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(71) Applicant: PHILIP MORRIS PRODUCTS S.A.
[CH/CH]; Quai Jeanrenaud 3, 2000 Neuchâtel (CH).

(72) Inventors: CALLI, Ricardo; Julius-Hatry-Strasse 1, 68163 Mannheim (DE). RAJAN, Toney; Julius-Hatry-Strasse 1, 68163 Mannheim (DE).

(74) Agent: MAIWALD PATENTANWALTS- UND RECHTSANWALTSGESELLSCHAFT MBH; Postfach 33 05 23, 80065 München (DE).

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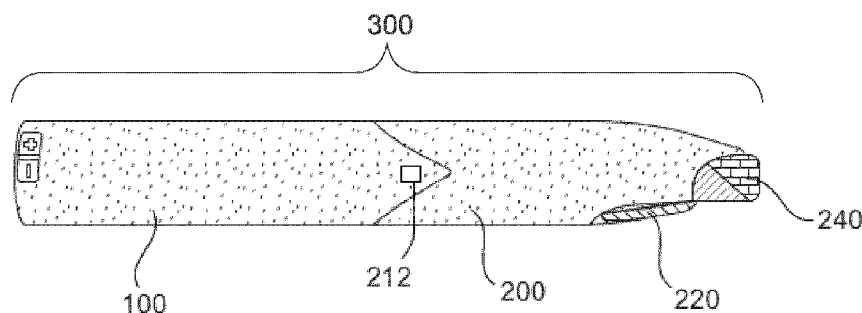


Fig. 1a

(57) Abstract: An aerosol generating device, comprising: a cartridge comprising a mouthpiece, wherein the mouthpiece is comprising a first electrode to provide a first electrical contact to a user and a second electrode to provide a second electrical contact to a user; wherein the first electrode and the second electrode are positioned at different locations to provide different contact areas for the user; a power source configured to provide an electrical potential between the first electrode and the second electrode of the mouthpiece; a control unit configured to control the electrical potential between the first electrode and the second electrode of the mouthpiece; and an authorization unit configured to determine whether a user is authorized to use the aerosol generating device and configured to release a use of the aerosol generating device in case a user is authorized to use the aerosol generating device and to set a predefined electrical potential between the first electrode and the second electrode of the mouthpiece corresponding to an artificial taste of unpleasant nature in case a user is not authorized to use the aerosol generating device.



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AEROSOL GENERATING DEVICE WITH AUTHORIZATION UNIT

The present disclosure relates to an aerosol generating device, a cartridge comprising a mouthpiece for such an aerosol generating device, a use of such a cartridge, a use of a consumable in such an aerosol generating device and a method for an electrical stimulation of taste buds of a user.

Electrically heated smoking systems or aerosol generating devices are generally known in the prior art and they do have a number of advantages over conventional cigarettes and cigars. However, a general concern is to ensure that no unauthorized use is made of such an aerosol generating device.

In view of this, it is found that a further need exists to provide an improved aerosol generating device, in particular an aerosol generating device that is protected against unauthorized use.

It is therefore an object of the present invention to provide an improved aerosol generating device, in particular an improved aerosol generating device that is protected against unauthorized use.

These and other objects, which become apparent upon reading the following description, are solved by the subject matter of the independent claims. The dependent claims refer to preferred embodiments of the present disclosure.

According to a first aspect, an aerosol generating device is provided, comprising: a cartridge comprising a mouthpiece, wherein the mouthpiece comprises a first electrode to provide a first electrical contact to a user and a second electrode to provide a second electrical contact to a user; a power source configured to provide an electrical potential between the first electrode and the second electrode of the mouthpiece, a control unit configured to control the electrical potential between the first electrode and the second electrode of the mouthpiece; and an authorization unit configured to determine whether a user is authorized to use the aerosol generating device and configured to release a use of the aerosol generating device in case a user is authorized to use the aerosol generating device or to set a predefined electrical potential between the first electrode and the second electrode of the mouthpiece in case a user is not authorized to use the aerosol generating device.

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A mouthpiece for an aerosol generating device may provide means to electrically stimulate the taste during consumption. It has a mouthpiece with two electrodes that can have a connection to a mouth of the user and can thereby stimulate the taste buds of the tongue via electrical signals. In other words, electrical impulses may be used to provide electrical taste stimulation on the tongue. As a result, the mouthpiece for an aerosol generating device may allow a better performance in terms of taste sensation and overall sensorial performance. The stimulation via the electric potential may cause the user to experience a taste of saltiness, bitterness and/or sour to improve the flavor experience. The combination of taste and aroma perception may provide flavor resembling the flavor of conventional cigarettes and cigars. This may ease a change of a user from conventional cigarettes and cigars to aerosol generating devices.

The mouthpiece can be understood as a preferably replaceable mouthpiece for an aerosol generating device. The mouthpiece may comprise a reservoir configured for containing a liquid, namely an e-liquid. The mouthpiece may further comprise an aerosol generator as a heater configured for heating the reservoir and/or the liquid to form aerosol. The mouthpiece may be connected or reversibly connectable to a power source (e.g. a battery pack), wherein the power source provides power to the aerosol generator. In an example, the power source may be additionally configured to provide energy to the aerosol generator. This means the power source may be the only power source of the aerosol generating device and it can be used to provide an electrical potential between the first electrode and the second electrode as well as to provide energy for heating the e-liquid to generate the aerosol. This makes the aerosol generating device very efficient and/or allows reducing the number of components. Of course, there can be also two different power sources for heating the e-liquid and for providing the electrical potential between the electrodes.

In use, the liquid in the reservoir may be vaporized by the heater to form a supersaturated vapor. The supersaturated vapor may be mixed with and carried in an air flow. The air flow flows from an air inlet at a distal position or end to a proximal position or end, with the proximal position being a mouth end or a mouthpiece opening of the device. The air flow may enter the device at the distal position of the mouthpiece. During the flow, the vapor may condense to form an aerosol and the aerosol may be carried towards a mouth of a user. The mouthpiece

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may be cylindrical or tubular. The mouthpiece may have a circular, oval or other cross-sectional shape.

The mouthpiece may further comprise a mouthpiece housing. The mouthpiece housing may comprise an inner housing arranged in the mouthpiece housing. The mouthpiece and/or its housing(s) may surround an airflow channel. The airflow channel can be understood as a channel configured to guide a flow of aerosol through the mouthpiece and to the user. The airflow channel may be surrounded by the mouthpiece. The airflow channel may extend at least partially in a longitudinal direction through the mouthpiece to a mouthpiece opening. The mouthpiece opening can be understood to be configured to be inserted into a user's mouth. The mouthpiece opening may create an opening to be engaged by the mouth of a user. The mouthpiece opening can be arranged at a proximal end of the mouthpiece. The mouthpiece opening can be understood as an outlet of the airflow channel in a front face of a mouth end of the airflow channel. The front face of the mouthpiece can be understood as an end surface of the mouthpiece. The front face may extend essentially perpendicular or angular to a longitudinal direction of the mouthpiece and/or the airflow channel. The front face may extend essentially perpendicular or angular to a lateral surface of the mouthpiece. The lateral surface of the mouthpiece can be understood as different from the front face of the mouthpiece. It can be an outer surface of the mouthpiece extending along the longitudinal direction of the mouthpiece. The lateral surface can be a circumferential or peripheral surface of the mouthpiece.

