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(54) **CARTOMIZER WITH LEAKAGE PREVENTION FOR AN AEROSOL GENERATION DEVICE**

(57) A cartomizer (1) equips an aerosol generation device and comprises a first housing (4) comprising at least one reservoir (5) storing an aerosol-forming precursor and a heating chamber (7) configured for heating the aerosol-forming precursor to generate an aerosol. The heating chamber (7) and reservoir (5) are rotatable relative to each other between a closed position in which the aerosol-forming precursor is prevented from leaving the reservoir (5) and an open position in which the aerosol-forming precursor can leave the reservoir (5) to reach the heating chamber (7).

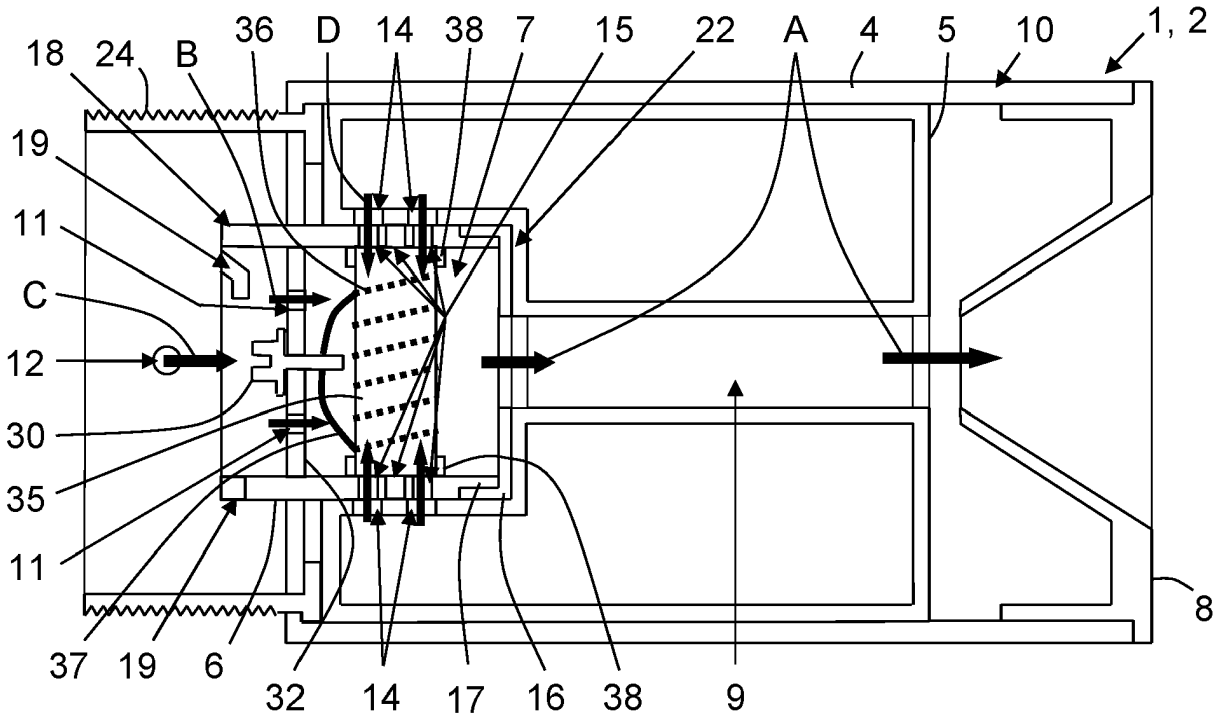

FIG.3

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Description

Field of the invention

[0001] The present invention relates to an aerosol generation device, and more precisely to a cartomizer intended for equipping an aerosol generation device.

Background

[0002] Different types of aerosol generation devices are already known in the art. The invention concerns aerosol generation devices comprising an electrical and control device and a cartomizer mechanically and electrically coupled to this electrical and control device.

[0003] A cartomizer is generally a consumable formed as an exchangeable assembly of a cartridge containing aerosol-forming precursor and an atomizing (or heating) device.

[0004] Generally the electrical and control device comprises at least:

- a power source, possibly a rechargeable battery, storing electrical energy,
- a controller (or control device) electrically coupled to the power source and controlling operation of the cartomizer at least during a vaping session (and possibly during a charging session), and
- optionally, a user interface coupled to this controller and allowing a user to control the controller (and therefore the cartomizer), at least to switch on the device.

[0005] Sometimes the user interface comprises also a display, such as a screen or light emitting diode (or LED)-type interface, for displaying information relative to a vaping session or a possible charging session e.g. when the power source is a rechargeable battery. For instance, the displayed information may be the current status of the session. The cartomizer comprises at least a first housing comprising :

- at least one reservoir storing an aerosol-forming precursor, and
- a heating chamber configured, when it is fed with air and aerosol-forming precursor, for heating the latter to generate an aerosol, and fluidly coupled to a mouthpiece by an aerosol passage.

[0006] When the user sucks on the mouthpiece during a vaping session, the aerosol generated in the heating chamber flows into the aerosol passage and reaches the mouthpiece, which allows the user to inhale the aerosol.

[0007] The heating of the aerosol-forming precursor is carried out by conduction, convection and/or radiation by a heating device at least partially housed in the cartomizer, possibly inside the heating chamber. Such a heating device comprises one or more electrically activated resistive or inductive heating elements.

[0008] The aerosol generation device may be portable, i.e. usable when held by a user. Moreover the aerosol generation device may be adapted to generate a variable amount of aerosol, e.g. by activating the heating device partially or totally possibly for a variable amount of time (as opposed to a metered dose of aerosol). In this case the variable amount of aerosol can be controlled by the controller and an inhalation sensor and possibly by user's input(s) on the user interface. The inhalation sensor may be sensitive to the strength of inhalation as well as the duration of inhalation to enable a variable amount of vapor to be provided (so as to mimic the effect of smoking a conventional combustible smoking article such as a cigarette, cigar or pipe). Generally, the inhalation sensor is a flow or pressure sensor or microphone positioned in the air flow path in the aerosol generation device. The aerosol generation device may also include a temperature regulation control to drive the temperature of the heating device and/or the heated aerosol-forming precursor to a specified target temperature and thereafter to maintain the temperature at the target temperature that enables an efficient generation of aerosol.

