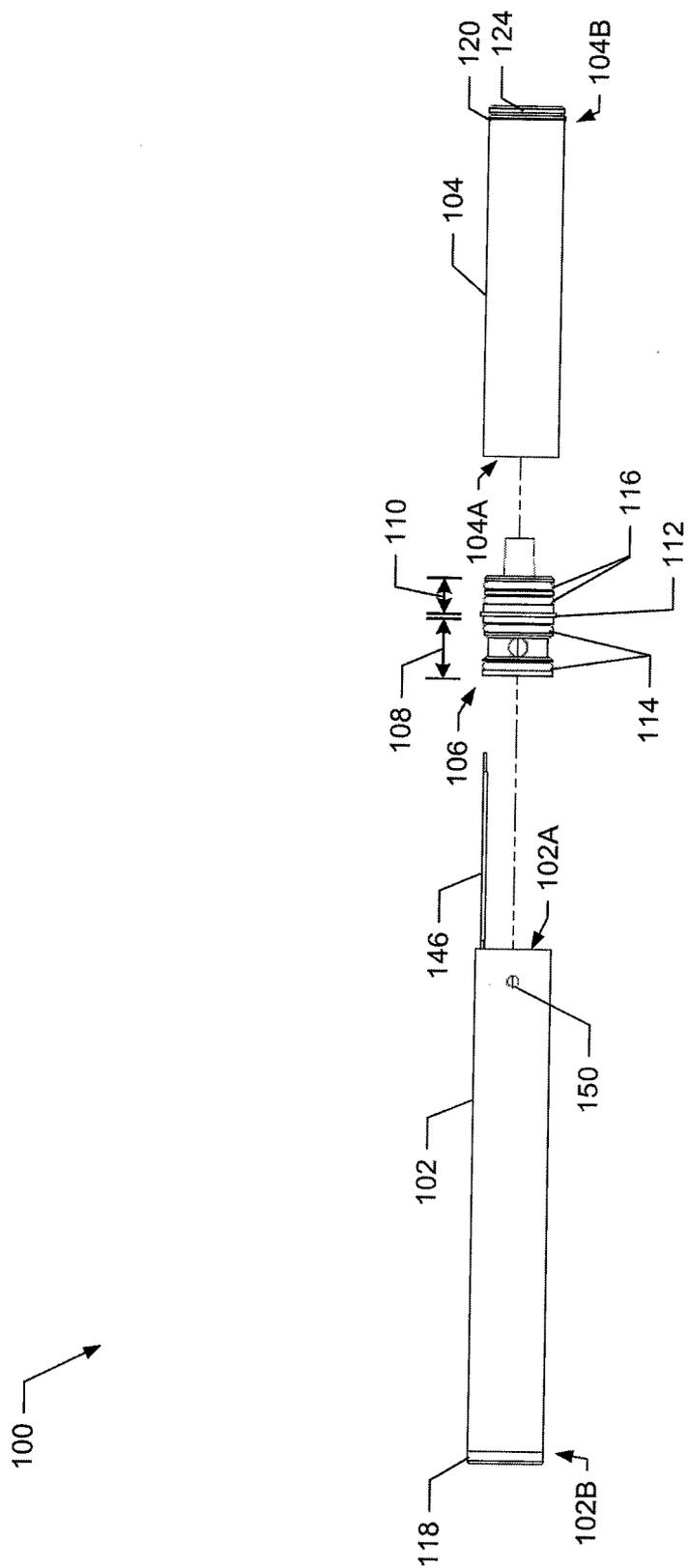


FIG. 2

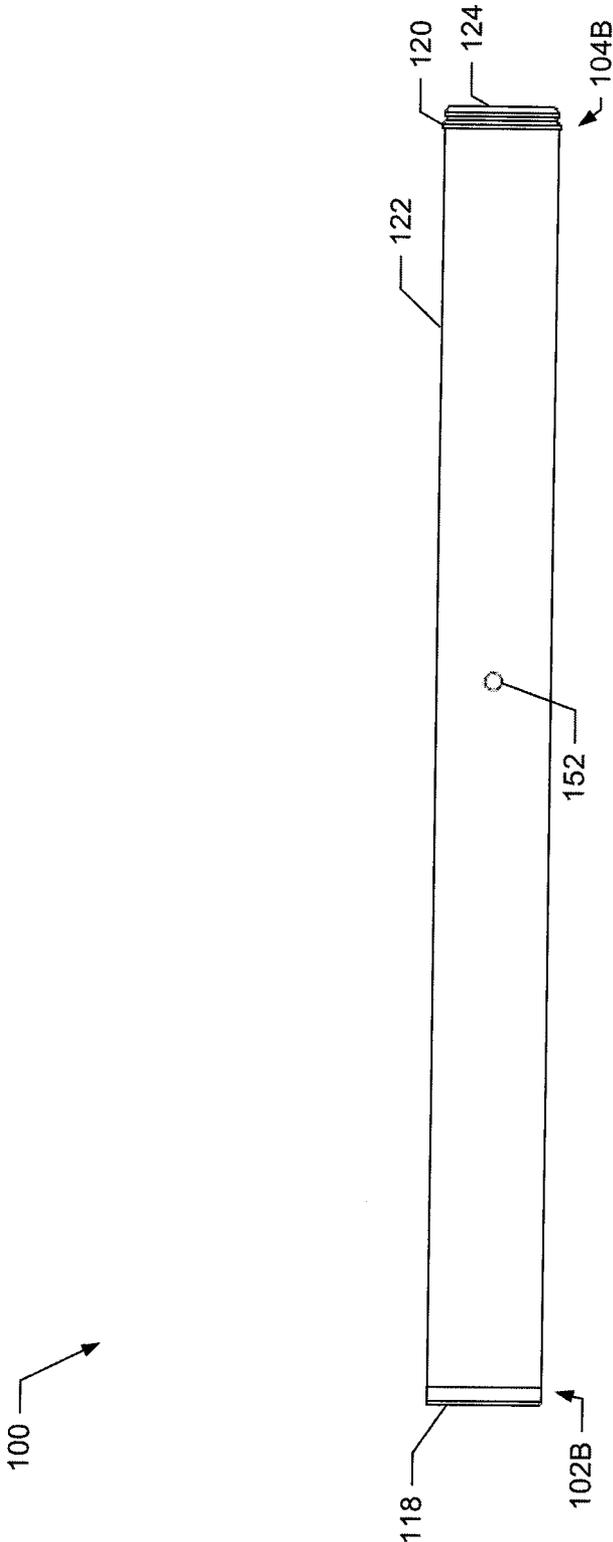


FIG. 3

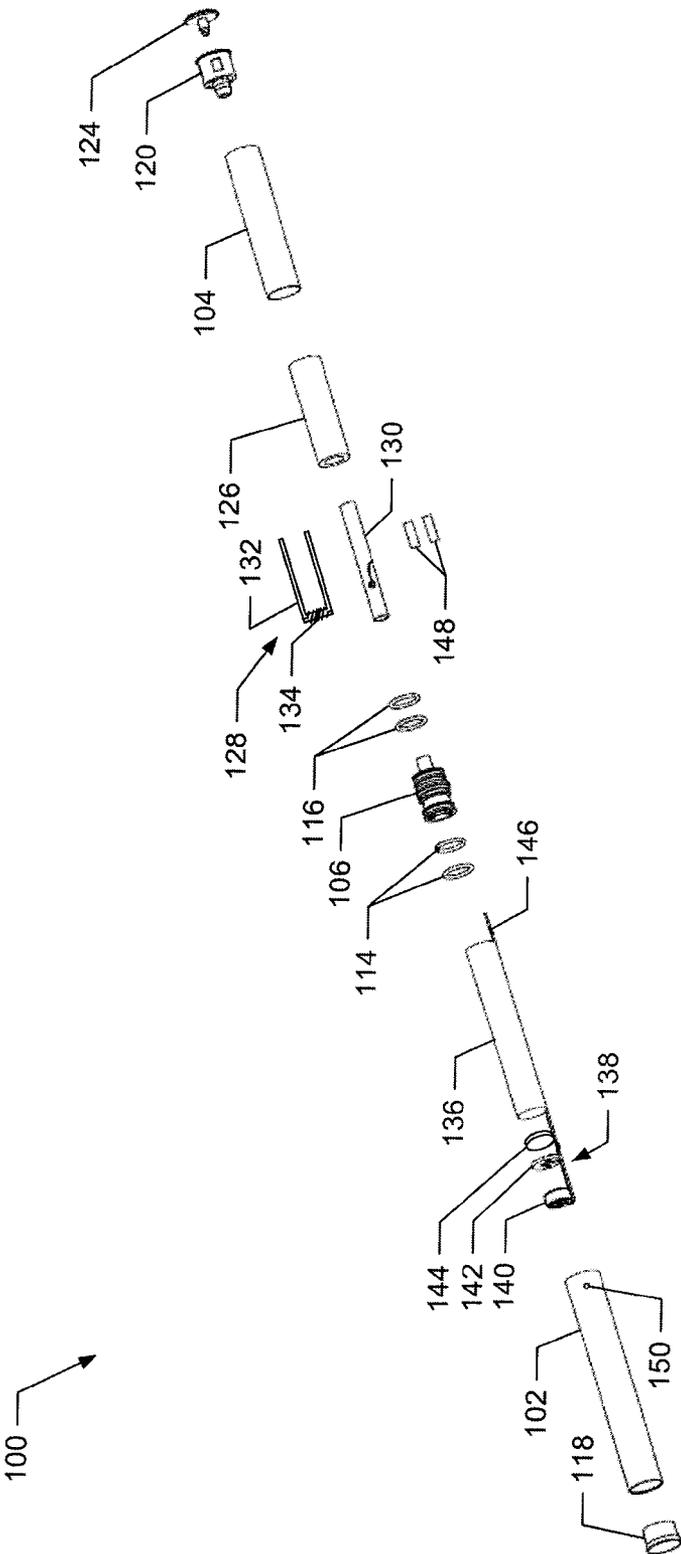


FIG. 4

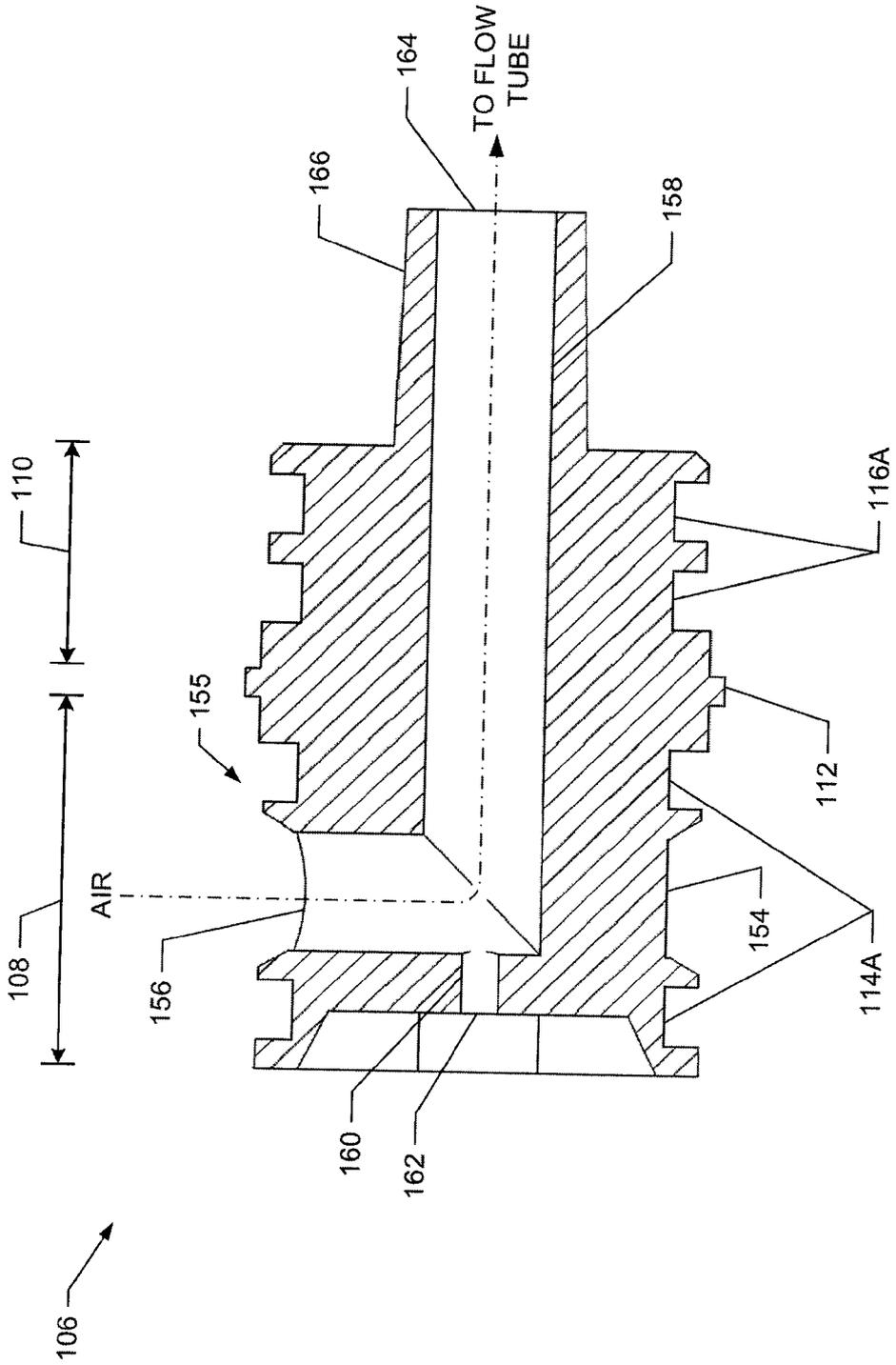


FIG. 6

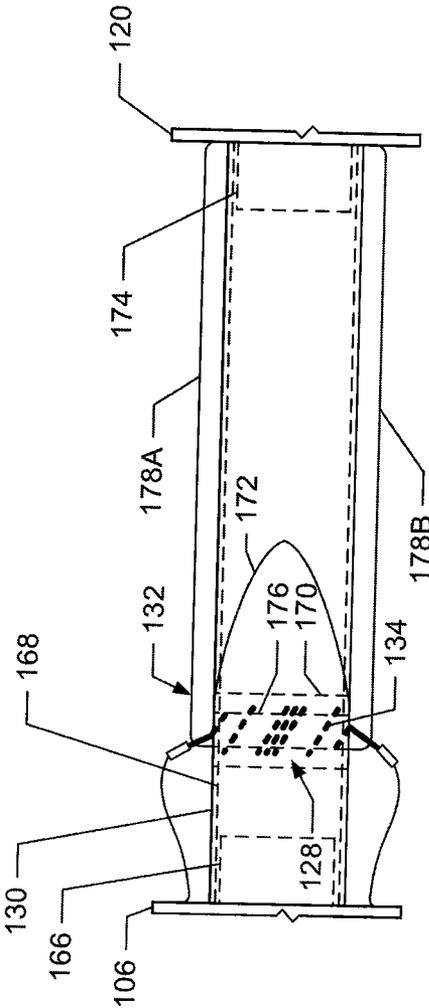


FIG. 7

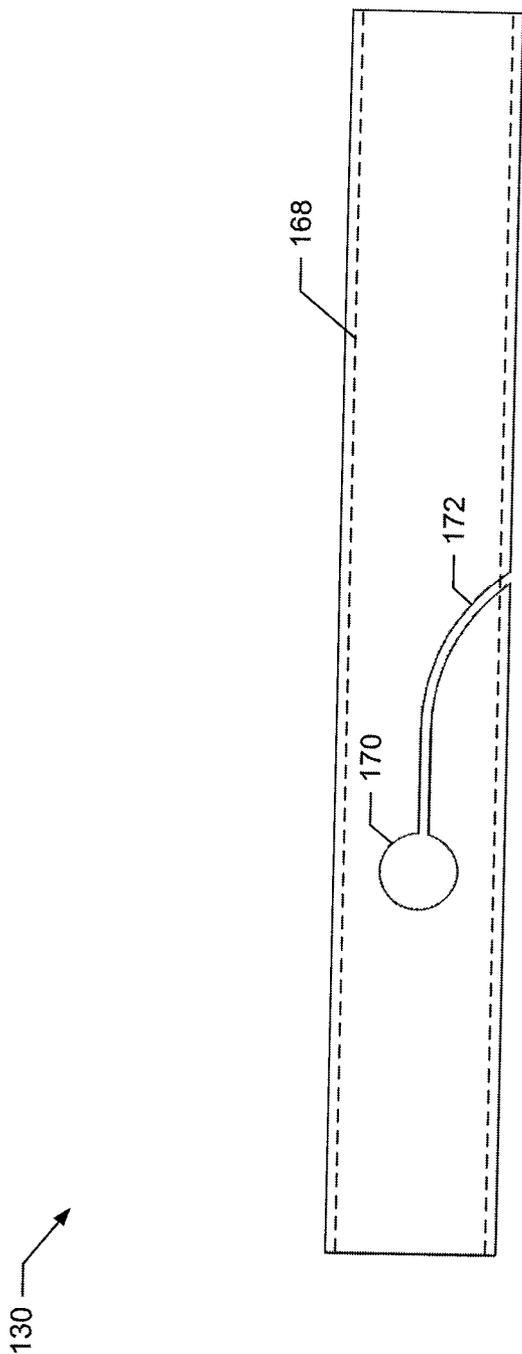


FIG. 8

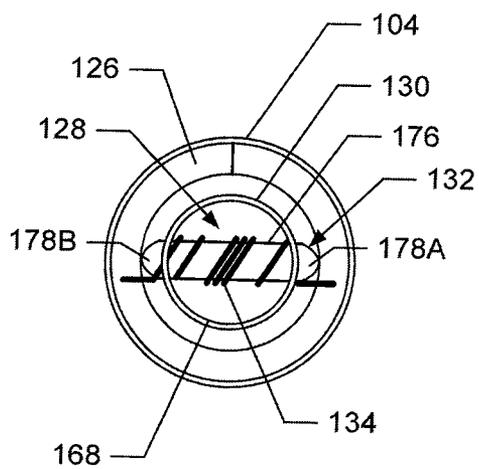


FIG. 9

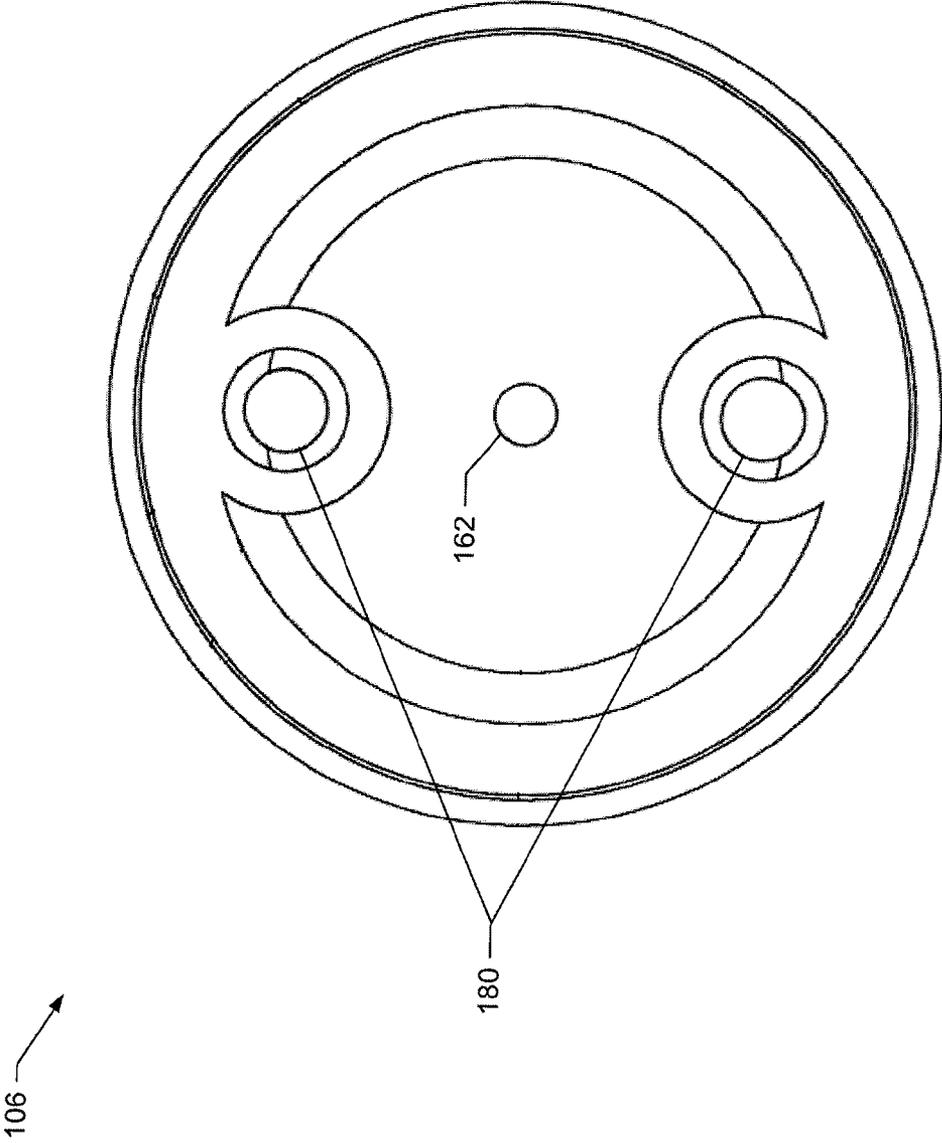


FIG. 10

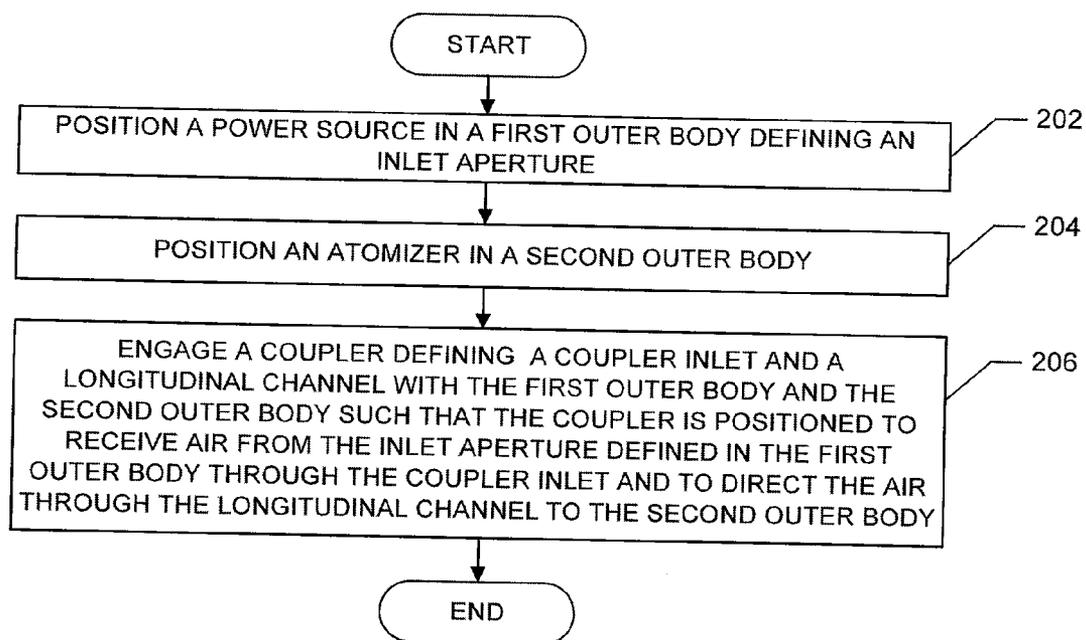


FIG. 11

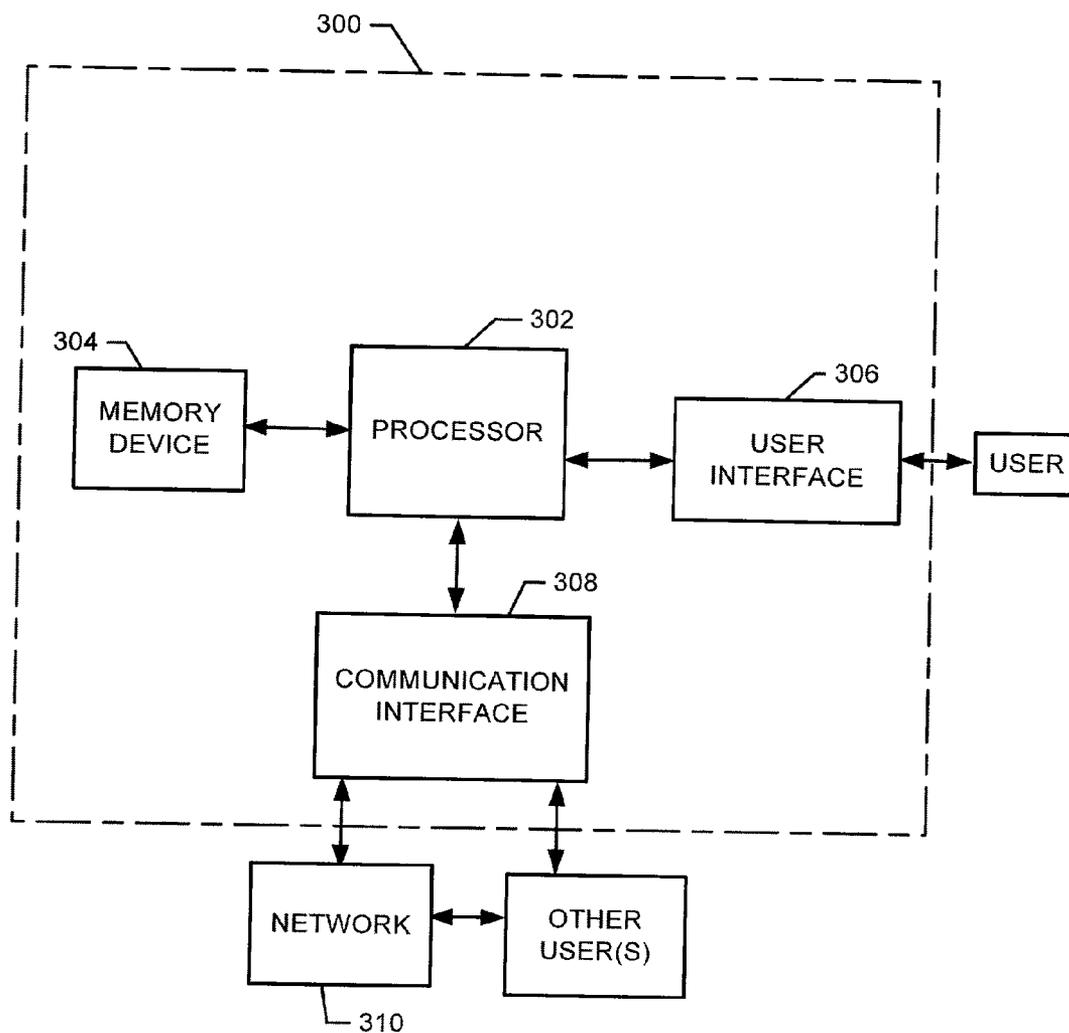


FIG. 12

**AEROSOL DELIVERY DEVICE
COMPRISING MULTIPLE OUTER BODIES
AND RELATED ASSEMBLY METHOD**

FIELD OF THE DISCLOSURE

[0001] The present disclosure relates to aerosol delivery devices such as smoking articles, and more particularly, to aerosol delivery devices that include multiple outer bodies. The aerosol delivery device incorporates an aerosol formation device or an atomizer. A typical atomizer is configured to heat an aerosol precursor including components that may be made or derived from tobacco or otherwise incorporate tobacco using an electrically powered resistance heater. As a result, the aerosol delivery device provides an inhalable substance for human consumption.

BACKGROUND

[0002] Many smoking devices have been proposed through the years as improvements upon, or alternatives to, smoking products that require combusting tobacco for use. Many of those devices purportedly have been designed to provide the sensations associated with cigarette, cigar, or pipe smoking, but without delivering considerable quantities of incomplete combustion and pyrolysis products that result from the burning of tobacco. To this end, there have been proposed numerous smoking products, flavor generators, and medicinal inhalers that utilize electrical energy to vaporize or heat a volatile material, or attempt to provide the sensations of cigarette, cigar, or pipe smoking without burning tobacco to a significant degree. See, for example, the various alternative smoking articles, aerosol delivery devices and heat generating sources set forth in the background art described in U.S. Pat. No. 7,726,320 to Robinson et al., U.S. Pat. Pub. No. 2013/0255702 to Griffith Jr. et al., U.S. Pat. Pub. No. 2014/0000638 to Sebastian et al., U.S. patent application Ser. No. 13/602,871 to Collett et al., filed Sep. 4, 2012, U.S. patent application Ser. No. 13/647,000 to Sears et al., filed Oct. 8, 2012, U.S. patent application Ser. No. 13/826,929 to Ampolini et al., filed Mar. 14, 2013, and U.S. patent application Ser. No. 14/011,992 to Davis et al., filed Aug. 28, 2013, which are incorporated herein by reference in their entirety.

[0003] Certain existing embodiments of aerosol delivery devices include a single, unitary, elongated outer housing that is substantially tubular in shape. In these embodiments, all of the components of the aerosol delivery device are at least partially contained within the single outer housing. However, it would be desirable to provide an alternate form or configuration of an aerosol delivery device that enhances user experience or allows for alternative manufacturing techniques. Thus, advances with respect to configurations of aerosol delivery devices and methods of assembly thereof may be desirable.

BRIEF SUMMARY OF THE DISCLOSURE