The first electrode and the second electrode are separate electrodes, which are positioned at different locations to provide different contact areas for the user. For example, a user may contact the first electrical contact with their tongue. For example, a user may contact the second electrode with another part of their tongue or their lip. A plane of the first electrode may be angular and preferably essentially perpendicular to a plane of the second electrode. The first electrode may extend over a part or the entire front face of the mouthpiece at the mouthpiece opening. The first electrode may additionally extend over a portion of the lateral surface of the mouthpiece. The second electrode may extend over a part of or the entire lateral surface of the mouthpiece. The electrodes may be made of an electric conductive material, preferably metal, and more preferably a Silver compound. The electrodes may have a dimension in a range of, for example, 20 mm x 15 mm x 0.2 mm.

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In an embodiment, the first electrical contact on the front face of the mouthpiece may be accessible to a tip of a tongue of a user. This means the first electrical contact may be at a location where it is touched by the tip of the tongue and its taste buds, when in use. It may face the tip of the tongue. The first electrical contact may provide a first electric potential to the tip of the tongue, which is in particular sensitive for taste sensations (for example, salty tastes).

In an embodiment, the first electrical contact on the front face of the mouthpiece may be accessible to a tip of a tongue of a user. This means the first electrical contact may be at a location where it is touched by the tip of the tongue and its taste buds, when in use. It may face the tip of the tongue. The first electrical contact may provide a first electric potential to the tip of the tongue, which is in particular sensitive for taste sensations (for example, salty tastes).

In an embodiment, the second electrical contact on the lateral surface of the mouthpiece may be accessible to a central area on the tongue of the user. This means the second electrical contact may be at a location where it is touched by a central part of the tongue, which is different to and "behind" the tip of the tongue, when in use. It essentially may face the central part of the tongue and its taste buds. The second electrical contact may provide a difference in electric potential between different parts of the tongue. A difference in potential between the first electric potential and the second electric potential may stimulate the taste buds of the tongue to bring an artificial taste to the tongue. For example, the second electrode may be available to taste receptors which sense salty, sour or bitter flavors. In an embodiment, the second electrode is available to an area of the tongue other than the region that senses "sweet" flavors, to mask the sweetness of the polyalcohol.

In another embodiment, the second electrical contact on the lateral surface of the mouthpiece may be accessible to a lip of the user. This means the second electrical contact may be at a location where it is touched by a lip of the user, when in use. The second electrical contact may provide a second electric potential to the lip to provide a difference in potential between the first electric potential at the tongue and the second electric potential at the lip. The difference in electrical potential may stimulate the taste buds of the tongue to bring an artificial taste to the tongue to mask the sweetness of the polyalcohol.

In an embodiment, the second electrical contact on the lateral surface of the mouthpiece may be accessible to a lower lip of the user. In another embodiment, the second electrical contact on the lateral surface of the mouthpiece may be accessible

to an upper lip of the user. In other words, the second electrical contact may be arranged and configured to touch the upper lip or the lower lip. The second electrical contact may also surround the mouthpiece at least partially to touch both lips.

In an embodiment, the first electrode may extend at least partially co-axially in the airflow channel. This means, the first electrode is not only at the front face of the mouthpiece, but may also extend in a longitudinal direction into and along the airflow channel. The first electrode may at least partially cover an inner surface of the airflow channel. Thereby, the first electrode is provided with a large surface that allows a cooling of the electrode, e.g. by means of the airflow.

In an embodiment, the second electrode may extend at least partially co-axially in the airflow channel. The second electrode may at least partially cover the inner surface of the airflow channel. Additionally or alternatively to the first electrode, also the second electrode may extend in a longitudinal direction into and along the airflow channel. Thereby, the second electrode is provided with a large surface that allows a cooling of the electrode, e.g. by means of the airflow. Preferably, the first electrode extends along the airflow channel in one portion of the airflow channel and the second electrode extends along the airflow channel in another portion of the airflow channel without contacting the first electrode.

In an embodiment, the second electrode may comprise an upper element arranged at an upper part of the mouthpiece body and a separate lower element arranged at an opposite, lower part of the mouthpiece body. This means the second electrode may comprise at least two parts or elements, which are arranged at different locations or portions of the mouthpiece body. As a result, the second electrode may be accessible for different body parts of the user, as e.g. an upper and a lower lip. This might intensify the user experience.

In an embodiment, the mouthpiece for an aerosol generating device may further comprise a third electrode arranged at the mouthpiece body to provide a third electrical contact. The third electrical contact may be accessible for a third region of the mouth, different from the first region and the second region. As a result, three different body parts of the user may be used for the taste stimulation, as e.g. the tongue, the upper and the lower lip or a first part of the tongue, a second, different part of the tongue and the lip. This might also intensify the user experience. Of course, the mouthpiece for an aerosol generating device may comprise even more than three electrodes.

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In an embodiment, the mouthpiece may be reversibly connectable or connected to a power source. The power source may be configured to provide the electrical potential between the first electrode and the second electrode to stimulate the taste buds. The power source may be a battery or a battery pack. It may be rechargeable. The connection between mouthpiece and power source may be reversible.

In an embodiment, the electrical potential may be an alternating electrical potential. It may have a frequency in a range of 50 Hz to 1200 Hz, preferably 500 Hz to 700 Hz. Such frequencies may have an apparent effect on human tissues without causing vibrations of the electrode.

In an embodiment, the power source may be configured to provide the electrical potential with a current in a range of 20 μ A to 300 μ A, preferably 20 μ A to 200 μ A, more preferably 40 μ A to 180 μ A, and even more preferably 100 μ A to 130 μ A. The electrical current may be an alternating electrical current, preferably with steps of 20 μ A to provide a distinguishable intensity of the stimulation.

In an embodiment, the mouthpiece may further comprise a temperature unit configured to control a temperature of the first electrode and/or the second electrode. The temperature unit may therefore comprise a means for adjusting the temperature of the electrodes, such as, for example, a heat sink. The heat sink may be a thermoelectric cooler, as e.g. a micropeltier element. It may have a dimension in a range of e.g. 1.0 mm x 1.6 mm x 0.62 mm to 6 mm x 5.1 mm x 0.62 mm. The heat sink may be arranged in contact with the first electrode and/or the second electrode. The heat sink may allow a heat transfer away from the first electrode and/or the second electrode to cool the first electrode and/or the second electrode. Cooling the first electrode and/or the second electrode may avoid an uncomfortable heat sensation at the tongue and/or the lip of the user.