[0009] In the following description the term "aerosol" may include a suspension of precursor as one or more of solid particles, liquid droplets and gas. Such a suspension may be in a gas including air. Aerosol herein may generally refer to, or include, a vapor, and may include one or more components of the precursor.

[0010] Also in the following description the term "aerosol-forming precursor" (or "precursor", or "aerosol-forming substance", or else "substance") may refer to a fluid. The precursor may be processable by the heating device of the cartomizer to form an aerosol, and may comprise components such as one or more nicotinoids, one or more cannabinoids, or caffeine. A component may be carried by a carrier, which may be an aerosolisable liquid comprising aerosol former such as propylene glycol, glycerol for instance, water and oil such as terpene. A flavoring may also be present in the aerosol-forming precursor. The flavoring may include Ethylvanillin (vanilla), menthol, Isoamyl acetate (banana oil) or similar, for instance.

[0011] In most existing systems, the reservoir of the cartomizer is in permanent fluid communication with the heating chamber like via a capillary transport element (or wick). Therefore, when the aerosol generation device is not used, aerosol-forming precursor may drip into the heating chamber and then may leak out of the cartomizer at both ends (mouth end and air inlet end). This may be considered as a design defect and/or a manufacturing defect by the user, which may compel this user to change the cartomizer for security, or even to buy cartomizers of another brand. Solutions such as seals exist for closing both ends of the cartomizer. However such solutions do not address the problem when the cartomizer is in place in the aerosol generation device.

[0012] In the patent document US 10,188,147 B2 it has

been proposed to rotate an atomization (or vaporization) base (comprising openings) with respect to an atomization (or vaporization) sleeve (housed fixedly into the reservoir and comprising aerosol-forming precursor guide holes) to align these guide holes and openings to allow the aerosol-forming precursor to reach the heating (or atomization) chamber defined into the atomization sleeve. But such an alignment, critical for a correct generation of aerosol, is not guaranteed. Moreover, after a use of the aerosol generation device, if the user wants to prevent the aerosol-forming precursor from reaching the heating chamber, he must rotate manually the atomization base with respect to the atomization sleeve in order to align an invisible matching hole (defined into the atomization base) with a corresponding visible hole (defined in the atomization sleeve), and then must insert manually a positioning (or locking) pin into the aligned invisible matching hole and visible hole to lock the rotation. Moreover, the positioning (or locking) pin is a very small piece that is very easy to lose and hard to find in a pocket or a bag. Still more, only decoupling the cartomizer from the electrical and control device cannot prevent the aerosol-forming precursor from reaching the heating chamber. Therefore, the user must rotate the atomization base with respect to the atomization sleeve to align the invisible matching hole and the visible hole and then must insert the positioning pin for locking the rotation, which is not an easy task.

Summary of the invention

[0013] The proposed invention provides notably an embodiment of a cartomizer intended for equipping an aerosol generation device and comprising a first housing comprising :

- at least one reservoir storing an aerosol-forming precursor, and
- a heating chamber configured, when it is fed with air and aerosol-forming precursor, for heating the latter to generate an aerosol, and fluidly coupled to a mouthpiece by an aerosol passage.

[0014] This cartomizer is characterized in that the heating chamber and the reservoir are rotatable relative to each other between a closed position in which the aerosol-forming precursor is prevented from leaving the reservoir and an open position in which the aerosol-forming precursor can leave the reservoir to reach the heating chamber.

[0015] So, a single relative rotation between the heating chamber and the reservoir is now sufficient to guarantee the correct transition between the closed and open positions (or states).

[0016] Preferably, the reservoir or the heating chamber comprises a fastening member configured for fastening the cartomizer to the aerosol generation device and for rotating the heating chamber and the reservoir relative to each other to the open position.

[0017] The embodiment of cartomizer may comprise other aspects or features, considered separately or combined, as defined hereafter.

- The cartomizer may comprise a first sleeve defining the heating chamber and rotatably arranged relative to the reservoir between the closed and open positions.
- The first sleeve, or respectively the reservoir, may have at least one first fastening member configured to cooperate with a corresponding and complementary second fastening member of an electrical and control device of the aerosol generation device for connecting mechanically the first sleeve, or respectively the reservoir, to the electrical and control device to allow the first sleeve, or respectively the reservoir, to rotate relative to the reservoir, or respectively the first sleeve, between the closed and open positions.
- In one example of the embodiment, each first fastening member may be a bayonet mount recess arranged for receiving and holding a part of a bayonet mount leg defined by the corresponding second fastening member. In a variant, each first fastening member may be a bayonet mount leg arranged for being engaged into, and held by, a bayonet mount recess defined by a corresponding second fastening member.
- The reservoir may comprise at least one first opening and the first sleeve may comprise at least one second opening which matches with a corresponding first opening in the open position and is offset relative to the corresponding first opening in the closed position.
- The first sleeve may be sealed with respect to the reservoir in the vicinity of the aerosol passage to prevent the aerosol-forming precursor stored in the reservoir to reach the aerosol passage in the closed and open positions.
- The (one) reservoir may have an annular shape and a central passage defining the aerosol passage and communicating with a recess housing a part of the first sleeve.
- The heating chamber may comprise an electrical heating device arranged for heating the aerosol-forming precursor to generate the aerosol when it receives electrical energy originating from a power source of an electrical and control device of the aerosol generation device.
- The heating chamber may comprise an aerosol-forming precursor transport element, such as a capillary wick, to transport aerosol-forming precursor from the second opening(s) of the first sleeve to the heating device.
- The heating device may be a resistive heater, such as resistive coil, and/or an inductive heater, such as a metallic susceptor.

