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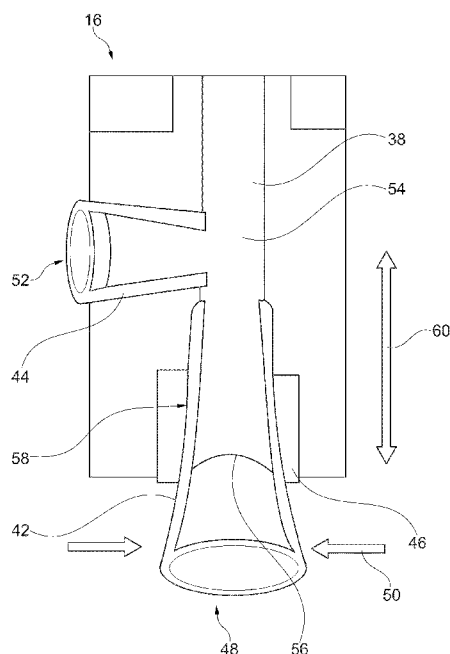


Fig. 4

(57) Abstract: The invention relates to a liquid release assembly for an aerosol-generating device. The liquid release assembly comprises a liquid channel comprising a liquid-suspending portion. The liquid-suspending portion comprises a discharge orifice and is configured to define a heating area. The liquid release assembly comprises a regulating channel defining a vent opening configured to be fluidly connected with the liquid channel. The regulating channel and the liquid-suspending portion are configured to suspend liquid in the liquid-suspending portion. An air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

LIQUID RELEASE ASSEMBLY COMPRISING A LIQUID-SUSPENDING PORTION

The present invention relates to a liquid release assembly for an aerosol-generating device. The invention further relates to an aerosol-generating device. The invention further relates to an aerosol-generating system. The invention further relates to a method for generating an aerosol with an aerosol-generating device comprising the liquid release assembly.

It is known to provide an aerosol-generating device for generating an inhalable vapor. Such devices may heat aerosol-forming substrate to a temperature at which one or more components of the aerosol-forming substrate are volatilised without burning the aerosol-forming substrate. Liquid aerosol-forming substrate may be provided in a liquid reservoir of a cartridge. The cartridge may be inserted into the aerosol-generating device. Liquid from the liquid reservoir may be transferred to a wick. A heating element may be arranged for heating the aerosol-forming substrate of the wick.

It would be desirable to provide an aerosol-generating system having a reduced risk of leakage of liquid. It would be desirable to provide an aerosol-generating system with improved control of the conveyance of liquid from the liquid reservoir to the heating element. It would be desirable to provide an aerosol-generating system having a reduced risk of a built-up of negative pressure upon depletion of the liquid reservoir. It would be desirable to provide a liquid release assembly having a self-regulating inflow of liquid. It would be desirable to provide a more compact heating arrangement. It would be desirable to provide an aerosol-generating system offering improved handling and user comfort. It would be desirable to provide an aerosol-generating system offering an improved user experience. It would be desirable to provide an aerosol-generating system with improved energy consumption efficiency. It would be desirable to provide an aerosol-generating system with improved control of liquid supply to the heating element. It would be desirable to provide an aerosol-generating system reducing or avoiding the risk of dry puffs. It would be desirable to provide an aerosol-generating system reducing or avoiding the risk of leaks on electrical contacts. It would be desirable to provide an aerosol-generating system avoiding the risk of degradation of the wick.

According to an embodiment of the invention there is provided a liquid release assembly for an aerosol-generating device. The liquid release assembly may comprise a liquid channel comprising a liquid-suspending portion. The liquid-suspending portion may comprise a discharge orifice and may be configured to define a heating area. The liquid release assembly may comprise a regulating channel defining a vent opening configured to be fluidly connected with the liquid channel. The regulating channel and the liquid-suspending portion

may be configured to suspend liquid in the liquid-suspending portion. An air-liquid interface of the suspended liquid may be arranged in the heating area of the liquid-suspending portion.

According to an embodiment of the invention there is provided a liquid release assembly for an aerosol-generating device. The liquid release assembly comprises a liquid channel comprising a liquid-suspending portion. The liquid-suspending portion comprises a discharge orifice and is configured to define a heating area. The liquid release assembly comprises a regulating channel defining a vent opening configured to be fluidly connected with the liquid channel. The regulating channel and the liquid-suspending portion are configured to suspend liquid in the liquid-suspending portion. An air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

The aerosol-generating system may have a reduced risk of leakage of liquid. The liquid release assembly may have a reduced risk of leakage of liquid. The aerosol-generating system may provide improved control of the conveyance of liquid from the liquid reservoir to the heating element. The aerosol-generating system may have a reduced risk of a built-up of negative pressure upon depletion of the liquid reservoir. The aerosol-generating system may provide a liquid release assembly having a self-regulating inflow of liquid. The aerosol-generating system may provide a more compact heating arrangement. The aerosol-generating system may offer improved handling and user comfort. The aerosol-generating system may offer an improved user experience. The aerosol-generating system may provide an improved energy consumption efficiency. The aerosol-generating system may have an improved control of liquid supply to the heating element. The aerosol-generating system may reduce or avoid dry puffs. The aerosol-generating system may reduce or avoid the risk of leaks on electrical contacts. The aerosol-generating system may avoid the risk of degradation of the wick.

By providing a liquid-suspending portion, the risk of leakage may be reduced or avoided. By providing a regulating channel, the risk of leakage may be reduced or avoided. By providing a liquid-suspending portion, the risk of a built-up of a negative pressure in the liquid reservoir may be reduced or avoided. By providing a regulating channel, the risk of a built-up of a negative pressure in the liquid reservoir may be reduced or avoided.

The liquid release assembly may be configured to self-adjust a level of the liquid suspended in the liquid-suspending portion. The liquid release assembly may be configured to self-adjust the position of the air-liquid interface in the liquid-suspending portion. The liquid release assembly may be configured to hold a liquid at a fixed position in the liquid-suspending portion. The liquid release assembly may be configured to hold the air-liquid interface in the liquid-suspending portion at a fixed position in the liquid-suspending portion. The liquid release assembly may be configured to adjust a level of the liquid suspended in the liquid-suspending

portion to a predetermined level. The liquid release assembly may be configured to adjust a position of the air-liquid interface in the liquid-suspending portion to a predetermined position.

The liquid release assembly may be configured to bias a level of liquid suspended in the liquid-suspending portion towards a predetermined level. The liquid-suspending portion may be configured to bias a level of liquid suspended in the liquid-suspending portion towards a predetermined level. The regulating channel may be configured to bias a level of liquid suspended in the liquid-suspending portion towards a predetermined level. The liquid-suspending portion and the regulating channel may be configured to bias a level of liquid suspended in the liquid-suspending portion towards a predetermined level. The discharge orifice may be configured to bias a level of liquid suspended in the liquid-suspending portion towards a predetermined level. The vent opening may be configured to bias a level of liquid suspended in the liquid-suspending portion towards a predetermined level. The discharge orifice and vent opening may be configured to bias a level of liquid suspended in the liquid-suspending portion towards a predetermined level.

The liquid release assembly may be configured to bias the air-liquid interface of the liquid suspended in the liquid-suspending portion towards a predetermined position. The liquid-suspending portion may be configured to bias the air-liquid interface of the liquid suspended in the liquid-suspending portion towards a predetermined position. The regulating channel may be configured to bias the air-liquid interface of the liquid suspended in the liquid-suspending portion towards a predetermined position. The liquid-suspending portion and the regulating channel may be configured to bias the air-liquid interface of the liquid suspended in the liquid-suspending portion towards a predetermined position. The discharge orifice may be configured to bias the air-liquid interface of the liquid suspended in the liquid-suspending portion towards a predetermined position. The vent opening may be configured to bias the air-liquid interface of the liquid suspended in the liquid-suspending portion towards a predetermined position. The discharge orifice and vent opening may be configured to bias the air-liquid interface of the liquid suspended in the liquid-suspending portion towards a predetermined position.

The predetermined level of the liquid suspended in the liquid-suspending portion may be determined by the configuration of the liquid release assembly. The predetermined position of the air-liquid interface of the liquid suspended in the liquid-suspending portion may be determined by the configuration of the liquid release assembly. The predetermined level of the liquid suspended in the liquid-suspending portion may be determined by a diameter of the liquid-suspending portion. The predetermined position of the air-liquid interface of the liquid suspended in the liquid-suspending portion may be determined by a diameter of the regulating channel.

The configuration of the liquid release assembly may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. The configuration of the liquid release assembly may be adapted to adjust the position of the air-liquid interface of the liquid suspended in the liquid-suspending portion.

5 The configuration of the liquid-suspending portion may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. The configuration of the liquid-suspending portion may be adapted to adjust the position of the air-liquid interface of the liquid suspended in the liquid-suspending portion. The configuration of the regulating channel may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. The
10 configuration of the regulating channel may be adapted to adjust the position of the air-liquid interface of the liquid suspended in the liquid-suspending portion.

A diameter of the liquid-suspending portion may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. A diameter of the liquid-suspending portion may be adapted to adjust the position of the air-liquid interface of the liquid suspended in the
15 liquid-suspending portion. A diameter of the regulating channel may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. A diameter of the regulating channel may be adapted to adjust the position of the air-liquid interface of the liquid suspended in the liquid-suspending portion. A diameter of the regulating channel and a diameter of the
20 liquid-suspending portion may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. A diameter of the regulating channel and a diameter of the liquid-suspending portion may be adapted to adjust the position of the air-liquid interface of the liquid suspended in the liquid-suspending portion.

The discharge orifice may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. The discharge orifice may be adapted to adjust the position of the
25 air-liquid interface of the liquid suspended in the liquid-suspending portion. The vent opening may be adapted to adjust the level of the liquid suspended in the liquid-suspending portion. The vent opening may be adapted to adjust the position of the air-liquid interface of the liquid suspended in the liquid-suspending portion.

The liquid release assembly may be configured to balance a level of liquid suspended
30 in the liquid-suspending portion. The liquid-suspending portion may be configured to balance a level of liquid suspended in the liquid-suspending portion. The regulating channel may be configured to balance a level of liquid suspended in the liquid-suspending portion. The liquid-suspending portion and the regulating channel may be configured to balance a level of liquid suspended in the liquid-suspending portion. The discharge orifice may be configured to
35 balance a level of liquid suspended in the liquid-suspending portion. The vent opening may be configured to balance a level of liquid suspended in the liquid-suspending portion. The

discharge orifice and vent opening may be configured to balance a level of liquid suspended in the liquid-suspending portion.

By suspending liquid in the liquid-suspending portion, the risk of undesired a leakage of liquid may be reduced or avoided. By adjusting the position of the air-liquid interface in the liquid-suspending portion, the risk of undesired a leakage of liquid may be reduced or avoided. By adjusting the position of the air-liquid interface in the liquid-suspending portion, heating of the suspended liquid by the susceptor member discussed below may be improved. The position of the air-liquid interface may be adjusted, such that the susceptor member discussed below circumscribes at least a portion of the suspended liquid. By providing a regulating channel, the risk of a built-up of negative pressure in a liquid reservoir supplying liquid to the liquid release assembly may be reduced or avoided. Upon volatilization of liquid from the liquid-suspending portion, air may be pulled into the headspace of the liquid reservoir via the regulating channel to counteract the built-up of negative pressure in the liquid reservoir caused by the volatilization of liquid from the liquid-suspending portion.

The liquid channel may have a cylindrical shape. The liquid channel may have a hollow cylindrical shape. The liquid channel may have a substantially circular cross-section. The liquid channel may have a skewed circular cross-section. The liquid channel may be a tube. The liquid channel may be a capillary tube. The liquid channel may comprise an outer wall. The outer wall may define the liquid channel. The liquid channel may comprise a proximal end. The liquid channel may comprise a distal end. The proximal end of the liquid channel may be fluidly connected to the distal end of the liquid channel. The discharge orifice may be arranged at the proximal end of the liquid channel. The distal end of the liquid channel may be configured to be fluidly connected to a liquid reservoir discussed below. The discharge orifice of the liquid-suspending portion may be arranged at a proximal end of the liquid channel.

