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(54) **AEROSOL GENERATING DEVICE COMPRISING A HEATING CHAMBER CONFIGURED TO RECEIVE AT LEAST PARTIALLY AN AEROSOL GENERATING ARTICLE**

(57) Aerosol generating device comprising a heating chamber (60) extending along a device axis (Y) and comprising a heating zone (62) adapted to heat at least a part of an aerosol generating article and a mounting zone (61).

The mounting zone (61) is engaged with a support to form an attaching zone of the heating chamber (60) to the device body, said attaching zone being the only attaching zone of the heating chamber (60) to the device body. The mounting zone (61) is engaged with the support by means of at least one protruding part (80A, 80B). The heating chamber (60) forms a flat shape extending between two first parallel longitudinal planes. At least one protruding part (80A, 80B) extends according to a central plane arranged between the first parallel longitudinal planes.

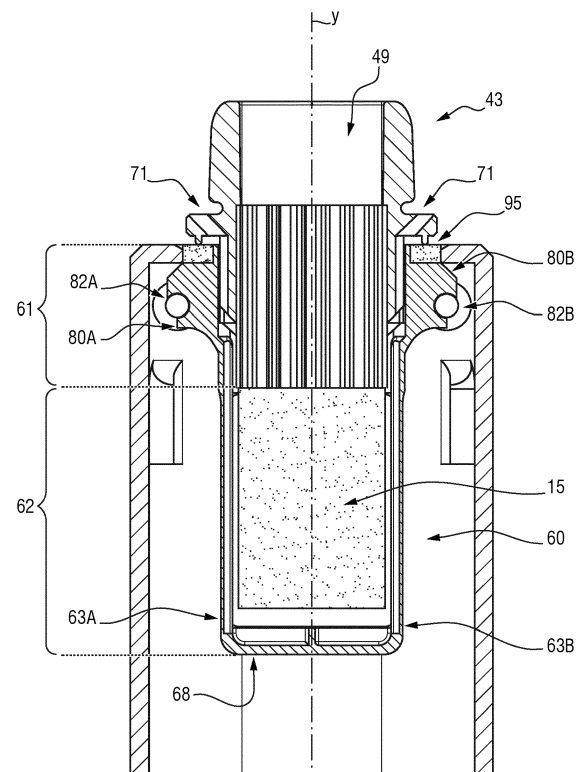


FIG.4

Description

FIELD OF THE INVENTION

[0001] The present invention concerns an aerosol generating device comprising a heating chamber configured to receive at least partially an aerosol generating article.

[0002] Particularly, the aerosol generating device according to the invention is configured to operate with an aerosol generating article, for example a flat-shaped tobacco article, which comprises for example a solid substrate able to form aerosol when being heated. Thus, such type of aerosol generating devices, also known as heat-not-burn devices, is adapted to heat, rather than burn, the substrate by conduction, convection and/or radiation, to generate aerosol for inhalation.

BACKGROUND OF THE INVENTION

[0003] The popularity and use of reduced-risk or modified-risk devices (also known as vaporisers) has grown rapidly in the past few years as an aid to assist habitual smokers wishing to quit smoking traditional tobacco products such as cigarettes, cigars, cigarillos, and rolling tobacco. Various devices and systems are available that heat or warm vaporizable substances as opposed to burning tobacco in conventional tobacco products.

[0004] A commonly available reduced-risk or modified-risk device is the heated substrate aerosol generation device or heat-not-burn device. Devices of this type generate aerosol or vapour by heating an aerosol substrate that typically comprises moist leaf tobacco or other suitable vaporizable material to a temperature typically in the range 150°C to 350°C. Heating an aerosol substrate, but not combusting or burning it, releases aerosol that comprises the components sought by the user but not the toxic and carcinogenic byproducts of combustion and burning. Furthermore, the aerosol produced by heating the tobacco or other vaporizable material does not typically comprise the burnt or bitter taste resulting from combustion and burning that can be unpleasant for the user and so the substrate does not therefore require the sugars and other additives that are typically added to such materials to make the smoke and/or vapour more palatable for the user.

[0005] Tobacco articles, usable with such type of aerosol generating devices can take various forms. Some of them can present an elongated stick or any other suitable shape, like for example a flat shape. Generally, such a tobacco article is received at least partially in a heating chamber of the device which comprises one or several heaters to heat the tobacco article.