- The first housing may comprise a first threaded portion arranged for being screwed relatively to a corresponding second threaded portion of an electrical and control device of the aerosol generation device, until reaching a final position in which the cartomizer is in the open position.
- The first housing may comprise an end receiving the aerosol from the aerosol passage and to which the mouthpiece is fixed.

[0018] The proposed invention provides also an embodiment of an aerosol generation device comprising an electrical and control device and a cartomizer such as the one above introduced and mechanically and electrically coupled to this electrical and control device.

[0019] The embodiment of aerosol generation device may comprise other features, considered separately or combined, as defined hereafter.

- The electrical and control device may comprise a power source storing electrical energy, a controller electrically coupled to this power source and controlling operation of the cartomizer during a vaping session, and a user interface.

- The power source may be a rechargeable battery.

- The aerosol generation device may constitute an electronic cigarette (or e-cigarette).

Brief description of the figures

[0020] The invention and its advantages will be better understood upon reading the following detailed description, which is given solely by way of non-limiting examples and which is made with reference to the appended drawings, in which :

- Figure 1 (FIG.1) schematically illustrates an example of embodiment of a cartomizer according to the invention intended to fit in an aerosol generation device according to the invention, and set in a closed position,
- Figure 2 (FIG.2) schematically illustrates an example of embodiment of an electrical and control device intended to be coupled to the cartomizer of figure 1 to define together an aerosol generation device according to the invention,
- Figure 3 (FIG.3) schematically illustrates the cartomizer of figure 1 set in an open position,
- Figure 4 (FIG.4) schematically illustrates an example of embodiment of a first sleeve of a cartomizer according to the invention,
- Figure 5 (FIG.5) schematically illustrates an example of embodiment of a reservoir of a cartomizer according to the invention, adapted to the first sleeve illustrated in figure 4, and
- Figure 6 (FIG.6) schematically illustrates an example of embodiment of a variant of heating device.

Detailed description of embodiments

[0021] The invention aims, notably, at offering a cartomizer 1 with leakage prevention, intended for equipping an aerosol generation device 2 also comprising an electrical and control device 3. More precisely, this cartomizer 1 is intended for being mechanically and electrically coupled to this electrical and control device 3.

[0022] In the following description it will be considered that the aerosol generation device 2 is an electronic cigarette (or e-cigarette or else personal vaporizer). But an aerosol generation device according to the invention could be of another type, as soon as it comprises a cartomizer according to the invention and allows the generation of an aerosol by heating an aerosol-forming precursor. So, for instance, the aerosol generation device 2 could be an inhaler.

[0023] It is recalled that an "aerosol-forming precursor" (or "aerosol-forming substance") may be a fluid (for instance a liquid), and may comprise one or more components such as nicotinoid(s), cannabinoid(s), or caffeine, and/or a flavoring.

[0024] It is also recalled that the term "aerosol" may include a suspension of precursor as one or more of solid (very small) particles, liquid droplets, vapor and gas, and that such a suspension may be in a gas including air.

[0025] As illustrated in figures 1 and 3 a cartomizer 1, according to the invention and intended for equipping an aerosol generation device 1, comprises a first housing 4 comprising at least one reservoir 5 and a heating chamber 7.

[0026] The (each) reservoir 5 is arranged for storing an aerosol-forming precursor. In the non-limiting example of figures 1 and 3 the first housing 4 houses only one reservoir 5. But it could house several (for instance two, three or four) reservoirs storing identical or different aerosol-forming precursors. It could be possible to have two different aerosol-forming precursors to either have them react with each other (for instance one with nicotine salts and the other one with an acid source (e.g. a benzoic acid)) or to allow the user to choose between different flavours (first flavour, second flavor, or a mixture of both (possibly the user being able to determine the amount of each of them)).

[0027] The heating chamber 7 is configured, when it is fed with air and aerosol-forming precursor, for heating the latter to generate an aerosol. This heating chamber 7 is fluidly coupled to a mouthpiece 8 by an aerosol passage 9.

[0028] For instance, and as illustrated in the non-limiting example of figures 1, 3 and 4, the cartomizer 1 may comprise a first sleeve 6 defining the heating chamber 7. Also for instance, and as illustrated in the non-limiting example of figure 4, the first sleeve 6 may have an annular shape.

[0029] The mouthpiece 8 is the piece of the cartomizer

1 through which the user inhales the aerosol generated in the heating chamber 7 and flowing into the aerosol passage 9 during a vaping session (as illustrated by the arrows A in figure 3). In the non-limiting example illustrated in figures 1 and 3 the first housing 4 comprises an end 10 which receives the aerosol from the aerosol passage 9 and to which the mouthpiece 8 is fixed, for instance by screwing or clipping.

[0030] In the illustrated example the heating chamber 7 comprises an electrical heating device 36 arranged for heating the aerosol-forming precursor to generate the aerosol (originating from a (the) reservoir 5), when it receives electrical energy originating from a power source 23 of the electrical and control device 3. This heating device 36 may be a resistive heater, such as resistive coil, and/or an inductive heater, such as a metallic susceptor. In this case, the heating device 36 may comprise one or more electrically activated resistive and/or inductive heating elements. But in a variant not illustrated the heating device 36 could be at least partially housed into the cartomizer 1 and therefore partly outside the heating chamber 7. The heating can be made by conduction, convection and/or radiation.

[0031] The heating chamber 7 is fed with air (sucked in by the user) through at least one first air inlet 11 defined in a wall of the first sleeve 6 (as illustrated by the two small arrows B in figure 3). This air comes from outside through at least one second air inlet 12 which is defined in the first housing 4 (as illustrated by the arrow C in figure 3). But, each second air inlet 12 could be defined in a wall of the second housing 13 of the electrical and control device 3.

