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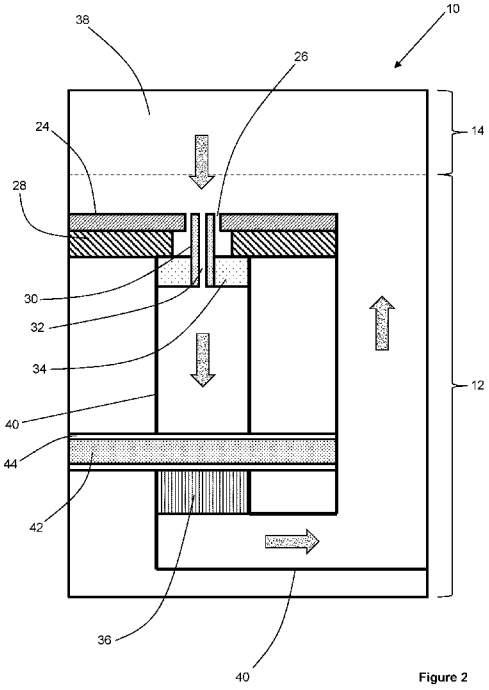


Figure 2

(57) Abstract: There is provided a cleaning device (10) for cleaning an aerosol-generating device (102). The cleaning device (10) comprises a housing (12) arranged to receive an aerosol-generating device (102); and a cleaning head (30) arranged to engage the aerosol-generating device (102) when the aerosol-generating device (102) is received within the housing (12). The cleaning head (30) is movable with respect to an aerosol-generating device (102) received within the housing (12). The cleaning head (30) comprises an airflow passage (32) extending through the cleaning head (30). The cleaning device (10) also comprises an air moving device (36) arranged to draw air through the airflow passage (32).

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A CLEANING DEVICE FOR CLEANING AN AEROSOL-GENERATING DEVICE

The present invention relates to a cleaning device for cleaning an aerosol-generating device. The present invention also relates to a cleaning system comprising a cleaning device and an aerosol-generating device.

Aerosol-generating systems in which an aerosol-forming substrate for generating an inhalable aerosol is heated, rather than combusted, are known in the art. The aim of such aerosol-generating systems is to reduce known harmful smoke constituents produced by the combustion and pyrolytic degradation of tobacco in conventional cigarettes. Typically in such heated aerosol-generating systems, an aerosol is generated by the transfer of heat from a heat source to a physically separate aerosol-forming substrate or material, which may be located within, around or downstream of the heat source. During smoking, volatile compounds are released from the aerosol-forming substrate by heat transfer from the heat source and are entrained in air drawn through the aerosol-generating article. As the released compounds cool, they condense to form an aerosol that is inhaled by the consumer.

WO 2013/102614 A2 discloses an example of an electrically operated aerosol-generating device in which an aerosol-forming substrate of an aerosol-generating article is heated in direct contact with a heating element to form an inhalable aerosol. The heating element is in the form of a blade which is inserted into an aerosol-forming substrate segment of an aerosol-generating article. It is also known to insert heating pins into such aerosol-forming substrate segments, instead of or in addition to a heating blade.

When an aerosol-forming substrate, such as a tobacco substrate, is heated, volatile compounds are released. Volatile compounds and aerosol evolved by the heat from the heating element may become deposited on the aerosol-generating device and in particular on a surface in or proximal to a heating region of the aerosol-generating device. For example, volatile compounds and aerosol may become deposited on a surface of a cavity, such as a heating chamber, or on a surface of the heating element or on both a surface of a cavity and on a surface of a heating element of an aerosol-generating device. Particles of the aerosol-forming substrate itself may also become adhered to the heating element. This may be particularly pronounced if the heating element is in direct contact with the aerosol-forming substrate. Particles of the aerosol-forming substrate itself may become lodged in areas of a heating region, such as a cavity, of an aerosol-generating device. For example sharp interfaces, corners or angles in a cavity of an aerosol-generating device may be particularly susceptible to this problem. Dust or other debris may become lodged or stuck or otherwise accumulate in a cavity of an aerosol-generating device. For example, when using the device described in WO 2013/102614 A2, a heating blade heats a tobacco substrate to temperatures in excess of 200 degrees Celsius, releasing volatile compounds, nicotine and glycerol, all of which form a respiratory aerosol for inhalation by the

consumer. However, residues and dust tend to collect inside the cavity in the device after smoking multiple aerosol-generating articles.

Particles and compounds adhered to or deposited on the heating element or in the cavity of an aerosol-generating device may prevent or impede the heating element from functioning in an optimal manner. These particles and compounds may also break down during use of the aerosol-generating device and impart unpleasant or bitter flavours to a user. For these reasons it is desirable to clean periodically the heating element and the cavity in which the heating element is located.

Cleaning may be effected by a pyrolysis method, in which the heating element is heated to a temperature sufficiently high to burn any residues or deposits. However, pyrolysis on its own may not always be effective. A cleaning consumable, such as a brush, may be used as an alternative to, or in addition to, pyrolysis. However, such prior art cleaning consumables may be small and easy to lose. Prior art cleaning consumables may also rely on a user correctly using the cleaning consumable to provide effective cleaning, to avoid damaging the aerosol-generating device, or both.

It would be desirable to provide an improved device for cleaning an aerosol-generating device.

According to a first aspect of the present invention there is provided a cleaning device for cleaning an aerosol-generating device. The cleaning device may comprise a housing arranged to receive at least part of an aerosol-generating device. The cleaning device may comprise a cleaning head. The cleaning head may be arranged to engage the aerosol-generating device when the aerosol-generating device. The cleaning head may be movable with respect to an aerosol-generating device. The cleaning head may comprise an airflow passage extending through the cleaning head. The cleaning device may also comprise an air moving device. The air moving device may be arranged to draw air through the airflow passage.

Preferably, the cleaning device comprises a housing arranged to receive an aerosol-generating device and a cleaning head arranged to engage the aerosol-generating device when the aerosol-generating device is received within the housing. The cleaning head is movable with respect to an aerosol-generating device received within the housing. The cleaning head comprises an airflow passage extending through the cleaning head. The cleaning device also comprises an air moving device arranged to draw air through the airflow passage. An airflow path may be defined by the housing and the airflow passage of the cleaning head.

Advantageously, providing a cleaning head as part of a cleaning device may provide a more reliable and consistent cleaning operation when compared to a handheld cleaning element, such as a brush. Advantageously, a cleaning device comprising a cleaning head may facilitate semi-automated or automated cleaning of an aerosol-generating device. Advantageously, the

cleaning device may reduce or eliminate the risk of a user damaging an aerosol-generating device by reducing or eliminating the possibility of incorrect use by a user.

Advantageously, the cleaning device may be larger than known cleaning consumables. Advantageously, a larger cleaning device may be easier to use, more difficult to lose, or both.

Advantageously, the combination of an airflow passage extending through a cleaning head and an air moving device arranged to draw air through the airflow passage may assist the cleaning of an aerosol-generating device by drawing residues or deposits out of a cavity of the aerosol-generating device. Advantageously, drawing residues or deposits through the airflow passage may reduce or prevent contamination of the cleaning head. Advantageously, reducing or preventing contamination of the cleaning head may facilitate repeated use of the cleaning head for multiple cleaning operations.

The cleaning head may define a first aperture and a second aperture, wherein the airflow passage extends between the first aperture and the second aperture.

The cleaning head may comprise a first end and a second end opposite the first end, wherein the airflow passage extends between the first end and the second end. In embodiments in which the cleaning head defines a first aperture and a second aperture, the first aperture may be positioned at the first end of the cleaning head and the second aperture may be positioned at the second end of the cleaning head.

The cleaning head may comprise a longitudinal axis. The airflow passage may be substantially parallel to the longitudinal axis of the cleaning head. The airflow passage may extend along the longitudinal axis of the cleaning head. In embodiments in which the cleaning head comprises a first end and a second end, the longitudinal axis may extend between the first end and the second end. In embodiments in which the cleaning head comprises a first aperture and a second aperture, the first and second apertures may each be positioned along the longitudinal axis. In other words, the longitudinal axis may extend between the first aperture and the second aperture.

In some embodiments, the air moving device comprises a fan.

Preferably, the air moving device is arranged to recirculate air within the cleaning device. Advantageously, recirculating air within the housing may contain, within the cleaning device, any odour associated with residues or deposits being cleaned from an aerosol-generating device. Advantageously, recirculating air within the housing may facilitate control of an air flow rate through the airflow passage.

The terms “recirculate”, “recirculation” and “recirculating” are used herein to refer to a closed airflow path within the cleaning device. During use, air flows in one direction around the closed airflow path.

Preferably, the cleaning device comprises a filter positioned within the housing, such as along an airflow path between the airflow passage of the cleaning head and the air moving device.

The air moving device may be arranged to draw air from the airflow passage through the filter. Advantageously, the filter may retain at least one of residues, deposits and odours from an aerosol-generating device and drawn through the airflow passage. Advantageously, retaining residues and deposits from an aerosol-generating device may reduce or prevent contamination of at least one of the air moving device and other components of the cleaning device.

Preferably, the filter is removable from the housing. Advantageously, a removable filter may be cleaned or replaced when the filter becomes fouled with residues and deposits from one or more aerosol-generating devices. The housing may define a slot through which the filter may be inserted into the cleaning device and removed from the cleaning device. To facilitate insertion of the filter into the cleaning device and removal of the filter from the cleaning device, the cleaning device may comprise a filter carrier on which the filter is supported. Preferably, the filter carrier may be slidable with respect to the housing. In embodiments in which the housing defines a slot, the filter carrier may be arranged to slide through the slot. The cleaning device may comprise a handle attached to the filter carrier. Advantageously, the handle may assist a user in removing the filter carrier from the cleaning device and inserting the filter carrier into the cleaning device.

Preferably, the cleaning device comprises a filter seal arranged to substantially prevent airflow between the filter carrier and the slot when the filter carrier is received within the cleaning device. The filter seal may be particularly advantageous in embodiments in which the air moving device is arranged to recirculate air within the cleaning device.