In an embodiment, the heat transfer element may be configured for a physical contact with a housing of the mouthpiece. This contact may transfer the heat from the first electrode and/or the second electrode to the mouthpiece housing to cool the first electrode and/or the second electrode more efficiently. To provide enough thermal capacity for cooling the electrodes, the mouthpiece housing may be made of a dense material, which allows storing and dissipating heat energy, as for example, aluminum or ceramic. Additional heat sink materials may be utilized.

In an embodiment, the heat sink may comprise a thermo-paste. The thermo-paste may be arranged between the respective electrode and the mouthpiece

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housing. The thermo-paste may improve the heat transfer and thereby the cooling of the first electrode and/or the second electrode.

In an embodiment, the temperature unit may be configured to control the temperature of the first electrode and/or the second electrode in a range of 20 to 35 degrees Celsius, preferably 22 to 25 degrees Celsius. This temperature range seems to be very comfortable for the mouth of the user.

Therefore, the mouthpiece may use electrical impulses with preferably alternating electric potential of varying frequency or varying current or both, optionally within a controlled temperature range, for taste stimulation. Current, frequency and/or temperature alone or in combination may result in a different taste and could reduce or eliminate the sweetness taste of e-liquids. This may be achieved without additional chemicals to mask the sweetness and would therefore not require any change to existing formulations of e-liquids.

In an embodiment, the aerosol generating device may comprise a power supply housing, which houses the power source. The power supply housing may have a first portion at its outer surface configured for an overlapping or complimentary interaction with a corresponding second portion arranged on the mouthpiece. As a result, it is easy to reliably attach or connect the power supply housing to the mouthpiece to form the aerosol generating device. The connection between the power supply housing and the mouthpiece may prevent a flow of fluids, including liquid and gas, between the power source and the mouthpiece. In embodiments, the power supply housing and the mouthpiece may be attached via any means known in the art including a fitting engagement or a complimentary lock-and-key type fitting, a screw attachment, friction fit, clasp, magnetic or other attachment.

In an embodiment, the aerosol generating device may comprise a user input device. The user input device may be any type of user interface, including, for example, a button. The button may be configured to activate the aerosol generator. The button may be configured to activate an electrical potential between the first electrode and the second electrode. As a result, it may allow switching the aerosol generator and/or the artificial taste stimulation on and off.

In an embodiment, the button may be further configured to control the amount of electrical potential between the first electrode and the second electrode. As a result, it may further control an intensity of the electrical stimulation and thereby allow an adjustment of the strength of taste simulation.

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The control unit and the power source are connectable to the mouthpiece.

The mouthpiece comprises an aerosol generator and a liquid reservoir. The aerosol generator is configured to heat liquid from the liquid reservoir to form an aerosol.

In an embodiment, the power source may be additionally configured to provide energy to the aerosol generator. This means the power source may be the only power source of the aerosol generating device and it can be used to provide an electrical potential between the first electrode and the second electrode as well as to provide energy for heating the e-liquid to generate the aerosol. This makes the aerosol generating device very efficient and/or allows reducing the number of components. Of course, there can be also two different power sources for heating the e-liquid and for providing the electrical potential between the electrodes.

The control unit is configured to control the amount of electrical potential between the first electrode and the second electrode. As a result, the control unit may thereby control an intensity or strength of the electrical stimulation. This may allow adapting the aerosol generating device to each and every user. The control unit can be part of the power source or part of the mouthpiece.

The present aerosol generating device therefore may provide means to electrically stimulate the user's mouth or tongue, and may stimulate taste during consumption. It has a mouthpiece with two electrodes that can have a connection to a mouth of the user to stimulate the taste buds of the tongue via electrical signals. The electrical signals may bring in artificial taste stimulation on the tongue.

This possibility, namely to bring in artificial taste stimulation on a tongue, is used in the present disclosure for inducing an artificial taste of unpleasant nature, when an unauthorized user places the device on his/her mouth. It is possible to provide such a highly unpleasant taste by electrical stimulation such that an unauthorized user would not continue using the aerosol generating device. Parameters to produce unpleasant stimulated taste can be, for example from about 20 to 200 μA , about 80 to 200 μA , preferably about 100 to 200 μA , and about 50 to about 1200 Hz, from about 200 to 1000 Hz, preferably of about 600 to 1000 Hz, and about 50 to 110 Pulses per second, preferably about 80 to 100 Pulses per second, considering an effective area of the electrode(s) of about 50 to 80 sq. mm, preferably of about 55 to 65 sq. mm, and considering a gap between pulses of about 0.33 to 0.77 msec, preferably 0.45 to 0.65 msec, and using current tension of about 1.1 to 1.9 V, preferably about 1.25 to 1.50 Volts.

Thus, an unauthorized use of the aerosol generating device can be prevented without any chemical compounds, and related potential problems of chemical degradation/interaction, and storage conditions, and shelf life. The unpleasant taste can be a strong salty, bitter or sour taste or could be their combination.

The authorization unit serves to determine whether a user is authorized to use the device or not. Notably, the term authorization unit is to be understood in a broad manner. The only requirement here is that, individually or in combination with other parts/units, means are provided to determine whether a user is an authorized user or not. For this purpose, the authorization unit may be connected to or include communication means. For example, the authorization unit can be connected to various input means either provided on the aerosol generating device or provided on a separate device with which the aerosol generating device may communicate. The authorization unit can be a part of the control unit or a separate unit of the aerosol generating device.

In case it is determined that a user is authorized to use the aerosol generating device, a use of the aerosol generating device is allowed. However, in case a user is not authorized to use the aerosol generating device a predefined electrical potential between the first electrode and the second electrode of the mouthpiece is set. In this respect, the authorization unit may directly be connected to the power source so that the authorization unit itself may issue a corresponding control signal. However, a corresponding control signal may also be provided via the control unit, i.e. the authorization unit sends a signal to the control unit, and the control unit controls the electric potential between the first electrode and the second electrode.

For example, the authorization unit may also include or be connected to a data storage unit, e.g. an internal memory unit. For example, a factory-set authorization data may be stored in such a data storage unit. However, such a data storage unit may also contain individualized authorization data, i.e. authorization data defined by a user. A user can, for example, use a personal password or a personal input that she/he could enter after using the aerosol generating device for the first time.

In an embodiment, the aerosol generating device comprises a wireless data communication interface and the authorization unit is configured to receive and/or request authorization from another device via the wireless data communication interface. In an example, the authorization unit is configured to receive and/or request authorization data from a mobile computer device, e.g. a wearable, a smartphone, a tablet or a laptop. For example, the aerosol generating device may

be unlocked by entering an authorization, such as a password or numerical code, on such a mobile computer device. For example, an authorization app may be provided on the mobile computer device, which is set up to communicate with the device.