[0032] The heating chamber 7 and the (each) reservoir 5 are rotatable relative to each other between a closed position and an open position. In the closed position, illustrated in figure 1, the aerosol-forming precursor is prevented from leaving the reservoir 5. In the open position, illustrated in figure 3, the aerosol-forming precursor can leave the reservoir 5 to reach the heating chamber 7 (see the four arrows D).

[0033] So, now a single relative rotation between the first sleeve 6 and the reservoir 5 ensures the correct transition between the closed and open positions (or states). In the case where the heating chamber 7 is defined in the first sleeve 6, the latter may be rotatably arranged relative to the reservoir 5 between the closed and open positions. So, a rotation of the first sleeve 6 relative to the reservoir 5 may induce the correct transition from the closed position to the open position or inversely the correct transition from the open position to the closed position, or a rotation of the reservoir 5 relative to the first sleeve 6 may induce the correct transition from the closed position to the open position or inversely the correct transition from the open position to the closed position.

[0034] The cartomizer 1 may be in the closed position (or state) when it is still under packaging or not coupled to the electrical and control device 3), for instance. In this closed position the aerosol-forming precursor cannot reach the heating chamber 7 and therefore cannot leak outside the cartomizer 1 (through the first air inlet 11).

[0035] The cartomizer 1 may be in the open position (or state) when it is coupled to the electrical and control device 3, for instance. In this open position the aerosol-forming precursor can reach the heating chamber 7 and therefore may be heated during a vaping session.

[0036] Preferably the reservoir 5 or the heating chamber 7 may comprise a fastening member configured for fastening the cartomizer 1 to the aerosol generation device 2 and for rotating the heating chamber 7 and the reservoir 5 relative to each other to the open position.

[0037] For instance, and as illustrated in the non-limiting example of figures 1 and 3, it is a matching or an offset (or mismatch) between corresponding openings 14 and 15, defined respectively in the reservoir 5 and first sleeve 6, that makes the difference between the open and closed positions. More precisely, the reservoir 5 may comprise at least one first opening 14 and the first sleeve 6 may comprise at least one second opening 15 which matches with a corresponding first opening 14 in the open position and is offset relative to the corresponding first opening 14 in the closed position. In other words when the cartomizer 1 is in the open position, the first opening(s) 14 is (are) facing the corresponding second opening(s) 15 (see figure 3), which allows the aerosol-forming precursor to reach the heating chamber 7, and when the cartomizer 1 is in the closed position, the first opening(s) 14 is (are) not facing the corresponding second opening(s) 15 (even partially) which prevents the aerosol-forming precursor to reach the heating chamber 7 (see figure 1).

[0038] In the non-limiting example illustrated in figures 1 and 3 to 5, the reservoir 5 comprises two first sets of first openings 14 diametrically opposed, and the first sleeve 6 comprises two second sets of second openings 15 (here nine) diametrically opposed. Each first set is intended to cooperate with a corresponding second set in the open position.

[0039] Preferably, and as illustrated in the non-limiting example of figures 1 and 3, the first sleeve 6 is sealed with respect to the reservoir 5 in the vicinity of the aerosol passage 9 to prevent the aerosol-forming precursor, stored in the reservoir 5, to reach the aerosol passage 9 in the closed and open positions. To this effect, the first sleeve 6 comprises a seal 16 which is in contact with the reservoir 5 in the vicinity of the aerosol passage 9 to prevent the aerosol-forming precursor to flow between the reservoir 5 and the first sleeve 6. In the non-limiting example the term "in the vicinity" means around the space located between the outlet of the heating chamber 7 and the inlet of the aerosol passage 9. It is also preferable to have another seal between the first housing 4 of the cartomizer 1 and the second housing 13 of the electrical and control device 3 and/or between the first housing 4 and the first sleeve 6 at the interface side to avoid precursor leaking to the electronics and contacts.

[0040] In the non-limiting example illustrated in figures

1 and 3, the seal 16 is mounted on a first end 17 of the first sleeve 6 which is opposite to its second end 18 oriented towards the electrical and control device 3. For instance, and as illustrated, the first end 17 of the first sleeve 6 may comprise a seat whose thickness is smaller than the thickness of the remaining part of the first sleeve 6 to allow housing of a part of the seal 16.

[0041] The transition from the closed position to the open position or inversely the transition from the open position to the closed position can be performed manually by the user (with a simple relative rotation between the first sleeve 6 and the reservoir 5) when the cartomizer 1 is not coupled to the electrical and control device 3. But these transitions are preferably performed automatically during the coupling of the cartomizer 1 to the electrical and control device 3 by the user or inversely during the decoupling of the cartomizer 1 from the electrical and control device 3 by the user.

[0042] To allow such automatic transitions, the first sleeve 6 may have at least one first fastening member 19 configured to cooperate with a corresponding and complementary second fastening member 20 of the electrical and control device 3, as illustrated in the non-limiting example of figures 1 to 3. The (each) first fastening member 19 is configured to cooperate with a corresponding and complementary second fastening member 20 for connecting mechanically the first sleeve 6 to the electrical and control device 3 (and more precisely to the second housing 13 of the latter (3)), to allow the first sleeve 6 to rotate relative to the reservoir 5 between the closed and open positions.

[0043] In a variant, the reservoir 5 may have at least one first fastening member configured to cooperate with a corresponding and complementary second fastening member of the electrical and control device 3. The (each) first fastening member is configured to cooperate with a corresponding and complementary second fastening member for connecting mechanically the reservoir 5 to the electrical and control device 3 (and more precisely to the second housing 13 of the latter (3)), to allow the reservoir 5 to rotate relative to the first sleeve 6 between the closed and open positions.