[0006] Heating efficiency by the heating chamber is thus an important operation parameter of the aerosol generating device. In some aerosol generating devices, heat generated by the heating chamber can be dissipated. This can cause not only under-heating of the tobacco article and as a consequence a poor vapour generation,

but in some cases also over-heating of the device body and notably of a zone of the device body used to handle the device by the user. This can conduct to a poor user experience.

SUMMARY OF THE INVENTION

[0007] One of the aims of the invention is to propose an aerosol generating device providing a better heating efficiency of an aerosol generating article and as a consequence, a better user experience. Thus, the quality of vapour generation can be increased while reducing the device body over-heating.

[0008] For this purpose, the invention relates to an aerosol generating device comprising a device body and a heating chamber configured to receive at least partially an aerosol generating article;

the device body extending along a device axis between an open end and a closed end, the open end defining a support;

the heating chamber extending along the device axis and comprising a heating zone adapted to heat at least a part of the aerosol generating article and a mounting zone arranged successively with the heating zone along the device axis;

wherein the mounting zone is engaged with the support to form an attaching zone of the heating chamber to the device body, said attaching zone being the only attaching zone of the heating chamber to the device body;

wherein the mounting zone is engaged with the support by means of at least one protruding part;

wherein the heating chamber forms a flat shape extending between two first parallel longitudinal planes; and

wherein said at least one protruding part extends according to a central plane arranged between the first parallel longitudinal planes.

[0009] Thanks to these features, the heating chamber is attached to the device body only in the mounting zone. Thus, the mounting zone forms the only heat transfer zone between the heating chamber and the device body. Heat transfer can thus be minimized by optimizing the structure of the mounting zone. For this purpose, the mounting zone can be configured to be engaged with the support of the device body using optimized means. These means can be optimized to minimize heat transfer between the heating chamber and the device body.

[0010] In some embodiments, the means attaching the heating chamber to the device body can be configured to be easily disengaged by the user. Thus, the heating chamber can be detached from the device body to be for example cleaned or replaced by the user.

[0011] Additionally, thanks to its flat shape, the heating chamber is adapted to receive an aerosol generating article having a flat shape. The flat shape of the heating

chamber is particularly advantageous to ensure a fast preheating phase of the aerosol generating article. Thus, the article can be ready to generate vapor only a few seconds (for example 5 s or 15 s or 20 s) after activating the heating chamber. The flat shape of the heating chamber is also advantageous to ensure a relatively great amount of vapor and homogeneous heating of the aerosol generating article during a vaping phase.

[0012] Furthermore, the or each protruding part extends according to the central plane to reduce the size of the device body and keep it also substantially flat. For example, the flat shape of the heating chamber can extend according to the central plane. In this case, the or each protruding part extends according to this plane without breaking the flat shape of the device body receiving the heating chamber. Thus, the device body can be only slightly thicker than the heating chamber.

[0013] According to some embodiments, the mounting zone and the heating zone form opposite ends of the heating chamber.

[0014] Thanks to these features, the distance between the mounting zone and the heating zone of the heating chamber can be maximized, minimizing thus heat transfer from the heating zone to the mounting zone. Provided with this structure, the heating chamber can be seen as a floating structure inside the device body which is attached to this body only at one of its ends.

[0015] According to some embodiments, the mounting zone is engaged with the support by means of two protruding parts,

[0016] Thanks to these features, the heating chamber can be solidary attached to the support.

[0017] According to some embodiments, the mounting zone is engaged with the support by means of only two protruding parts engaged with two respective pins.

[0018] Thanks to these features, the number of contact points between the heating chamber and the device body can be minimized. Thus, heat transfer from the heating chamber to the device body can further be decreased.

[0019] According to some embodiments, the or each protruding part is engaged with a pin.

[0020] The or each pin can be formed either by the mounting zone of the heating chamber or by the support of the device body. Respectively, the or each protruding part can be formed either by the support of the device body or the mounting zone of the heating chamber.

[0021] The or each pin can have a thin cylindrical shape that minimizes its contact surface with the corresponding protruding part while ensuring a secure fixation. Thus, heat transfer between the pin and the corresponding protruding part can be minimized. Additionally, since each protruding part protrudes from the corresponding surface of the support or the mounting zone, heat transfer toward this surface can also be minimized.

[0022] According to some embodiments, the or each protruding part comprises a mounting ear configured to receive the corresponding pin.