In an embodiment, the wireless data communication interface is a Bluetooth interface, a mobile radio interface, a wireless LAN interface, or an infrared interface.

In an embodiment, the aerosol generating device comprises input means configured for a user to input a predefined authorization sequence on the basis of which the authorization unit determines the authorization. Such input means may be part of the authorization unit or means, which are already provided on the aerosol generating device for a different purpose, e.g. an on/off button.

In an embodiment, the input means comprise button elements by which a user may input a predefined authorization sequence, wherein the predefined authorization sequence may be provided by predefined button activations and/or by a predefined timing of button activations. For example, such an authorization code may be provided by a specific sequence of three or more keystrokes.

According to a further aspect, a cartridge comprising a mouthpiece for an aerosol generating device is provided, comprising: a first electrode to provide a first electrical contact to a user and a second electrode to provide a second electrical contact to a user; a power source configured to provide an electrical potential between the first electrode and the second electrode of the mouthpiece, wherein the mouthpiece is configured to be connected to a power source for providing an electrical potential between the first electrode and the second electrode; wherein the mouthpiece is configured to be connected to a control unit for controlling the electrical potential between the first electrode and the second electrode of the mouthpiece; and wherein the mouthpiece is configured to be connected with an authorization unit for determining whether a user is authorized to use the aerosol generating device and configured to release a use of the aerosol generating device in case a user is authorized to use the aerosol generating device or to set a predefined electrical potential between the first electrode and the second electrode of the mouthpiece in case a user is not authorized to use the aerosol generating device. With respect to the possible structure of the mouthpiece and its parts, reference is made to the above explanations, which also apply here.

A further aspect of the present disclosure refers to a use of a cartridge comprising a mouthpiece explained above in an aerosol generating device explained above.

A still further aspect of the present disclosure refers to a use of a consumable in an aerosol generating device explained above for generating an aerosol. The consumable may be, for example, liquid in a reservoir.

According to a further aspect, a method for an electrical stimulation of taste buds of a user is provided, comprising the following steps: providing a cartridge explained above, determining by means of an authorization unit whether a user is authorized to use the aerosol generating device; and in case a user is authorized to use the aerosol generating device releasing a use of the aerosol generating device; or in case a user is not authorized to use the aerosol generating device causing a predefined electrical potential between a first electrode and the second electrode of a mouthpiece.

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

- A. An aerosol generating device, comprising:
- a cartridge comprising a mouthpiece, wherein the mouthpiece is comprising a first electrode to provide a first electrical contact to a user and a second electrode to provide a second electrical contact to a user;
 - a power source configured to provide an electrical potential between the first electrode and the second electrode of the mouthpiece,
 - a control unit configured to control the electrical potential between the first electrode and the second electrode of the mouthpiece; and
 - an authorization unit configured to determine whether a user is authorized to use the aerosol generating device and configured to release a use of the aerosol generating device in case a user is authorized to use the aerosol generating device or to set a predefined electrical potential between the first electrode and the second electrode of the mouthpiece in case a user is not authorized to use the aerosol generating device.
- B. Aerosol generating device according to claim A, wherein
- the aerosol generating device comprises a wireless data communication interface and wherein the authorization unit is configured to receive and/or request authorization from another device via the wireless data communication interface.
- C. Aerosol generating device according to claim B, wherein

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the wireless data communication interface is a Bluetooth interface, a mobile radio interface, a wireless LAN interface, or an infrared interface.

- D. Aerosol generating device according any one of the preceding claims, wherein
the authorization unit is configured to receive and/or request authorization data from a mobile computer device.
- E. Aerosol generating device according to claim D, wherein
the mobile device is a wearable, a smartphone, a tablet or a laptop.
- F. Aerosol generating device according to any one of the preceding claims, wherein
the aerosol generating device comprises input means configured for a user to input a predefined authorization sequence on the basis of which the authorization unit determines the authorization.
- G. Aerosol generating device according to claim F, wherein
the input means comprise button elements by which a user may input a predefined authorization sequence.
- H. Aerosol generating device according to claim G, wherein
the predefined authorization sequence is provided by predefined button activations and/or by a predefined timing of button activations.
- I. Aerosol generating device according to any one of the preceding claims, wherein
the first electrode is arranged on a front face of the mouthpiece to provide a first electrical contact to a user; and/or
the second electrode arranged on a lateral surface of the mouthpiece to provide a second electrical contact to a user.
- J. Aerosol generating device according to any one of the preceding claims, wherein
the first electrode and the second electrode are provided by means of charging ports of the aerosol generating device.
- K. Aerosol generating device according to any one of the preceding claims, wherein
wherein the first electrical contact on the front face of the mouthpiece is accessible to a tip of a tongue of a user.
- L. Aerosol generating device according to any one of the preceding claims, wherein

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the second electrical contact on the lateral surface of the mouthpiece is accessible to a central area on the tongue of the user.

- M. Aerosol generating device according to any one of the preceding claims, wherein
the second electrical contact on the lateral surface of the mouthpiece is accessible to a lip of the user.
- N. Aerosol generating device according to any one of the preceding claims, wherein
the second electrode comprises an upper element arranged at an upper part of the mouthpiece body and a separate lower element arranged at an opposite, lower part of the mouthpiece body.
- O. Aerosol generating device according to any one of the preceding claims, wherein
the electrical potential is an alternating electric-potential with a frequency in a range of 50 Hz to 1200 Hz.
- P. Aerosol generating device according to any one of the preceding claims, wherein
the power source is configured to provide the electrical potential with a current in a range of 20 μ A to 300 μ A.
- Q. Aerosol generating device according to any one of the preceding claims, wherein
a temperature unit configured to control a temperature of the first electrode and/or the second electrode, wherein the temperature unit comprises at least a heat sink, which is arranged in contact with the first electrode and/or the second electrode.
- R. Aerosol generating device according to claim Q, wherein
the heat sink comprises a thermo-paste.
- S. Aerosol generating device according to claim Q or claim R, wherein
the temperature unit is configured to control the temperature of the first electrode and/or the second electrode in a range of 20 to 35 degrees Celsius.
- T. A cartridge comprising a mouthpiece for an aerosol generating device comprising:
a first electrode to provide a first electrical contact to a user and a second electrode to provide a second electrical contact to a user;

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a power source configured to provide an electrical potential between the first electrode and the second electrode of the mouthpiece,
wherein the mouthpiece is configured to be connected to a power source for providing an electrical potential between the first electrode and the second electrode;

wherein the mouthpiece is configured to be connected to a control unit for controlling the electrical potential between the first electrode and the second electrode of the mouthpiece; and

wherein the mouthpiece is configured to be connected with an authorization unit for determining whether a user is authorized to use the aerosol generating device and configured to release a use of the aerosol generating device in case a user is authorized to use the aerosol generating device or to set a predefined electrical potential between the first electrode and the second electrode of the mouthpiece in case a user is not authorized to use the aerosol generating device.