The filter may comprise any suitable filter material. The filter may be classed as G1, G2, G3 or G4 under European standard EN 779:2012. Advantageously, filters falling within these classes may provide sufficient filtration while also facilitating a desired airflow rate through the filter.

The housing of the cleaning device may define an opening through which the aerosol-generating device may be inserted into the housing and removed from the housing. The opening may have at least one of a cross-sectional size and a cross-sectional shape that corresponds to a cross-sectional size and a cross-sectional shape of an aerosol-generating device. The cleaning device may be arranged so that a portion of an aerosol-generating device protrudes from the cleaning device when the aerosol-generating device is received within the housing.

Preferably, the cleaning device comprises a lid arranged for movement with respect to the housing between an open position in which an aerosol-generating device may be inserted into the housing and a closed position in which the lid and the housing together define an interior space of the cleaning device within which an aerosol-generating device may be contained. Advantageously, the lid may substantially seal the aerosol-generating device within the interior space of the cleaning device when the lid is in the closed position. In embodiments in which the air moving device is arranged to recirculate air within the cleaning device, substantially sealing the aerosol-generating device within the cleaning device may facilitate recirculation of air within

the interior space of the cleaning device. Preferably, the air moving device is arranged to recirculate air within the interior space of the cleaning device.

In embodiments in which the housing of cleaning device defines an opening through which an aerosol-generating device may be inserted into the housing and removed from the housing, preferably, the lid overlies the opening when the lid is in the closed position. Advantageously, providing a lid that overlies the opening when the lid is in the closed position may facilitate the use of an opening that is significantly larger than an aerosol-generating device. Advantageously, a larger opening may simplify insertion of an aerosol-generating device into the cleaning device and removal of an aerosol-generating device from the cleaning device when the lid is in the open position.

The lid may comprise an engagement portion arranged to engage an aerosol-generating device received by the housing. Advantageously, the engagement portion may facilitate maintaining an aerosol-generating device received by the housing in a correct orientation during use of the cleaning device.

The engagement portion may comprise at least one projection extending from an interior surface of the lid.

The engagement portions may comprise an aperture arranged to receive a portion of an aerosol-generating device receiving by the housing. The lid may comprise an outer portion at least partially defining an outer surface of the lid and an inner portion at least partially defining an inner surface of the lid. The aperture may be provided in the inner portion of the lid. Preferably, at least part of the inner portion is spaced apart from at least part of the outer portion to define a space between the inner portion and the outer portion. The lid may be arranged so that, when an aerosol-generating device is received by the housing and the lid is in the closed position, a portion of the aerosol-generating device extends through the aperture and into the space between the inner portion and the outer portion.

The lid may be movably attached to the housing. The lid may be rotatable with respect to the housing between the open position and the closed position. The lid may be attached to the housing by a shaft, wherein the lid is rotatable about the shaft with respect to the housing. The lid may be pivotable with respect to the housing between the open position and the closed position. The lid may be attached to the housing by a hinge, wherein the lid is pivotable about the hinge with respect to the housing. The lid may be slidable with respect to the housing between the open position and the closed position.

The lid may be detachable from the housing. The cleaning device may be arranged so that the lid is in the open position when the lid is detached from the housing. The cleaning device may be arranged so that the lid is in the closed position when the lid is attached to the housing.

The cleaning device may comprise a closure element arranged to retain the lid in the closed position. The closure element may comprise an interference fit between a portion of the

lid and a portion of the housing. The closure element may comprise at least one magnetic material arranged to retain the lid in the closed position. The at least one magnetic material may comprise a first magnet provided on the lid and an opposed second magnet provided on the housing, wherein the first magnet is arranged to overlie the second magnet when the lid is in the closed position. The closure element may comprise a latch and a recess arranged to receive the latch when the lid is in the closed position. The latch may be provided on the lid and the recess may be defined by the housing. The latch may be provided on the housing and the recess may be defined by the lid.

In embodiments in which the lid is movably attached to the housing, the cleaning device may comprise a biasing element arranged to bias the lid towards the closed position. The biasing element may comprise a spring. In embodiments in which the lid is rotatable or pivotable with respect to the housing, the spring may comprise a torsion spring. In embodiments in which the lid is slidable with respect to the housing, the spring may comprise a compression spring.

Preferably, the cleaning device comprises at least one handle attached to the lid. Advantageously, the handle may assist a user in moving the lid between the open position and the closed position.

The cleaning device may comprise a seal positioned between the lid and the housing when the lid is in the closed position. Advantageously, the seal may facilitate substantially sealing the aerosol-generating device within the interior space of the cleaning device when the lid is in the closed position. The seal may be provided on the lid. The seal may be provided on the housing. The seal may comprise a first portion provided on the lid and a second portion provided on the housing. Preferably, the seal comprises an elastically deformable material. The seal may comprise a rubber. The rubber may comprise at least one of a natural rubber and a synthetic rubber.

The cleaning device may comprise an aerosol-generating device adapter positioned within the housing and arranged to receive an aerosol-generating device when the aerosol-generating device is received within the housing.

The term “aerosol-generating device adapter” is used herein to refer to a part of the cleaning device that is configured to engage an aerosol-generating device when the aerosol-generating device is received within the housing.

Advantageously, the aerosol-generating device adapter may support the aerosol-generating device within the cleaning device during a cleaning process.

Preferably, the aerosol-generating device adapter has at least one of a size and a shape that corresponds to a size and a shape of a portion of an aerosol-generating device.

Preferably, a through-hole extends through the aerosol-generating device adapter. Advantageously, the through-hole may facilitate engagement between an aerosol-generating

device received within the housing and the cleaning head. Preferably, the through-hole is aligned with the cleaning head. The cleaning head may be arranged to extend into the through-hole.

Preferably, the aerosol-generating device adapter is removable from the housing. Advantageously, a removable aerosol-generating device adapter may facilitate swapping the aerosol-generating device adapter for a different aerosol-generating device adapter. Advantageously, different aerosol-generating device adapters may facilitate use of the cleaning device with different aerosol-generating devices. Advantageously, a removable aerosol-generating device adapter may facilitate cleaning of the aerosol-generating device adapter. Advantageously, a removable aerosol-generating device adapter may facilitate hygienic use of the cleaning device. For example, a removable aerosol-generating device adapter may allow a user to provide and use a personal aerosol-generating device adapter.

The cleaning head may be removable from the cleaning device. Advantageously, a removable cleaning head may be cleaned or replaced when the cleaning head becomes damaged. Advantageously, a removable cleaning head may be cleaned or replaced when the cleaning head becomes fouled with residues and deposits from one or more aerosol-generating devices. Advantageously, a removable cleaning head may facilitate swapping the cleaning head for a different cleaning head. Advantageously, different cleaning heads may be configured or suited to cleaning different aerosol-generating devices.

The cleaning head may comprise a brush. The brush may comprise a shaft and a plurality of bristles extending from the shaft. The brush may be a tube brush.

The cleaning head may comprise an elongate body having a proximal end portion and a distal end portion, wherein the distal end portion of the elongate body defines a recess for receiving a heating element of an aerosol-generating device. The recess extends from an opening in a distal end face of the elongate body towards the proximal end portion of the elongate body. The distal end portion of the elongate body is provided with at least one protrusion inwardly projecting into the recess.

The term “elongate body” refers to a body of the cleaning head having a length which is greater than its diameter. For example, the cleaning head may have a length which is at least twice the diameter of the cleaning head.

The terms “longitudinal”, “transverse”, “proximal” and “distal” are defined in terms of the elongate body of the cleaning head. As such, the term “longitudinal” refers to the direction along the length of the body of the cleaning head, and the term “transverse” refers to the direction perpendicular to the longitudinal direction. The term “distal end” refers to the end of the elongate body of the cleaning head that is intended to be received first by an aerosol-generating device. The term “proximal end” refers to the end of the body of the cleaning head which is opposite to the distal end.

Advantageously, the elongate body may facilitate insertion of the cleaning head into a cavity of an aerosol-generating device.

Advantageously, the recess may receive one or more heating elements of the aerosol-generating device, such as a heating blade or a heating pin.

Advantageously, by providing the cleaning head with at least one protrusion which extends into the recess, the cleaning head may be used to clean the heating element of the aerosol-generating device by moving the cleaning head relative to the heating element such that the at least one protrusion engages with the heating element, when the heating element is received within the recess of the tool.

Preferably, the airflow passage extends between the proximal end portion and the distal end portion, wherein the recess forms at least part of the airflow passage. Advantageously, arranging the recess to form at least part of the airflow passage allows airflow through the airflow passage to draw residues or deposits cleaned from a cavity of an aerosol-generating device out of the recess. Advantageously, drawing residues or deposits out of the recess reduces of prevents contamination of the cleaning head. Advantageously, reducing or preventing contamination of the cleaning head facilitates repeated use of the cleaning head with multiple aerosol-generating devices.

Preferably, the at least one protrusion is elastically deformable. An elastically deformable protrusion may improve the cleaning effect of the at least one protrusion. An elastically deformable protrusion may help to increase the contact time between the at least one protrusion and a heating element of an aerosol-generating device during cleaning. An elastically deformable protrusion may help to reduce the risk of the at least one protrusion damaging a heating element of an aerosol-generating device during cleaning.

Preferably, the at least one protrusion is formed of a flexible material. Advantageously, the at least one protrusion formed of a flexible material may be arranged so that the at least one protrusion can bend while abutting a heating element of an aerosol-generating device. Advantageously, a bending action while in contact with a heating element can result in a wiping action of the heating element, and thereby remove debris from the heating element.

Preferably, the at least one protrusion comprises or is formed of one or more thermoplastic elastomers (TPE), such as one or more of Arnitel, Hytrel, Dryflex, Mediprene, Kraton, Pibiflex, Sofprene, and Laprene.

The at least one protrusion disposed within the recess may be formed of the same material as the elongate body of the cleaning head. Preferably, the at least one protrusion disposed within the recess is formed of a different material from a material that forms the elongate body of the cleaning head. For example, the elongate body of the cleaning head may be formed of a mouldable plastic and the at least one protrusion disposed within the recess may be formed of a flexible material, such as one or more thermoplastic elastomers.