[0023] A mounting ear presents a particularly advantageous

structure to be engaged with a pin. Particularly, the mounting ear can define a central hole having a lateral opening. The pin can be engaged laterally inside the central hole using the lateral opening. Thus, the heating chamber can be easily fixed to the device body. Additionally, the mounting ear structure can be configured to easily disengage the pin and detach the heating chamber from the device body. Additionally, contact surface between a mounting ear and a pin can be minimized while ensuring a secure fixation. Thus, heat transfer from the heating chamber to the device body can further be minimized.

[0024] According to some embodiments, the mounting zone of the heating chamber forms said protruding part(s) and the support of the device body forms said pin(s).

[0025] This respective arrangement of the pin(s) and the protruding part(s) is particularly advantageous since the protruding part(s) can be arranged outwardly in respect with an external surface of the heating chamber and the pin(s) can be easily arranged inside the device body to be engaged with the corresponding protruding part(s).

[0026] According to some embodiments, the aerosol generating device further comprises an airflow channel, the airflow channel comprising an upstream part extending through the mounting zone and a downstream part designed to extend through the aerosol generating article when it is inserted into the heating chamber.

[0027] Thanks to these features, fresh air aspired for the exterior of the aerosol generating device can cool the mounting zone before being heated by the heating chamber in the downstream part of the airflow channel. Since the mounting zone is permanently cooled while the aerosol generating device is operating to generate aerosol, heat transfer between the heating chamber and the device body can further be minimized.

[0028] For this purpose, for example, the airflow channel can form one or several air inlets in the vicinity of the mounting zone. The upstream part of the airflow channel can be formed by one or several branches extending between said one or several air inlets until a closed end of the heating chamber. The upstream part can extend at least partially interior and/or exterior to the heating chamber. The downstream part of the flow channel can extend from the closed end of the heating chamber and then, through the aerosol generating article before achieving the user's lips or mouth.

[0029] According to some embodiments, the aerosol generating device further comprises a mouthpiece mounted on the open end of the device body, and a seal arranged between the mounting zone and the mouthpiece.

[0030] Thanks to these features, it is possible to avoid leakages between an edge of the mouthpiece and the heating chamber. Additionally, the seal provides a thermal break between the heating chamber and the mouthpiece minimizing thus heat transfer from the heating chamber to the mouthpiece. The seal can be made of

silicone for example.

[0031] According to some embodiments, the mouthpiece is fixed to the device body using fixing means, advantageously magnetic fixing means.

[0032] Thanks to these features, the mouthpiece can be securely attached to the device body. Additionally, using these fixing means, the mouthpiece can exert pressure toward the heating chamber to secure its fixation inside the device body. The pressure can for example be exerted through the seal provided between the mouthpiece and the heating chamber.

[0033] According to some embodiments, the mouthpiece comprises:

- a support part extending substantially perpendicularly to the device axis and mounted on the open end of the device body; and
- a contact part extending along the device axis and designed to be in contact with user's lips or mouth.

[0034] The seal can for example be provided under the support part of the mouthpiece and can extend along a periphery of the opening formed by the heating chamber. Additionally, when the upstream part of the airflow channel extends through the mounting zone of the heating chamber, the air inlet(s) can be arranged on the support part of the mouthpiece.

[0035] According to some embodiments, a thermal break is provided between the support part and the contact part of the mouthpiece.

[0036] This thermal break can for example be formed by a groove extending between the support part and the contact part, for example around a central hole of the mouthpiece. Thanks to this thermal break, heat transfer of the support part which is arranged closer to the heating chamber than the contact part, can be minimized.

[0037] According to some embodiments, the mouthpiece further comprises a holding part designed to hold at least a part of the aerosol generating article inside the heating chamber.

[0038] The holding part can for example be configured to hold a mouthpiece portion of the aerosol generating article. In some embodiments, before inserting the aerosol generating device in the heating chamber, the mouthpiece is unmounted and the mouthpiece portion of the aerosol generating article is inserted inside the mouthpiece. Then, the mouthpiece together with the aerosol generating article can be mounted on the device and the corresponding part of the aerosol generating article can be inserted inside the heating chamber. This part of the tobacco generating article can be at least partially in contact with walls of the heating chamber and/or form a gap with at least some of these walls.

[0039] According to some embodiments, an air gap is formed between walls of the heating chamber in the mounting zone and the holding part of the mouthpiece.

[0040] Thanks to these features, the mouthpiece can be further thermally isolated from the walls of the heating

chamber and heat transfer from the heating chamber to the mouthpiece can further be minimized. To form this air gap, the heating chamber can present an enlarged section near its open end.