[0004] The present disclosure relates to aerosol delivery devices configured to produce aerosol. Certain types of these devices can be characterized as electronic cigarettes. In one aspect an aerosol delivery device is provided. The aerosol delivery device may include a first outer body defining an inlet aperture, a second outer body, a power source positioned in the first outer body, an atomizer positioned in the second outer body, and a coupler positioned between, and engaged with, the first outer body and the second outer body. The

coupler may define a coupler inlet and a longitudinal channel. The coupler may be configured to receive air from the inlet aperture defined in the first outer body through the coupler inlet and to direct the air through the longitudinal channel to the second outer body.

[0005] In some embodiments the aerosol delivery device may further include at least one securing mechanism configured to substantially irreversibly secure the first outer body to the second outer body. The at least one securing mechanism may be a wrapper extending at least partially around the first outer body, the second outer body, and the coupler. The aerosol delivery device may additionally include a reservoir substrate and a flow director positioned in the second outer body, the flow director may extend at least partially through the reservoir substrate. The flow director may define a transverse aperture extending therethrough, and the atomizer may extend through the transverse aperture.

[0006] In some embodiments a plurality of electrical connectors may extend from the atomizer through the coupler to the power source. The atomizer may include a heating element and a liquid transport element defining a center portion and first and second opposing arms extending therefrom, the heating element may be coupled to the center portion of the liquid transport element. The coupler may define a nipple and the flow director may engage the nipple of the coupler. Accordingly, the positioning of the components is such that an airflow passageway is created.

[0007] In some embodiments the aerosol delivery device may additional include a mouthpiece defining a nipple, and the flow director may engage the nipple of the mouthpiece. The coupler may define a rib, and the rib may separate the first outer body from the second outer body. One of the first outer body and the second outer body may define an inlet aperture aligned with a recessed portion of the coupler.

[0008] In an additional aspect, a method for assembling an aerosol delivery device is provided. The method may include positioning a power source in a first outer body defining an inlet aperture, positioning an atomizer in a second outer body, and engaging a coupler defining a coupler inlet and a longitudinal channel with the first outer body and the second outer body such that the coupler is positioned to receive air from the inlet aperture defined in the first outer body through the coupler inlet and to direct the air through the longitudinal channel to the second outer body.