The at least one protrusion disposed within the recess may be secured to the elongate body by way of an adhesive. The at least one protrusion may be mechanically secured to the elongate body.

To effect the cleaning of an aerosol-generating device, the cleaning head may be movable with respect to an aerosol-generating device received within the housing. In some embodiments, the aerosol-generating device received within the housing may be movable with respect to the cleaning head. The cleaning device may be arranged to allow a user to manually effect a relative movement between the cleaning head and an aerosol-generating device. The cleaning device may be arranged to allow a user to manually move an aerosol-generating device with respect to the cleaning head. The cleaning device may be arranged to allow a user to manually move the cleaning head with respect to an aerosol-generating device received within the cleaning device.

Preferably, the cleaning device is arranged to provide relative movement between the cleaning head and an aerosol-generating device received within the cleaning device. Advantageously, a cleaning device arranged to provide relative movement between a cleaning head and an aerosol-generating device may simplify use of the cleaning device by a user. Advantageously, a cleaning device arranged to provide relative movement between a cleaning head and an aerosol-generating device may provide more reliable and consistent cleaning of an aerosol-generating device received within the cleaning device.

The cleaning device may be arranged to move an aerosol-generating device received within the housing relative to the cleaning head.

Preferably, the cleaning device is arranged to move the cleaning head relative to an aerosol-generating device received within the housing. Preferably, the cleaning device comprises a motor arranged to move the cleaning head with respect to an aerosol-generating device received within the housing. Preferably, the motor is arranged to provide at least one of a rotational movement of the cleaning head, a reciprocating movement of the cleaning head, and an eccentric movement of the cleaning head relative to an aerosol-generating device received within the housing.

In embodiments in which the cleaning device comprises a lid, preferably the cleaning device comprises a lid sensor arranged to determine whether the lid is in the closed position or the open position. Preferably, the cleaning device is arranged to provide relative movement between the cleaning head and an aerosol-generating device received within the cleaning device only when the lid sensor provides a signal indicative of the lid being in the closed position.

In embodiments in which the cleaning device comprises a motor, preferably, the cleaning device is arranged so that the motor may move the cleaning head only when the lid sensor provides a signal indicative of the lid being in the closed position. Advantageously, arranging the motor to operate only when the lid is in the closed position may prevent a user from inserting an aerosol-generating device into the cleaning device or removing an aerosol-generating device from

the cleaning device when the motor is moving the cleaning head. Advantageously, this may prevent damage to at least one of the motor, the cleaning head and the aerosol-generating device.

The lid sensor may comprise any suitable sensor for determining the position of the lid. The lid sensor may comprise at least one of a magnetic sensor, a pressure sensor, a light sensor, and a galvanic switch.

The cleaning head may be a first head, wherein the airflow passage is a first airflow passage. The cleaning device may further comprise a second cleaning head positioned within the housing, wherein the second cleaning head is movable with respect to an aerosol-generating device received within the housing. The second cleaning head comprises a second airflow passage extending through the second cleaning head, wherein the air moving device is arranged to draw air through the first airflow passage and the second airflow passage.

Advantageously, first and second cleaning heads may facilitate simultaneous cleaning of first and second aerosol-generating devices. Advantageously, first and second cleaning heads may facilitate simultaneous cleaning of first and second parts of an aerosol-generating device comprising a plurality of separable parts. For example, an aerosol-generating device may comprise a heating section comprising a heating element and a detachable housing portion. First and second cleaning heads may facilitate separate but simultaneous cleaning of the detachable housing portion and the heating element of the heating section.

The first and second cleaning heads may be substantially the same. Advantageously, the same first and second cleaning heads may facilitate simultaneous cleaning of similar aerosol-generating devices.

The second cleaning head may have at least one of a different size and a different shape compared to the first cleaning head. Advantageously, different first and second cleaning heads may facilitate use of the cleaning device for cleaning different aerosol-generating devices. Advantageously, first and second cleaning heads may facilitate simultaneous cleaning of first and second parts of an aerosol-generating device comprising a plurality of separable parts, wherein the first and second parts are different to each other.

Each of the first and second cleaning heads may comprise any of the optional or preferred features described herein.

The skilled person will appreciate that the features of embodiments comprising first and second cleaning heads can be extended to cleaning devices comprising more than two cleaning heads. Advantageously, providing a cleaning device with more than two cleaning heads may facilitate simultaneous cleaning of more than two aerosol-generating devices. This may be particularly advantageous in examples in which the cleaning device is used in a commercial setting.

In embodiments comprising an aerosol-generating device adapter, the aerosol-generating device adapter may be a first aerosol-generating device adapter arranged to receive an aerosol-

generating device to be cleaned by the first cleaning head. The cleaning device may comprise a second aerosol-generating device adapter arranged to receive an aerosol-generating device to be cleaned by the second cleaning head. Each of the first and second aerosol-generating device adapters may comprise any of the optional or preferred features described herein.

The first and second aerosol-generating device adapters may have substantially the same size and shape. Advantageously, first and second aerosol-generating device adapters having the same size and shape may facilitate simultaneous cleaning of identical first and second aerosol-generating device.

The first and second aerosol-generating device adapters may have at least one of a different size, a different shape, and offset mounting positions within the housing. Advantageously, first and second aerosol-generating device adapters having at least one of a different size, a different shape, and offset mounting positions may facilitate simultaneous cleaning of two aerosol-generating devices having different geometries. Advantageously, first and second aerosol-generating device adapters having at least one of a different size, a different shape, and offset mounting positions may facilitate simultaneous cleaning of first and second separable parts of an aerosol-generating device. For examiner, an aerosol-generating device may comprise a heating section comprising a power supply and a heating element, and a detachable housing portion, wherein the first aerosol-generating device adapter is configured to receive the heating section and the second aerosol-generating device adapter is configured to receive the detachable housing portion.

The skilled person will appreciate that the features of embodiments comprising first and second aerosol-generating device adapters can be extended to cleaning devices comprising more than two aerosol-generating device adapters where the cleaning device comprises more than two cleaning heads.

In embodiments comprising a motor, the motor may be a first motor arranged to move the first cleaning head. The cleaning device may comprise a second motor arranged to move the second cleaning head. Each of the first and second motors may comprise any of the optional or preferred features described herein. The number of motors may be further increased to match the number of cleaning heads in embodiments in which the cleaning device comprises more than two cleaning heads.

The air moving device may be a single air moving device arranged to draw air through both the first airflow passage and the second airflow passage. Advantageously, a single air moving device may facilitate simple and cost-effective manufacture of the cleaning device

The cleaning device may comprise an airflow modulating element movable with respect to the housing between a plurality of positions to vary a ratio of a first airflow rate through the first airflow passage to a second airflow rate through the second airflow passage. The airflow

modulating element may be particularly advantageous in embodiments in which the air moving device is a single air moving device.

Advantageously, the airflow modulating element may be used to direct most or all of the airflow through either the first airflow passage or the second airflow passage when only the first cleaning head or the second cleaning head is being used to clean an aerosol-generating device.

Advantageously, the airflow modulating element may be used to provide unequal first and second airflow rates. Unequal first and second airflow rates may be preferred when one of the cleaning heads is being to remove a smaller amount of residues or deposits from an aerosol-generating device than the other cleaning head.

The airflow modulating element may comprise at least one of a valve and a moveable baffle.

The air moving device may be a first air moving device arranged to draw air through the first airflow passage. The cleaning device may comprise a second air moving device arranged to draw air through the second airflow passage.

Advantageously, providing first and second air moving device allows airflow through the first airflow passage to be controlled independently of airflow through the second airflow passage. Advantageously, independent control of airflow through the first and second airflow passages may facilitate more efficient operation of the cleaning device. For example, each of the first and second air moving device may be operated according to the airflow requirements through each of the first and second airflow passages depending on a particular cleaning operation. In examples in which only the first or second cleaning head is being used to clean an aerosol-generating device, it is necessary to operate only one of the first and second air moving devices.

Each of the first and second air moving devices may comprise any of the optional or preferred features described herein.

Preferably, the cleaning device comprises a controller arranged to control the air moving device. Preferably, the controller is arranged to switch the air moving device on and off. The controller may be arranged to control a speed of the air moving device to control an airflow rate through the airflow passage of the cleaning head.

Preferably, the controller is configured to control at least one of the motor and the airflow modulating device, where present. In embodiments in which the cleaning device comprises a lid sensor, preferably the controller is arranged to receive a signal from the lid sensor indicative of a position of the lid.

Preferably, the cleaning device comprises a user interface arranged to allow a user to control one or more elements of the cleaning device. In embodiments in which the cleaning device comprises a controller, preferably the user interface allows a user to interact with the controller. The user interface may comprise at least one button. The user interface may comprise at least one switch. The user interface may comprise a touchscreen display.

Preferably, the cleaning device comprises a feedback device arranged to provide feedback to a user. The feedback device may be arranged to provide a user with information regarding one or more operational parameters of the cleaning device. For example, the feedback device may be arranged to indicate when a cleaning operation has finished. In embodiments in which the cleaning device comprises a controller, preferably the controller is configured to control the feedback device. The feedback device may comprise at least one of an audible feedback device, a tactile feedback device, and a visual feedback device. The visual feedback device may comprise a visual display. In embodiments in which the cleaning device comprises a touchscreen display, the touchscreen display may function as both a user interface and a feedback device.

The cleaning device may comprise at least one cleaning device electrical contact arranged to electrically connect to at least one aerosol-generating device electrical contact when the aerosol-generating device is received by the cleaning device. Advantageously, the at least one cleaning device electrical contact may facilitate data transfer between the cleaning device and an aerosol-generating device received by the cleaning device.

In embodiments in which the cleaning device comprises a lid, the at least one cleaning device electrical contact may be provided on the lid. The at least one cleaning device electrical contact may be provided on an inner surface of the lid.