[0044] Before the beginning of the coupling the cartomizer 1 is in its closed position, and during the coupling the corresponding first 19 and second 20 fastening members interconnect therebetween. So, the continuation of the coupling operation induces a rotation of the first sleeve 6 relative to the reservoir 5 till its position relative to the first sleeve 6 reaches a final relative position defining the open position of the cartomizer 1. In the illustrated non-limiting example several first openings 14 are in front of (or match) corresponding second openings 15 when the first sleeve 6 is in its final relative position (see figure 3).

[0045] During the decoupling of the cartomizer 1 from the electrical and control device 3 the first sleeve 6 rotates relative to the reservoir 5 from its final relative position to an initial relative position defining the closed position of the cartomizer 1 and allowing the disconnection of the first 19 and second 20 fastening members. Then the decoupling goes on till the cartomizer 1 becomes fully separated from the electrical and control device 3. When the first sleeve 6 returns to its initial relative position, the cartomizer 1 returns to its closed position (in which the aerosol-forming precursor cannot reach the heating chamber 7 and therefore cannot leak outside the cartomizer 1 (through the first air inlet 11)).

[0046] Preferably the number of first fastening members 19 and the number of second fastening members 20 are at least equal to two. For instance, they may be equal to three as illustrated in figure 4.

[0047] Also for instance, and as illustrated in the non-limiting example of figures 1 to 4, each first fastening member 19 may be a bayonet mount recess arranged for receiving and holding a part of a bayonet mount leg defined by the corresponding second fastening member 20.

[0048] In a variant, not illustrated, each first fastening member 19 may be a bayonet mount leg arranged for being engaged into, and held by, a bayonet mount recess defined by the corresponding second fastening member 20.

[0049] In the non-limiting example illustrated in figure 2, the second fastening members 20 protrude from an external face of a (preferably hollow) second sleeve 26 which is housed into the second housing 13 of the electrical and control device 3. Here the second sleeve 26 is integral with the second housing 13, but it could be an insert.

[0050] Also for instance, and as illustrated in the non-limiting example of figures 1, 3 and 5, the reservoir 5 may have an annular shape and a central passage defining the aerosol passage 9 and communicating with a recess 22 housing a part of the first sleeve 6. In the case where the shape of the first sleeve 6 is also annular, the recess 22 has also an annular shape which is well adapted to the rotation of the first sleeve 6 relative to the reservoir 5.

[0051] For instance, and as illustrated in the non-limiting example of figures 1 to 3, the coupling between the cartomizer 1 and the electrical and control device 3 can be done by screwing by means of two corresponding threaded portions 24 and 25. In this case, the first housing 4 may comprise a first threaded portion 24 arranged for being screwed relatively to a corresponding second threaded portion 25 of the electrical and control device 3, until reaching a final position in which the cartomizer 1 is in the open position (and then the first sleeve 6 in its final relative position). As known by a skilled person, the bayonet mount is compatible with this screwing when the pitch, the number of threads and the number of turns of the threaded connection are judiciously computed.

[0052] In the non-limiting example illustrated in figure 2, the second threaded portion 25 is defined in the free end of the second housing 13 of the electrical and control device 3.

[0053] As illustrated in figure 2 the second housing 13

may comprise at least a controller (or control device) 27 and a user interface 28 in addition to the power source 23 (storing electrical energy).

[0054] For instance, the power source 23 may be a rechargeable battery. In this case the second housing 13 may comprise an electrical connector to which a charger cable may be connected during a charging session of the rechargeable battery 23. Such a charger cable may be coupled to an (AC) adapter or to a wall socket. The charger cable and/or the (AC) adapter may belong to the aerosol generation device 2.

[0055] The controller 27 is electrically coupled to the power source 23 and controls operation of the cartomizer 1 (and notably its heating device 36) during a vaping session and also during a possible charging session. For instance, and as illustrated in the non-limiting example of figure 2, the controller 27 may be fixed onto a printed circuit board 29 (housed in the second housing 13).

[0056] Explicit use of the term "controller" should not be construed to refer exclusively to hardware capable of executing software, and may implicitly include, without limitation, digital signal processor (DSP) hardware, processor, application specific integrated circuit (ASIC), field programmable gate array (FPGA), read only memory (ROM) for storing software, random access memory (RAM), and non volatile storage. Other hardware, conventional and/or custom, may also be included. The functions of the controller 27 may be carried out through the operation of program logic, through dedicated logic, through the interaction of program control and dedicated logic, or even manually (by the user). These functions may be provided through the use of dedicated hardware as well as hardware capable of executing software in association with appropriate software.

[0057] The user interface 28 is coupled to the controller 27 and the power source 23 and allows the user to control at least partly the controller 27. For instance, the user interface 28 may comprise a display (such as a screen or light emitting diode (or LED)-type interface) arranged for displaying information relative to a current vaping session or a possible current charging session and for allowing the user to control the controller 27. Also for instance, the displayed information may be a current status representing the current percentage of remaining (or elapsed) vaping time (with respect to a programmed (or chosen) vaping duration) during a vaping session, or the current percentage of charge (with respect to the full charge) of the power source 23 during a possible charging session. The current percentage may be represented by the length of a straight line or by a number of parallel bars or else by a value, for instance.

[0058] Also for instance, and as illustrated in the non-limiting example of figure 2, the user interface 28 may be fixed partly to the printed circuit board 29 to ease and simplify its connections with the controller 27. The user interface 28 may have its own printed circuit board connected to the printed circuit board 29 by wires of flexible circuit(s) in order to be deported anywhere.

[0059] Also for instance, and as illustrated in the non-limiting example of figures 1 to 3, the cartomizer 1 and the electrical and control device 3 may comprise respectively first 30 and second 31 electrical pins intended for contacting each other during their coupling to allow the feeding of the first sleeve 6 with electrical energy during a vaping session.