[0009] In some embodiments, the method may further include substantially irreversibly securing the first outer body to the second outer body with a securing mechanism. Substantially irreversibly securing the first outer body to the second outer body with the securing mechanism may include wrapping a wrapper at least partially around the first outer body, the second outer body, and the coupler. The method may additionally include positioning a reservoir substrate and a flow director in the second outer body such that the flow director extends at least partially through the reservoir substrate. Positioning the atomizer in the second outer body may include inserting the atomizer through a transverse aperture extending through the flow director.

[0010] In some embodiments the method may additionally include inserting a plurality of electrical connectors through the coupler and connecting the electrical connectors to the power source and the atomizer. Additionally, the method may include coupling a heating element to a center portion of a liquid transport element to form the atomizer and folding first and second opposing arms of the liquid transport element

extending from the center section away from the coupler. Further, the method may include coupling the flow director to a nipple of the coupler. The method may also include coupling the flow director to a nipple of a mouthpiece. Engaging the coupler with the first outer body and the second outer body may include engaging a rib of the coupler with the first outer body and the second outer body. Engaging the coupler with the first outer body may include aligning an inlet aperture defined through the first outer body with a recessed portion of the coupler.

[0011] In an additional embodiment a coupler for an aerosol delivery device is provided. The coupler may include a first engagement portion configured to engage a first outer body, a second engagement portion configured to engage a second outer body, a coupler inlet defined through a peripheral surface of the first engagement portion, and a longitudinal channel in fluid communication with the coupler inlet and extending through the second engagement portion to a coupler outlet opening.

[0012] In some embodiments the coupler may additionally include a pressure port opening in fluid communication with at least one of the coupler inlet and the longitudinal channel and extending through the first engagement portion. The coupler inlet may be defined between first and second grooves configured to respectively receive a gasket). Further, the coupler may include a recessed portion at the peripheral surface of the first engagement portion, and the coupler inlet may be defined through the recessed portion. Additionally, the coupler may include a nipple configured to engage a flow director, and the longitudinal channel may extend through the nipple.

[0013] These and other features, aspects, and advantages of the disclosure will be apparent from a reading of the following detailed description together with the accompanying drawings, which are briefly described below. The invention includes any combination of two, three, four, or more of the above-noted embodiments as well as combinations of any two, three, four, or more features or elements set forth in this disclosure, regardless of whether such features or elements are expressly combined in a specific embodiment description herein. This disclosure is intended to be read holistically such that any separable features or elements of the disclosed invention, in any of its various aspects and embodiments, should be viewed as intended to be combinable unless the context clearly dictates otherwise.