The cleaning device may be arranged to receive data from an aerosol-generating device received by the cleaning device. The cleaning device may be arranged to receive data relating to at least one of a number of heating cycles, a number of cleaning cycles, a number of charging cycles, a battery condition, a serial number, a software version, and combinations thereof. Preferably, the cleaning device comprises a controller arranged to receive data from an aerosol-generating device received by the cleaning device. In embodiments in which the cleaning device comprises a feedback device, the cleaning device may be arranged to provide feedback to a user based on at least some of the data received from the aerosol-generating device. For example, the cleaning device may determine a battery condition of the aerosol-generating device based on data received from the aerosol-generating device. The cleaning device may be arranged to communicate the determined battery condition to a user by the feedback device. The cleaning device may be arranged to recommend to a user at least one of a battery replacement and an aerosol-generating device replacement when the determined battery condition is below a predetermined threshold.

The cleaning device may comprise a communications device. The communications device may comprise at least one of a wired communications device and a wireless communications device. Preferably, the communications device is arranged to communicate with an external device. For example, the communications device may be arranged to communicate with at least one of a local computing device and a remote computing device. The cleaning device

may be arranged to communicate data received from an aerosol-generating device to an external device.

The cleaning device may be arranged to transmit data to an aerosol-generating device received by the cleaning device. For example, the cleaning device may be arranged to transmit a software update to an aerosol-generating device received by the cleaning device. In embodiments in which the cleaning device comprises a communications device, the cleaning device may be arranged to receive a software update for an aerosol-generating device from an external device.

The cleaning device may comprise a power supply input arranged to receive electrical power from an external power supply. Preferably, the power supply input is arranged to supply electrical power to the air moving device. Preferably, the power supply input is arranged to supply electrical power to at least one of the motor, the lid sensor, the airflow modulating element, the controller, the user interface, and the feedback device, where present. Preferably, the power supply input comprises at least one a plug and a socket.

The cleaning device may comprise a power supply arranged to supply electrical power to the air moving device. Preferably, the power supply is arranged to supply electrical power to at least one of the motor, the lid sensor, the airflow modulating element, the controller, the user interface, and the feedback device, where present.

The power supply may be a DC voltage source. In preferred embodiments, the power supply is a battery. For example, the power supply may be a nickel-metal hydride battery, a nickel cadmium battery, or a lithium based battery, for example a lithium-cobalt, a lithium-iron-phosphate or a lithium-polymer battery. The power supply may be rechargeable. In embodiments in which the cleaning device comprises a power supply input, the power supply input may be arranged to supply electrical power to the power supply to recharge the power supply.

The housing of the cleaning device may comprise any suitable material. The housing may comprise or be formed from at least one of a plastic and a metal. The housing may comprise aluminium. The housing may comprise stainless steel.

In embodiments in which the cleaning device comprises a lid, the lid may be formed from the same material as the housing or a different material from the housing.

The cleaning device may comprise a window arranged to allow a user to view an aerosol-generating device when the aerosol-generating device is received within the housing. The window may be provided in the housing. In embodiments in which the cleaning device comprises a lid, the window may be provided in the lid. The cleaning device may comprise a light arranged to illuminate an aerosol-generating device received within the housing. Advantageously, illuminating an aerosol-generating device received within the housing may facilitate a user viewing the aerosol-generating device through the window.

According to a second aspect of the present invention, there is provided a cleaning system comprising a cleaning device according to the first aspect of the present invention, in accordance with any of the embodiments and examples described herein. The cleaning system also comprises an aerosol-generating device comprising a cavity for receiving an aerosol-forming substrate and a heating element arranged to heat an aerosol-forming substrate when the aerosol-forming substrate is received within the cavity. The housing of the cleaning device is arranged to receive the aerosol-generating device, and the cleaning head is arranged to be at least partially received within the cavity of the aerosol-generating device when the aerosol-generating device is received within the housing.

As used herein, the term “aerosol-generating device” refers to a device comprising a heating element that interacts with an aerosol-forming substrate to generate an aerosol.

The heating element may be positioned within the cavity and arranged for insertion into the plug of aerosol-forming substrate when the aerosol-forming substrate is received within the cavity of the aerosol-generating device. The heating element may extend into the cavity.

The heater may be arranged to extend around an outer surface of the aerosol-forming substrate when the aerosol-forming substrate is received within the cavity of the aerosol-generating device.

Preferably, the heating element is an electrical heating element.

The electrical heating element may extend into the cavity. The electrical heating element may be an elongate electrical heating element. The elongate electrical heating element may comprise a distal end arranged to be received within an aerosol-forming substrate and a proximal end opposite the distal end. The electrical heating element may be blade-shaped. The electrical heating element may be pin-shaped. The electrical heating element may be cone-shaped.

The elongate electrical heating element may comprise at least one resistive heating track. The at least one resistive heating track may be surrounded by an electrically insulating substrate. The at least one resistive heating track may be embedded within an electrically insulating substrate. The electrically insulating substrate may comprise a ceramic. The electrically insulating substrate may be received within a tubular shell. The tubular shell may comprise at least one metal.

The electrical heating element may comprise a resistive heating element. During use, an electrical current is supplied to the resistive heating element to generate heat by resistive heating.

The electrical heating element may be arranged to extend around an outer surface of an aerosol-forming substrate received within the cavity. The electrical heating element may have a tubular shape. The electrical heating element may comprise an electrically insulating substrate and at least one resistive heating track on the electrically insulating substrate. The electrically insulating substrate may comprise a flexible sheet. Advantageously, a flexible sheet may facilitate manufacturing the electrical heating element in a flat state and subsequently deforming the

flexible sheet into a desired shape. For example, the electrical heating element may be formed in a flat state and then rolled into a tubular shape. The electrically insulating substrate may comprise a polyimide film. The at least one resistive heating track may comprise at least one metal.

The at least one resistive heating track may define a plurality of heating zones.

The at least one resistive heating track may comprise a plurality of heating tracks. The plurality of heating tracks may define a plurality of heating zones.

The at least one resistive heating track may comprise a single heating track comprising a plurality of portions, wherein each portion defines a heating zone.

Advantageously, at least some of the heating zones may be heated to different temperature during use. Advantageously, at least some of the heating zones may be heated at different times during use. Each heating zone may be defined by a single resistive heating track. Each heating zone may be defined by a plurality of resistive heating tracks.

The electrical heating element may comprise an inductive heating element. During use, the inductive heating element inductively heats a susceptor material to heat an aerosol-forming substrate when the aerosol-forming substrate is received within the cavity. The susceptor material may form part of the aerosol-generating device. The susceptor material may form part of an aerosol-generating article comprising the aerosol-forming substrate.

Preferably, the aerosol-generating device comprises a device power supply and a device controller arranged to supply power from the device power supply to the electrical heating element during use of the aerosol-generating device.

Preferably, the controller is arranged to supply power from the device power supply to the electrical heating element according to a predetermined heating cycle when the aerosol-generating device is used to heat an aerosol-forming substrate received within the cavity of the aerosol-generating device.

The device power supply may be a DC voltage source. In preferred embodiments, the device power supply is a battery. For example, the device power supply may be a nickel-metal hydride battery, a nickel cadmium battery, or a lithium based battery, for example a lithium-cobalt, a lithium-iron-phosphate or a lithium-polymer battery. The device power supply may alternatively be another form of charge storage device such as a capacitor. The device power supply may be rechargeable and may have a capacity that allows for the storage of enough energy for use of the aerosol-generating device with one or more aerosol-forming substrates.

Preferably, the aerosol-generating device comprises at least one air inlet. Preferably, the at least one air inlet provides fluid communication between the exterior of the aerosol-generating device and the cavity. Advantageously, the at least one air inlet allows air to enter cavity when the aerosol-generating device is used to heat an aerosol-forming substrate. Advantageously, the

at least one air inlet allows air to flow into the cavity and through the airflow passage of the cleaning head when the aerosol-generating device is received by the cleaning device.

Preferably, the at least one air inlet is in fluid communication with an upstream end of the cavity. In embodiments in which the aerosol-generating device comprises an elongate electrical heating element, preferably the elongate electrical heating element extends into the cavity from the upstream end of the cavity. When the aerosol-generating device is received within the housing of the cleaning device, preferably air is drawn through the at least one air inlet into the cavity of the aerosol-generating device and out of the cavity through the airflow passage of the cleaning head.

The aerosol-generating device may comprise a heating section comprising the heating element and a detachable housing portion. In embodiments in which the aerosol-generating device comprises at least one air inlet, the at least one air inlet may comprise at least one of an aperture in the detachable housing portion, an aperture in the heating section, and an aperture formed between the detachable housing portion and the heating section when the detachable housing portion is attached to the heating section.

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

Figure 1 shows a perspective view of a cleaning device according to a first embodiment of the present invention;

Figure 2 shows a cross-sectional view of the cleaning device of Figure 1;

Figure 3 shows a perspective view of the cleaning head of the cleaning device of Figure 1;

Figure 4 shows a cross-sectional view of an aerosol-generating device;

Figure 5 shows a cross-sectional view of a cleaning system comprising the cleaning device of Figure 1 and the aerosol-generating device of Figure 4;

Figure 6 shows a cross-sectional view of a cleaning system comprising a cleaning device according to a second embodiment of the present invention and two aerosol-generating devices;

Figure 7 shows a cross-sectional view of a cleaning system comprising a cleaning device according to a third embodiment of the present invention and two aerosol-generating devices; and

Figure 8 shows a cleaning system comprising the cleaning device of Figure 7 and two parts of a single aerosol-generating device.

Figure 1 shows a cleaning device 10 according to a first embodiment of the present invention. The cleaning device 10 comprises a housing 12 and a lid 14 attached to a top edge of the housing 12 by a hinge 16. The lid 14 is moveable about the hinge 16 between a closed position shown in Figure 1 and an open position. A latch 18 retains the lid 14 in the closed position.

A touchscreen display 20 is positioned on a front wall of the housing 12 to allow a user to control the cleaning device 10 and to provide visual feedback to the user.