The liquid-suspending portion may have a cylindrical shape. The liquid-suspending portion may have a hollow cylindrical shape. The liquid-suspending portion may have a substantially circular cross-section. The liquid-suspending portion may have a skewed circular cross-section. The liquid-suspending portion may be a tube. The liquid-suspending portion may be a capillary tube. The liquid-suspending portion may comprise an outer wall. The outer wall may define the liquid-suspending portion. The liquid-suspending portion may comprise a proximal end. The liquid-suspending portion may comprise a distal end. The proximal end of the liquid-suspending portion may be fluidly connected to the distal end of the liquid-suspending portion. The discharge orifice may be arranged at the proximal end of the liquid-suspending portion. The liquid-suspending portion may be a section of the liquid channel.

The regulating channel may have a cylindrical shape. The regulating channel may have a hollow cylindrical shape. The regulating channel may have a substantially circular cross-

section. The regulating channel may have a skewed circular cross-section. The regulating channel may be a tube. The regulating channel may be a capillary tube. The regulating channel may comprise an outer wall. The outer wall may define the regulating channel. The regulating channel may comprise a proximal end. The regulating channel may comprise a distal end. The proximal end of the regulating channel may be fluidly connected to the distal end of the regulating channel. The vent opening may be arranged at the proximal end of the regulating channel.

The discharge orifice may be an opening of the liquid-suspending portion. The discharge orifice may be fluidly connected to the surroundings of the liquid release assembly.

The vent opening may be fluidly connected to the surroundings of the liquid release assembly.

The vent opening may be fluidly connected with the liquid-suspending portion. The vent opening may be fluidly connected to the discharge orifice of the liquid-suspending portion.

The regulating channel may consist of the vent opening. The vent opening may be arranged in the outer wall of the liquid channel.

The vent opening may be at least partially covered with a membrane. The vent opening may be at least covered with a membrane. The membrane may be a perforated membrane. The perforated membrane may be flexible. The membrane may reduce or avoid leakage of liquid out of the liquid channel. The membrane may be configured to regulate the transfer of liquid to the liquid-suspending portion. The membrane may be configured to regulate a level of liquid in the liquid-suspending portion. The membrane may comprise or be fabricated from a material selected from the group consisting of: rubber, polyolefins, elastomer, ethylene vinyl acetate or combinations thereof. The membrane may be preferably used with embodiments in which the regulating channel consists of the vent opening. The membrane may be preferably used with embodiments in which the regulating channel consists of the vent opening and the lateral opening is the vent opening. The heating area may be section of the liquid-suspending portion configured to be heated. The heating area may be section of the liquid-suspending portion configured to be heated by a heating element. The heating area may be section of the liquid-suspending portion configured to be heated by the susceptor member discussed below.

The liquid channel may be configured to hold a liquid. The liquid channel may be configured to convey a liquid. The liquid-suspending portion may be configured to hold a liquid. The regulating channel may be configured to hold a liquid. The liquid-suspending portion may be configured to be at least partially be filled with liquid. The regulating channel may be configured to be at least partially filled with liquid.

The liquid may be a liquid aerosol-forming substrate.

The liquid release assembly may be configured such that the air-liquid interface of the suspended liquid is arranged in the liquid-suspending portion. The liquid release assembly may be configured such that the liquid-suspending portion comprises a first section filled with liquid and a second section filled with gas. The first section filled with liquid may be arranged
5 distal to the second section filled with gas. The air-liquid interface of the suspended liquid may be arranged in the liquid-suspending portion. The air-liquid interface of the suspended liquid in the liquid-suspending portion may be a meniscus.

The regulating channel and the liquid-suspending portion may be configured such that only a part of the liquid-suspending portion is filled with liquid. The regulating channel and the
10 liquid-suspending portion may be configured such that only a distal part of the liquid-suspending portion is filled with liquid.

The regulating channel and the liquid-suspending portion may be configured such that less than 90 percent, preferably less than 75 percent, more preferably less than 50 percent of the liquid-suspending portion is filled with liquid.

15 The regulating channel and the liquid-suspending portion may be configured such that an air gap is formed between the liquid in the liquid-suspending portion and the discharge orifice of the liquid-suspending portion.

The regulating channel and the liquid-suspending portion may be configured such that an air gap is formed between the air-liquid interface of the suspended liquid in the liquid-
20 suspending portion and the discharge orifice of the liquid-suspending portion.

A diameter of the regulating channel and a diameter of the liquid-suspending portion may be selected to suspend liquid in the liquid-suspending portion such that an air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

25 The diameter of the liquid-suspending portion may be a diameter of a cross-section of the liquid-suspending portion. The cross-section of the liquid-suspending portion may be a cross-section in a plane orthogonal to a longitudinal axis of the liquid-suspending portion. The diameter of the regulating channel may be a diameter of a cross-section of the regulating channel. The cross-section of the regulating channel may be a cross-section in a plane
30 orthogonal to a longitudinal axis of the regulating channel.

The diameter of the liquid-suspending portion may be a diameter of the discharge orifice. The diameter of the regulating channel may be the diameter of the vent opening.

The liquid-suspending portion may be configured as a tapering liquid-suspending portion. A diameter of the tapering liquid-suspending portion may gradually increase towards
35 the discharge orifice of the liquid-suspending portion.

The diameter of the tapering liquid-suspending portion may continuously increase towards the discharge orifice of the liquid-suspending portion. The diameter of the tapering liquid-suspending portion may increase towards the proximal end of the regulating channel. The diameter of the tapering liquid-suspending portion may gradually increase towards the proximal end of the liquid-suspending portion. The diameter of the tapering liquid-suspending portion may continuously increase towards the proximal end of the liquid-suspending portion. The diameter of the tapering liquid-suspending portion may increase towards the discharge orifice. The diameter of the tapering liquid-suspending portion may continuously increase towards the discharge orifice.

The tapering liquid-suspending portion may provide improved flexibility to the liquid release assembly. The tapering liquid-suspending portion may stabilize the level of liquid in the liquid-suspending portion. The tapering liquid-suspending portion may strongly bias the level of liquid in the liquid-suspending portion to an equilibrium state. The tapering liquid-suspending portion may provide an improved flexibility to the handling of the aerosol-generating system.

The liquid-suspending portion may be configured to hold liquid aerosol-forming substrate in a position for volatilization of the liquid. The liquid-suspending portion may be configured to prevent undesired leakage of liquid aerosol-forming substrate from the discharge orifice.

The regulating channel may be mounted at the liquid channel.

The liquid channel may comprise a lateral opening. The lateral opening may be arranged in the outer wall of the liquid channel. The regulating channel may consist of the vent opening and the lateral opening may be the vent opening. The regulating channel may consist of the vent opening. Alternatively, the regulating channel may extend from the liquid channel and the lateral opening may be a distal opening of the regulating channel. The regulating channel may extend between the liquid channel and the vent opening. The regulating channel may extend between the lateral opening of the liquid channel and the vent opening. The lateral opening of the liquid channel may be the distal end of the regulating channel. The lateral opening of the liquid channel may be arranged at the distal end of the regulating channel. The vent opening of the regulating channel may be arranged at the proximal end of the regulating channel. The lateral opening of the liquid channel may be configured to be fluidly connected to the vent opening of the regulating channel.

The regulating channel may be integrally formed with the liquid channel.

The regulating channel may extend laterally from liquid channel.

The regulating channel may extend radially from the liquid channel.

The regulating channel may be configured as a tapering regulating channel. A diameter of the tapering regulating channel may gradually decrease towards the liquid channel.

The diameter of the tapering regulating channel may continuously decrease towards the liquid channel. The diameter of the tapering regulating channel may increase towards the proximal end of the regulating channel. The diameter of the tapering regulating channel may gradually increase towards the proximal end of the regulating channel. The diameter of the tapering regulating channel may continuously increase towards the proximal end of the regulating channel. The diameter of the tapering liquid-suspending portion may increase towards the vent opening. The diameter of the tapering liquid-suspending portion may gradually increase towards the vent opening. The diameter of the tapering liquid-suspending portion may continuously increase towards the vent opening.

The tapering regulating channel may stabilize the level of liquid in the liquid-suspending portion. The tapering regulating channel may strongly bias the level of liquid in the liquid-suspending portion to an equilibrium state. The tapering regulating channel may provide an improved flexibility to the handling of the aerosol-generating system.

The liquid-suspending portion may be arranged orthogonal to the regulating channel. The liquid-suspending portion may be arranged substantially orthogonal to the regulating channel. A longitudinal axis of the liquid-suspending portion may be arranged orthogonal to a longitudinal axis of the regulating channel. The liquid channel and the regulating channel may be configured to together form a T-shape.

The regulating channel may at least partially be filled with liquid. The regulating channel may be filled with liquid. The liquid channel may be partially filled with liquid.

The regulating channel may be configured to regulate a level of the liquid suspended in the liquid-suspending portion. The regulating channel may be configured to regulate a position of the air-liquid interface of the liquid suspended in the liquid-suspending portion. The regulating channel may be configured to regulate the conveyance of fluid from the liquid a reservoir of the cartridge to the liquid-suspending portion. The regulating channel may be configured to regulate a pressure of the liquid reservoir. The regulating channel may be configured to balance a pressure in a headspace of the liquid reservoir. The regulating channel may be configured to regulate a pressure in a headspace of the liquid reservoir.

The regulating channel may be configured as a sudden expansion valve. The regulating channel may be configured to vary in diameter. The regulating channel may be configured to alternately increase and decrease in diameter along a longitudinal axis of the regulating channel. At least a portion of the regulating channel may have a diameter smaller than a diameter of the vent opening. A ratio of a diameter of the regulating channel and a diameter of the vent opening may be of between 0.33 and 0.95, optionally of between 0.5 and

0.87 and optionally of between 0.55 and 0.80. At least a portion of the regulating channel may have a diameter larger than a diameter of the vent opening. For example, a ratio of a diameter of the regulating channel and a diameter of the vent opening may be of between 3 and 1.05, optionally of between 2 and 1.15 and optionally of between 1.8 and 1.25

5 The liquid-suspending portion may be arranged proximal to at least a portion of the regulating channel.

 The liquid-suspending portion may be arranged proximal to the regulating channel. The liquid-suspending portion may be arranged proximal to the lateral opening of the liquid channel.

 A ratio of the diameter of the regulating channel and the diameter of the liquid-suspending portion may be smaller than 1. Preferably the ratio may be between 0.9 and 0.5. More preferably the ratio may be between 0.8 and 0.6.

 The diameter of the liquid-suspending portion may be larger than the diameter of the regulating channel.

 A diameter of the regulating channel may be less than 1000 micrometers, preferably less than 700 micrometers, more preferably less than 500 micrometers.

 A diameter of the liquid-suspending portion may be less than 2500 micrometers, preferably less than 800 micrometers, more preferably less than 600 micrometers.

 A length of the liquid-suspending portion may be of between 3 centimeters and 0.6 centimeters, preferably of between 2.3 centimeters and 0.8 centimeters, more preferably of between 1.9 centimeters and 1 centimeter

 The liquid-suspending portion may have a hollow cylindrical shape. The liquid-suspending portion may have a substantially circular cross-section. The liquid-suspending portion may have a tubular shape.

 The regulating channel may have a hollow cylindrical shape. The regulating channel may have a substantially circular cross-section. The regulating channel may have a tubular shape.

 The liquid channel may have a substantially circular cross-section. The liquid channel may have a hollow cylindrical shape. The liquid channel may have a tubular shape.

 The liquid release assembly may comprise a susceptor member configured to heat the heating area.

 The susceptor member may be arranged at a proximal end of the liquid-suspending portion. The susceptor member may be arranged at a proximal portion of the liquid-suspending portion.

 The susceptor member may be co-axially arranged around at least a part of the liquid-suspending portion. The susceptor member may be co-axially arranged around the heating area. At least a portion of the susceptor member may be co-axially arranged around the air-

liquid interface. The susceptor member may be co-axially arranged around a proximal part of the liquid-suspending portion.