BRIEF DESCRIPTION OF THE FIGURES

[0014] Having thus described the disclosure in the foregoing general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

[0015] FIG. 1 illustrates a side view of an aerosol delivery device in an assembled configuration, the aerosol delivery device having the general configuration of what can be characterized as an electronic cigarette, and comprising a first outer body, a second outer body, and a coupler positioned therebetween according to an example embodiment of the present disclosure;

[0016] FIG. 2 illustrates a partially exploded side view of the aerosol delivery device of FIG. 1 according to an example embodiment of the present disclosure;

[0017] FIG. 3 illustrates a side view of the aerosol delivery device of FIG. 1 in an assembled configuration, wherein the

aerosol delivery device further comprises a wrapper according to an example embodiment of the present disclosure;

[0018] FIG. 4 illustrates an exploded perspective view of the aerosol delivery device of FIG. 1 according to an example embodiment of the present disclosure;

[0019] FIG. 5 illustrates a modified sectional view through the aerosol delivery device of FIG. 1 at the first outer body and the coupler according to an example embodiment of the present disclosure;

[0020] FIG. 6 illustrates a sectional view through the coupler of FIG. 1 along line A-A from FIG. 5 according to an example embodiment of the present disclosure;

[0021] FIG. 7 illustrates a bottom view of an atomizer, a flow director, a mouthpiece, and the coupler of the aerosol delivery device of FIG. 1 according to an example embodiment of the present disclosure;

[0022] FIG. 8 illustrates a side view of the flow director of FIG. 7 according to an example embodiment of the present disclosure;

[0023] FIG. 9 illustrates an end view of the flow director and the atomizer of FIG. 7 according to an example embodiment of the present disclosure;

[0024] FIG. 10 illustrates an end view of the coupler of the aerosol delivery device of FIG. 1 according to an example embodiment of the present disclosure;

[0025] FIG. 11 schematically illustrates a method for assembling an aerosol delivery device according to an example embodiment of the present disclosure; and

[0026] FIG. 12 schematically illustrates a controller according to an example embodiment of the present disclosure.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0027] The present disclosure will now be described more fully hereinafter with reference to exemplary embodiments thereof. These exemplary embodiments are described so that this disclosure will be thorough and complete, and will fully convey the scope of the disclosure to those skilled in the art. Indeed, the disclosure may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. As used in the specification, and in the appended claims, the singular forms “a”, “an”, “the”, include plural variations unless the context clearly dictates otherwise.

[0028] As described hereinafter, embodiments of the present disclosure relate to aerosol delivery devices. Aerosol delivery devices according to the present disclosure may use electrical energy to heat a material (preferably without combusting the material to any significant degree) to form an inhalable substance; such articles most preferably being sufficiently compact to be considered “hand-held” devices. An aerosol delivery device may provide some or all of the sensations (e.g., inhalation and exhalation rituals, types of tastes or flavors, organoleptic effects, physical feel, use rituals, visual cues such as those provided by visible aerosol, and the like) of smoking a cigarette, cigar, or pipe, without any substantial degree of combustion of any component of that article or device. The aerosol delivery device may not produce smoke in the sense of the aerosol resulting from by-products of combustion or pyrolysis of tobacco, but rather, that the article or device most preferably yields vapors (including vapors within aerosols that can be considered to be visible

aerosols that might be considered to be described as smoke-like) resulting from volatilization or vaporization of certain components of the article or device. In highly preferred embodiments, aerosol delivery devices may incorporate tobacco and/or components derived from tobacco. As such, the aerosol delivery device can be characterized as an electronic cigarette.

[0029] Aerosol delivery devices of the present disclosure also can be characterized as being vapor-producing articles or medicament delivery articles. Thus, such articles or devices can be adapted so as to provide one or more substances (e.g., flavors and/or pharmaceutical active ingredients) in an inhalable form or state. For example, inhalable substances can be substantially in the form of a vapor (i.e., a substance that is in the gas phase at a temperature lower than its critical point). Alternatively, inhalable substances can be in the form of an aerosol (i.e., a suspension of fine solid particles or liquid droplets in a gas). For purposes of simplicity, the term “aerosol” as used herein is meant to include vapors, gases and aerosols of a form or type suitable for human inhalation, whether or not visible, and whether or not of a form that might be considered to be smoke-like.

[0030] In use, aerosol delivery devices of the present disclosure may be subjected to many of the physical actions employed by an individual in using a traditional type of smoking article (e.g., a cigarette, cigar or pipe that is employed by lighting and inhaling tobacco). For example, the user of an aerosol delivery device of the present disclosure can hold that article much like a traditional type of smoking article, draw on one end of that article for inhalation of aerosol produced by that article, take puffs at selected intervals of time, etc.

[0031] The aerosol delivery device most preferably comprises two or more outer bodies or shells. Existing embodiments of aerosol delivery devices including multiple outer bodies or shells are typically configured such that the two or more shells are separable. For example, an aerosol delivery device can possess at one end a control body comprising an outer body or shell containing one or more reusable components (e.g., a rechargeable battery and various electronics for controlling the operation of that article), and at the other end and removably attached thereto an outer body or shell containing a disposable portion (e.g., a disposable flavor-containing cartridge).

[0032] However, as described hereinafter, embodiments of the present disclosure relate to aerosol delivery devices comprising multiple shells or outer bodies that may not be configured to be separable. In this regard, the aerosol delivery devices of the present disclosure may be disposable in some embodiments. However, in other embodiments the aerosol delivery devices of the present disclosure may be reusable. For example, a power source (e.g., a battery) provided therein may be replaceable or the aerosol delivery device may include a rechargeable battery that may be recharged with any type of recharging technology, including connection to a typical alternating current electrical outlet, connection to a car charger (e.g., cigarette lighter receptacle), and connection to a computer, such as through a universal serial bus (USB) connection or cable. Further, a refilling port or other mechanism may allow for refilling an aerosol precursor composition in some embodiments.

[0033] Aerosol delivery devices of the present disclosure most preferably comprise some combination of a power source (i.e., an electrical power source), at least one control

component (e.g., means for actuating, controlling, regulating and/or ceasing power for heat generation, such as by controlling electrical current flow from the power source to other components of the aerosol delivery device), a heater or heat generation component (e.g., an electrical resistance heating element or component commonly referred to as an “atomizer”), and an aerosol precursor composition (e.g., commonly a liquid capable of yielding an aerosol upon application of sufficient heat, such as ingredients commonly referred to as “smoke juice,” “e-liquid” and “e-juice”), and a mouthend region or tip for allowing draw upon the aerosol delivery device for aerosol inhalation (e.g., a defined air flow path through the article such that aerosol generated can be withdrawn therefrom upon draw). Exemplary formulations for aerosol precursor materials that may be used according to the present disclosure are described in U.S. Pat. Pub. No. 2013/0008457 to Zheng et al. and U.S. Pat. Pub. No. 2013/0213417 to Chong et al., the disclosures of which are incorporated herein by reference in their entirety.

[0034] Alignment of the components within the aerosol delivery device of the present disclosure can vary. In specific embodiments, the aerosol precursor composition can be located near an end of the aerosol delivery device which may be configured to be positioned proximal to the mouth of a user so as to maximize aerosol delivery to the user. Other configurations, however, are not excluded. Generally, the heating element can be positioned sufficiently near the aerosol precursor composition so that heat from the heating element can volatilize the aerosol precursor (as well as one or more flavorants, medicaments, or the like that may likewise be provided for delivery to a user) and form an aerosol for delivery to the user. When the heating element heats the aerosol precursor composition, an aerosol is formed, released, or generated in a physical form suitable for inhalation by a consumer. It should be noted that the foregoing terms are meant to be interchangeable such that reference to release, releasing, releases, or released includes form or generate, forming or generating, forms or generates, and formed or generated. Specifically, an inhalable substance is released in the form of a vapor or aerosol or mixture thereof.

[0035] As noted above, the aerosol delivery device may incorporate a battery or other electrical power source to provide current flow sufficient to provide various functionalities to the aerosol delivery device, such as powering of a heater, powering of control systems, powering of indicators, and the like. The power source can take on various embodiments. Preferably, the power source is able to deliver sufficient power to rapidly heat the heating element to provide for aerosol formation and power the aerosol delivery device through use for a desired duration of time. The power source preferably is sized to fit conveniently within the aerosol delivery device so that the aerosol delivery device can be easily handled. Additionally, a preferred power source is of a sufficiently light weight to not detract from a desirable smoking experience.

[0036] More specific formats, configurations and arrangements of components within the aerosol delivery device of the present disclosure will be evident in light of the further disclosure provided hereinafter. Additionally, the selection of various aerosol delivery device components can be appreciated upon consideration of the commercially available electronic aerosol delivery devices, such as those representative products listed in the background art section of the present disclosure. Further, the arrangement of the components

within the aerosol delivery device can also be appreciated upon consideration of the commercially available electronic aerosol delivery devices, such as those representative products listed in the background art section of the present disclosure.

[0037] One example embodiment of an aerosol delivery device **100** according to the present disclosure is illustrated in FIG. 1. In particular, FIG. 1 illustrates the aerosol delivery device **100** in an assembled configuration. As illustrated, the aerosol delivery device **100** may include a first outer body **102**, a second outer body **104**, and a coupler **106** positioned between and engaged with the first and second outer bodies. In some embodiments the first outer body **102**, the second outer body **104**, and/or the coupler **106** may be formed from plastic (e.g., polycarbonate or acrylonitrile butadiene styrene (ABS)), metal (e.g., stainless steel or aluminum), paperboard, cardboard, ceramic, fiberglass, glass (e.g., a resilient glass), or a graphite composite. In some embodiments various attributes of the outer bodies **102**, **104** may be similar to those employed in the control body and cartridge of the VUSE® product available from R. J. Reynolds Tobacco Company. Note that while the aerosol delivery device discussed herein is generally described as having two outer bodies and a coupler, additional outer bodies may be employed when respectively connected by an additional coupler.

[0038] The coupler **106** may couple the first outer body **102** to the second outer body **104** in an assembled configuration, as illustrated in FIG. 1. In this regard, as illustrated in FIG. 2, the coupler **106** may include a first engagement portion **108**, a second engagement portion **110**, and a rib **112** positioned therebetween. The first engagement portion **108** of the coupler **106** may be configured to engage an inner end **102A** of the first outer body **102** (e.g., by insertion therein). In this regard, one or more gaskets **114** (e.g., one or more suitably sized seals, washers, O-rings, or other gasket means for providing sealing and/or resilience, which may comprise rubber, silicone or other sealant material that is non-reactive with the aerosol forming components) may be positioned in respective grooves **114A** (see, FIG. 6) in the first engagement portion **108** of the coupler **106** and configured to engage an inner surface of the first outer body **102**. Similarly, the second engagement portion **110** of the coupler **106** may be configured to engage an inner end **104A** of the second outer body **104** (e.g., by insertion therein). In this regard, one or more gaskets **116** may be positioned in respective grooves **116A** (see, FIG. 6) in the second engagement portion **110** of the coupler and configured to engage an inner surface of the second outer body **104**.

[0039] Accordingly, in some embodiments a press-fit arrangement may be employed to connect the outer bodies **102**, **104** to the coupler **106**. However, various other connection mechanisms may be employed to couple the outer bodies to the coupler. For example, threaded engagement, an interference fit, magnetic engagement or other connection mechanisms and arrangements may be employed in other embodiments.

[0040] The rib **112** of the coupler **106** may be configured to abut the inner end **102A** of the first outer body **102** and the inner end **104A** of the second outer body **104**. Accordingly, as illustrated in FIG. 1, the rib **112** may separate the first outer body **102** from the second outer body **104**. As such, the first outer body **102** and the second outer body **104** may be prevented from making a physical connection (i.e., the first outer body does not directly contact the second outer body). In

some embodiments, as illustrated in FIG. 1, the rib **112** may be configured to match an outer profile of the first outer body **102** and the second outer body **104**. In this regard, in cylindrical embodiments of the aerosol delivery device **100**, the diameter of the rib **112** may be substantially equal to the diameters of the first outer body **102** and the second outer body **104**.