A slot 22 extends through a side wall of the housing 12 to accommodate a removable filter assembly, as further described herein.

As shown in Figure 2, the cleaning device 10 further comprises an aerosol-generating device adapter 24 positioned within the housing 12. The aerosol-generating device adapter 24 defines an aperture 26 having a size and shape for receiving and supporting an aerosol-generating device. The aerosol-generating device adapter 24 is removable from the housing 12 to allow different aerosol-generating device adapters to be used with the cleaning device 10. The aerosol-generating device adapter 24 is removably received on a supporting top plate 28 fixed to the housing 12.

The cleaning device 10 also comprises a cleaning head 30 extending into the aperture 26 of the aerosol-generating device adapter 24 and arranged to engage an aerosol-generating device when the aerosol-generating device is received within the housing 12 and the aerosol-generating device adapter 24. The cleaning head 30 comprises an airflow passage 32 extending through the cleaning head 30. A motor 34 is secured to an underside of the supporting top plate 38 and is engaged with the cleaning head 30 to rotate the cleaning head 30 relative to an aerosol-generating device received within the aerosol-generating device adapter 24. The cleaning head 30 is detachable from the motor 34 to allow the cleaning head 30 to be removed from the cleaning device 10 for cleaning or replacement of the cleaning head 30.

An air moving device 36 in the form of a fan is positioned within the housing 12 and arranged to draw air through the airflow passage 32 of the cleaning head 34. The lid 14 and the housing 12 together define an interior space 38 of the cleaning device 10 when the lid 14 is in the closed position. A plurality of fixed baffles 40 positioned within the housing are arranged so that the air moving device 36 recirculates air within the interior space 38, as illustrated by the shaded arrows in Figure 2.

The cleaning device 10 also comprises a filter 42 positioned between the cleaning head 30 and the air moving device 36. Air drawn through the airflow passage 32 passes through the filter 42 before reaching the air moving device 36. Therefore, the filter 42 may remove residues and deposits from the airflow to reduce or prevent contamination of the air moving device 36. The filter 42 is arranged on a removable carrier 44 that is received within the slot 22 of the housing 12. The removable carrier 44 facilitates removal of the filter 42 from the housing 12 for cleaning or replacement of the filter 42.

Figure 3 shows a perspective view of the cleaning head 30. The cleaning head 30 comprises an elongate body 52 having a generally cylindrical shape, with a proximal end portion 53 and a distal end portion 54. The distal end portion 54 of the elongate body 52 defines a recess 55 for receiving a heating element of an aerosol-generating device. The recess 55 extends from

an opening in a distal end face 56 of the elongate body 52 towards the proximal end portion 53 of the elongate body 52. The recess 55 forms part of the airflow passage 32.

At the distal end face 56 are a first set of protrusions 60. Each of the protrusions 60 extends into a central region of the recess 55 from a point on the periphery of the distal end face 56, as viewed along the longitudinal axis of the elongate body 52. Each of the protrusions 60 is in the form of a substantially planar fin. The first protrusions 60 are formed of a flexible material, such as a thermoplastic elastomer.

During use of the cleaning device 10, a heating element of an aerosol-generating device can be inserted into the recess 55 so that at least a portion of the length of the heating element extends along at least a portion of the length of the recess. The motor 34 rotates the cleaning head 30 relative to the heating element and causes the first set of protrusions 60 to come into contact with the heating element. As the cleaning head 30 is further rotated, the first set of protrusions 60 may engage and slide along the surface of the heating element to remove residues and deposits from the surface of the heating element.

The distal end face 56 of the cleaning head 30 is also provided with a second set of protrusions 70. The second set of protrusions 70 are disposed around the peripheral region of the distal end face 56, with each of the protrusions 70 extending towards the central region of the distal end face 56. The protrusions 70 of the second set are smaller than the protrusions 60 of the first set. In other words, the second protrusions 70 do not extend as far across the distal end face 56 as the first protrusions 60. Instead, the second protrusions 70 remain in the peripheral region of the distal end face 56. The second protrusions 70 are formed of a rigid material, such as a polyimide.

The second protrusions 70 together form a scraping surface at the distal end face 56 of the elongate body 52, which provides a different cleaning function from that of the first protrusions 60. In particular, the second protrusions 70 can be used to clean the base of a cavity which contains a heating element of an aerosol-generating device when the motor 34 rotates the cleaning head 30.

Figure 4 shows a cross-sectional view of an aerosol-generating device 102 for heating an aerosol-forming substrate. The aerosol-generating device 102 comprises a housing 104 defining a cavity 106 for receiving an aerosol-forming substrate and an air inlet 107 in fluid communication with an upstream end of the cavity 106. An elongate heating element 108 extends into the cavity 106 and is arranged for insertion into an aerosol-forming substrate when the aerosol-forming substrate is inserted into the cavity 106. The aerosol-generating device 102 also comprises a power supply 110 and a controller 112. During use, the controller 112 controls a supply of electrical power from the power supply 110 to the elongate heating element 108. The elongate heating element 108 heats the aerosol-forming substrate to release volatile compounds from the aerosol-forming substrate for inhalation by a user. During heating, the cavity 106 and the elongate

heating element 108 may become contaminated with residues and deposits from the aerosol-forming substrate. The cleaning device 10 of the present invention may be used to clean the elongate heating element 108 and the cavity 106.

Figure 5 shows a cross-sectional view of a cleaning system 200 comprising the cleaning device 10 of Figure 1 and the aerosol-generating device 102 of Figure 4. The aerosol-generating device 102 is received in the aerosol-generating device adapter 24 so that the cleaning head 30 is received within the cavity 106 of the aerosol-generating device 102 and the elongate heating element 108 is received within the cleaning head 30. Once a user has inserted the aerosol-generating device 102 into the cleaning device 10 and closed the lid 14, the user may initiate a cleaning process using the touchscreen display 20. During the cleaning process, the motor 34 rotates the cleaning head 30 with respect to the aerosol-generating device 102 to remove residues and deposits from the elongate heating element 108 and the cavity 106. Simultaneously, the air moving device 36 draws air through the airflow inlet 107 and the airflow passage 32 to draw the removed residues and deposits out of the cleaning head 30 and into the filter 42.

Figure 6 shows a cross-sectional view of a cleaning system 300 comprising a cleaning device 400 according to a second embodiment of the present invention. The cleaning device 400 is similar to the cleaning device 10 of Figure 1 and like reference numerals are used to designate like parts. The cleaning device 400 differs from the cleaning device 10 by being configured to receive and clean two aerosol-generating devices 102 simultaneously. To accommodate two aerosol-generating devices 102, the aerosol-generating device adapter 24 comprises two apertures for receiving the aerosol-generating devices 102. The cleaning device 400 also comprises first and second cleaning heads 30, 31, first and second motors 34, 35, and a larger air moving device 36 for drawing air simultaneously through the first and second airflow passages 32, 33 of the cleaning heads 30, 31.

To direct a larger proportion of airflow through the first airflow passage 32 of the first cleaning head 30 when the second cleaning head 31 is not being used, or when an aerosol-generating device 102 engaged with the second cleaning head 31 requires less cleaning, the cleaning device 400 comprises an additional fixed baffle 41 and an airflow modulating element 441 in the form of a moveable baffle. The moveable baffle may be moved relative to the additional fixed baffle 41 to vary a flow area between the moveable baffle and the additional fixed baffle. Reducing the flow area increases a ratio of airflow through the first airflow passage 32 to airflow through the second airflow passage 33.

Figure 7 shows a cross-sectional view of a cleaning system 500 comprising a cleaning device 600 according to a third embodiment of the present invention. The cleaning device 600 is similar to the cleaning device 400 of Figure 6 and like reference numerals are used to designate like parts. The cleaning device 600 differs from the cleaning device 400 by removal of the airflow modulating element 441 and replacement of the single air moving device 36 with a first air moving

device 36 and a second air moving device 37. In the cleaning device 600, the ratio of airflow through the first airflow passage 32 to airflow through the second airflow passage 33 can be varied by independent controlling the first and second air moving devices 36, 37.

Figure 8 shows a cross-sectional view of a cleaning system 700 comprising the cleaning device 600 of Figure 7. In the embodiment shown in Figure 8, the cleaning device 600 is used to simultaneously clean two separable parts of an aerosol-generating device 902. In particular, the aerosol-generating device 902 comprises a heating section 903 comprising a heating element, a power supply and a controller. The aerosol-generating device 902 also comprises a detachable housing portion 905. During use of the cleaning device 600, the heating section 903 is engaged with the first cleaning head 30 and the detachable housing portion 905 is engaged with the second cleaning head 31. The skilled person will appreciate that the cleaning devices 400 of Figure 6 may also be used to simultaneously clean the heating section 903 and the detachable housing portion 905 of the aerosol-generating device 902.

Claims

1. A cleaning device for cleaning an aerosol-generating device, the cleaning device comprising:

a housing arranged to receive an aerosol-generating device;

a cleaning head arranged to engage the aerosol-generating device when the aerosol-generating device is received by the housing, wherein the cleaning head is movable with respect to an aerosol-generating device received by the housing, and wherein the cleaning head comprises an airflow passage extending through the cleaning head; and

an air moving device arranged to draw air through the airflow passage.

2. A cleaning device according to claim 1, wherein the air moving device is arranged to recirculate air within the cleaning device.

3. A cleaning device according to claim 1 or 2, further comprising a filter positioned within the housing between the airflow passage and the air moving device, wherein the air moving device is arranged to draw air from the airflow passage through the filter.

4. A cleaning device according to claim 3, wherein the filter is removable from the housing.

5. A cleaning device according to any preceding claim, further comprising a lid arranged for movement with respect to the housing between an open position in which an aerosol-generating device may be inserted into the housing and a closed position in which the lid and the housing together define an interior space of the cleaning device within which an aerosol-generating device may be contained.

6. A cleaning device according to claim 5, wherein the air moving device is arranged to recirculate air within the interior space of the cleaning device.

7. A cleaning device according to any preceding claim, further comprising an aerosol-generating device adapter positioned within the housing and arranged to receive an aerosol-generating device when the aerosol-generating device is received within the housing.