The susceptor member may be coaxially arranged around the air-liquid interface of the liquid-suspending portion. The susceptor member may be coaxially arranged around liquid
5 suspended in the liquid-suspending portion. The susceptor member may be coaxially arranged around a part of the liquid-suspending portion filled with liquid. The susceptor member may be arranged to heat liquid arranged in the heating area. The susceptor member may be arranged to heat the air-liquid interface of the liquid-suspending portion. The susceptor member may be arranged to heat at least a portion of the liquid suspended in the liquid-suspending portion.
10 The susceptor member may be arranged to heat the liquid suspended in the liquid-suspending portion.

The susceptor member may be arranged to volatize liquid arranged in the heating area. The susceptor member may be arranged to volatize liquid at the air-liquid interface of the liquid-suspending portion. The susceptor member may be arranged to volatize at least a portion of
15 the liquid suspended in the liquid-suspending portion. The susceptor member may be arranged to volatize the liquid suspended in the liquid-suspending portion.

The susceptor member may be configured to heat liquid arranged in the heating area. The susceptor member may be configured to heat liquid at the air-liquid interface of the liquid-suspending portion. The susceptor member may be configured to heat at least a portion of the
20 liquid suspended in the liquid-suspending portion. The susceptor member may be configured to heat the liquid suspended in the liquid-suspending portion.

The susceptor member may be configured to volatize liquid arranged in the heating area. The susceptor member may be configured to volatize liquid at the air-liquid interface of the liquid-suspending portion. The susceptor member may be configured to volatize at least a
25 portion of the liquid suspended in the liquid-suspending portion. The susceptor member may be configured to volatize the liquid suspended in the liquid-suspending portion.

The susceptor member may be arranged to be in contact with at least a part of the liquid-suspending portion. The susceptor member may be arranged to abut at least a portion of the liquid-suspending portion.

30 The susceptor member may have a ring shape. The susceptor member may have a tapering ring shape. The shape of the susceptor member may be configured to be complimentary to the shape of the liquid-suspending portion. The shape of the susceptor member may be configured to correspond to the shape of the liquid-suspending portion.

The susceptor member may be configured to at least partially circumscribe at least a
35 portion of the liquid-suspending portion. The susceptor member may be configured to fully circumscribe at least a portion of the liquid-suspending portion. The susceptor member may

be configured to at least partially circumscribe the liquid-suspending portion. The susceptor member may be configured to at least partially circumscribe the heating area. The susceptor member may be configured to fully circumscribe the heating area.

The susceptor member may comprise a susceptor material. The susceptor material
5 may be configured to circumscribe a part of the liquid-suspending portion. The susceptor material may be configured to circumscribe at least a portion of the liquid suspended in the liquid-suspending portion. The susceptor material may be configured to be heated by the induction coil discussed below. The susceptor material may be configured to heat at least
10 portion of the liquid suspended in the liquid-suspending portion. The susceptor material may be arranged at a proximal part of the liquid-suspending portion. The susceptor material may be configured to circumscribe a portion of the of the liquid-suspending portion desired to be heated. The susceptor material may be configured to circumscribe the heating area of the liquid-suspending portion. The induction coil discussed below may be configured to circumscribe at least a part of the susceptor material. The induction coil discussed below may
15 be configured to circumscribe the susceptor material.

The susceptor member may comprise an insulating material. The insulating material may be a plastic. The insulating material may be polyether ether ketone (PEEK). The insulating material may circumscribe a part of the liquid-suspending portion. The insulating material may circumscribe parts of the liquid-suspending portion which are not desired to be heated. The
20 insulating material may be configured to circumscribe parts of the liquid-suspending portion which are desired to be heated to lower temperatures. The insulating material may be configured to circumscribe a distal part of the liquid-suspending portion.

Usage of the susceptor member may reduce or avoid the risk of leaks on electrical contacts. Usage of the susceptor member may reduce the energy consumption of the aerosol-
25 generating device and aerosol-generating system. Usage of the susceptor member may reduce or avoid the risk of malfunctioning of the aerosol-generating device and aerosol-generating system.

The aerosol-generating device may comprise a heating element. The heating element may be an electrically resistive heating element. The heating element may be co-axially
30 arranged around at least a part of the liquid-suspending portion. The heating element may be co-axially arranged around the heating area. The heating element may be co-axially arranged around the air-liquid interface. The heating element may be co-axially arranged around at least a portion of the liquid suspended in the liquid-suspending portion. The heating element may be co-axially arranged around the liquid suspended in the liquid-suspending portion. The
35 heating element may have a substantially circular cross-section. The heating element may have a skewed circular cross-section. The heating element may have a ring shape. The

heating element may have a hollow tubular shape. The heating element may have a shape complementary to the liquid-suspending portion. The heating element may be in contact with the liquid-suspending portion.

5 The invention further provides an aerosol-generating device comprising the liquid release assembly as described herein.

The aerosol-generating device may be configured for removably receiving a cartridge.

The aerosol-generating device may comprise a cavity. The cavity of the aerosol-generating device may be configured to removably receive the cartridge.

10 The cartridge may comprise a housing. The cartridge may comprise a liquid reservoir. The housing may enclose the liquid reservoir. The liquid reservoir may be configured to hold liquid aerosol-forming substrate. The cartridge may comprise a liquid outlet. The liquid outlet of the cartridge may be configured to be fluidly connected to the liquid release assembly.

15 The aerosol-generating device may comprise a removably attachable connection element configured to fluidly connect the cartridge and the liquid channel of the liquid release assembly.

20 The connection element may comprise a liquid inlet. The liquid inlet of the connection element may be arranged at a distal end of the connection element. The connection element may comprise a liquid outlet. The liquid outlet of the connection element may be arranged at a proximal end of the connection element. The liquid inlet of the connection element may be fluidly connected to the liquid outlet of the connection element.

25 The connection element may comprise a liquid conduit. The liquid conduit may comprise the liquid inlet of the connection element. The liquid inlet of the connection element may be arranged at a distal end of the liquid conduit. The liquid conduit may comprise the liquid outlet of the connection element. The liquid outlet of the connection element may be arranged at a proximal end of the liquid conduit. The liquid inlet of the connection element may be fluidly connected to the liquid outlet of the connection element via the liquid conduit of the connection element. The liquid conduit may be tubular shaped. The liquid conduit may be a capillary tube. At least a portion of the liquid conduit may be a capillary tube. By providing the liquid conduit as a capillary tube, the liquid conduit may hold sufficient liquid to provide to the liquid release assembly to continue a user experience when liquid supply from the liquid reservoir to the connection element is temporarily interrupted.

35 The liquid conduit may be configured as tapering liquid conduit. At least a portion of the liquid conduit may be configured to be tapering. A proximal portion of the liquid conduit may be configured to be tapering. A diameter of the tapering liquid conduit may continuously increase towards the liquid outlet of the connection element. A diameter of the liquid conduit may increase towards the proximal end of the liquid conduit. A diameter of the tapering liquid

conduit may gradually increase towards the proximal end of the liquid conduit. A diameter of the tapering liquid conduit may continuously increase towards the proximal end of the liquid conduit. A diameter of the tapering liquid conduit may increase towards the liquid outlet of the connection element. A diameter of the tapering liquid conduit may continuously increase
5 towards the liquid outlet of the connection element.

The liquid channel may be configured to be connected to the connection element. The liquid channel may be configured to be fluidly connected to the connection element. The distal end of the liquid channel may be configured to be connected to the connection element. The distal end of the liquid channel may be configured to be connected to the liquid outlet of the
10 connection element. The liquid channel may be configured to be complementary to the liquid outlet of the connection element.

The cartridge may be configured to be connected to the connection element. The cartridge may be configured to be fluidly connected to the connection element. The liquid outlet of the cartridge may be configured to be connected to the connection element. The liquid outlet
15 of the cartridge may be configured to be connected to the liquid inlet of the connection element.

The cartridge may be configured to be fluidly connectable to the connection element. The liquid release assembly may be configured to be fluidly connectable to the connection element. The liquid outlet of the cartridge may be configured to be fluidly connectable to the liquid inlet of the connection element. The liquid outlet of the connection element may be
20 configured to be fluidly connectable to the liquid channel of the liquid release assembly. The liquid outlet of the connection element may be configured to be fluidly connectable to the distal end of liquid channel of the liquid release assembly.

The connection element may be arranged between the cartridge and the liquid release assembly. The connection element may be configured as an adapter.

The cartridge may be arranged distal to the connection element. The connection element may be arranged distal to the liquid release assembly. The cartridge may be arranged distal to the liquid release assembly.

The cartridge may be configured to abut the connection element. The connection element may be configured to abut the liquid release assembly. The connection element may
30 be filled with liquid.

The aerosol-generating device may comprise an induction coil arranged to heat the susceptor member.

The induction coil may be co-axially arranged around the susceptor member.

The induction coil may be co-axially arranged around the heating area. The induction
35 coil may be co-axially arranged around the air-liquid interface of the liquid-suspending portion. The induction coil may be co-axially arranged around at least a part of the liquid-suspending

portion. The induction coil may be co-axially arranged around the liquid-suspending portion. The induction coil may be co-axially arranged around at least a portion of the liquid suspended in the liquid-suspending portion

The induction coil may be arranged around a portion of the susceptor member. The induction coil may be arranged around a portion of the susceptor material of the susceptor member. The induction coil may be partly offset from the susceptor member. The susceptor member may heat the liquid-suspending portion such that the temperature gradient forms along a longitudinal axis of the liquid-suspending portion.

At least a portion of the induction coil may be arranged to at least partially circumscribe the susceptor member. At least a portion of the induction coil may be arranged to fully circumscribe the susceptor member.

The induction coil may be arranged to at least partially circumscribe the susceptor member. The induction coil may be arranged to circumscribe the susceptor member. At least a portion of the induction coil may be arranged to circumscribe the susceptor member.

The susceptor member may be arranged in an alternating magnetic field generated by the induction coil. The induction coil may be configured to heat the susceptor member.

The aerosol-generating device may comprise an airflow channel. One or both of the liquid release assembly and the connection element may be arranged within the airflow channel. The liquid release assembly may be arranged within the airflow channel. The connection element may be arranged within the airflow channel.

The induction coil may be co-axially arranged around at least a portion of the airflow channel.

At least a portion of the airflow channel may be configured to circumscribe the liquid-suspending portion.

One or both of the discharge orifice of the liquid-suspending portion and the vent opening of the regulating channel may be configured to be fluidly connected with the airflow channel. The discharge orifice of the liquid-suspending portion and the vent opening of the regulating channel may be configured to be fluidly connected with the airflow channel.

The aerosol-generating device may comprise an air inlet configured to be fluidly connected to the airflow channel of the aerosol-generating device.

The aerosol-generating device may comprise a housing. The air inlet may be arranged in the housing of the aerosol-generating device.

The housing may be configured to receive the liquid release assembly. The housing may be configured to receive the connection element. The housing may be configured to removably receive the cartridge.

The aerosol-generating device may comprise an aerosol outlet. The aerosol outlet may be arranged to be fluidly connected with the airflow channel. The aerosol outlet may be configured to be fluidly connected with the airflow channel.

The aerosol outlet may be configured to be fluidly connected to the air inlet. The aerosol
5 outlet may be configured to be fluidly connected to the air inlet via the airflow channel.

The airflow channel may comprise an aerosol-forming chamber. The aerosol-forming chamber may be configured as a chimney.

The chimney may be arranged proximal to the liquid release assembly. The chimney may be arranged distal to the aerosol outlet. The chimney may be arranged between the liquid
10 release assembly and the aerosol outlet.

Aerosol-forming substrate volatilized by the susceptor element may condense in the aerosol-forming chamber to form an aerosol. Aerosol-forming substrate volatilized by the susceptor element may condense in the chimney to form an aerosol.

The invention further provides an aerosol-generating system comprising the aerosol-
15 generating device as described herein and a cartridge comprising a liquid reservoir holding liquid aerosol-forming substrate.