[0041] The outer bodies **102**, **104** may be configured to house and protect a plurality of components received therein, as discussed hereinafter. The outer bodies **102**, **104** may thus define any of a plurality of shapes and configurations. However, as described above, in some embodiments it may be preferable to provide the aerosol delivery device with a size, shape, and/or configuration resembling a smoking article such as a cigarette or cigar. Thus, in some embodiments the outer bodies **102**, **104** may be generally cylindrical and the aerosol delivery device **100** may define an elongated cylindrical configuration as a result of coupler **106** engaging the inner ends **102A**, **104A** of the outer bodies **102**, **104**. The aerosol delivery device **100** may thus be described as substantially rod-like, substantially tubular shaped, or substantially cylindrically shaped in some embodiments when in the assembled configuration. Accordingly, the typical size, shape and general appearance of the aerosol delivery device **100** may be comparable to commercially available electronic cigarettes.

[0042] In some embodiments the outer bodies **102**, **104** may define a majority of an outer surface extending along a longitudinal length of the aerosol delivery device **100**, which may receive a wrapper thereon, as discussed below. In this regard, in one embodiment the outer bodies may define at least 75%, preferably at least 90%, and most preferably 95% of the outer surface extending along a longitudinal length of the aerosol delivery device, depending on the length of the dimensions of the end cap **118** and the mouthpiece **120**. Further, in some embodiments the first outer body **102** and the second outer body **104** may define substantially the same longitudinal length. However, in other embodiments the outer bodies **102**, **104** may define differing longitudinal lengths. For example, a ratio of a longitudinal length of the first outer body **102** to a longitudinal length of the second outer body **104** may be from about 2:1 to about 1:2, from about 3:5 to about 5:3, or from about 4:5 to about 5:4. In this regard, in some embodiments the dimensions of the first outer body **102** may be similar to that of a filter element and the dimensions of the second outer body **104** may be similar to that of a tobacco rod of a traditional cigarette in some embodiments. This configuration may provide adequate room in the second outer body **104** for a power source, which may be included therein as discussed hereinafter.

[0043] As illustrated in FIGS. 1 and 2, an end cap **118** may be coupled to the first outer body **102** at an outer end **102B** thereof. Further, a mouthpiece **120** may be coupled to an outer end **104B** of the second outer body **104**. In some embodiments the outer end **102B** of the first outer body **102** and/or the outer end **104B** of the second outer body **104B** may define a chamfer at the inner surface thereof, which may facilitate respective coupling of the end cap **118** and the mouthpiece **120** thereto.

[0044] Briefly, the end cap **118** may be configured to cover and substantially prevent access to the outer end **104B** of the second outer body **104** and, in some embodiments, provide for output of illumination therethrough. The mouthpiece **120** may be configured to receive a user draw thereon during use

to direct aerosol to the user. In some embodiments a sealant or adhesive such as a room temperature vulcanizing (RTV) sealant, a silicone resin, or a polysiloxane, may seal the end cap **118** to the first outer body **102** and/or seal the mouthpiece **120** to the second outer body **104**. The mouthpiece **120** may be textured and/or shaped as desired. Example embodiments of mouthpieces that may be employed in the aerosol delivery device of the present disclosure are provided in U.S. Pat. Pub. No. 2013/0276802 to Scatterday.

[0045] As illustrated in FIG. 3, in some embodiments a wrapper **122** (e.g., a label or an overwrap) may at least partially surround the outer bodies **102**, **104**. For example, the wrapper **122** may include an overlapping or abutting seam. In one embodiment the wrapper **122** may comprise a single layer of a material (e.g., plastic, paper, or foil). Alternatively, the wrapper **122** may comprise a multi-layer lamination (e.g., a lamination of plastic, paper, and/or foil). The wrapper **122** may include indicia on an outer surface thereof. For example, the indicia may include information such as a product identifier, which may be formed by ink applied to one or more of the layers of the wrapper **122**. The indicia on the wrapper **122** likewise may include texturing, coloring, and/or other physical attributes that may provide a desired appearance to the device, such as resembling a conventional cigarette or a conventional electronic cigarette. Example embodiments of wrappers which may be employed in the aerosol delivery device of the present disclosure are provided in U.S. Pat. Pub. No. 2013/0284190 to Scatterday et al., which is incorporated herein by reference in its entirety.

[0046] The wrapper **122** may include an adhesive at an inner surface thereof or adhesive may otherwise be positioned between the wrapper and the outer bodies **102**, **104**. Thus, the wrapper **122** may be secured to an outer surface of the outer bodies **102**, **104**. In this regard, embodiments of the present disclosure may include at least one securing mechanism configured to substantially irreversibly secure the first outer body **102** to the second outer body **104**. In some embodiments the securing mechanism may comprise the above-described wrapper **122**. Thus, when adhered to the first outer body **102** and the second outer body **104**, the wrapper **122** may act as a structural member that assists in retaining the coupling between the outer bodies via the coupler **106**. For example, in the illustrated embodiment, the wrapper **122** extends from the outer end **102B** of the first outer body **102** to the outer end **104B** of the second outer body **104**, such that coupling between the wrapper and the first and second outer bodies retains the aerosol delivery device **100** in the assembled configuration. Additionally, in embodiments in which the coupler **106** includes the rib **112**, contact between the wrapper **122** and the rib may further assist in maintaining the aerosol delivery device in the assembled configuration. Further, in some embodiments the wrapper **122** may extend at least partially over the end cap **118** to secure the end cap to the first outer body **102** and/or extend at least partially over the mouthpiece **120** to secure the mouthpiece to the second outer body **104**.

[0047] Although the securing mechanism is described above as comprising the wrapper **122**, various other embodiments of securing mechanisms configured to substantially irreversibly secure the first outer body **102** to the second outer body **104** may be employed. Thus, for example, the securing mechanism may comprise sealant applied between the coupler **106** and one or both of the outer bodies **102**, **104**. By way of further example, the securing mechanism may comprise

single-use connectors at the coupler **106** configured to engage the outer bodies **102**, **104**. In another embodiment the securing mechanism may comprise other connection mechanisms (e.g., welds, crimps, or solder), that cause portions of the outer bodies **102**, **104** to engage the coupler **106**. Note that substantially irreversibly secured, as used herein, refers to a configuration in which the outer bodies **102**, **104** may not be separated from one another without damaging the securing mechanism and/or without preventing recoupling of the referenced components. Thus, for example, the wrapper **122** may be torn or otherwise damaged if the outer bodies **102**, **104** of the aerosol delivery device **100** were to be separated.

[0048] FIG. 4 illustrates an exploded view of the aerosol delivery device **100**. As illustrated, the aerosol delivery device **100** may include a plurality of additional components as described in greater detail hereinafter. In this regard, the aerosol delivery device **100** may additionally include a mouthpiece shipping plug **124** which may be configured to engage and protect the mouthpiece **120** prior to use of the aerosol delivery device. For example, the mouthpiece shipping plug **120** may prevent the entry of contaminants into the mouthpiece **120**. Thus, the mouthpiece shipping plug **120** may be removed prior to use of the aerosol delivery device **100**.

[0049] Further, a plurality of components may be positioned in one or both of the first outer body **102** and the second outer body **104**. In this regard, a reservoir substrate **126**, an atomizer **128**, and a flow director **130** (e.g., a flow tube or other structure defining an airflow passage) may be positioned in the second outer body **104**. The atomizer **128** may include a liquid transport element **132** with a heating element **134** coupled thereto.

[0050] Further, a power source **136** and an electrical circuit **138** may be positioned in the first outer body **102**. Examples of power sources are described in U.S. Pat. App. Pub. No. 2010/0028766 by Peckerar et al., the disclosure of which is incorporated herein by reference in its entirety. The electrical circuit **138** may include a control module **140**, a spacer **142**, and/or a safety switch **144** in some embodiments. One or more electrical connectors **146** (e.g., electrical wires) may be configured to electrically connect the atomizer **128** to the power source **136**. In this regard, the electrical connectors **146** may extend between the first outer body **102** and the second outer body **104** through the coupler **106** in the assembled configuration. In one embodiment one or more electrical couplers **148** (e.g., brass couplers, solder, crimped couplers, or wound wires) may be employed to couple the electrical connectors **146** to the heating element **134**. Thus, in some embodiments the electrical couplers **148** may be received in the second outer body **104**.

[0051] In terms of operation of the aerosol delivery device **100**, a user may draw on the mouthpiece **120**. Accordingly, air may enter the aerosol delivery device **100** through an inlet aperture. For example, in the illustrated embodiment, an inlet aperture **150** (see, e.g., FIG. 1) is defined in the first outer body **102**. However, in other embodiments the inlet aperture may be defined in the second outer body. Note that in embodiments of the aerosol delivery device **100** including the wrapper **122**, a cutout **152** (see, FIG. 3) may align with the inlet aperture **150** such that the inlet aperture is not blocked. Alternatively, the wrapper may be substantially air-permeable, particularly in the area adjacent the inlet aperture, so as to allow sufficient air passage therethrough and into the aperture.

[0052] Air entering through the inlet aperture 150 in the first outer body 102 may be directed through the coupler 106 to the second outer body 104. In this regard, as illustrated in FIG. 5, the inlet aperture 150 may align with a recessed portion 154 defined at a peripheral surface 155 of the first engagement portion 108 of the coupler 106. Note that alignment of the recessed portion 154 of the coupler 106 may only require longitudinal alignment of the inlet aperture 150 with the recessed portion, along the longitudinal length of the aerosol delivery device 100. In this regard, in some embodiments the recessed portion 154 may extend around the peripheral surface 155 of the coupler 106 (e.g., around the entirety of the circumference thereof). Further, as illustrated, in some embodiments the inlet aperture 150 and the recessed portion 154 may be configured to align when the inner end 102A of the first outer body 102 abuts the rib 112. Accordingly, alignment of the inlet aperture 150 with the recessed portion 154 may be substantially easily achieved during assembly. Air received in the recessed portion 154 of the coupler 106 may be directed through one or more coupler inlet(s) 156 defined in the coupler 106 at the recessed portion.

[0053] FIG. 6 illustrates a cross-sectional view through the coupler 106 along line A-A in FIG. 5. As illustrated in FIG. 6, the coupler inlet 156 may connect to a longitudinal channel 158 extending along at least a portion of the longitudinal length of the coupler 106. Further, a pressure port 160 may additionally be in communication with the coupler inlet 156 and/or the longitudinal channel 158. The pressure port 160 may extend to a pressure port opening 162 positioned inside the first outer body 102 when the coupler 106 is connected thereto.

[0054] Accordingly, the control module 140 (see, FIG. 4) may detect when a user draws on the mouthpiece 120. In this regard, the control module 140 may comprise a sensor configured to detect a puff. For example, a pressure sensor may be used to detect a pressure drop accompanying a draw on the mouthpiece 120. Representative current regulating components and other current controlling components including various microcontrollers for aerosol delivery devices are described in U.S. Pat. No. 4,735,217 to Gerth et al., U.S. Pat. Nos. 4,922,901, 4,947,874, and 4,947,875, all to Brooks et al., U.S. Pat. No. 5,372,143 to McCafferty et al., U.S. Pat. No. 6,040,560 to Fleischhauer et al., U.S. Pat. No. 7,040,314 to Nguyen et al., and U.S. Pat. No. 8,205,622 to Pan, all of which are incorporated herein by reference in their entireties. Reference also is made to the control schemes described in U.S. application Ser. No. 13/837,542 to Ampolini et al., filed Mar. 15, 2013, which is incorporated herein by reference in its entirety. In some embodiments, a pressure sensor and a microcontroller may be combined in control module 140.