- U. Cartridge according to claim T, wherein
wherein the first electrical contact on the front face of the mouthpiece is accessible to a tip of a tongue of a user.
- V. Cartridge according to claim T or claim U, wherein
the second electrical contact on the lateral surface of the mouthpiece is accessible to a central area on the tongue of the user.
- W. Cartridge according to any one of claims T to V, wherein
the second electrical contact on the lateral surface of the mouthpiece is accessible to a lip of the user.
- X. Cartridge according to any one of claims T to W, wherein
the second electrode comprises an upper element arranged at an upper part of the mouthpiece body and a separate lower element arranged at an opposite, lower part of the mouthpiece body.
- Y. Cartridge according to any one of claims T to X, wherein
the electrical potential is an alternating electric-potential with a frequency in a range of 50 Hz to 1200 Hz.
- Z. Cartridge according to any one of claims T to Y, wherein
the power source is configured to provide the electrical potential with a current in a range of 20 μ A to 300 μ A.
- AA. Cartridge according to any one of claims T to Z, further comprising

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a temperature unit configured to control a temperature of the first electrode and/or the second electrode, wherein the temperature unit comprises at least a heat sink, which is arranged in contact with the first electrode and/or the second electrode.

- BB. Cartridge according to claim AA, wherein the heat sink comprises a thermo-paste.
- CC. Cartridge according to claim AA or claim BB, wherein the temperature unit is configured to control the temperature of the first electrode and/or the second electrode in a range of 20 to 35 degrees Celsius.
- DD. Use of a cartridge according to any one of claims T to BB in an aerosol generating device according to any one A to S.
- EE. Use of a consumable in an aerosol generating device according to any one of claims A to S for generating an aerosol.
- FF. A method for an electrical stimulation of taste buds of a user, comprising the steps:
providing an aerosol generating device according to any one of claims A to S;
determining by means of an authorization unit whether a user is authorized to use the aerosol generating device; and
in case a user is authorized to use the aerosol generating device releasing a use of the aerosol generating device; or
in case a user is not authorized to use the aerosol generating device causing a predefined electrical potential between a first electrode and the second electrode of a mouthpiece.
- GG. A computer program element which when executed by a processor is configured to carry out a method according to claim FF.

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

Figures 1a and 1b show schematically and exemplarily an embodiment of an aerosol generating device according to the present disclosure.

Figures 2a, 2b and 2c show schematically and exemplarily an embodiment of a mouthpiece for the aerosol generating device according to the disclosure.

Figure 3 shows schematically and exemplarily another embodiment of a mouthpiece for the aerosol generating device according to the disclosure.

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Figures 1a and 1b show an aerosol generating device 300 according to the present disclosure. The aerosol generating device 300 comprises a power supply housing 100 and a mouthpiece 200. In Figure 1a, the power supply housing 100 and the mouthpiece 200 are assembled; in Figure 1b, the power supply housing 100 and the mouthpiece 200 are disassembled into separate parts.

The mouthpiece 200 comprises an aerosol generator 213 with a liquid reservoir and a heater. A resistive coil and wick heater is shown, but any form of heater may be used, including an inductive heater. For example, in WO 2011/050943 A1 different geometries/arrangements of the aerosol generator 213 comprising a liquid reservoir and a heater are shown. In this respect, WO 2011/050943 is incorporated by reference.

The aerosol generator is configured to heat liquid from the liquid reservoir to form an aerosol.

The mouthpiece 200 comprises a first electrode 240 arranged on a front face F of the mouthpiece 200 to provide a first electrical contact to a user. The mouthpiece 200 comprises a second electrode 220 arranged on a lateral surface L of the mouthpiece 200 to provide a second electrical contact to a user. When in use, a tongue of the user makes contact with the first electrode 240 and, for example, a lower lip is in contact with the second electrode 220. The mouthpiece 200 comprises at least one airflow inlet 212 (see Figures 1a and 1b) into an airflow channel 230 (see Figures 2a-c) extending through the mouthpiece 200. With respect to the different geometries of the flow paths and the potential arrangement of the airflow inlets 212 in the mouthpiece 200, it is referred to WO 2011/050943 A1, which is incorporated in this respect by reference.

The power supply housing 100 comprises a power source 130 and a control unit 110. The power supply housing 100 and thereby the control unit 110 and the power source 130 are reversibly connectable to the mouthpiece 200.

The power source 130 comprises a battery configured to provide energy to the heater. The battery also provides an electrical potential between the first electrode 240 and the second electrode 220 of the mouthpiece 200.

The control unit 110 is configured to control the electrical potential provided by the power source 130. The control unit 110 and the two electrodes 220, 240 form an electrical circuit. If the user touches the electrodes 220, 240 with her or his lips or tongue, the circuit is completed between both electrodes 220, 240 (through the user) and this is recognized by the control unit 110. The control unit 110 subsequently

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starts providing an artificial taste stimulation. The control unit 110 may also control an intermittent operation of the taste stimulation to optimize a taste sensitization.

On activation of the aerosol generator device 300 by the user, the aerosol generation occurs and the electrodes 240, 220 on the mouthpiece 200 receive the electrical potential. The electrical potential and a current between the first electrode 240 and the second electrode 220 act on the user's tongue with a simulation of an artificial taste based on the potential and/or the current. The preferably alternating current is here in a range of 20 to 200 μA , about 80 to 200 μA , preferably about 100 to 200 μA , with steps of 20 μA and provides a distinguishable intensity of the stimulation. The frequency of the alternating electric potential is here in the range of 50 Hz to 1200 Hz, about 50 to about 1200 Hz, from about 200 to 1000 Hz from about 200 to 1000 Hz, preferably of about 600 to 1000 Hz, and about 50 to 110 pulses per second, preferably about 80 to 100 pulses per second, considering an effective area of the electrode(s) of about 50 to 80 sq. mm, preferably of about 55 to 65 sq. mm, and considering a gap between pulses of about 0.33 to 0.77 msec, preferably 0.45 to 0.65 msec, and using current tension of about 1.1 to 1.9 V, preferably about 1.25 to 1.50 Volts

The power supply housing 100 further comprises a button 120, which can be pressed to switch the aerosol generating device 300 on or off, for example, when it is pressed for a longer duration. The button 120 can also be pressed during the operation of the aerosol generating device 300 in an intermittent manner to control an intermittent operation of the taste stimulation to optimize a taste sensitization. The control via the button 120 can be alternatively or additionally to the control via the control unit 110. The control unit 110 may store a preferred setting in an internal memory to adjust on start an intensity of the taste stimulation according to a preferred setting of the user.