[0041] According to some embodiments, the contact part of the mouthpiece presents a cross-section narrowing from the support part.

[0042] This decreases the thermal mass of the mouthpiece and as a consequence, undesired heat absorption by the mouthpiece. Additionally, this ensures an ergonomic shape of the mouthpiece to enable a better contact of the user's lips or mouth with the mouthpiece.

[0043] According to some embodiments, the heating chamber further comprises a thermal insulator arranged between the heating zone and the mounting zone.

[0044] Such thermal insulator can for example be arranged on an external surface of the heating chamber. Its shape, size and dimensions can be adapted to different respective examples of arrangement of the heating and mounting zones. This thermal insulator can be formed by vacuum or an air chamber, a sheet(s), powders, etc., and can comprise various materials such superwool, aerogel, etc.

[0045] In some embodiments, a thermal insulator can be provided between the heating chamber and an internal surface of walls forming the device body. This thermal insulator can be formed by vacuum or an air chamber, a sheet(s), powders, etc., and can comprise various materials such superwool, aerogel, etc.

[0046] According to some embodiments, the heating chamber further comprises at least one heating surface arranged adjacent to the heating zone, the heating surface comprising a pair of contacts.

[0047] In some embodiments, the heating surface can be formed by a plate made at least partially from ceramics comprising heating circuit passing through the plate. The heating circuits are connected to a battery of the device with said pair of contacts. In some other embodiments, the heating surface is formed by a flexible film attached for example to a plate forming a wall of the heating chamber. According to still another embodiment, a long strip of flexible heater comprising two separate track patterns is wound around the heating chamber so those two patterns form at least one or several heating surfaces.

[0048] Advantageously, the heating chamber and the aerosol generating article form a flat shape.

[0049] By "flat shape" of the heating chamber or of the aerosol generating article, it is understood that it extends between two first parallel longitudinal planes and two second parallel longitudinal planes perpendicular to the first parallel longitudinal planes, the distance between the second parallel longitudinal planes being at least 3 times, advantageously 5 times and preferably 10 times, greater than the distance between the first parallel longitudinal planes.

[0050] According to some embodiments, the two protruding parts presenting for example mounting ears are arranged opposite to each other in a central plane ar-

ranged between the first parallel longitudinal planes at equal distances, said first parallel longitudinal planes delimiting the flat shape of the heating chamber. In other words, the central plane is arranged parallel to the first longitudinal planes. The central plane forms for example a plane of symmetry of the heating chamber.

[0051] Such arrangement of the protruding parts is particularly advantageous for the heating chamber having a flat-shape. Providing with the arrangement of the protruding parts, the heating chamber can be securely attached inside the device body while ensuring a flat and an ergonomic shape of the device body.

BRIEF DESCRIPTION OF THE DRAWINGS

[0052] The invention and its advantages will be better understood upon reading the following description, which is given by way of non-limiting example and which is made with reference to the appended drawings, in which:

- Figure 1 is a perspective view of an aerosol generating assembly, the aerosol generating assembly comprising an aerosol generating device according to the invention and an aerosol generating article usable with the aerosol generating device;
- Figure 2 is a perspective view of the aerosol generating article of Figure 1;
- Figure 3 is a partial cross-sectional view of the aerosol generating assembly of Figure 1 according to plane III;
- Figure 4 is a partial cross-sectional view of the aerosol generating assembly of Figure 1 according to plane IV;
- Figure 5 is a schematic view of an airflow channel extending inside the aerosol generating assembly of Figure 1; and
- Figure 6 is a schematic view of a heating surface arranged inside the aerosol generating device of Figure 1.

DETAILED DESCRIPTION OF THE INVENTION

[0053] Before describing the invention, it is to be understood that it is not limited to the details of construction set forth in the following description. It will be apparent to those skilled in the art having the benefit of the present disclosure that the invention is capable of other embodiments and of being practiced or being carried out in various ways.

[0054] The expression "**substantially equal to**" is understood hereinafter as an equality at plus or minus 10% and preferably at plus or minus 5%.