The cartridge may be removably inserted into the aerosol-generating device. The cartridge may be configured to be disposable. The cartridge may be a consumable. The cartridge may be configured to be replaceable.

20 The regulating channel and the liquid-suspending portion may be configured to suspend liquid aerosol-forming substrate transferred from the liquid reservoir in the liquid-suspending portion. The air-liquid interface of the suspended liquid aerosol-forming substrate may be arranged in the heating area of the liquid-suspending portion

The cartridge may be configured for removably insertable into the device. The cartridge
25 may be configured for removably insertable into the airflow channel.

The cartridge may comprise a housing.

The liquid release assembly may be arranged proximal to the cartridge.

The liquid reservoir may at least partially be filled with liquid. The liquid reservoir may be filled with liquid. The liquid reservoir may be fluidly connected to the liquid release assembly.
30 The liquid reservoir may be fluidly connected to the liquid release assembly via the connection element.

The invention further provides a method for generating an aerosol with an aerosol-generating device comprising a liquid release assembly. The liquid release assembly is provided with a liquid channel comprising a liquid-suspending portion. The liquid-suspending
35 portion is provided with a discharge orifice and is configured to define a heating area. The liquid release assembly is provided with a regulating channel defining a vent opening

configured to be fluidly connected with the liquid channel. The regulating channel and the liquid-suspending portion are configured to suspend liquid in the liquid-suspending portion. An air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

5 The invention further provides a method for generating an aerosol with an aerosol-generating device comprising a liquid release assembly. The liquid release assembly may be provided with a liquid channel comprising a liquid-suspending portion. The liquid-suspending portion may be provided with a discharge orifice and is configured to define a heating area. The liquid release assembly may be provided with a regulating channel defining a vent opening
10 configured to be fluidly connected with the liquid channel. The regulating channel and the liquid-suspending portion may be configured to suspend liquid in the liquid-suspending portion. An air-liquid interface of the suspended liquid may be arranged in the heating area of the liquid-suspending portion.

The factors governing the position of the liquid suspended the liquid-suspending portion
15 may be described with the help of the Navier-Stokes equation. For the liquid release assembly fluidly connected to the liquid reservoir, the level the liquid suspended in the liquid-suspending portion of may be described by the following equation:

$$H_h = \frac{2\gamma \left(1 - \frac{r_{reg}}{r_{sus}}\right)}{\rho g r_{reg}}$$

Wherein H_h is the height of the liquid in the liquid-suspending portion, γ is the liquid
20 surface tension of the suspended liquid, r_{reg} is a radius of the regulating channel, r_{sus} is a radius of the liquid-suspending portion, ρ is the bulk density of the suspended liquid and g is the gravitational constant.

In use, the liquid reservoir of the cartridge may be fluidly connected to the liquid release assembly via the connection element, such that continues a body of liquid is held in the
25 cartridge, connection element and liquid release assembly. The air-liquid interface of the liquid suspended in the liquid-suspending portion may be held at a predetermined position. The susceptor member may circumscribe at least a portion of the liquid suspended in the liquid-suspending portion. A user may draw on the aerosol outlet of the aerosol-generating device to pull air into the air inlet of the aerosol-generating device. Power may be supplied from a power
30 supply of the device to the induction coil to heat the susceptor member. The susceptor member may heat at least a portion of the liquid suspended in the liquid-suspending portion. The susceptor member may volatilize at least a portion of the liquid suspended in the liquid-suspending portion. Volatized liquid aerosol-forming substrate may be released into the air flow channel via the discharge orifice. Volatized liquid aerosol-forming substrate may

condense in the aerosol-forming chamber to form an aerosol. The aerosol may be inhaled by the user through the aerosol outlet of the aerosol-generating device.

Upon volatilization of liquid aerosol-forming substrate, the position of the air-liquid interface temporarily moves in a distal direction in the liquid-suspending portion. Due to the volatilization of liquid aerosol-forming substrate, the equilibrium of the liquid release assembly is temporarily disturbed. The sum of the static liquid pressure above the retreated air-liquid interface and the capillary suction at the liquid-suspending portion may be temporarily larger than the capillary suction at the regulating channel. The diameter of the liquid-suspending portion at the position of the air-liquid interface may be temporarily smaller than the diameter of the vent opening such that liquid aerosol-forming substrate is triggered to move in a proximal direction in the liquid-suspending portion, while the liquid in the regulating channel end may be triggered to move in a distal direction, such that eventually air bubbles are drawn into the liquid release assembly as long as the vaporization continues. The air bubbles may progress through the liquid to the headspace of the liquid reservoir to counteract the built-up of a negative pressure in the liquid reservoir. After the heating by the susceptor element is stopped, the system may move to equilibrium again, restoring the initial predetermined position of the air-liquid interface in the liquid-suspending portion.

In the case that the regulating channel becomes void of liquid, the level of liquid in the liquid-suspending portion may be stabilized by the presence of the distal opening of the regulating channel fluidly connecting the regulating channel with the liquid channel.

In a preferred embodiment of the liquid release assembly, the liquid release assembly may comprise the susceptor member configured to heat the heating area. The regulating channel and the liquid channel may be fluidly connected. The liquid channel may be configured to be reversibly connected to the liquid reservoir of the cartridge via the connection element. The discharge orifice may be arranged at the proximal end of the liquid-suspending portion. The susceptor member may be configured to heat at least a part of the liquid suspended in the liquid-suspending portion. The susceptor member may circumscribe a part of the liquid-suspending portion filled with suspended liquid. The susceptor member may abut at least a part of the liquid-suspending portion. A diameter of the regulating channel may be configured to bias the air-liquid interface in the liquid-suspending portion towards a predetermined position.

In a preferred embodiment of the aerosol-generating system, the system may comprise the aerosol-generating device comprising the preferred embodiment of the liquid release assembly described in the previous paragraph, and the connection element. The aerosol-generating device may further comprise the cartridge being removably received in the aerosol-generating device. The liquid reservoir of the cartridge may hold liquid aerosol-forming

substrate. The liquid reservoir of the cartridge may be fluidly connected to the liquid channel of the liquid release assembly via the connection element. The aerosol-generating device of the system may comprise the airflow channel arranged between the air inlet of the device and the aerosol outlet of the device. The vent opening and the discharge orifice may be configured to be fluidly connected to the airflow channel. The aerosol-generating device of the system may comprise the induction coil. The induction coil may be co-axially arranged around at least a part of the susceptor member. The induction coil may be configured to heat the susceptor member of the liquid release assembly. When a user initiates a draw, power may be supplied to the induction coil to heat the susceptor member. The susceptor member may be configured to volatilize at least a portion the liquid suspended in the liquid-suspending portion. Upon volatilization of the at least a portion of the liquid suspended in the liquid-suspending portion, a built-up of negative pressure in the headspace of the liquid reservoir resulting from the volatilization of the liquid suspended in the liquid-suspending portion may be balanced by air being pulled in from the airflow channel into the headspace of the liquid reservoir via the regulating channel. After the power supply to the induction coil is stopped, the predetermined position of the air-liquid interface in the liquid-suspending portion may be restored.

A component may comprise a longitudinal axis. The longitudinal axis of the component may extend between a proximal end of the component and the distal end of the component. A cross-section of the component may refer to a cross-section of the component in a plane orthogonal to the longitudinal axis of the component. The liquid channel may comprise a longitudinal axis. The longitudinal axis of the liquid channel may extend between the proximal end of the liquid channel and the distal end of the liquid channel. A cross-section of the liquid channel may refer to a cross-section of the liquid channel in a plane orthogonal to the longitudinal axis of the liquid channel. The liquid-suspending portion may comprise a longitudinal axis. The longitudinal axis of the liquid-suspending portion may extend between the proximal end of the liquid-suspending portion and the distal end of the liquid-suspending portion. A cross-section of the liquid-suspending portion may refer to a cross-section of the liquid-suspending portion in a plane orthogonal to the longitudinal axis of the liquid-suspending portion. The regulating channel may comprise a longitudinal axis. The longitudinal axis of the regulating channel may extend between the proximal end of the regulating channel and the distal end of the regulating channel. A cross-section of the regulating channel may refer to a cross-section of the regulating channel in a plane orthogonal to the longitudinal axis of the regulating channel.

As used herein, the terms 'proximal', 'distal', 'downstream' and 'upstream' may be used to describe the relative positions of components, or portions of components, of the aerosol-generating device and the aerosol-generating system in relation to the direction in which a user

draws on the aerosol-generating device during use thereof. As used herein, the terms 'proximal', 'distal', 'downstream' and 'upstream' may be used to describe the relative positions of components, or portions of components, of any of the aerosol-generating device, aerosol-generating system, liquid release assembly, the connection element and the cartridge in relation to the direction of liquid flow. For example, liquid may be transferred from the liquid reservoir of the cartridge to the liquid release assembly. Accordingly, the liquid release assembly is arranged proximal to the liquid reservoir.

The aerosol-generating device may comprise a mouth end through which in use an aerosol exits the aerosol-generating device and is delivered to a user. The mouth end may also be referred to as the proximal end. In use, a user draws on the proximal or mouth end of the aerosol-generating device in order to inhale an aerosol generated by the aerosol-generating device. The aerosol-generating device comprises a distal end opposed to the proximal or mouth end. The proximal or mouth end of the aerosol-generating device may also be referred to as the downstream end and the distal end of the aerosol-generating device may also be referred to as the upstream end. Components, or portions of components, of the aerosol-generating device may be described as being upstream or downstream of one another based on their relative positions between the proximal, downstream or mouth end and the distal or upstream end of the aerosol-generating device.

As used herein, an 'aerosol-generating device' may relate to a device that interacts with an aerosol-forming substrate to generate an aerosol. An aerosol-generating device may be a smoking device that interacts with an aerosol-forming substrate to generate an aerosol that is directly inhalable into a user's lungs thorough the user's mouth. An aerosol-generating device may be a holder. The device may be an electrically heated smoking device. The aerosol-generating device may comprise a housing, electric circuitry, a power supply, a heating chamber and a heating element.

As used herein with reference to the present invention, the term 'smoking' with reference to a device, article, system, substrate, or otherwise does not refer to conventional smoking in which an aerosol-forming substrate is fully or at least partially combusted. The aerosol-generating device of the present invention may be arranged to heat the aerosol-forming substrate to a temperature below a combustion temperature of the aerosol-forming substrate, but at or above a temperature at which one or more volatile compounds of the aerosol-forming substrate are released to form an inhalable aerosol.

The aerosol-generating device may comprise electric circuitry. The electric circuitry may comprise a microprocessor, which may be a programmable microprocessor. The microprocessor may be part of a controller. The electric circuitry may comprise further electronic components. The electric circuitry may be configured to regulate a supply of power

to the electrically resistive heating element or the induction coil. Power may be supplied to the electrically resistive heating element or the induction coil continuously following activation of the aerosol-generating device or may be supplied intermittently, such as on a puff-by-puff basis. The power may be supplied to the electrically resistive heating element or the induction
5 coil in the form of pulses of electrical current.

The aerosol-generating device may comprise a power supply, typically a battery, within a main body of the aerosol-generating device. In one embodiment, the power supply is a Lithium-ion battery. Alternatively, 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-
10 Iron-Phosphate, Lithium Titanate or a Lithium-Polymer battery. As an alternative, the power supply may be another form of charge storage device such as a capacitor. The power supply may require recharging and may have a capacity that enables to store enough energy for one or more usage experiences; for example, the power supply may have sufficient capacity to continuously generate aerosol for a period of around six minutes or for a period of a multiple
15 of six minutes. In another example, the power supply may have sufficient capacity to provide a predetermined number of puffs or discrete activations of the the electrically resistive heating element or the induction coil.