[0060] In the non-limiting example illustrated in figures 1 to 3, the first electrical pin 30 is mounted on a first internal wall 32 closing the heating chamber 7 and in which the first air inlet(s) 11 is (are) defined, and the second electrical pin 31 is mounted on a second internal wall 33 housed into the second sleeve 26. So, it is the rotation of the first sleeve 6 relative to the reservoir 5 that induces the contact (or the end of the contact) between the first 30 and second 31 electrical pins. But other arrangements are possible.

[0061] Also for instance, and as illustrated in the non-limiting example of figure 2, the electrical and control device 3 may comprise a puff sensor 34 intended for detecting when the user sucks in (or inhales) during a vaping session, and for informing the controller 27 each time such a detection occurs.

[0062] Also for instance, and as illustrated in the non-limiting example of figures 1 and 3, the heating chamber 7 may comprise an aerosol-forming precursor transport element 35 to transport aerosol-forming precursor from the second openings 15 of the first sleeve 6 to the heating device 36. For instance, this aerosol-forming precursor transport element 35 may be a capillary element (possibly a capillary wick) having two opposite ends set in front of the second openings 15, and preferably against the latter (and therefore against the internal surface of the first sleeve 6). This capillary element 35 can be a fiber or ceramic rod, for instance. For instance, the heating device 36 may comprise a resistive coil wound around the capillary element 35 and connected to the first electrode 30 via lead wires 37. Also for instance, the capillary element 35 can be supported by support elements 38 positioned on two opposite internal surfaces of the first sleeve 6. Eventually these support elements 38 may also have a sealing function to seal the ends of the capillary element 35 against opposite internal surfaces of the first sleeve 6 where the second openings 15 are defined so that aerosol-forming precursor cannot leak in the heating chamber 7. To this effect the support elements 38 may have an annular shape and may be made of resilient material such as a silicone rubber, for instance.

[0063] In a first variant (not illustrated) the aerosol-forming precursor transport element 35 may be supported in lateral slots of a support member that is fixed to the internal wall 32 (or even replaced the latter (32)) to remain always fixed with respect to the reservoir 5 to allow the ends of the aerosol-forming precursor transport element 35 to always face the first openings 14 of the reservoir 5.

[0064] In a second variant, illustrated in figure 6, the heating device 36 may comprise a disk 40 of porous ceramic that fills up at least partly (and preferably most of)

the heating chamber 7 and which comprises resistive heater tracks or susceptor elements 41 to heat the aerosol-forming precursor to volatilise it. The tracks 41 may be inside the ceramic disk and/or on top of one or more surfaces of the disk 40, as illustrated. In the illustrated example tracks 41 are defined on the top surface 42 of the disk 40 which is close to the outlet of the heating chamber 7.

[0065] It should be appreciated by those skilled in the art that some block diagrams of figures 1 to 3 herein represent conceptual views of illustrative circuitry embodying the principles of the invention.

[0066] The description and drawings merely illustrate the principles of the invention. It will thus be appreciated that those skilled in the art will be able to devise various arrangements that, although not explicitly described or shown herein, embody the principles of the invention and are included within its spirit and scope. Furthermore, all examples recited herein are principally intended expressly to be only for pedagogical purposes to aid the reader in understanding the principles of the invention and the concepts contributed by the inventor(s) to furthering the art, and are to be construed as being without limitation to such specifically recited examples and conditions. Moreover, all statements herein reciting principles, aspects, and embodiments of the invention, as well as specific examples thereof, are intended to encompass equivalents thereof.

Claims

1. Cartomizer (1) for an aerosol generation device (2), said cartomizer (1) comprising a first housing (4) comprising :

   - at least one reservoir (5) storing an aerosol-forming precursor, and
   - a heating chamber (7) configured, when it is fed with air and aerosol-forming precursor, for heating the latter to generate an aerosol, and fluidly coupled to a mouthpiece (8) by an aerosol passage (9),

   wherein said heating chamber (7) and said reservoir (5) are rotatable relative to each other between a closed position in which said aerosol-forming precursor is prevented from leaving said reservoir (5) and an open position in which said aerosol-forming precursor can leave said reservoir (5) to reach said heating chamber (7).

2. Cartomizer according to claim 1, wherein said reservoir (5) or said heating chamber (7) comprises a fastening member configured for fastening said cartomizer (1) to said aerosol generation device (2) and for rotating said heating chamber (7) and said reservoir (5) relative to each other to the open position.

3. Cartomizer according to claim 1 or 2, wherein it comprises a first sleeve (6) defining said heating chamber (7) and rotatably arranged relative to said reservoir (5) between said closed and open positions.

4. Cartomizer according to claim 3, wherein said first sleeve (6), or respectively said reservoir (5), has at least one first fastening member (19) configured to cooperate with a corresponding and complementary second fastening member (20) of an electrical and control device (3) of said aerosol generation device (2) for connecting mechanically said first sleeve (6), or respectively said reservoir (5), to said electrical and control device (3) to allow said first sleeve (6), or respectively said reservoir (5), to rotate relative to said reservoir (5), or respectively said first sleeve (6), between said closed and open positions.

5. Cartomizer according to claim 4, wherein each first fastening member (19) is a bayonet mount recess arranged for receiving and holding a part of a bayonet mount leg defined by said corresponding second fastening member (20).

6. Cartomizer according to claim 4, wherein each first fastening member (19) is a bayonet mount leg arranged for being engaged into, and held by, a bayonet mount recess defined by said corresponding second fastening member (20).

7. Cartomizer according to any one of claims 3 to 6, wherein said reservoir (5) comprises at least one first opening (14) and said first sleeve (6) comprises at least one second opening (15) which matches with a corresponding first opening (14) in said open position and is offset relative to said corresponding first opening (14) in said closed position.