[0055] Thus, as a result of the control module 140 being positioned in the first outer body 102, a drop in pressure may be detected when a user draws on the aerosol delivery device 100. In this regard, the first outer body 102 may be substantially sealed as a result of the end cap 118 being positioned at the outer end 102B and the gaskets 114 being positioned at the inner end 102A of the outer body (see, e.g., FIG. 4). Thereby, the pressure drop associated with the puff on the aerosol delivery device 100 may be detected, but airflow through the first outer body 102 may be substantially avoided, since the first outer body is substantially sealed other than at the pressure port 160.

[0056] Airflow in the above described manner is designed to avoid airflow past the power source 136. Further, note that

a size of the pressure port opening 162 (e.g., a diameter thereof) may be smaller than a diameter of a coupler outlet opening 164 (see, FIG. 6) in communication with the second outer body 104. Accordingly, a Venturi effect may be created during a draw on the aerosol delivery device 100, which further assists in preventing airflow through the first outer body 102 while still allowing detection of a pressure drop therein.

[0057] Thus, as noted above, the control module 140 may sense a puff on the aerosol delivery device 100. When the puff is sensed, control module 140 may direct current from the power source 136 through the electrical connectors 146 to the heating element 134. Thus, as described in greater detail below, the heating element 134 may vaporize an aerosol precursor composition directed from the reservoir substrate 126 to the heating element via the liquid transport element 132. Accordingly, the heating element 134 may vaporize the aerosol precursor composition directed to an aerosolization zone from the reservoir substrate 126 by the liquid transport element 132 and air and the entrained vapor (e.g., the components of the aerosol precursor composition in an inhalable form) may be directed to a user drawing thereon.

[0058] The safety switch 144 may be configured to control or stop the flow of current to the heating element 134 under certain circumstances. For example, the safety switch may be configured to stop the flow of current to the heating element 134 after a predetermined length of time, regardless of whether a detected puff continues, in order to prevent the heating element 134 from overheating. Accordingly, issues with respect to the aerosol delivery device 100 overheating may be avoided.

[0059] In some embodiments the control module 140 may perform additional functions. For example, the control module 140 may also include an optional indicator (e.g., a light emitting diode (LED)). The indicator may illuminate, for example, during a user drawing on the aerosol delivery device, as detected by the control module 140. The end cap 118 may be adapted to make visible the illumination provided thereunder by the indicator. Accordingly, the indicator may illuminate during use of the aerosol delivery device 100 to simulate the lit end of a smoking article. However, in other embodiments the indicator can be provided in varying numbers and can take on different shapes and can even be an opening in the outer body (such as for release of sound when such indicators are present).

[0060] As noted above, air received through the inlet aperture 150 in the first outer body 102 may be directed through the recessed portion 154, the coupler inlet 156, and the longitudinal channel 158 extending along at least a portion of the longitudinal length of the coupler 106. Thereby, the air may be directed to the flow director 130. The flow director 130 may define a tubular configuration or other structure in which an air passageway is defined therethrough. In this regard, as illustrated in FIGS. 5 and 6, the coupler 106 may define a nipple 166.

[0061] Further, as illustrated in FIG. 7, the nipple 166 may couple to the flow director 130. For example, the flow director 130 may extend over the nipple 166 to provide for engagement therebetween. In this regard, the flow director 130 may comprise a flexible, resilient material such as fiberglass which may deform (e.g., stretch) slightly to allow for receipt of the nipple 166 therein and fit snugly over the nipple and form a

seal therewith. Accordingly, air received from the coupler **106** may be directed through a longitudinal aperture **168** defined through the flow director **130**.

[0062] Thus, drawn air through the device is directed past the heating element **134**. More particularly, as illustrated in FIG. 8, the flow director **130** may define a transverse aperture **170** extending therethrough. As illustrated, the transverse aperture **170** may extend substantially perpendicularly to the longitudinal aperture **168**. As illustrated in FIG. 7, the atomizer **128** may extend through the transverse aperture **170**. Thereby, the heating element **134** may be positioned in the longitudinal aperture **168** extending along the length of the flow director **130**. More particularly, the heating element **134** may extend transversely relative to the longitudinal aperture **168** such that at least a portion of the heating element is positioned in the longitudinal aperture.

[0063] In some embodiments, in order to facilitate insertion of the atomizer **128** in the transverse aperture **170**, a slit **172** may be defined in the flow director **130**. The slit **172** may extend from an outer surface of the flow director **130** to the transverse aperture **170**. For example, as illustrated in FIG. 7, the slit **172** may define a V-shape. Thereby, during assembly, the flow director **130** may be folded at the slit **172** to facilitate insertion of the atomizer **128** into the transverse aperture **170**, rather than inserted lengthwise through the transverse aperture **170**. For example, the heating element **134** may catch on the flow director **130** during lengthwise insertion of the atomizer **128** when longitudinal insertion is employed. Thus, use of the slit **172** may expedite assembly of the aerosol delivery device **100** by allowing for coupling of the atomizer **128** to the flow director **130** without requiring lengthwise insertion of the atomizer **128** through the transverse aperture **170**.

[0064] Following insertion of the atomizer **128** into the transverse aperture **170**, the flow director **130** may be folded back into the original longitudinal (e.g., tubular) configuration. Accordingly, as illustrated in FIG. 9, the heating element **134** may be at least partially positioned within the longitudinal aperture **168** extending through the flow director **130**. Thus, drawn air received from the coupler **106** during a user puff may be directed by the flow director **130** past the heating element **134** before being directed by the longitudinal aperture **168** to the mouthpiece **120**, as illustrated in FIG. 7. In this regard, the mouthpiece **120** may define a nipple **174**. Thus, the flow director **130** may extend over the nipple **174** to provide for engagement therebetween. As noted above, the flow director **130** may comprise a flexible, resilient material such as fiberglass which may deform (e.g., stretch) slightly to allow for receipt of the nipple **174** therein. Accordingly, air traveling through the longitudinal aperture **168** defined through the flow director **130** may be directed through the mouthpiece **120** and to a user's mouth.

[0065] As illustrated in FIG. 9, the flow director **130** may extend at least partially through the reservoir substrate **126** so as to define an air passageway therethrough. Further, as illustrated in FIGS. 8 and 9, the liquid transport element **132** may define a center portion **176** and first and second opposing arms **178A**, **178B** extending therefrom. The heating element **134** may be coupled to the center portion **176** of the liquid transport element **132**.

[0066] The opposing arms **178A**, **178B** of the liquid transport element **134** may be configured to direct an aerosol precursor composition to the heating element **134**. In this regard, the reservoir substrate **126** may be configured to hold (e.g., support, carry, and/or store) an aerosol precursor com-

position therein. The aerosol precursor composition, also referred to as a vapor precursor composition, may comprise a variety of components including, by way of example, a polyhydric alcohol (e.g., glycerin, propylene glycol, or a mixture thereof), nicotine, tobacco, tobacco extract, and/or flavorants. Various components that may be included in the aerosol precursor composition are described in U.S. Pat. No. 7,726,320 to Robinson et al., which is incorporated herein by reference in its entirety. Additional representative types of aerosol precursor compositions are set forth in U.S. Pat. No. 4,793,365 to Sensabaugh, Jr. et al.; U.S. Pat. No. 5,101,839 to Jakob et al.; PCT WO 98/57556 to Biggs et al.; and Chemical and Biological Studies on New Cigarette Prototypes that Heat Instead of Burn Tobacco, R. J. Reynolds Tobacco Company Monograph (1988); the disclosures of which are incorporated herein by reference in their entireties. Other aerosol precursors which may be employed in the aerosol delivery device **100** include the aerosol precursors included in the VUSE® product by R. J. Reynolds Vapor Company, the BLU™ product by Lorillard Technologies, the Mystic Menthol product by Mystic Ecigs, and the Vype product by CN Creative Ltd. Also desirable are the so-called "Smoke Juices" for electronic cigarettes that have been available from Johnson Creek Enterprises LLC.

[0067] The reservoir substrate **126** may comprise one layer or a plurality of layers of woven or nonwoven fibers (e.g., C-glass, E-glass) formed into the shape of a tube encircling the interior of the second outer body **104**. Thus, liquid components, for example, can be sorptively retained by the reservoir substrate **126**. The reservoir substrate **126** is in fluid connection with the liquid transport element **132**. In this regard, the opposing arms **178A**, **178B** may be positioned between the flow director **130** and the reservoir substrate **126**. Accordingly, contact between the liquid transport element **132** and the reservoir substrate **126** may allow for fluid transfer therebetween. Thus, the liquid transport element **132** may be configured to transport liquid from the reservoir substrate **126** to the heating element **134** (e.g., via wicking or capillary action). In FIG. 9, a space is present between the reservoir substrate **126** and the flow director **130** for accommodating the opposing arms **178A**, **178B**. In other embodiments, the reservoir substrate **126** may be in substantial contact with the flow director **130** around at least a portion of the circumference of the flow director. As such, at least a portion of the opposing arms **178A**, **178B** may be substantially flattened between the reservoir substrate and the flow director. Exemplary reservoirs formed of cellulose acetate fibers and liquid transport elements that may be used herein as described in U.S. patent application Ser. No. 13/802,950 to Chapman et al., filed Mar. 14, 2013, which is incorporated herein by reference in its entirety.

[0068] As illustrated in FIG. 9, the liquid transport element **132** may be in direct contact with the heating element **134**. As further illustrated in FIG. 9, the heating element **134** may comprise a wire defining a plurality of coils (e.g., from about 4 coils to about 12 coils) wound about the liquid transport element **132**. In some embodiments the heating element **134** may be formed by winding the wire about the liquid transport element **132** as described in U.S. patent application Ser. No. 13/708,381 to Ward et al., filed Dec. 7, 2012, which is incorporated herein by reference in its entirety. Further, in some embodiments the wire may define a variable coil spacing, as described in U.S. patent application Ser. No. 13/827,994 to DePiano et al., filed Mar. 14, 2013, which is incorporated

herein by reference in its entirety. Various embodiments of materials configured to produce heat when electrical current is applied therethrough may be employed to form the heating element **134**. Example materials from which the wire coil may be formed include Kanthal (FeCrAl), Nichrome, Molybdenum disilicide (MoSi_2), molybdenum silicide (MoSi), Molybdenum disilicide doped with Aluminum ($\text{Mo}(\text{Si},\text{Al})_2$), graphite and graphite-based materials; and ceramic (e.g., a positive or negative temperature coefficient ceramic).

[0069] However, various other embodiments of methods may be employed to form the heating element **134**, and various other embodiments of heating elements may be employed in the atomizer **128**. For example, a stamped heating element may be employed in the atomizer, as described in U.S. patent application Ser. No. 13/842,125 to DePiano et al., filed Mar. 15, 2013, which is incorporated herein by reference in its entirety. Further to the above, additional representative heating elements and materials for use therein are described in U.S. Pat. No. 5,060,671 to Counts et al.; U.S. Pat. No. 5,093,894 to Deevi et al.; U.S. Pat. No. 5,224,498 to Deevi et al.; U.S. Pat. No. 5,228,460 to Sprinkel Jr., et al.; U.S. Pat. No. 5,322,075 to Deevi et al.; U.S. Pat. No. 5,353,813 to Deevi et al.; U.S. Pat. No. 5,468,936 to Deevi et al.; U.S. Pat. No. 5,498,850 to Das; U.S. Pat. No. 5,659,656 to Das; U.S. Pat. No. 5,498,855 to Deevi et al.; U.S. Pat. No. 5,530,225 to Hajaligol; U.S. Pat. No. 5,665,262 to Hajaligol; U.S. Pat. No. 5,573,692 to Das et al.; and U.S. Pat. No. 5,591,368 to Fleischhauer et al., and U.S. Pat. Pub. No. 2013/0192618 to Li et al., the disclosures of which are incorporated herein by reference in their entireties. Further, chemical heating may be employed in other embodiments. Various additional examples of heaters and materials employed to form heaters are described in U.S. patent application Ser. No. 13/602,871 to Collett et al., filed Sep. 4, 2012, which is incorporated herein by reference, as noted above. Additionally, in various embodiments, one or more microheaters or like solid state heaters may be used.