The electrically resistive heating element may comprise an electrically resistive material. Suitable electrically resistive materials include but are not limited to: semiconductors
20 such as doped ceramics, electrically "conductive" ceramics (such as, for example, molybdenum disilicide), carbon, graphite, metals, metal alloys and composite materials made of a ceramic material and a metallic material. Such composite materials may comprise doped or undoped ceramics. Examples of suitable doped ceramics include doped silicon carbides. Examples of suitable metals include titanium, zirconium, tantalum platinum, gold and silver.
25 Examples of suitable metal alloys include stainless steel, nickel-, cobalt-, chromium-, aluminium- titanium- zirconium-, hafnium-, niobium-, molybdenum-, tantalum-, tungsten-, tin-, gallium-, manganese-, gold- and iron-containing alloys, and super-alloys based on nickel, iron, cobalt, stainless steel, Timetal® and iron-manganese-aluminium based alloys. In composite materials, the electrically resistive material may optionally be embedded in, encapsulated or
30 coated with an insulating material or vice-versa, depending on the kinetics of energy transfer and the external physicochemical properties required.

The susceptor member may comprise a susceptor material that is capable of generating heat, when penetrated by an alternating magnetic field. If the susceptor material is conductive, then typically eddy currents are induced by the alternating magnetic field. If the
35 susceptor material is magnetic, then typically another effect that contributes to the heating is commonly referred to hysteresis losses. Hysteresis losses occur mainly due to the movement

of the magnetic domain blocks within the susceptor material, because the magnetic orientation of these will align with the magnetic induction field, which alternates. Another effect contributing to the hysteresis loss is when the magnetic domains will grow or shrink within the susceptor material. Commonly all these changes in the susceptor material that happen on a nano-scale
5 or below are referred to as “hysteresis losses”, because they produce heat in the susceptor material. Hence, if the susceptor material is both magnetic and electrically conductive, both hysteresis losses and the generation of eddy currents will contribute to the heating of the susceptor material. If the susceptor material is magnetic, but not conductive, then hysteresis losses will be the only means by which the susceptor material will heat, when penetrated by
10 an alternating magnetic field. According to the invention, the susceptor material may be electrically conductive or magnetic or both electrically conductive and magnetic. An alternating magnetic field generated by one or several induction coils heat the susceptor material, which then transfers the heat to the aerosol-forming substrate, such that an aerosol is formed. The heat transfer may be mainly by conduction of heat. Such a transfer of heat is best, if the
15 susceptor material is in close thermal contact with the aerosol-forming substrate. The susceptor material may be a metallic material.

The cartridge may comprise a liquid aerosol-forming substrate that is capable of releasing volatile compounds that can form an aerosol. The cartridge may be disposable.

As used herein, the term ‘aerosol-forming substrate’ relates to a substrate capable of
20 releasing one or more volatile compounds that can form an aerosol. Such volatile compounds may be released by heating the aerosol-forming substrate. An aerosol-forming substrate may conveniently be part of the cartridge.

The aerosol-forming substrate may be a liquid aerosol-forming substrate. The aerosol-forming substrate may comprise a tobacco-containing material containing volatile tobacco
25 flavour compounds which are released from the substrate upon heating. The aerosol-forming substrate may comprise a non-tobacco material. The aerosol-forming substrate may comprise a flavoring material. The aerosol-forming substrate may comprise nicotine. The aerosol-forming substrate may comprise an aerosol former that facilitates the formation of a dense and stable aerosol. Examples of suitable aerosol formers are glycerine and propylene glycol.

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

Example 1: A liquid release assembly for an aerosol-generating device, wherein the liquid release assembly comprises a liquid channel comprising a liquid-suspending portion,
35 wherein the liquid-suspending portion comprises a discharge orifice and is configured to define a heating area; and a regulating channel defining a vent opening configured to be fluidly

connected with the liquid channel, wherein the regulating channel and the liquid-suspending portion are configured to suspend liquid in the liquid-suspending portion, wherein an air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

5 Example 2: The liquid release assembly according to example 1, wherein the discharge orifice of the liquid-suspending portion is arranged at a proximal end of the liquid channel.

 Example 3: The liquid release assembly according to example 1 or example 2, wherein the regulating channel and the liquid-suspending portion are configured such that only a part, preferably a distal part of the liquid-suspending portion is filled with liquid.

10 Example 4: The liquid release assembly according to any of the preceding examples, wherein the regulating channel and the liquid-suspending portion are configured such that less than 90 percent, preferably less than 75 percent, more preferably less than 50 percent of the liquid-suspending portion is filled with liquid.

 Example 5: The liquid release assembly according to any of the preceding examples, 15 wherein the regulating channel and the liquid-suspending portion are configured such that an air gap is formed between the liquid in the liquid-suspending portion and the discharge orifice of the liquid-suspending portion.

 Example 6: The liquid release assembly according to any of the preceding examples, wherein the liquid-suspending portion is configured as a tapering liquid-suspending portion, 20 preferably wherein a diameter of the tapering liquid-suspending portion gradually increases towards the discharge orifice of the liquid-suspending portion.

 Example 7: The liquid release assembly according to any of the preceding examples, wherein the regulating channel is mounted at the liquid channel.

 Example 8: The liquid release assembly according to any of the preceding examples, 25 wherein the regulating channel is integrally formed with the liquid channel.

 Example 9: The liquid release assembly according to any of the preceding examples, wherein the regulating channel extends laterally from liquid channel.

 Example 10: The liquid release assembly according to any of the preceding examples, wherein the regulating channel extends radially from the liquid channel.

30 Example 11: The liquid release assembly according to any of the preceding examples, wherein the regulating channel is configured as a tapering regulating channel, preferably wherein a diameter of the tapering regulating channel gradually decreases towards the liquid channel.

 Example 12: The liquid release assembly according to any of the preceding examples, 35 wherein the liquid-suspending portion is arranged orthogonal to the regulating channel.

Example 13: The liquid release assembly according to any of the preceding examples, wherein the liquid-suspending portion is arranged proximal to at least a portion of the regulating channel.

5 Example 14: The liquid release assembly according to any of the preceding examples, wherein a diameter of the regulating channel and a diameter of the liquid-suspending portion are selected to suspend liquid in the liquid-suspending portion such that the air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

10 Example 15: The liquid release assembly according to example 14, wherein a ratio of the diameter of the regulating channel and the diameter of the liquid-suspending portion is smaller than 1, preferably wherein the ratio is of between 0.9 and 0.5, more preferably wherein the ratio is of between 0.8 and 0.6.

Example 16: The liquid release assembly according to example 14 or example 15, wherein a diameter of the regulating channel is less than 1000 micrometers, preferably less than 700 micrometers, more preferably less than 500 micrometers.

15 Example 17: The liquid release assembly according to any of examples 14 to 16, wherein a diameter of the liquid-suspending portion is less than 2500 micrometers, preferably less than 800 micrometers, more preferably less than 600 micrometers.

20 Example 18: The liquid release assembly according to any of the preceding examples, wherein a length of the liquid-suspending portion is of between 3 centimeters and 0.6 centimeters, preferably of between 2.3 centimeters and 0.8 centimeters, more preferably of between 1.9 centimeters and 1 centimeter

Example 19: The liquid release assembly according to any of the preceding examples, wherein the liquid-suspending portion has a hollow cylindrical shape, preferably wherein the liquid-suspending portion has a substantially circular cross-section.

25 Example 20: The liquid release assembly according to any of the preceding examples, wherein the regulating channel has a hollow cylindrical shape, preferably wherein the regulating channel has a substantially circular cross-section.

Example 21: The liquid release assembly according to any of the preceding examples, wherein the liquid channel has a substantially circular cross-section.

30 Example 22: The liquid release assembly according to any of the preceding examples, wherein the liquid release assembly comprises a susceptor member arranged to heat the heating area.

Example 23: The liquid release assembly according to example 22, wherein the susceptor member is arranged at a proximal end of the liquid-suspending portion.

35 Example 24: The liquid release assembly according to example 22 or example 23, wherein the susceptor member is co-axially arranged around at least a part of the liquid-

suspending portion, preferably wherein the susceptor member is co-axially arranged around the heating area, more preferably wherein at least a portion of the susceptor member is co-axially arranged around air-liquid interface.

5 Example 25: An aerosol-generating device comprising the liquid release assembly according to any of the preceding examples.

Example 26: The aerosol-generating device according to example 25, wherein the aerosol-generating device is configured for removably receiving a cartridge.

10 Example 27: The aerosol-generating device according to example 25 or example 26, wherein the aerosol-generating device comprises a removably attachable connection element configured to fluidly connect the cartridge and the liquid channel of the liquid release assembly.

Example 28: The aerosol-generating device according to example to any of example 25 to 27, wherein he aerosol-generating device comprises the liquid release assembly according to any of examples 22 to 24, wherein the aerosol-generating device comprises an induction coil arranged to heat the susceptor member.

15 Example 29: The aerosol-generating device according to example 28, wherein the induction coil is co-axially arranged around the susceptor member.

Example 30: The aerosol-generating device according to example 28 or example 29, wherein at least a portion of the induction coil is arranged to at least partially, preferably fully circumscribe the susceptor member.

20 Example 31: The aerosol-generating device according to any of the preceding claims, wherein the device comprises an airflow channel, preferably wherein one or both of the liquid release assembly and the connection element are arranged within the airflow channel.

25 Example 32: The aerosol-generating device according to any of examples 28 to 30 and example 31, wherein the induction coil is co-axially arranged around at least a portion of the airflow channel.

Example 33: The aerosol-generating device according to example 31 or example 32, wherein one or both of the discharge orifice of the liquid-suspending portion and the vent opening of the regulating channel are configured to be fluidly connected with the airflow channel.

30 Example 34: The aerosol-generating device according to any of examples 31 to 33, wherein the aerosol-generating device comprises an air inlet configured to be fluidly connected to the airflow channel of the aerosol-generating device.

35 Example 35: The aerosol-generating device according to any of examples 25 to 34, wherein the aerosol-generating device comprises a housing, preferably wherein the air inlet is arranged in the housing of the aerosol-generating device.

Example 36: The aerosol-generating device according to any of examples 25 to 35, wherein the aerosol-generating device comprises an aerosol outlet, preferably arranged to be fluidly connected with the airflow channel.

Example 37: The aerosol-generating device according to any of examples 31 to 36, wherein the airflow channel comprises an aerosol-forming chamber, preferably wherein the aerosol-forming chamber is configured as a chimney.

Example 38: An aerosol-generating system comprising the aerosol-generating device according to any of examples 25 to 37 and a cartridge comprising a liquid reservoir holding liquid aerosol-forming substrate.

Example 39: The aerosol-generating system according to example 38, wherein the regulating channel and the liquid-suspending portion are configured to suspend liquid aerosol-forming substrate transferred from the liquid reservoir in the liquid-suspending portion, wherein the air-liquid interface of the suspended liquid aerosol-forming substrate is arranged in the heating area of the liquid-suspending portion.

Example 40: The aerosol-generating system according to example 38 or example 39, wherein the cartridge is configured for removably insertable into the device, preferably into the airflow channel.

Example 41: The aerosol-generating system according to any of examples 38 to 40, wherein the cartridge comprises a housing.

Example 42: The aerosol-generating system according to any of any of examples 38 to 41, wherein the liquid release assembly is arranged proximal to the cartridge.

Example 43: The aerosol-generating system according to any of examples 38 to 42, wherein the liquid reservoir is fluidly connected to the liquid release assembly, preferably via the connection element.

Example 44: A method for generating an aerosol with an aerosol-generating device comprising a liquid release assembly, wherein the liquid release assembly is provided with a liquid channel comprising a liquid-suspending portion, wherein the liquid-suspending portion is provided with a discharge orifice and is configured to define a heating area, wherein the liquid release assembly is provided with a regulating channel defining a vent opening configured to be fluidly connected with the liquid channel, wherein the regulating channel and the liquid-suspending portion are configured to suspend liquid in the liquid-suspending portion, wherein an air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

Features described in relation to one embodiment may equally be applied to other embodiments of the invention.