8. Cartomizer according to any one of claims 3 to 7, wherein said first sleeve (6) is sealed with respect to said reservoir (5) in the vicinity of said aerosol passage (9) to prevent said aerosol-forming precursor stored in said reservoir (5) to reach said aerosol passage (9) in said closed and open positions.

9. Cartomizer according to any one of claims 2 to 8, wherein said reservoir (5) has an annular shape and a central passage defining said aerosol passage (9) and communicating with a recess (22) housing a part of said first sleeve (6).

10. Cartomizer according to any one of the preceding claims, wherein said heating chamber (7) comprises an electrical heating device (36) arranged for heating said aerosol-forming precursor to generate said aerosol when it receives electrical energy originating from a power source (23) of an electrical and control device (3) of said aerosol generation device (2).

11. Cartomizer according to the combination of claims 7 and 10, wherein said heating chamber (7) comprises an aerosol-forming precursor transport element (35) to transport aerosol-forming precursor from said second opening (15) of said first sleeve (6) to said heating device (36).

12. Cartomizer according to claim 10 or 11, wherein said heating device (36) is a resistive heater and/or an inductive heater.

13. Cartomizer according to any one of the preceding claims, wherein said first housing (4) comprises a first threaded portion (24) arranged for being screwed relatively to a corresponding second threaded portion (25) of an electrical and control device (3) of said aerosol generation device (2), until reaching a final position in which said cartomizer (1) is in said open position.

14. Aerosol generation device (2) comprising an electrical and control device (3), wherein it further comprises a cartomizer (1) according to any one of the preceding claims, mechanically and electrically coupled to said electrical and control device (3).

15. Aerosol generation device according to claim 14, wherein said electrical and control device (3) comprises a power source (23) storing electrical energy, a controller (27) electrically coupled to said power source (23) and controlling operation of said cartomizer (1) during a vaping session, and a user interface (28).

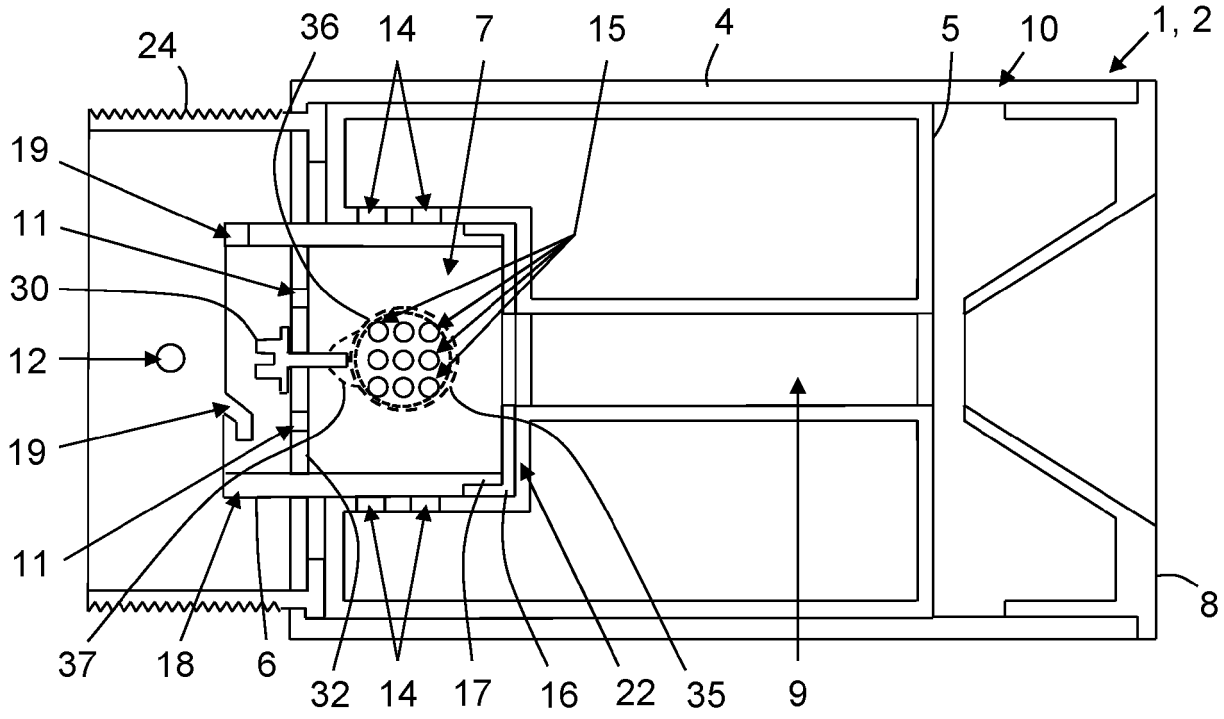
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FIG.1