The power supply housing 100 further comprises first portions 140, which are in physical contact and overlapping with respective second portions on the mouthpiece 200 to allow a reliable mechanical connection between the power supply housing 100 and the mouthpiece 200.

Figures 2a to 2c show the mouthpiece 200 according to the present disclosure. Figure 2a shows a cross section through the mouthpiece 200 in a side view. Figure 2b shows a cross section through the mouthpiece 200 in a front view. Figure 2c shows a cross section through the mouthpiece 200 in a rear view along section Z-Z in Figure 2a.

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As stated to Figures 1a and 1b, the mouthpiece 200 surrounds the airflow channel 230 through the mouthpiece 200. At the mouthpiece 200, the two electrodes 240, 220 for an electric-stimulation are arranged. The first electrode 240 here extends as a long part from the front face F co-axially along a longitudinal axis of the air-channel 230. The second electrode 220 is arranged on the lateral surface L of the mouthpiece 200.

The first electrode 240 is in contact with a thermoelectric cooling element 260 using thermo-paste on a first side 261 and a second side 262. The second electrode 220 is in contact with another thermoelectric cooling element 250 using thermo-contact paste on another first side 251 and another second side 251. Both of these thermoelectric cooling elements 250, 260 have contact with a mouthpiece housing 210 of the mouthpiece 200, such that a heat transfer is efficient between the electrodes 240, 220 and the mouthpiece housing 210 to maintain a suitable temperature on the electrodes 240, 220. Further, the mouthpiece 200 and the mouthpiece housing 210 transfers heat over overlapping or tapered portions to corresponding overlapping or tapered portions 140 of the heat-dissipating power supply housing 100. The temperature range for the operation of the aerosol generator device 300 is here between 24 °C to 35 °C.

The mouthpiece housing 210 comprises here an inner housing 211 also having a heating conduction ability. The mouthpiece housing 210 and the inner housing 211 are here oval-tubular and create the air channel 230 in the mouthpiece 200.

Figure 3 shows another embodiment of the mouthpiece 200 according to the present disclosure in a lateral cross section. This mouthpiece 200 is modified with a second electrode 220 in an extended manner such that both lips (upper and lower lips) of the user can touch the second electrode 220 while the first electrode 240 still makes contact with the tongue. The second electrode 220 therefore comprises an upper and a lower element.

The aerosol generating device 300 further comprises an authorization unit, which may be part of the control unit 110. However, in other embodiments, the authorization unit may be a separate unit, which is arranged in the power supply housing 100 and/or in the mouthpiece 200. The authorization unit serves to determine whether a user is authorized to use the aerosol generating device 300 or not. In case it is determined that a user is authorized to use the aerosol generating device 300, a use of the aerosol generating device 300 as explained above is

allowed. However, in case a user is not authorized to use the aerosol generating device 300, a predefined electrical potential between the first electrode 240 and the second electrode 220 is set corresponding to an artificial taste of unpleasant nature, e.g. a strong salty, bitter or sour taste or could be their combination. Thereby, it is possible to provide such a highly unpleasant taste by electrical stimulation such that an unauthorized user would not continue using the aerosol generating device 300. Thus, an unauthorized use of the aerosol generating device can be prevented without any chemical compounds, and related potential problems of chemical degradation/interaction, and storage conditions, and shelf life.

In an example, an authorization sequence can be provided by a user by entering a specific sequence on the button 120, e.g. press once for a long time, press twice for a short time.

Optionally, the aerosol generating device 300 may comprise a wireless data communication interface (not shown) and the authorization unit is configured to receive and/or request authorization from another device, e.g. a mobile device like a smartphone, via the wireless data communication interface. The wireless data communication interface may be a Bluetooth interface, a mobile radio interface, a wireless LAN interface, or an infrared interface. For example, the aerosol generating device 300 may be unlocked by entering an authorization, such as a password or numerical code, on such a mobile computer device.

For the purpose of the present description and of the appended claims, except where otherwise indicated, all numbers expressing amounts, quantities, percentages, and so forth, are to be understood as being modified in all instances by the term "about". Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein. In this context, therefore, a number A is understood as $A \pm 20\%$ of A. Within this context, a number A may be considered to include numerical values that are within general standard error for the measurement of the property that the number A modifies. The number A, in some instances as used in the appended claims, may deviate by the percentages enumerated above provided that the amount by which A deviates does not materially affect the basic characteristic(s) of the claimed disclosure. Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein.

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Although illustrative examples of the present disclosure have been described above, in part with reference to the accompanying drawings, it is to be understood that the disclosure is not limited to these examples. Variations to the disclosed examples can be understood and effected by those skilled in the art in practicing the disclosure, from a study of the drawings, the specification and the appended claims.

In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. The term "comprising" does not exclude the presence of elements or steps other than those listed in a claim. The word "a" or "an" preceding an elements does not exclude the presence of a plurality of such elements. The disclosure can be implemented by means of hardware comprising several distinct elements. In the device claim enumerating several means, several of these means can be embodied by one and the same item of hardware. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

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CLAIMS

1. An aerosol generating device (300), comprising:
 - a cartridge comprising a mouthpiece (200), wherein the mouthpiece (200) is comprising a first electrode (240) to provide a first electrical contact to a user and a second electrode (220) to provide a second electrical contact to a user; wherein the first electrode (240) and the second electrode (220) are positioned at different locations to provide different contact areas for the user;
 - a power source (130) configured to provide an electrical potential between the first electrode (240) and the second electrode (220) of the mouthpiece (200),
 - a control unit (110) configured to control the electrical potential between the first electrode (240) and the second electrode (220) of the mouthpiece (200); and
 - an authorization unit configured to determine whether a user is authorized to use the aerosol generating device (300) and configured to release a use of the aerosol generating device (300) in case a user is authorized to use the aerosol generating device (300) and to set a predefined electrical potential between the first electrode (240) and the second electrode (220) of the mouthpiece (200) corresponding to an artificial taste of unpleasant nature in case a user is not authorized to use the aerosol generating device (300).
2. Aerosol generating device (300) according to claim 1, wherein the aerosol generating device (300) comprises a wireless data communication interface and wherein the authorization unit is configured to receive and/or request authorization from another device via the wireless data communication interface.
3. Aerosol generating device (300) according to claim 2, wherein the wireless data communication interface is a Bluetooth interface, a mobile radio interface, a wireless LAN interface, or an infrared interface.