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

Fig. 1 shows an aerosol-generating system of the invention;

5 Fig. 2 shows a detailed view of a portion of an aerosol-generating device of the aerosol-generating system of Fig. 1;

Fig. 3 shows a detailed view of another portion of an aerosol-generating device of the aerosol-generating system of Fig. 1;

Fig. 4 shows a liquid release assembly of Fig. 1;

10 Fig. 5 shows a detailed view of a cartridge of Fig. 1;

Fig. 6 shows a detailed view of a connection element of Fig. 1;

Fig. 1 shows an aerosol-generating system 10 of the invention. The aerosol-generating system 10 comprises an aerosol-generating device 12 and a cartridge 14.

15 The aerosol-generating device 12 comprises a liquid release assembly 16. The aerosol-generating device 12 comprises a connection element 18. The cartridge 14 is fluidly connected to the liquid release assembly 16 via the connection element 18. The aerosol-generating device 12 comprises electric circuitry 20. The aerosol-generating device 12 comprises a battery 22. The aerosol-generating device 12 comprises a housing 24. The
20 cartridge 14 is removably received in the housing 24 of the aerosol-generating device 12. The aerosol-generating device 12 comprises an airflow channel 26. The liquid release assembly 16 is arranged in the air flow channel 26. The aerosol-generating device 12 comprises an aerosol-forming chamber 28. The aerosol-forming chamber 28 is configured as a chimney. The aerosol-generating device 12 comprises an air inlet 30. The aerosol-generating device 12
25 comprises an aerosol outlet 32. The air inlet 30 and the aerosol outlet 32 are fluidly connected via the airflow channel 26 and the aerosol-forming chamber 28. The aerosol-generating device 12 comprises an induction coil 34. The aerosol-generating device 12 is configured to supply power from the battery 22 to the induction coil 34. The supply of power from the battery 22 to the induction coil 34 may be controlled by electric circuitry 20.

30 The cartridge 14 comprises a housing 36. The cartridge 14 is removably inserted into the aerosol-generating device 12. The cartridge 14 comprises a liquid reservoir 40 holding liquid aerosol-forming substrate.

The liquid release assembly 16 comprises a liquid channel 38. The liquid channel 38 comprises a tapering liquid-suspending portion 42. The liquid release assembly 16 comprises
35 a tapering regulating channel 44. The liquid channel 38 and the regulating channel 44 are fluidly connected. The liquid-suspending portion 42 and the regulating channel 44 are fluidly

connected. The liquid channel 38 and the regulating channel 44 are supplied with a liquid aerosol-forming substrate from the liquid reservoir 40 of the cartridge 14. The liquid release assembly 16 comprises a susceptor member 46. The susceptor member 46 is configured to abut an outer wall of liquid-suspending portion 46. The susceptor member 46 circumscribes a part of the liquid-suspending portion 42. The susceptor member 46 is arranged around liquid suspended in the liquid-suspending portion 42. The induction coil 34 circumscribes at least a portion of the susceptor member 46. The induction coil 34 is configured to heat the susceptor member 46. The susceptor member 46 is configured to heat liquid suspended in the liquid-suspending portion 42. The susceptor member is configured to volatilize liquid suspended in the liquid-suspending portion 42.

The liquid channel 38 comprises the liquid-suspending portion 42. The liquid-suspending portion 42 comprises a discharge orifice. The discharge orifice is arranged at a proximal end of the liquid-suspending portion 42. The liquid-suspending portion is configured to define a heating area. The regulating channel 44 defines a vent opening fluidly connected with the liquid channel 38. The vent opening is arranged at a proximal end of the regulating channel 44. The regulating channel 44 and the liquid-suspending portion 42 are configured to suspend liquid in the liquid-suspending portion 42. An air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion 42. The regulating channel 44 and the liquid-suspending portion 42 are configured to bias the position of the air-liquid interface in the liquid-suspending portion towards a predetermined position in the liquid-suspending portion.

The liquid-suspending portion 42 is fluidly connected to the air flow channel 26 via the discharge orifice. The regulating channel 44 is fluidly connected to the air flow channel 26 via the vent opening. The liquid reservoir 40 of the cartridge 14 is fluidly connected to the liquid release assembly 16 via connection element 18.

In use, liquid aerosol-forming substrate is delivered from the cartridge 14 to the liquid release assembly 16 via connection element 18. The liquid aerosol-forming substrate is held in the liquid channel 38, regulating channel 44, connection element 18 and the liquid reservoir 40. The regulating channel 44 and the liquid-suspending portion 42 are configured such that liquid aerosol-forming substrate is suspended in the liquid-suspending portion 42. The regulating channel 44 and the liquid-suspending portion 42 are configured to bias the level of the liquid aerosol-forming substrate in the liquid-suspending portion such that liquid aerosol-forming substrate is arranged in the part of the liquid-suspending portion circumscribed by the susceptor member 46. The regulating channel 44 and the liquid-suspending portion 42 are configured to bias the level of the liquid aerosol-forming substrate in the liquid-suspending portion such that a proximal part of the liquid-suspending portion is void of liquid. The air-liquid

interface of the liquid suspended in the liquid-suspending portion is held at a predetermined position in the liquid-suspending portion.

When a user experience is desired, for example when the user draws on the aerosol outlet 32 to pull in air through air inlet 30, power is supplied to the induction coil 34 to inductively heat the susceptor member 46. The susceptor member 46 is configured to heat liquid aerosol-forming substrate suspended in the liquid-suspending portion 42. The susceptor member 46 is configured to volatilize liquid aerosol-forming substrate suspended in the liquid-suspending portion 42. The volatilized aerosol-forming substrate may be released into airflow channel 26 via the discharge orifice of the liquid-suspending portion 42. The volatilized aerosol-forming substrate may be drawn towards the aerosol outlet 32 by the draw of the user. The volatilized aerosol-forming substrate may condense in the aerosol-forming chamber 28 to form an aerosol to be inhaled by the drawing user via aerosol outlet 32.

Upon volatilization of liquid aerosol-forming substrate, the position of the air-liquid interface temporarily moves in a distal direction in the liquid-suspending portion. Due to the volatilization of liquid aerosol-forming substrate, the equilibrium of the liquid release assembly is temporarily disturbed. The sum of the static liquid pressure above the retreated air-liquid interface and the capillary suction at the liquid-suspending portion may be temporarily larger than the capillary suction at the regulating channel. The diameter of the liquid-suspending portion at the position of the air-liquid interface may be temporarily smaller than the diameter of the vent opening such that liquid aerosol-forming substrate is triggered to move in a proximal direction in the liquid-suspending portion, while the liquid in the regulating channel end is triggered to move in a distal direction, such that eventually air bubbles are drawn into the liquid release assembly as long as the vaporization continues. The air bubbles may progress through the liquid to the headspace of the liquid reservoir to counteract the built-up of a negative pressure in the liquid reservoir. After the heating by the susceptor element is stopped, the system moves to equilibrium again, restoring the initial predetermined position of the air-liquid interface in the liquid-suspending portion.

Fig. 2 shows a detailed view of a portion of an aerosol-generating device of the aerosol-generating system of Fig. 1. The remarks relating to Fig. 1 correspondingly apply.

Fig. 3 shows a detailed view of another portion of an aerosol-generating device of the aerosol-generating system of Fig. 1. The remarks relating to Fig. 1 correspondingly apply. The portion shown in Fig. 3 may be received by the portion of the aerosol-generating device shown in Fig. 2 as indicated in Fig. 1.

Fig. 4 shows a detailed view the liquid release assembly 16 of Fig. 1. The remarks relating to Fig. 1 correspondingly apply. The liquid-suspending portion 42 comprises a discharge orifice 48. The discharge orifice 48 has a diameter as indicated by arrows 50. The

discharge orifice 48 is arranged at the proximal end of the liquid-suspending portion 42. The regulating channel 44 comprises a vent opening 52. The vent opening 52 is arranged at a proximal end of the regulating channel 44. The liquid release assembly 16 is partially filled with liquid aerosol-forming substrate 54. The liquid aerosol-forming substrate 54 is suspended in the liquid-suspending portion 42. The air-liquid interface 56 of the liquid aerosol-forming substrate 54 suspended in the liquid-suspending portion is arranged in the heating area 58 of the liquid-suspending portion 42. The liquid suspended in the liquid-suspending portion is held at a height 60 (H_h) in the liquid-suspending portion.

Fig. 5 shows a detailed view of the cartridge of Fig. 1. The remarks relating to Fig. 1 correspondingly apply. The liquid reservoir 40 is configured to hold liquid aerosol-forming substrate 54. The cartridge 14 comprises a liquid outlet 62. The liquid outlet 62 is arranged at a proximal end of the cartridge 14. The liquid outlet 62 is configured to be fluidly connectable to the connection element 18 as shown in Fig. 1.

Fig. 6 shows a detailed view of the connection element 18 of Fig. 1. The remarks relating to Fig. 1 correspondingly apply. The connection element 18 comprises a liquid inlet 64. The liquid inlet 64 is arranged at a distal end of the connection element 18. The connection element 18 comprises a liquid outlet 66. The liquid outlet 66 is arranged at a proximal end of the connection element 18. The connection element 18 comprises a liquid conduit 68. The liquid conduit 68 is configured to fluidly connect the liquid inlet 64 and the liquid outlet 66. The connection element 18 is configured to convey liquid aerosol-forming substrate 54 from the cartridge 14 to the liquid release assembly 16 as shown in Fig. 1. The connection element 18 is configured as an adapter between the cartridge 14 and the liquid release assembly 16. The connection element 18 is configured to fluidly connect the liquid reservoir 40 of the cartridge 14 with the liquid channel 38 of the liquid release assembly 16.

CLAIMS

1. A liquid release assembly for an aerosol-generating device, wherein the liquid release assembly comprises

a liquid channel comprising a liquid-suspending portion, wherein the liquid-suspending
5 portion comprises a discharge orifice and is configured to define a heating area; and

a regulating channel defining a vent opening configured to be fluidly connected with the liquid channel, wherein the regulating channel and the liquid-suspending portion are configured to suspend liquid in the liquid-suspending portion, wherein an air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

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2. The liquid release assembly according to claim 1, wherein the discharge orifice of the liquid-suspending portion is arranged at a proximal end of the liquid channel.

3. The liquid release assembly according to claim 1 or claim 2, wherein the liquid-suspending portion is configured as a tapering liquid-suspending portion.

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4. The liquid release assembly according to any of the preceding claims, wherein the regulating channel extends laterally from liquid channel.

5. The liquid release assembly according to any of the preceding claims, wherein the regulating channel is configured as a tapering regulating channel.

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6. The liquid release assembly according to any of the preceding claims, wherein a diameter of the regulating channel and a diameter of the liquid-suspending portion are selected to suspend liquid in the liquid-suspending portion such that the air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

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7. The liquid release assembly according to claim 6, wherein a ratio of the diameter of the regulating channel and the diameter of the liquid-suspending portion is smaller than 1, preferably wherein the ratio is of between 0.9 and 0.5, more preferably wherein the ratio is of between 0.8 and 0.6.

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8. The liquid release assembly according to claim 6 or claim 7, wherein the diameter of the regulating channel is less than 1000 micrometers, preferably less than 700 micrometers, more preferably less than 500 micrometers.

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9. The liquid release assembly according to any of the preceding claims, wherein the liquid release assembly comprises a susceptor member arranged to heat the heating area, wherein the susceptor member is co-axially arranged around at least a part of the liquid-suspending portion.

5

10. An aerosol-generating device comprising the liquid release assembly according to any of the preceding claims.

10 11. The aerosol-generating device according to claim 10, wherein the aerosol-generating device is configured for removably receiving a cartridge.

12. The aerosol-generating device according to claim 10 or claim 11, wherein the aerosol-generating device comprises a removably attachable connection element configured to fluidly connect the cartridge and the liquid channel of the liquid release assembly.

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13. The aerosol-generating device according to any of claims 10 to 12, wherein the aerosol-generating device comprises the liquid release assembly according to claim 9, wherein the aerosol-generating device comprises an induction coil arranged to heat the susceptor member.

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14. An aerosol-generating system comprising the aerosol-generating device according to any of claims 10 to 13 and a cartridge comprising a liquid reservoir holding liquid aerosol-forming substrate.