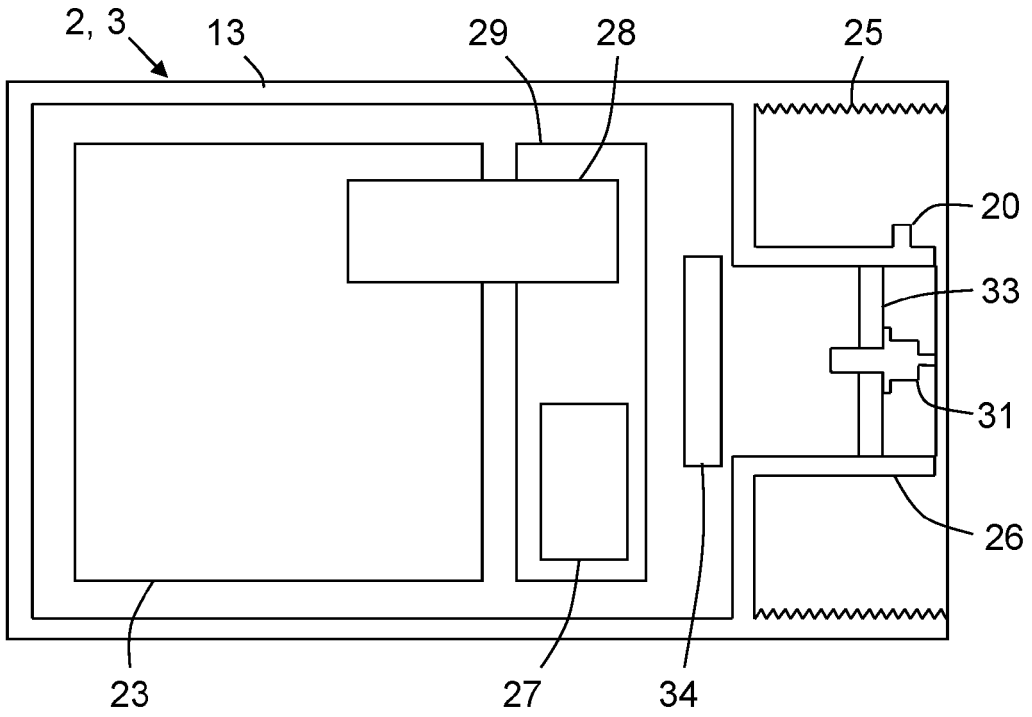
2, 3
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FIG.2

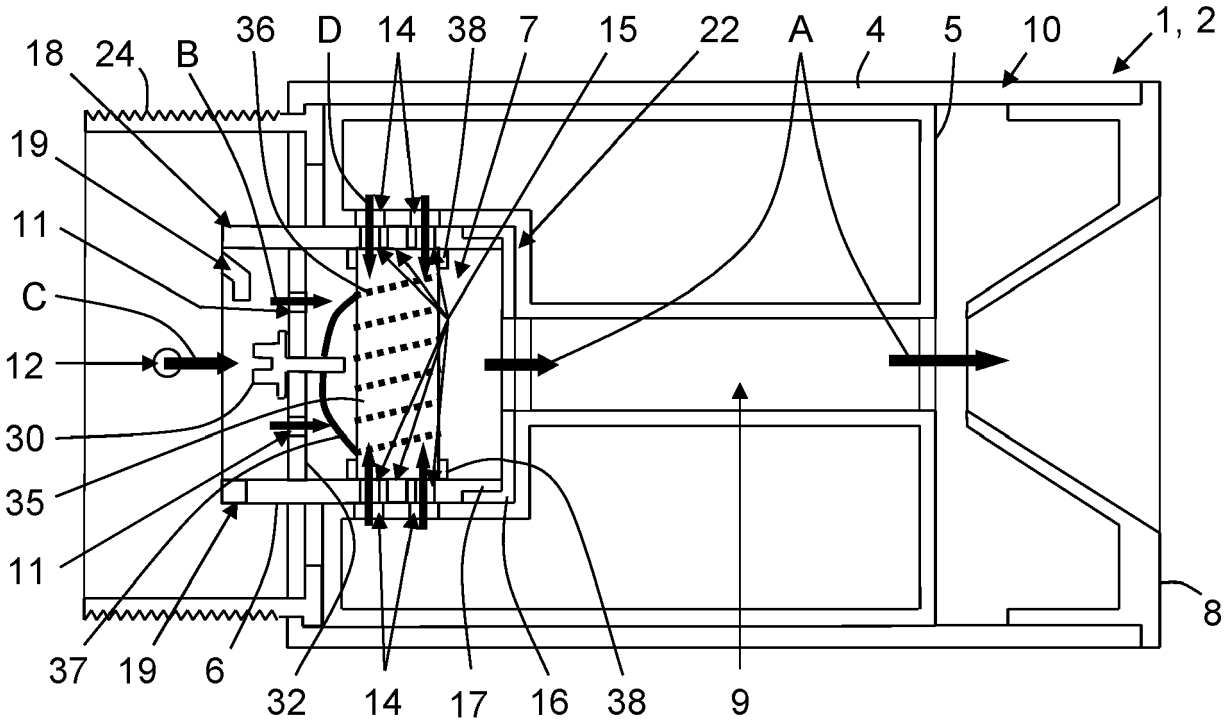

FIG.3

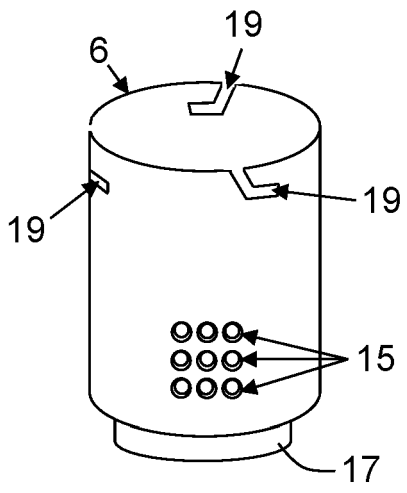

FIG.4

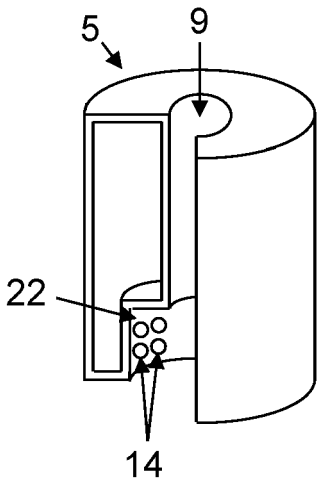

FIG.5

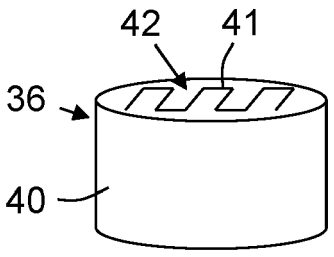

FIG.6

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EUROPEAN SEARCH REPORT

Application Number
EP 20 20 4144

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 April 2021	Trattner, Barbara

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