[0070] Note that, as illustrated in FIG. 7, the heating element **134** may be positioned relatively closer to the coupler **106** than the mouthpiece **120**. This configuration may be preferable in that it provides a separation between a user's mouth and the heating element **134**, which produces heat during use. Accordingly, as a result of the heating element **134** being positioned proximate the coupler **106**, the opposing arms **178A**, **178B** may be folded away from the coupler **106** in order for the liquid transport element **132** to remain in contact with a significant portion of the reservoir substrate **126**. This configuration may also result in the one or more electrical connectors **146** extending in an opposite direction as compared to the opposing arms **178A**, **178B** of the liquid transport element **132**, toward the coupler **106**, with the electrical couplers **148** connecting the heating element **134** to the electrical connectors **146**.

[0071] In this regard, FIG. 10 illustrates a view of the coupler **106** at an end configured to engage the first outer body **102**. As illustrated, one or more connector apertures **180** may extend through a longitudinal length of the coupler **106**. Accordingly, the electrical connectors **146** may extend from the first outer body **102** through the connector apertures **180** to the second outer body **104** in order to connect the atomizer **128** to the power source **136**.

[0072] Still further components can be utilized in the aerosol delivery device **100** of the present disclosure. For example, U.S. Pat. No. 5,154,192 to Sprinkel et al. and U.S.

Pat. No. 8,539,959 to Scatterday disclose indicators and LEDs for smoking articles; U.S. Pat. No. 5,261,424 to Sprinkel, Jr. discloses piezoelectric sensors that can be associated with the mouth-end of a device to detect user lip activity associated with taking a draw and then trigger heating; U.S. Pat. No. 5,372,148 to McCafferty et al. discloses a puff sensor for controlling energy flow into a heating load array in response to pressure drop through a mouthpiece; U.S. Pat. No. 5,967,148 to Harris et al. discloses receptacles in a smoking device that include an identifier that detects a non-uniformity in infrared transmissivity of an inserted component and a controller that executes a detection routine as the component is inserted into the receptacle; U.S. Pat. No. 6,040,560 to Fleischhauer et al. describes a defined executable power cycle with multiple differential phases; U.S. Pat. No. 5,934,289 to Watkins et al. discloses photonic-optronic components; U.S. Pat. No. 5,954,979 to Counts et al. discloses means for altering draw resistance through a smoking device; U.S. Pat. No. 6,803,545 to Blake et al. discloses specific battery configurations for use in smoking devices; U.S. Pat. No. 7,293,565 to Griffen et al. discloses various charging systems for use with smoking devices; U.S. Pat. No. 8,402,976 to Fernando et al. discloses computer interfacing means for smoking devices to facilitate charging and allow computer control of the device; U.S. Pat. App. Pub. No. 2010/0163063 by Fernando et al. discloses identification systems for smoking devices; and WO 2010/003480 by Flick discloses a fluid flow sensing system indicative of a puff in an aerosol generating system; all of the foregoing disclosures being incorporated herein by reference in their entireties. Further examples of components related to electronic aerosol delivery articles and disclosing materials or components that may be used in the present article include U.S. Pat. No. 4,735,217 to Gerth et al.; U.S. Pat. No. 5,249,586 to Morgan et al.; U.S. Pat. No. 5,666,977 to Higgins et al.; U.S. Pat. No. 6,053,176 to Adams et al.; U.S. Pat. No. 6,164,287 to White; U.S. Pat. No. 6,196,218 to Voges; U.S. Pat. No. 6,810,883 to Felter et al.; U.S. Pat. No. 6,854,461 to Nichols; U.S. Pat. No. 7,832,410 to Hon; U.S. Pat. No. 7,513,253 to Kobayashi; U.S. Pat. No. 7,896,006 to Hamano; U.S. Pat. No. 6,772,756 to Shayan; U.S. Pat. Nos. 8,156,944 and 8,375,957 to Hon; U.S. Pat. App. Pub. Nos. 2006/0196518 and 2009/0188490 to Hon; U.S. Pat. App. Pub. No. 2009/0272379 to Thorens et al.; U.S. Pat. App. Pub. Nos. 2009/0260641 and 2009/0260642 to Monsees et al.; U.S. Pat. App. Pub. Nos. 2008/0149118 and 2010/0024834 to Oglesby et al.; U.S. Pat. App. Pub. No. 2010/0307518 to Wang; WO 2010/091593 to Hon; WO 2013/089551 to Foo; and U.S. patent application Ser. No. 13/841,233 to DePiano et al., filed Mar. 15, 2013, each of which is incorporated herein by reference in its entirety. A variety of the materials disclosed by the foregoing documents may be incorporated into the present devices in various embodiments, and all of the foregoing disclosures are incorporated herein by reference in their entireties.

[0073] Various other details with respect to the components that may be included in the aerosol delivery device, are provided, for example, in U.S. patent application Ser. No. 13/840,264 to Novak et al., filed Mar. 15, 2013, U.S. Pat. No. 8,365,742 to Hon; U.S. Pat. Pub. Nos. 2013/0192623 to Tucker et al., 2013/0298905 to Leven et al., and 2013/0180553 to Kim et al., each of which is incorporated herein by reference in its entirety. Reference is also made, for example, to the reservoir and heater system for controllable delivery of multiple aerosolizable materials in an electronic smoking

article disclosed in U.S. Pat. App. Pub. No. 2014/0000638 to Sebastian et al., which is incorporated herein by reference in its entirety.

[0074] Additionally, various components of an aerosol delivery device according to the present disclosure can be chosen from components described in the art and that have been commercially available. In this regard, representative products that resemble many of the attributes of traditional types of cigarettes, cigars or pipes have been marketed as ACCORD® by Philip Morris Incorporated; ALPHA™, JOYE 510™ and M4™ by InnoVapor LLC; CIRRUS™ and FLING™ by White Cloud Cigarettes; BLU™ by Lorillard Technologies, Inc.; COHITA™, COLIBRI™, ELITE CLASSIC™, MAGNUM™, PHANTOM™ and SENSE™ by Epuffer® International Inc.; DUOPRO™, STORM™ and VAPORKING® by Electronic Cigarettes, Inc.; EGAR™ by Egar Australia; eGo-C™ and eGo-T™ by Joyetech; ELUSION™ by Elusion UK Ltd; EONSMOKE® by Eonsmoke LLC; FIN™ by FIN Branding Group, LLC; SMOKE® by Green Smoke Inc. USA; GREENARETTE™ by Greenarette LLC; HALLIGAN™, HENDU™, JET™, MAXXQ™, PINK™ and PITBULL™ by Smoke Stik®; HEATBAR™ by Philip Morris International, Inc.; HYDRO IMPERIAL™ and LXE™ from Crown7; LOGIC™ and THE CUBAN™ by LOGIC Technology; LUCI® by Luciano Smokes Inc.; METRO® by Nicotek, LLC; NJOY® and ONEJOY™ by Sottera, Inc.; NO. 7™ by SS Choice LLC; PREMIUM ELECTRONIC CIGARETTE™ by PremiumEstore LLC; RAPP E-MYSTICK™ by Ruyan America, Inc.; RED DRAGON™ by Red Dragon Products, LLC; RUYAN® by Ruyan Group (Holdings) Ltd.; SF® by Smoker Friendly International, LLC; GREEN SMART SMOKER® by The Smart Smoking Electronic Cigarette Company Ltd.; SMOKE ASSIST® by Coastline Products LLC; SMOKING EVERYWHERE® by Smoking Everywhere, Inc.; V2CIGS™ by VMR Products LLC; VAPOR NINE™ by VaporNine LLC; VAPOR4LIFE® by Vapor 4 Life, Inc.; VEPPO™ by E-CigaretteDirect, LLC; VUSE® by R. J. Reynolds Vapor Company; Mystic Menthol product by Mystic Ecigs; and the Vype product by CN Creative Ltd. Yet other electrically powered aerosol delivery devices, and in particular those devices that have been characterized as so-called electronic cigarettes, have been marketed under the tradenames COOLER VISIONS™; DIRECT E-CIG™; DRAGONFLY™; EMIST™; EVERSMOKE™; GAMUCCI®; HYBRID FLAME™; KNIGHT STICKS™; ROYAL BLUES™; SMOKETIP®; SOUTH BEACH SMOKE™.

[0075] Additional manufacturers, designers, and/or assignees of components and related technologies that may be employed in the aerosol delivery device of the present disclosure include Shenzhen Jieshibo Technology of Shenzhen, China; Shenzhen First Union Technology of Shenzhen City, China; Safe Cig of Los Angeles, Calif.; Janty Asia Company of the Philippines; Joyetech Changzhou Electronics of Shenzhen, China; SIS Resources; B2B International Holdings of Dover, Del.; Evolv LLC of OH; Montrade of Bologna, Italy; Shenzhen Bauway Technology of Shenzhen, China; Global Vapor Trademarks Inc. of Pompano Beach, Fla.; Vapor Corp. of Fort Lauderdale, Fla.; Nemtra GMBH of Raschau-Marketersbad, Germany; Perrigo L. Co. of Allegan, Mich.; Needs Co., Ltd.; Smokefree Innovatec of Las Vegas, Nev.; McNeil AB of Helsingborg, Sweden; Chong Corp; Alexza Pharmaceuticals of Mountain View, Calif.; BLEC, LLC of Charlotte, N.C.; Gaitrend Sarl of Rohrbach-les-Bitche, France; FeelLife

Bioscience International of Shenzhen, China; Vishay Electronic BMGH of Selb, Germany; Shenzhen Smaco Technology Ltd. of Shenzhen, China; Vapor Systems International of Boca Raton, Fla.; Exonoid Medical Devices of Israel; Shenzhen Nowotech Electronic of Shenzhen, China; Minilogic Device Corporation of Hong Kong, China; Shenzhen Kontle Electronics of Shenzhen, China, and Fuma International, LLC of Medina, Ohio, and 21st Century Smoke of Beloit, Wis.

[0076] In another embodiment, part or substantially all of the aerosol delivery device may be formed from one or more carbon materials, which may provide advantages in terms of biodegradability and absence of wires. In this regard, the heating element may comprise carbon foam, the reservoir may comprise carbonized fabric, and graphite may be employed to form an electrical connection with the battery and controller. An example embodiment of a carbon-based cartridge is provided in U.S. Pat. App. Pub. No. 2013/0255702 to Griffith et al., which is incorporated herein by reference in its entirety.

[0077] Note that in the embodiment of the aerosol delivery device **100** described above, first and second outer bodies **102**, **104** are employed. Use of two or more outer bodies may be advantageous in a number of respects. For example, the components may be assembled in each of the outer bodies **102**, **104** separately. Thus, for example, components may be assembled in the first outer body **102** at a separate time and/or location as compared to assembly of the components in the second outer body **104**. Thus, for example, the outer bodies **102**, **104** may be assembled with their respective components under different conditions in some embodiments. For example, it may be desirable to assemble components in the second outer body **104** under controlled conditions to avoid contamination of the flow path or undesirable absorption of moisture in the reservoir substrate **126**, which may cause leaks or affect the resulting aerosol.