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15. A method for generating an aerosol with an aerosol-generating device comprising a liquid release assembly, wherein the liquid release assembly is provided with a liquid channel comprising a liquid-suspending portion, wherein the liquid-suspending portion is provided with a discharge orifice and is configured to define a heating area, wherein the liquid release assembly is provided with a regulating channel defining a vent opening configured to
30 be fluidly connected with the liquid channel, wherein the regulating channel and the liquid-suspending portion are configured to suspend liquid in the liquid-suspending portion, wherein an air-liquid interface of the suspended liquid is arranged in the heating area of the liquid-suspending portion.

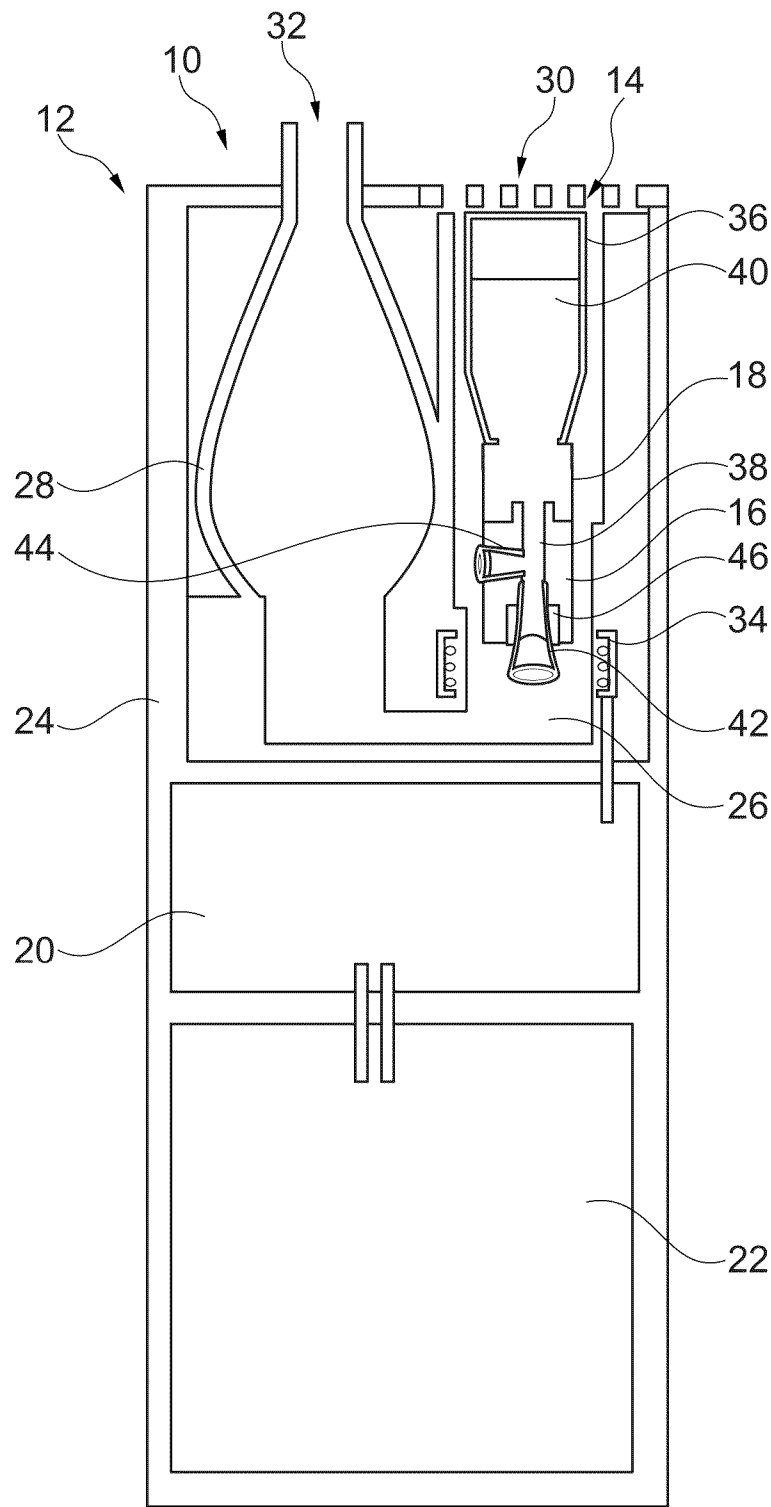


Fig. 1

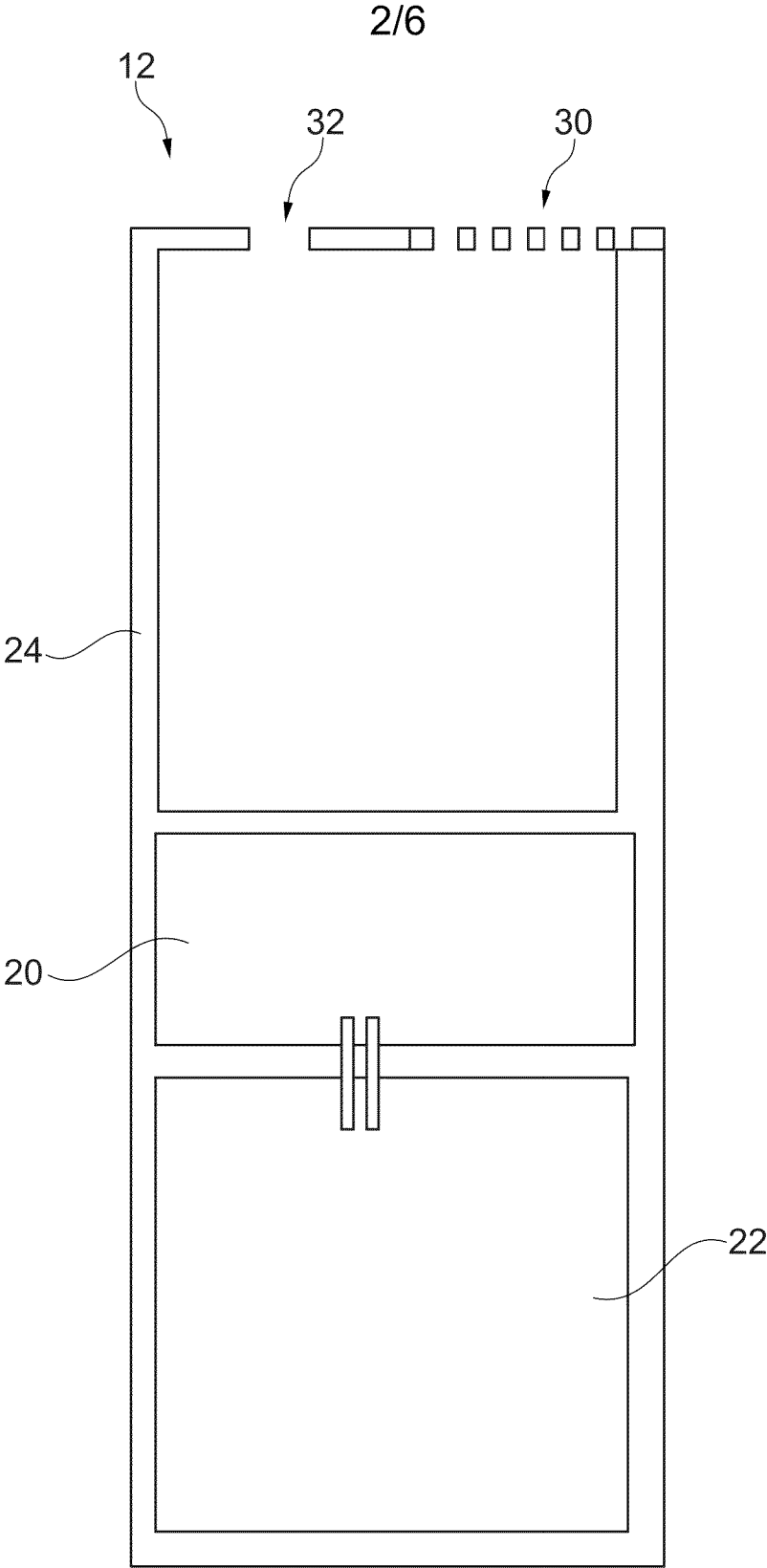


Fig. 2

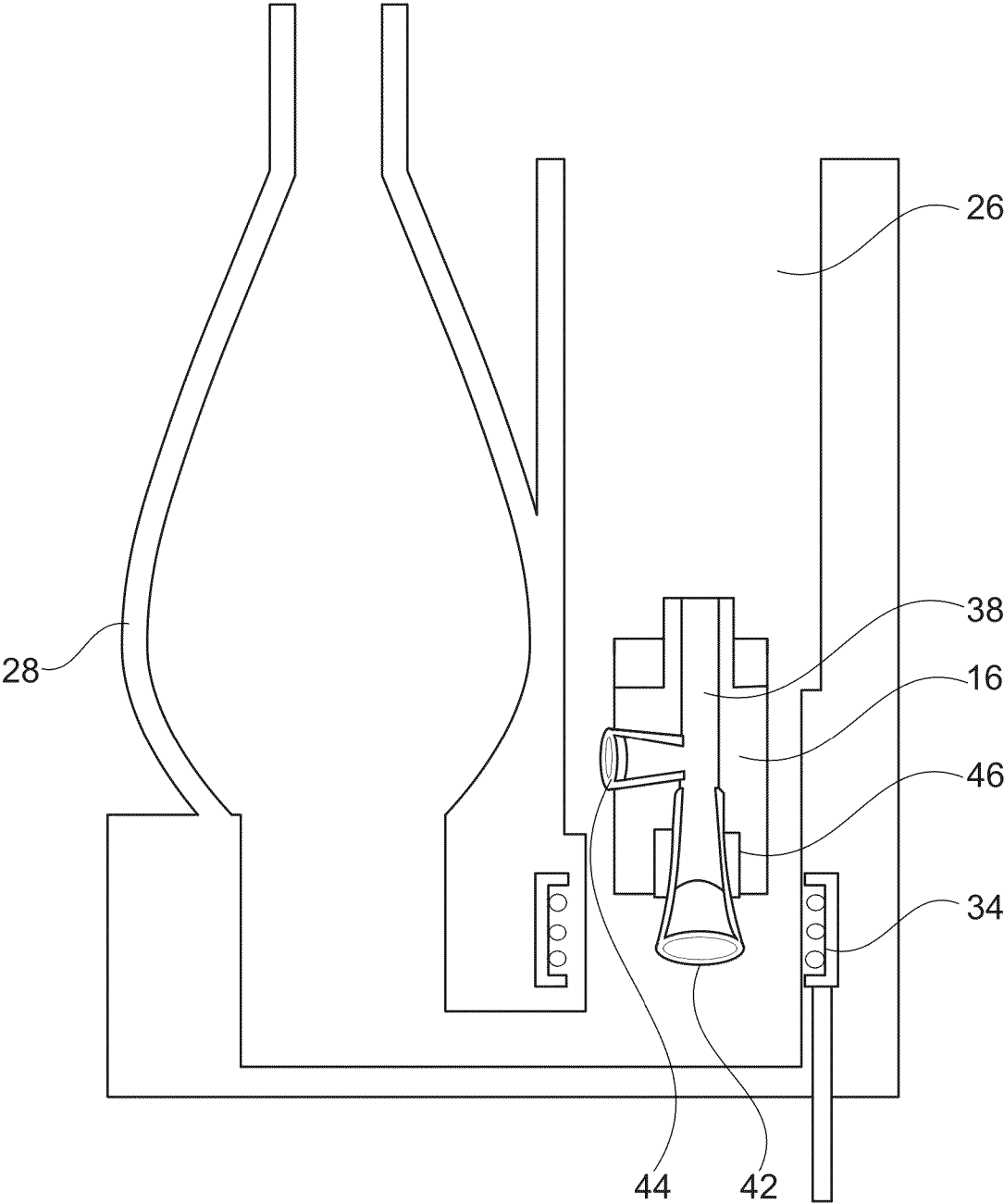


Fig. 3

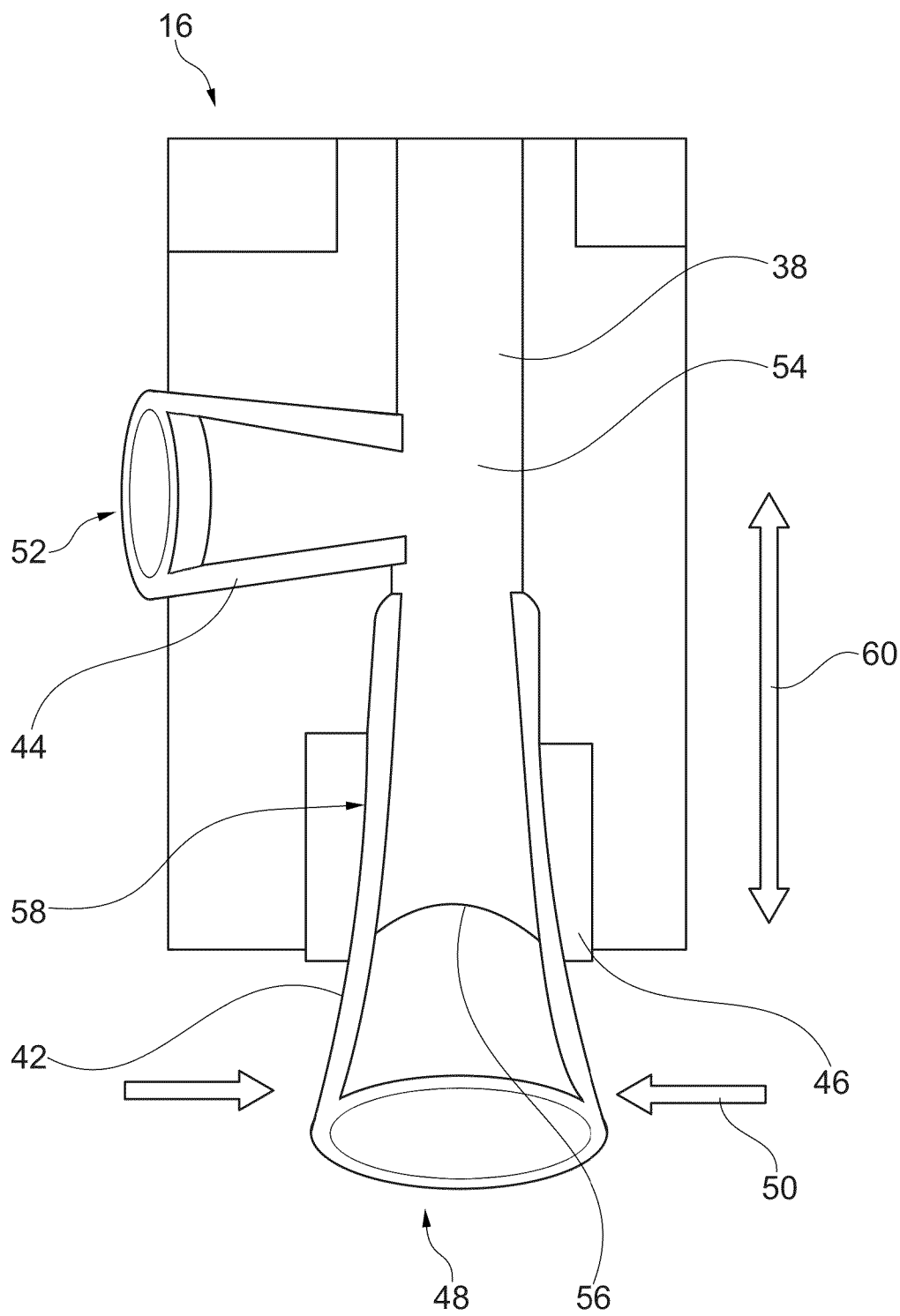


Fig. 4

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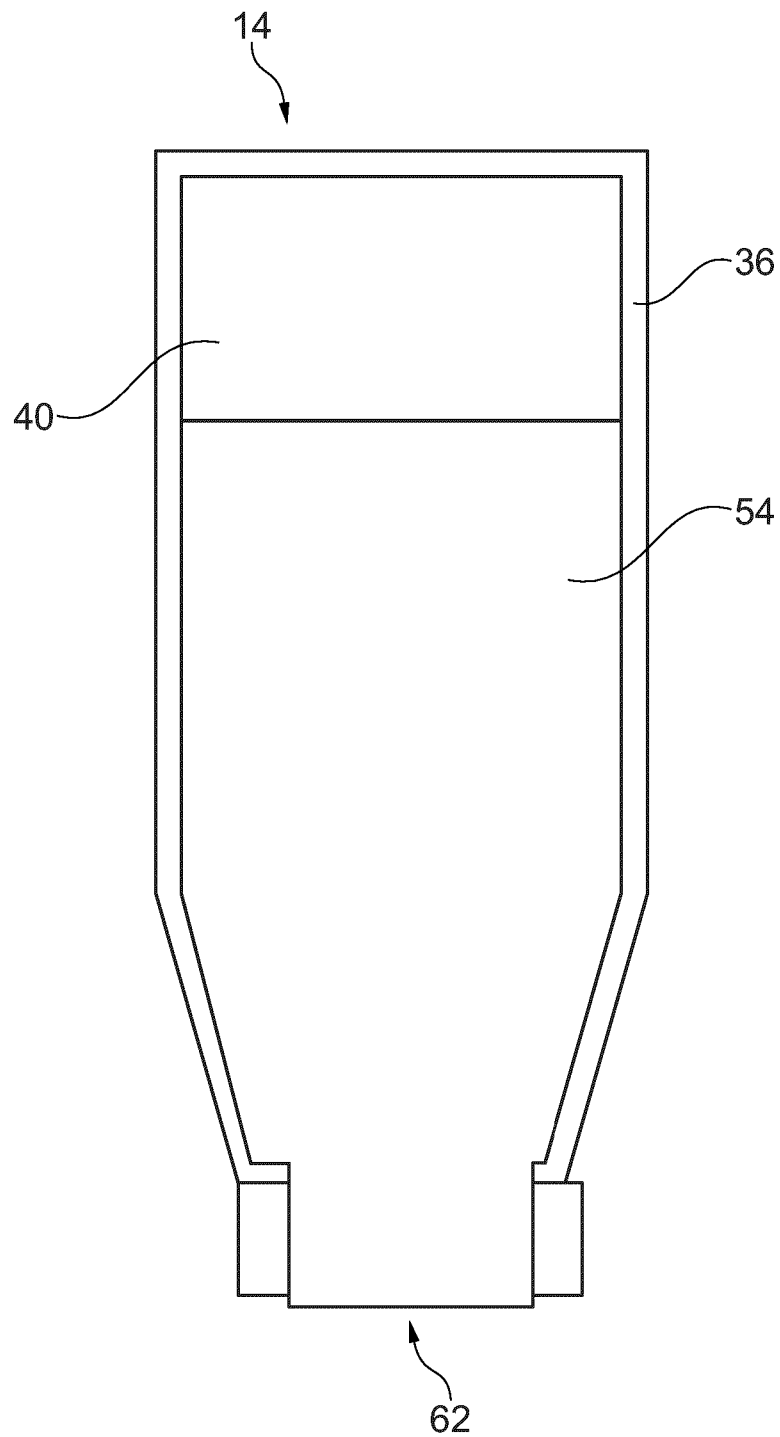