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4. Aerosol generating device (300) according to any one of the preceding claims, wherein the authorization unit is configured to receive and/or request authorization data from a mobile computer device.
5. Aerosol generating device (300) according to claim 4, wherein the mobile computer device is a wearable, a smartphone, a tablet or a laptop.
6. Aerosol generating device (300) according to any one of the preceding claims, wherein the aerosol generating device (300) comprises input means configured for a user to input a predefined authorization sequence on the basis of which the authorization unit determines the authorization.
7. Aerosol generating device (300) according to claim 6, wherein the input means comprise button elements (120) by which a user may input a predefined authorization sequence.
8. Aerosol generating device (300) according to claim 6 or claim 7, wherein the predefined authorization sequence is provided by predefined button activations and/or by a predefined timing of button activations.
9. Aerosol generating device (300) according to any one of the preceding claims, wherein the first electrode (240) is arranged on a front face of the mouthpiece (200) to provide a first electrical contact to a user; and/or the second electrode (220) is arranged on a lateral surface of the mouthpiece (200) to provide a second electrical contact to a user.
10. A cartridge comprising a mouthpiece (200) for an aerosol generating device (300) comprising:
 - a first electrode (240) to provide a first electrical contact to a user and a second electrode (220) to provide a second electrical contact to a user;
 - a power source (130) configured to provide an electrical potential between the first electrode (240) and the second electrode (220) of the mouthpiece (200);
 - wherein the mouthpiece (200) is configured to be connected to a power source (130) for providing an electrical potential between the first electrode

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(240) and the second electrode (220), wherein the first electrode (240) and the second electrode (220) are positioned at different locations to provide different contact areas for the user;

wherein the mouthpiece (200) is configured to be connected to a control unit (110) for controlling the electrical potential between the first electrode (240) and the second electrode (220) of the mouthpiece (200); and

wherein the mouthpiece (200) is configured to be connected with an authorization unit for determining whether a user is authorized to use the aerosol generating device (300) and configured to release a use of the aerosol generating device (300) in case a user is authorized to use the aerosol generating device (300) and to set a predefined electrical potential between the first electrode (250) and the second electrode (220) of the mouthpiece (200) corresponding to an artificial taste of unpleasant nature in case a user is not authorized to use the aerosol generating device (300).

11. Cartridge according to claim 10, wherein the first electrical electrode (250) on the front face of the mouthpiece (200) is accessible to a tip of a tongue of a user.
12. Cartridge according to claim 10 or claim 11, wherein the second electrode (220) on the lateral surface of the mouthpiece (200) is accessible to a central area on the tongue of the user.
13. Use of a cartridge according to any one of claims 10 to 12 in an aerosol generating device (300) according to any one of claims 1 to 9.
14. Use of a consumable in an aerosol generating device (300) according to any one of claims 1 to 9 for generating an aerosol.
15. A method for an electrical stimulation of taste buds of a user, comprising the steps:
 - providing an aerosol generating device (300) according to any one of claims 1 to 9;
 - determining by means of an authorization unit whether a user is authorized to use the aerosol generating device (300); and

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in case a user is authorized to use the aerosol generating device (300) releasing a use of the aerosol generating device (300); and

in case a user is not authorized to use the aerosol generating device (300) causing a predefined electrical potential between a first electrode (250) and the second electrode (220) of the mouthpiece (200) corresponding to an artificial taste of unpleasant nature.

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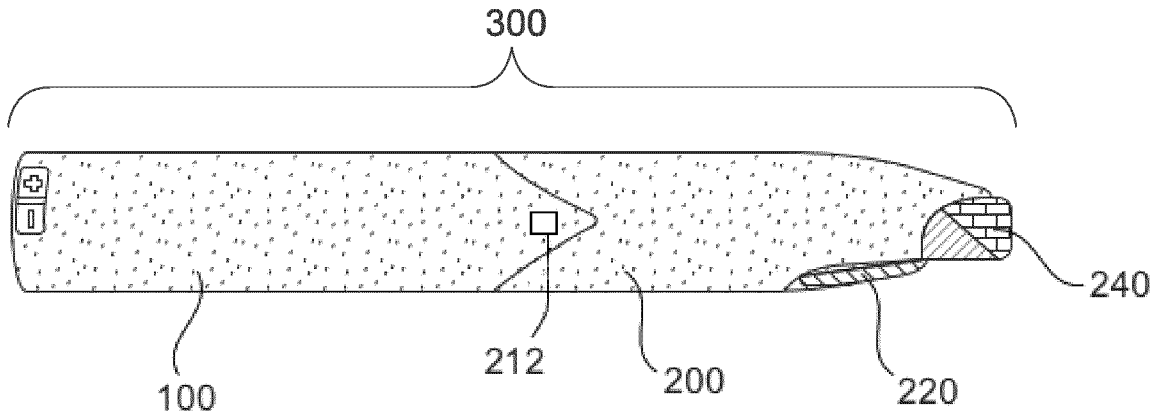