[0078] Further, separate assembly of the components in the outer bodies **102**, **104** may additionally allow for final assembly of the aerosol delivery device **100** at an alternate location and/or time, if desirable. For example, a consumer may be provided with the outer bodies **102**, **104** respectively having the components assembled therein, and final assembly may be completed by the consumer. Further, enhanced customization of the aerosol delivery device **100** and/or supply chain management may be provided by use of separate outer bodies **102**, **104**. In this regard, for example, multiple embodiments of components may be received in one or both of the outer bodies **102**, **104**. Thus for example, the first outer body **102** may be provided with either regular or extended capacity power sources **136**, which may be employed irrespective of the components received in the second outer body **104**. Conversely, the second outer body **104** may include reservoir substrates **126** having any of varying capacities and/or types of aerosol precursor compositions received therein. Thus, various embodiments of aerosol delivery devices **100** may be formed simply by selecting the appropriate desired embodiment of outer bodies **102**, **104**, which may be respectively assembled in advance, rather than specifically assembled to suit demand. As may be understood, the coupler **106** may additionally provide and/or facilitate the above-noted benefits by allowing for coupling of the outer bodies **102**, **104**. Further, the coupler **106** may be coupled to one of the outer bodies **102**, **104** in advance of completion of the aerosol delivery device **100** in order to complete a section of the

aerosol delivery device. Accordingly, the embodiments of aerosol delivery devices including multiple outer bodies as provided herein may provide benefits over existing embodiments of aerosol delivery devices that include a single, unitary housing, such as those embodiments of aerosol delivery devices disclosed in U.S. Pat. Nos. 8,364,742 and 8,393,331 to Hon, which are incorporated herein by reference in their entireties. Additional examples of aerosol delivery devices including a single, unitary housing are commercially available Vype™ by CN Creative, LTD and NJOY® by Sottera, Inc.

[0079] A method for assembling an aerosol delivery device is also provided. As illustrated in FIG. 11, the method may include positioning a power source in a first outer body defining an inlet aperture at operation 202. Further, the method may include positioning an atomizer in a second outer body at operation 204. The method may additionally include engaging a coupler defining a coupler inlet and a longitudinal channel with the first outer body and the second outer body such that the coupler is positioned to receive air from the inlet aperture defined in the first outer body through the coupler inlet and to direct the air through the longitudinal channel to the second outer body at operation 206.

[0080] In some embodiments the method may further comprise substantially irreversibly securing the first outer body to the second outer body with a securing mechanism. Substantially irreversibly securing the first outer body to the second outer body with the securing mechanism may comprise wrapping a wrapper at least partially around the first outer body, the second outer body, and the coupler. The method may additionally include positioning a reservoir substrate and a flow director in the second outer body such that the flow director extends at least partially through the reservoir substrate. Positioning the atomizer in the second outer body may comprise inserting the atomizer through a transverse aperture extending through the flow director.

[0081] The method may further comprise inserting a plurality of electrical connectors through the coupler and connecting the electrical connectors to the power source and the atomizer. The method may additionally include coupling a heating element to a center portion of a liquid transport element to form the atomizer and folding first and second opposing arms of the liquid transport element extending from the center section away from the coupler.

[0082] In some embodiments the method may further comprise coupling the flow director to a nipple of the coupler. The method may also include coupling the flow director to a nipple of a mouthpiece. Further, engaging the coupler with the first outer body and the second outer body at operation 206 may comprise engaging a rib of the coupler with the first outer body and the second outer body.

[0083] In an additional embodiment a controller configured to assemble the aerosol delivery device 100 of the present disclosure is provided. The controller may be configured to execute computer code for performing the operations described herein. In this regard, as illustrated in FIG. 12, the controller 300 may comprise a processor 302 that may be a microprocessor or a controller for controlling the overall operation thereof. In one embodiment the processor 302 may be particularly configured to perform the functions described herein, including the operations for assembling the aerosol delivery device 100 of the present disclosure. The controller 300 may also include a memory device 304. The memory device 304 may include non-transitory and tangible memory

that may be, for example, volatile and/or non-volatile memory. The memory device 304 may be configured to store information, data, files, applications, instructions or the like. For example, the memory device 304 could be configured to buffer input data for processing by the processor 302. Additionally or alternatively, the memory device 304 may be configured to store instructions for execution by the processor 302.

[0084] The controller 300 may also include a user interface 306 that allows a user to interact therewith. For example, the user interface 306 can take a variety of forms, such as a button, keypad, dial, touch screen, audio input interface, visual/image capture input interface, input in the form of sensor data, etc. Still further, the user interface 306 may be configured to output information to the user through a display, speaker, or other output device. A communication interface 308 may provide for transmitting and receiving data through, for example, a wired or wireless network 310 such as a local area network (LAN), a metropolitan area network (MAN), and/or a wide area network (WAN), for example, the Internet.

[0085] The various aspects, embodiments, implementations or features of the described embodiments can be used separately or in any combination. Various aspects of the described embodiments can be implemented by software, hardware or a combination of hardware and software. The described embodiments can also be embodied as computer readable code on a computer readable medium for controlling the above-described operations. In particular, computer readable code may be configured to perform each of the operations of the methods described herein and embodied as computer readable code on a computer readable medium for controlling the above-described operations. In this regard, a computer readable storage medium, as used herein, refers to a non-transitory, physical storage medium (e.g., a volatile or non-volatile memory device, which can be read by a computer system. Examples of the computer readable medium include read-only memory, random-access memory, CD-ROMs, DVDs, magnetic tape, and optical data storage devices. The computer readable medium can also be distributed over network-coupled computer systems so that the computer readable code is stored and executed in a distributed fashion.

[0086] As noted above, the controller 300 may be configured to execute computer code for performing the above-described assembly operations. In this regard, an embodiment of a non-transitory computer readable medium for storing computer instructions executed by a processor in a controller (e.g. controller 300) configured to assemble an aerosol delivery device is provided. The non-transitory computer readable medium may comprise program code instructions for positioning a power source in a first outer body defining an inlet aperture, program code instructions for positioning an atomizer in a second outer body, and program code instructions for engaging a coupler defining a coupler inlet and a longitudinal channel with the first outer body and the second outer body such that the coupler is positioned to receive air from the inlet aperture defined in the first outer body through the coupler inlet and to direct the air through the longitudinal channel to the second outer body.

[0087] In some embodiments the computer readable medium may further comprise program code instructions for substantially irreversibly securing the first outer body to the second outer body with a securing mechanism. The program code instructions for substantially irreversibly securing the

first outer body to the second outer body with the securing mechanism may comprise program code instructions for wrapping a wrapper at least partially around the first outer body, the second outer body, and the coupler. The computer readable medium may further comprise program code instructions for positioning a reservoir substrate and a flow director in the second outer body such that the flow director extends at least partially through the reservoir substrate. The program code instructions for positioning the atomizer in the second outer body may comprise program code instructions for inserting the atomizer through a transverse aperture extending through the flow director.

[0088] The computer readable medium may further comprise program code instructions for inserting a plurality of electrical connectors through the coupler program code instructions for connecting the electrical connectors to the power source and the atomizer. The computer readable medium may further comprise program code instructions for coupling a heating element to a center portion of a liquid transport element to form the atomizer and program code instructions for folding first and second opposing arms of the liquid transport element extending from the center section away from the coupler. The computer readable medium may further comprise program code instructions for coupling the flow director to a nipple of the coupler. The computer readable medium may further comprise program code instructions for coupling the flow director to a nipple of a mouthpiece. The program code instructions for engaging the coupler with the first outer body and the second outer body may comprise program code instructions for engaging a rib of the coupler with the first outer body and the second outer body.

[0089] Many modifications and other embodiments of the disclosure will come to mind to one skilled in the art to which this disclosure pertains having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the disclosure is not to be limited to the specific embodiments disclosed herein and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

1. An aerosol delivery device, comprising:
 - a first outer body defining an inlet aperture;
 - a second outer body;
 - a power source positioned in the first outer body;
 - an atomizer positioned in the second outer body; and
 - a coupler positioned between, and engaged with, the first outer body and the second outer body, the coupler defining a coupler inlet and a longitudinal channel, the coupler being configured to receive air from the inlet aperture defined in the first outer body through the coupler inlet and to direct the air through the longitudinal channel to the second outer body.
2. The aerosol delivery device of claim 1, further comprising at least one securing mechanism configured to substantially irreversibly secure the first outer body to the second outer body.
3. The aerosol delivery device of claim 2, wherein the at least one securing mechanism comprises a wrapper extending at least partially around the first outer body, the second outer body, and the coupler.

4. The aerosol delivery device of claim 1, further comprising a reservoir substrate and a flow director positioned in the second outer body, the flow director extending at least partially through the reservoir substrate.

5. The aerosol delivery device of claim 4, wherein the coupler defines a nipple and the flow director engages the nipple of the coupler.

6. The aerosol delivery device of claim 4, further comprising a mouthpiece defining a nipple, wherein the flow director engages the nipple of the mouthpiece.

7. The aerosol delivery device of claim 4, wherein the flow director defines a transverse aperture extending therethrough, the atomizer extending through the transverse aperture.

8. The aerosol delivery device of claim 1, further comprising a plurality of electrical connectors extending from the atomizer through the coupler to the power source.

9. The aerosol delivery device of claim 1, wherein the atomizer comprises a heating element and a liquid transport element defining a center portion and first and second opposing arms extending therefrom, the heating element being coupled to the center portion of the liquid transport element.

10. The aerosol delivery device of claim 1, wherein the coupler defines a rib, the rib separating the first outer body from the second outer body.

11. A method for assembling an aerosol delivery device, the method comprising:

- positioning a power source in a first outer body defining an inlet aperture;
- positioning an atomizer in a second outer body; and
- engaging a coupler defining a coupler inlet and a longitudinal channel with the first outer body and the second outer body such that the coupler is positioned to receive air from the inlet aperture defined in the first outer body through the coupler inlet and to direct the air through the longitudinal channel to the second outer body.

12. The method of claim 11, further comprising substantially irreversibly securing the first outer body to the second outer body with a securing mechanism.

13. The method of claim 11, wherein substantially irreversibly securing the first outer body to the second outer body with the securing mechanism comprises wrapping a wrapper at least partially around the first outer body, the second outer body, and the coupler.

14. The method of claim 11, further comprising positioning a reservoir substrate and a flow director in the second outer body such that the flow director extends at least partially through the reservoir substrate.

15. The method of claim 14, wherein positioning the atomizer in the second outer body comprises inserting the atomizer through a transverse aperture extending through the flow director.

16. The method of claim 14, further comprising coupling the flow director to a nipple of the coupler.

17. The method of claim 14, further comprising coupling the flow director to a nipple of a mouthpiece.

18. The method of claim 11, further comprising inserting a plurality of electrical connectors through the coupler; and connecting the electrical connectors to the power source and the atomizer.

19. The method of claim 11, further comprising coupling a heating element to a center portion of a liquid transport element to form the atomizer; and

folding first and second opposing arms of the liquid transport element extending from the center section away from the coupler.

20. The method of claim 11, wherein engaging the coupler with the first outer body and the second outer body comprises engaging a rib of the coupler with the first outer body and the second outer body.

21. A coupler for an aerosol delivery device, the coupler comprising:

a first engagement portion configured to engage a first outer body;

a second engagement portion configured to engage a second outer body;

a coupler inlet defined through a peripheral surface of the first engagement portion; and

a longitudinal channel in fluid communication with the coupler inlet and extending through the second engagement portion to a coupler outlet opening.

22. The coupler of claim 21, further comprising a pressure port opening in fluid communication with at least one of the coupler inlet and the longitudinal channel and extending through the first engagement portion.

23. The coupler of claim 21, wherein the coupler inlet is defined between first and second grooves configured to respectively receive a gasket.

24. The coupler of claim 21, further comprising a recessed portion at the peripheral surface of the first engagement portion, the coupler inlet being defined through the recessed portion.

25. The coupler of claim 21, further comprising a nipple configured to engage a flow director, the longitudinal channel extending through the nipple.

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