8. A cleaning device according to claim 7, wherein the aerosol-generating device adapter is removable from the housing.

9. A cleaning device according to any preceding claim, wherein the cleaning head comprises an elongate body having a proximal end portion and a distal end portion, wherein the distal end portion of the elongate body defines a recess for receiving a heating element of an aerosol-generating device, the recess extending from an opening in a distal end face of the elongate body towards the proximal end portion of the elongate body, and wherein the distal end portion of the elongate body is provided with at least one protrusion inwardly projecting into the recess.

10. A cleaning device according to claim 9, wherein the airflow passage extends between the proximal end portion and the distal end portion, and wherein the recess forms at least part of the airflow passage.

11. A cleaning device according to any preceding claim, wherein the cleaning head is a first cleaning head and wherein the airflow passage is a first airflow passage, the cleaning device further comprising a second cleaning head positioned within the housing, wherein the second cleaning head is movable with respect to an aerosol-generating device received within the housing, wherein the second cleaning head comprises a second airflow passage extending through the second cleaning head, and wherein the air moving device is arranged to draw air through the first airflow passage and the second airflow passage.

12. A cleaning device according to claim 11, wherein the air moving device is a first air moving device arranged to draw air through the first airflow passage, the cleaning device further comprising a second air moving device arranged to draw air through the second airflow passage.

13. A cleaning device according to claim 11 or 12, wherein the second cleaning head has at least one of a different size and a different shape compared to the first cleaning head.

14. A cleaning device according to claim 11, 12 or 13, further comprising an airflow modulating element movable with respect to the housing between a plurality of positions to vary a ratio of a first airflow rate through the first airflow passage to a second airflow rate through the second airflow passage.

15. A cleaning system comprising:

an aerosol-generating device comprising a cavity for receiving an aerosol-forming substrate and a heating element arranged to heat an aerosol-forming substrate when the aerosol-forming substrate is received within the cavity; and

a cleaning device according to any preceding claim, wherein the housing is arranged to receive the aerosol-generating device, and wherein the cleaning head is arranged to be at least

partially received within the cavity of the aerosol-generating device when the aerosol-generating device is received within the housing.