Fig. 1a

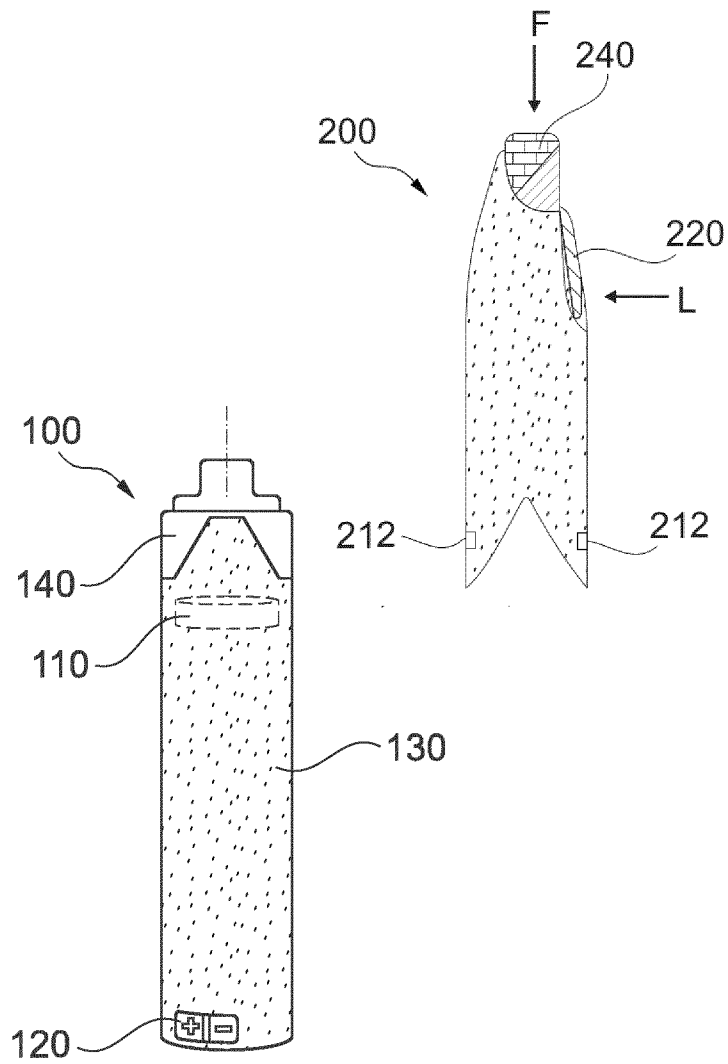


Fig. 1b

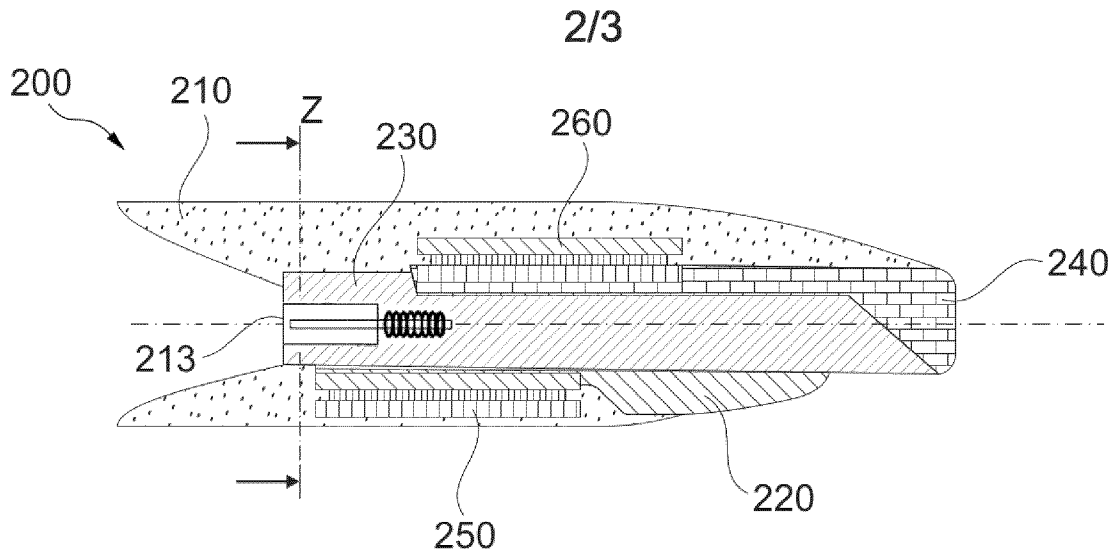


Fig. 2a

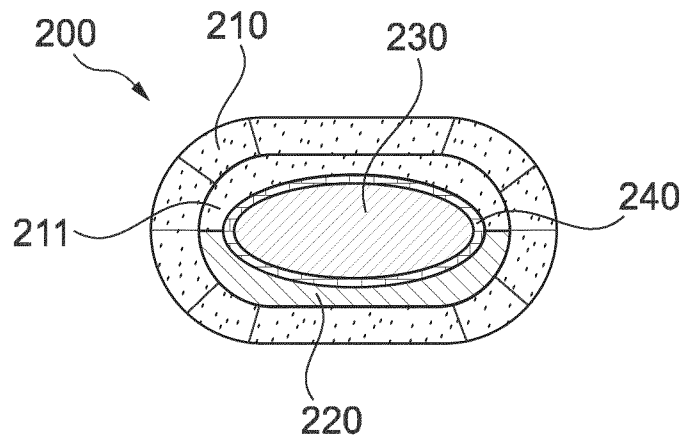


Fig. 2b

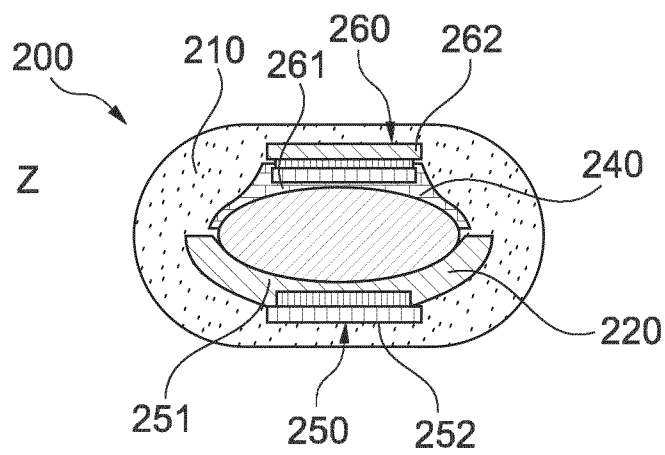


Fig. 2c

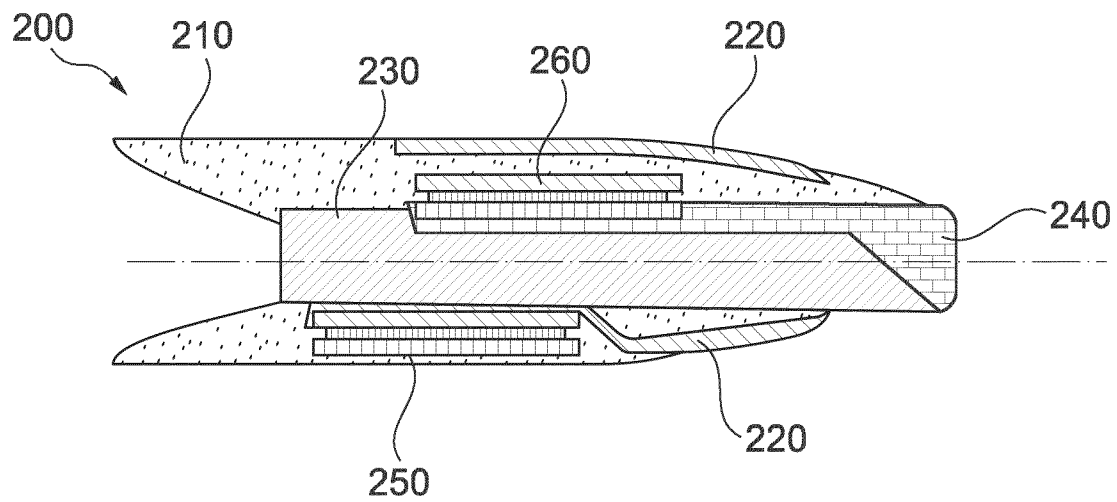


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2021/069398

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A24F40/53 A24F40/65 A24F40/51 A24D3/18 A24F40/42
 A61M15/06 G06F21/31 A61N1/36 A61N1/05
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 A24F A24D A61M G06F A61N

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)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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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
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- "O" document referring to an oral disclosure, use, exhibition or other means
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- "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 6 October 2021	Date of mailing of the international search report 18/10/2021
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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 Mier Abascal, Ana
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INTERNATIONAL SEARCH REPORT

International application No
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