Fig. 5

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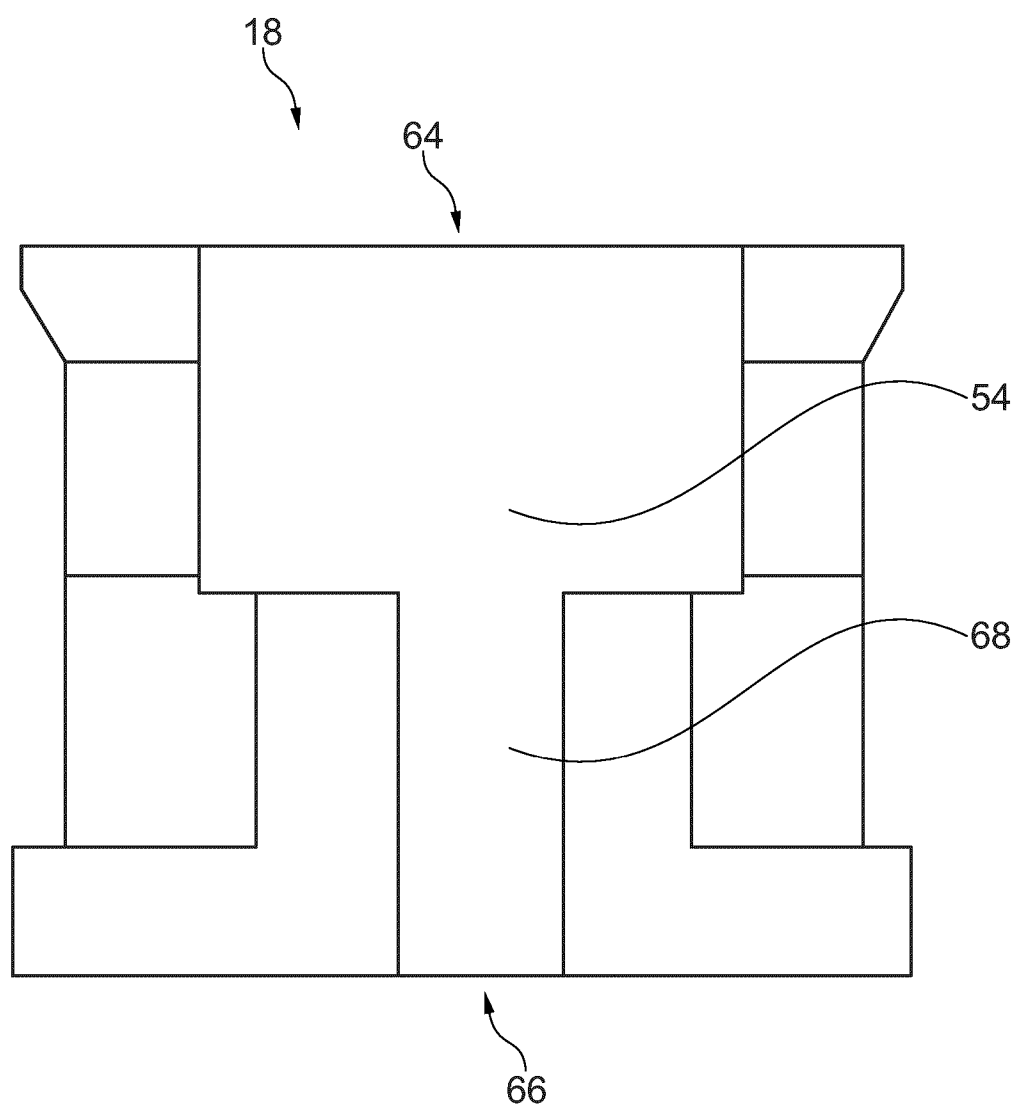


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/085229

A. CLASSIFICATION OF SUBJECT MATTER INV. A24F40/485 ADD. A24F40/465 A24F40/10 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.
X	WO 2017/011419 A1 (PAX LABS INC [US]) 19 January 2017 (2017-01-19)	1-3, 5-8, 10-12, 14, 15
Y	paragraphs [0082], [0083], [0107] -	9, 13
A	[0112]; figures 1-3 -----	4
Y	WO 2022/189579 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 15 September 2022 (2022-09-15) page 15, lines 19-24 page 27, lines 1-16 figure 6 -----	9, 13
A	WO 2023/281246 A1 (NICOVENTURES TRADING LTD [GB]) 12 January 2023 (2023-01-12) page 18, line 10 - page 19, line 24; figure 3 ----- -/-	1, 15
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 31 January 2025		Date of mailing of the international search report 12/02/2025
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Kock, Søren

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/085229

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