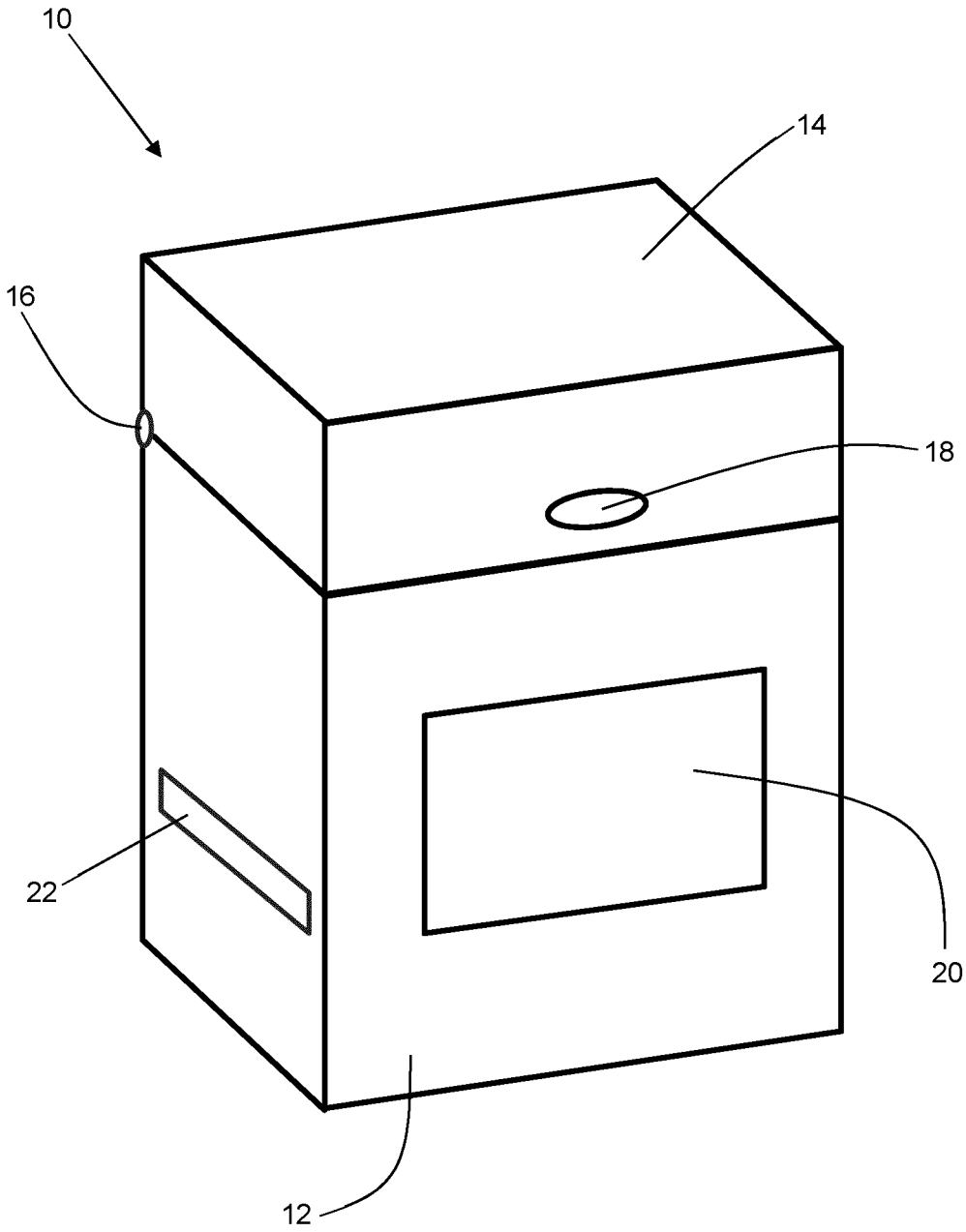


Figure 1

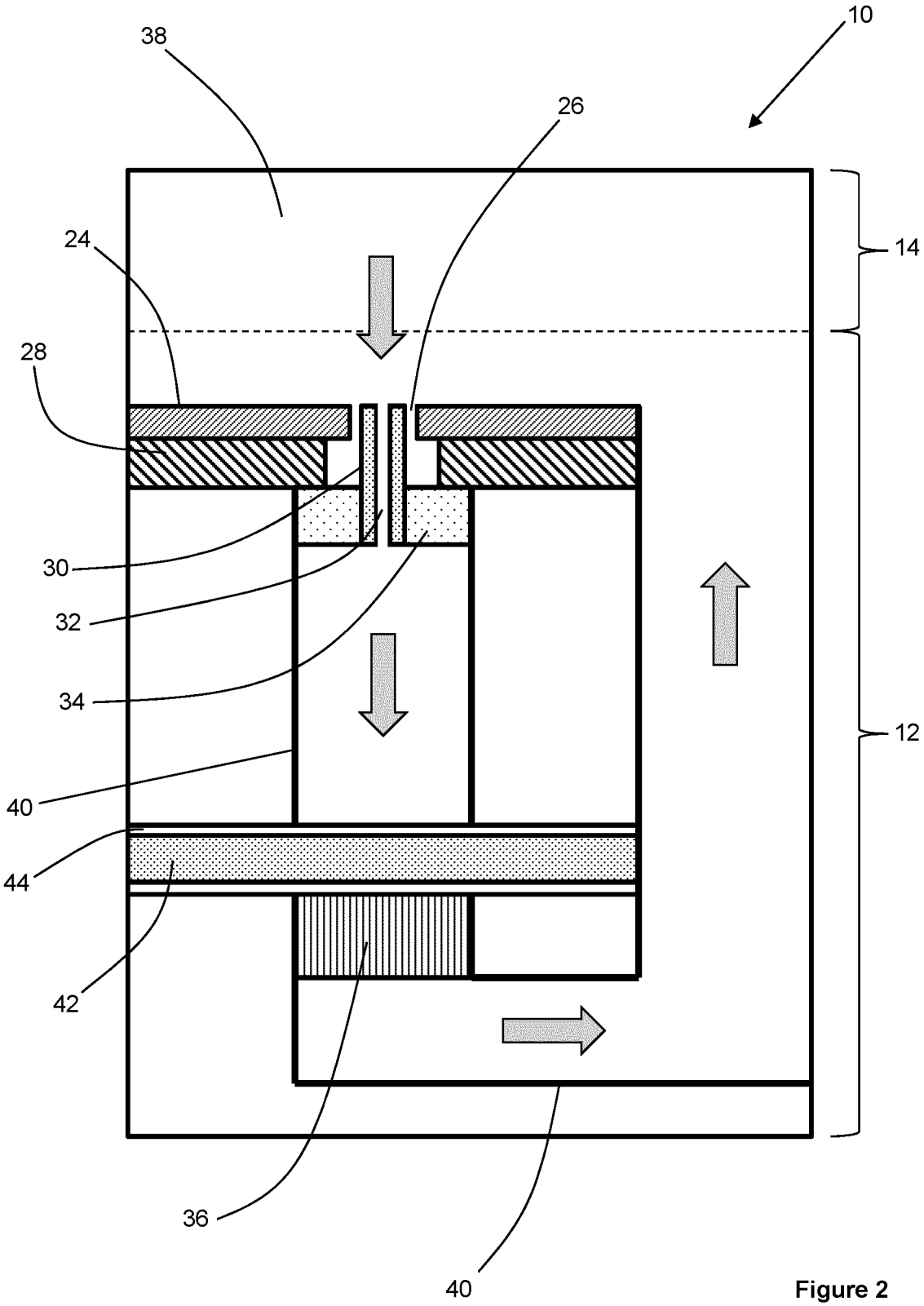


Figure 2

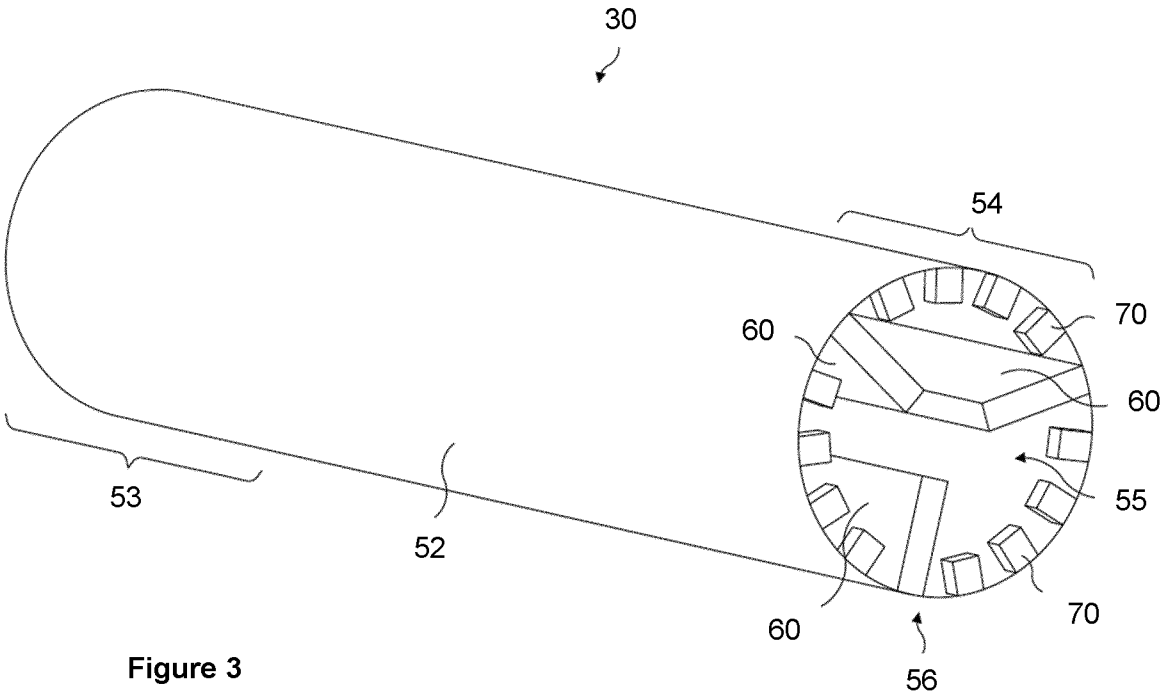


Figure 3

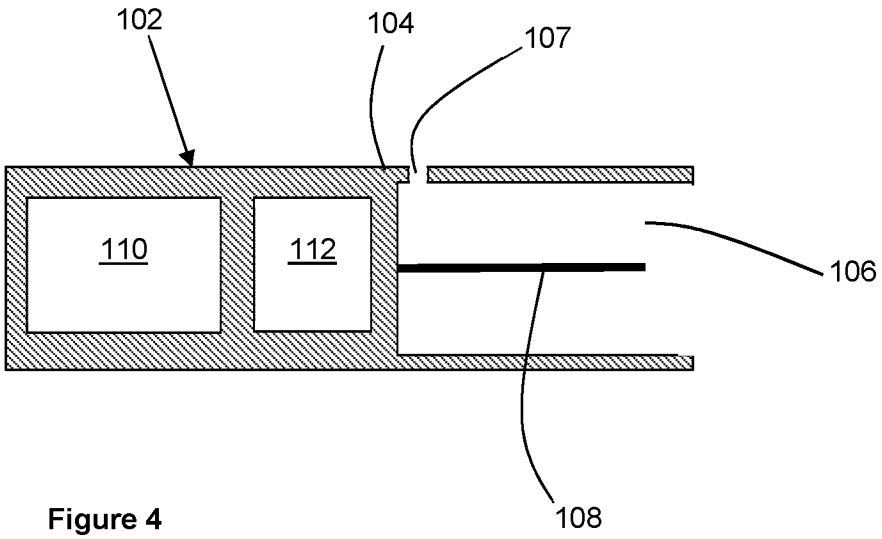


Figure 4

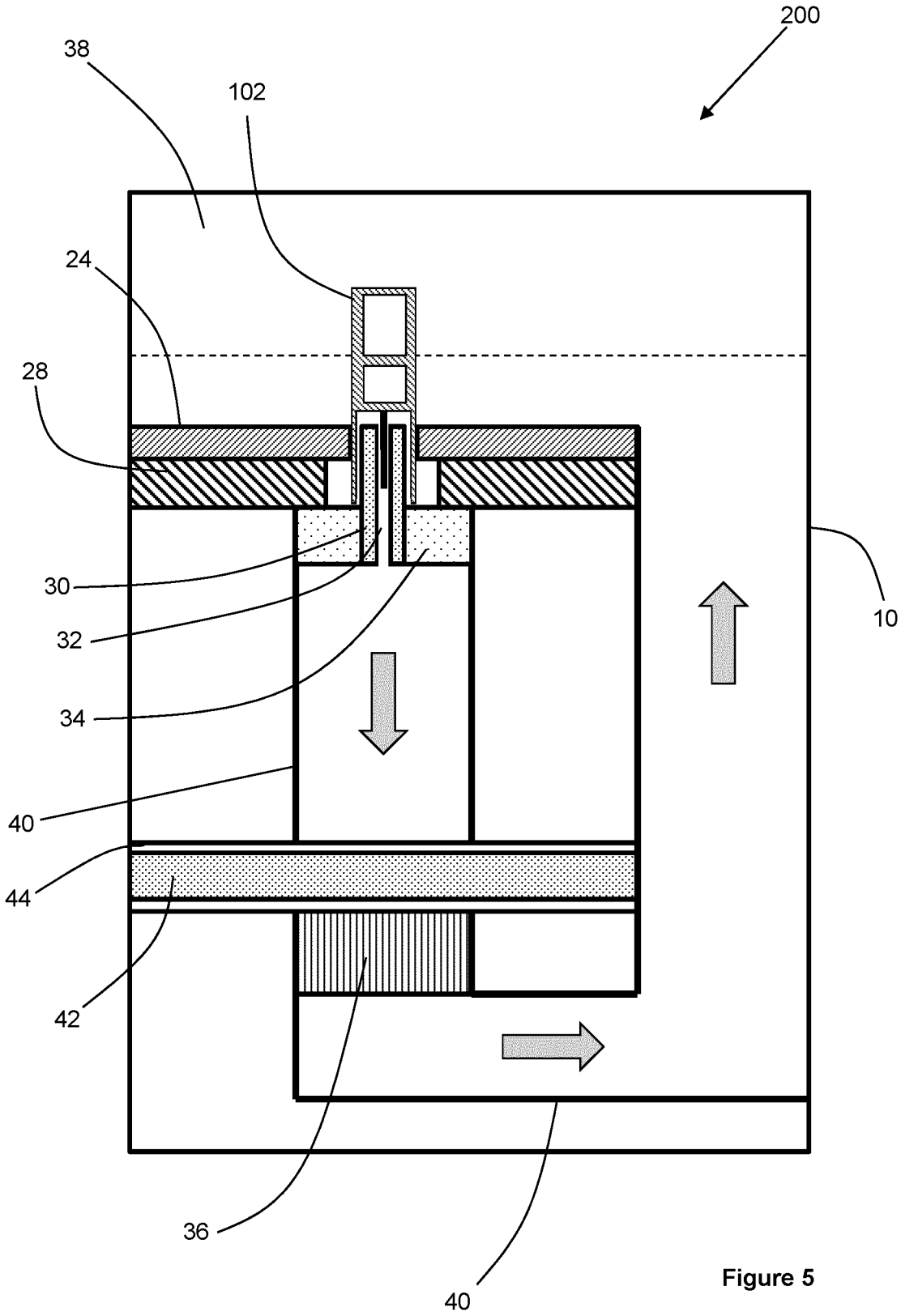


Figure 5

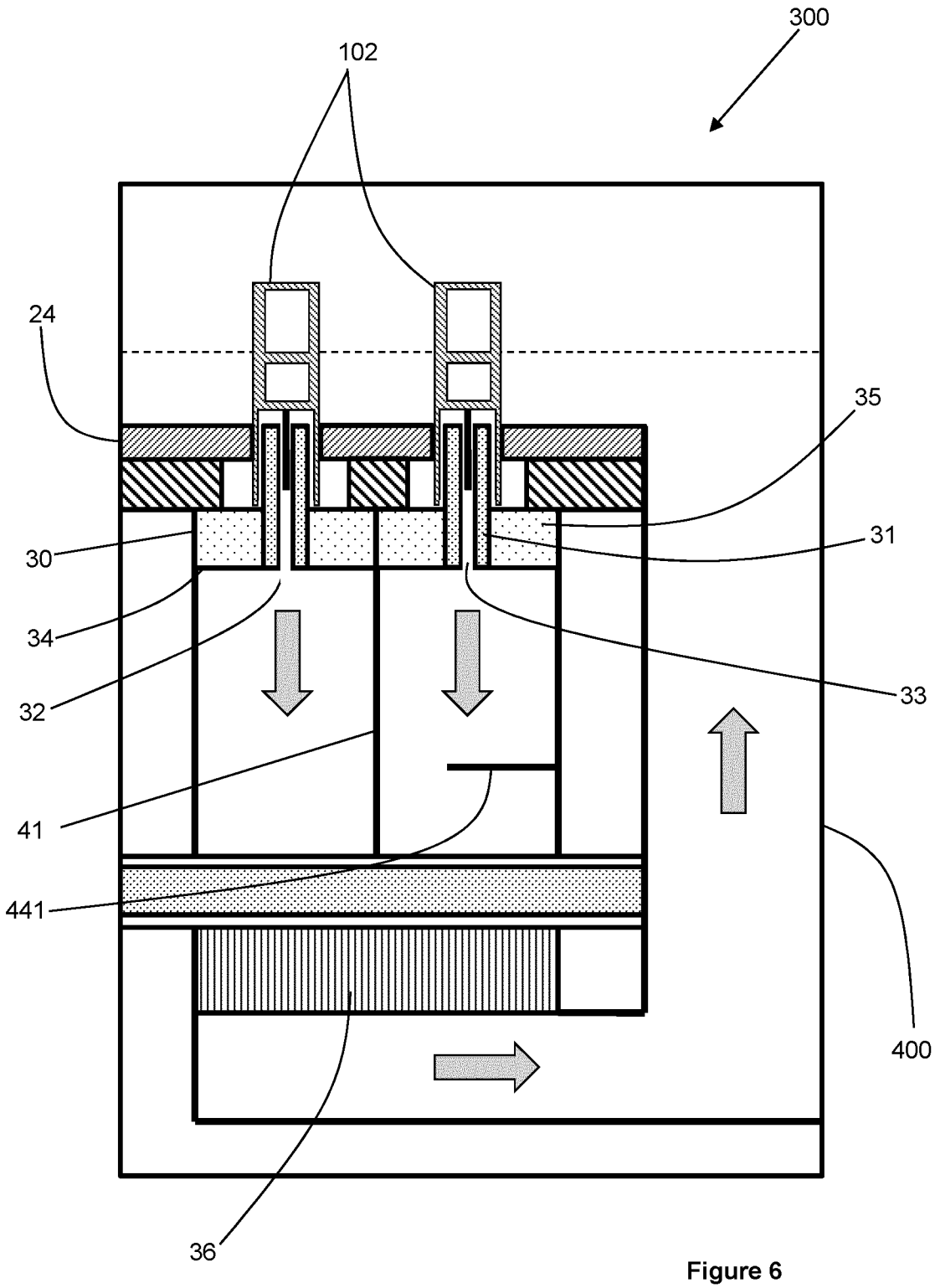


Figure 6

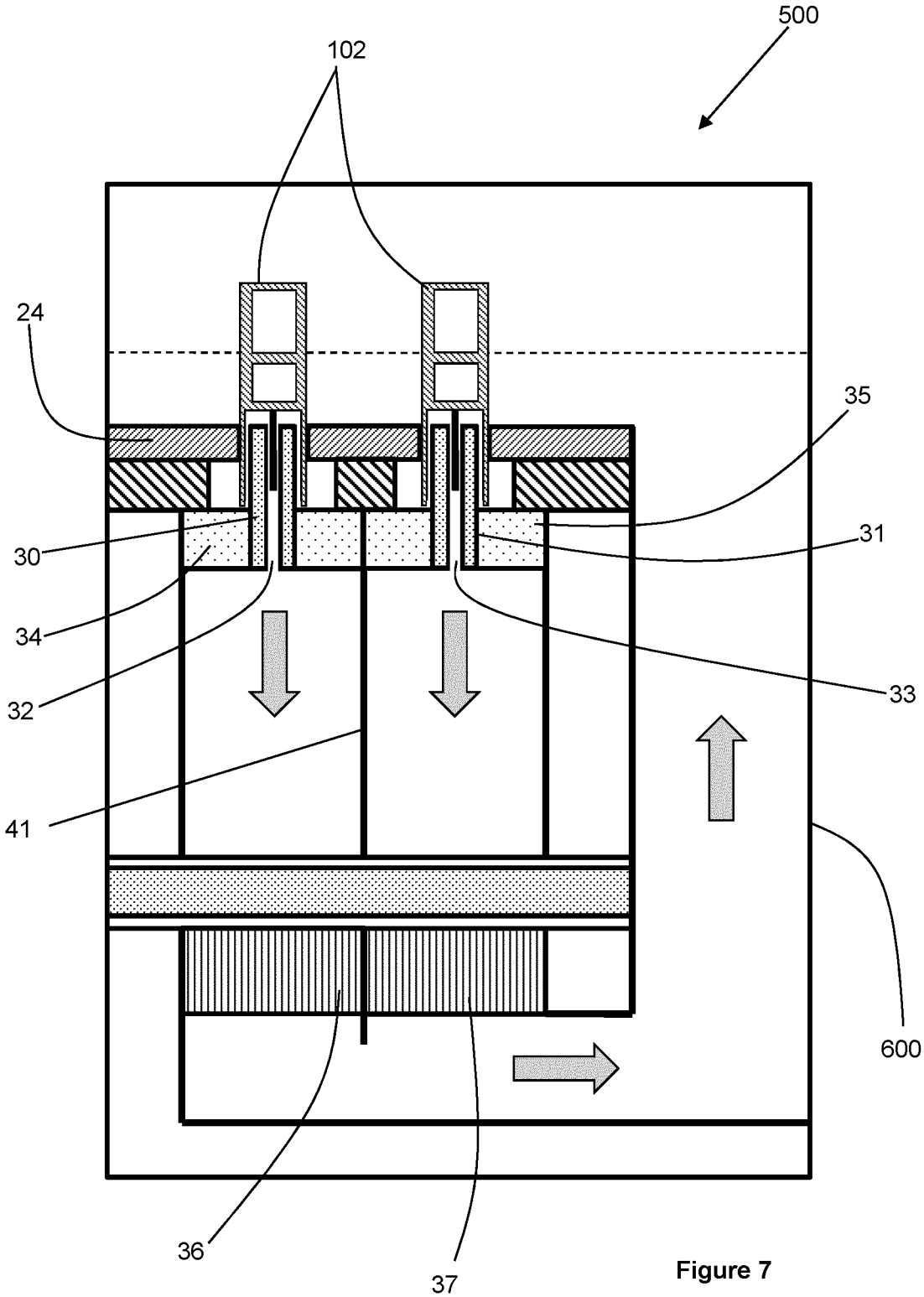


Figure 7

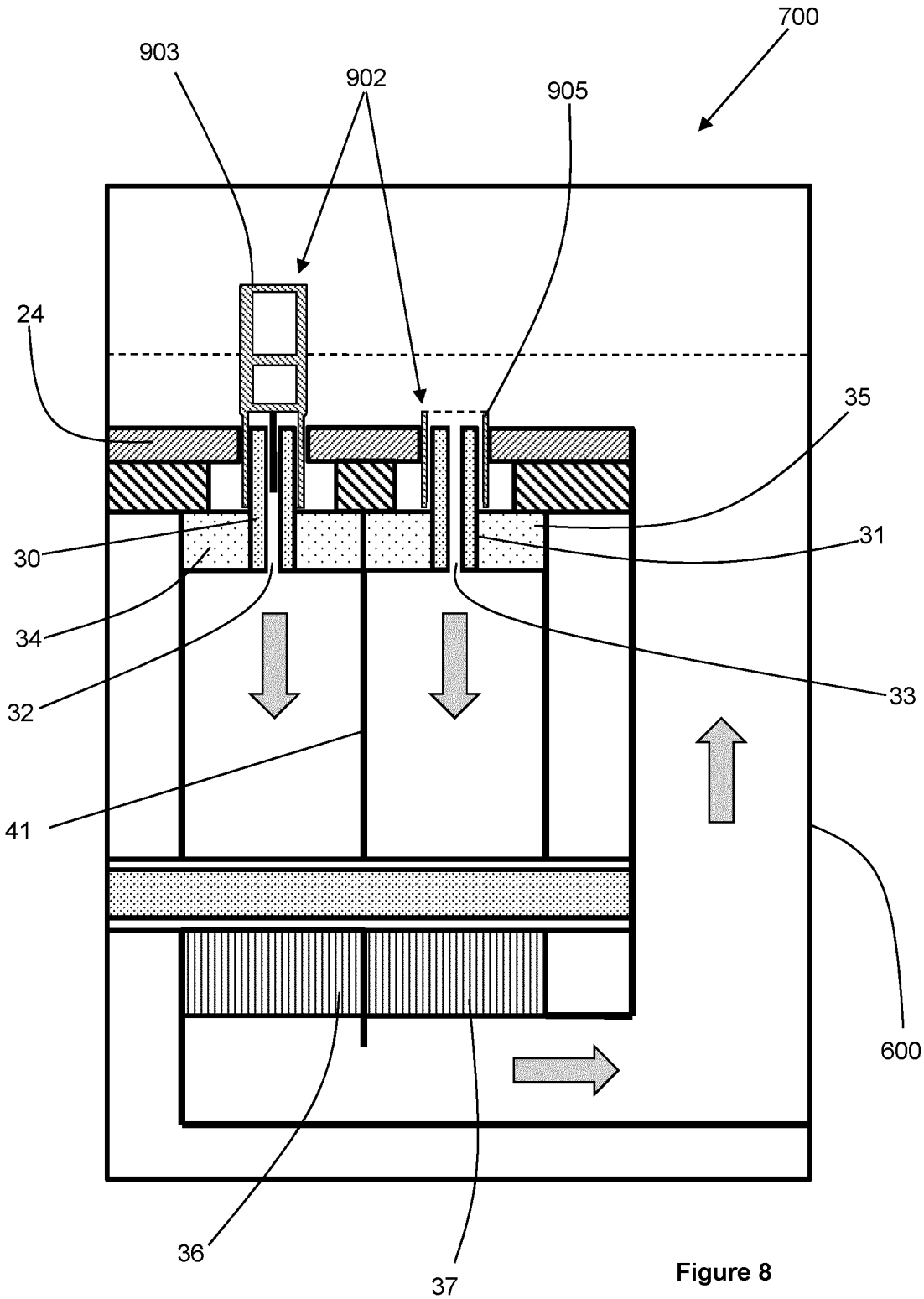


Figure 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2020/055718

A. CLASSIFICATION OF SUBJECT MATTER
INV. A24F47/00 A24F40/85
ADD.

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

B. FIELDS SEARCHED

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

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 125 866 A (NICHOLS WALTER ALLEN [US] ET AL) 3 October 2000 (2000-10-03) column 1, line 45 - column 2, line 18	1-15
A	KR 101 880 984 B1 (LEE JONG DUG [KR]) 23 July 2018 (2018-07-23) the whole document	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 May 2020	26/05/2020

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6125866 A	03-10-2000	NONE	
KR 101880984 B1	23-07-2018	NONE	