[0055] As used herein, the term "**aerosol generating**

device" or "**device**" may include a vaping device to deliver an aerosol to a user, including an aerosol for vaping, by means of a heater element explained in further detail below. The device may be portable. "Portable" may refer to the device being for use when held by a user. The device may be adapted to generate a variable amount of aerosol, e.g. by activating the heater element for a variable amount of time (as opposed to a metered dose of aerosol), which can be controlled by a trigger. The trigger may be user activated, such as a vaping button and/or inhalation sensor. The inhalation sensor may be sensitive to the strength of inhalation as well as the duration of inhalation to enable a variable amount of vapour to be provided (so as to mimic the effect of smoking a conventional combustible smoking article such as a cigarette, cigar or pipe, etc.). The device may include a temperature regulation control to drive the temperature of the heater and/or the heated aerosol generating substance (aerosol pre-cursor) to a specified target temperature and thereafter to maintain the temperature at the target temperature that enables efficient generation of aerosol.

[0056] As used herein, the term "**aerosol**" may include a suspension of vaporizable material as one or more of: solid particles; liquid droplets; gas. Said suspension may be in a gas including air. Aerosol herein may generally refer to/include a vapour. Aerosol may include one or more components of the vaporizable material.

[0057] As used herein, the term "**vaporizable material**" or "**precursor**" may refer to a smokable material which may for example comprise nicotine or tobacco and an aerosol former. Tobacco may take the form of various materials such as shredded tobacco, granulated tobacco, tobacco leaf and/or reconstituted tobacco. Suitable aerosol formers include: a polyol such as sorbitol, glycerol, and glycols like propylene glycol or triethylene glycol; a non-polyol such as monohydric alcohols, acids such as lactic acid, glycerol derivatives, esters such as triacetin, triethylene glycol diacetate, triethyl citrate, glycerin or vegetable glycerin. In some embodiments, the aerosol generating agent may be glycerol, propylene glycol, or a mixture of glycerol and propylene glycol. The substrate may also comprise at least one of a gelling agent, a binding agent, a stabilizing agent, and a humectant.

[0058] Figure 1 shows an aerosol generating assembly 10 comprising an aerosol generating device 11 and an aerosol generating article 12, also called tobacco article 12. The aerosol generating device 11 is intended to operate with the tobacco article 12 which is shown in more detail in Figure 2.

[0059] In the example of this Figure 2, the tobacco article 12 is a flat-shaped tobacco article presenting for example a flat-shaped cuboid extending along an article axis X and having external dimensions LxWxD. In a typical example, the length L of the article 12 according to the article axis X equals substantially to 33 mm while its width W and depth D are substantially equal respectively

to 12 mm and 1,2 mm. According to different examples, the values L, W and D can be selected within a range of +/- 40%, for example. The depth D of the tobacco article 12 is formed by a pair of parallel walls 13A, 13B, called hereinafter narrow walls 13A, 13B, and the width W of the tobacco article 12 is formed by a pair of parallel walls 14A, 14B, called hereinafter wide walls 14A, 14B. In some embodiments, the edges between the wide and narrow walls 13A, 13B, 14A, 14B can be rounded. According to other embodiments of the invention, the tobacco article 12 can have any other suitable flat shape and/or external dimensions. According to still other embodiments, the tobacco article 12 can present any other suitable shape, as for example a stick shape, having substantially circular or oval cross-section.

[0060] The tobacco article 12 comprises a tobacco portion 15 and a mouthpiece portion 16 arranged along the article axis X. The tobacco portion 15 may for example be slightly longer than the mouthpiece portion 16. For example, the length L2 of the tobacco portion 15 according to the article axis X may be substantially equal to 18 mm. The width W2 of the tobacco portion 15 is substantially equal to the width W of the tobacco article 12. The length L3 of the mouthpiece portion 16 according to the article axis X may be substantially equal to 15 mm. As in the previous case, the values L2 and L3 can be selected within a range of +/- 40%, for example. The tobacco portion 15 defines an abutting end 18 of the article 12 and the mouthpiece portion 16 defines a mouth end 20 of the article 12. The tobacco portion 15 and the mouthpiece portion 16 may be fixed one to the other by a wrapper 21 extending around the substrate axis X. The wrapper 21 forms the narrow and wide walls 13A, 13B, 14A, 14B of the tobacco article 12. In some embodiments, the wrapper 21 is formed from a same wrapping sheet. In some other embodiments, the wrapper 21 is formed by separate wrapping sheets wrapping separately the portions 15, 16 and fixed one to the other by any other suitable mean. The wrapper 21 may, for example, comprise paper and/or non-woven fabric and/or aluminium foil. The wrapper 21 may be porous or air impermeable and forms a plurality of airflow channels extending inside the article 12 between the abutting end 18 and the mouth end 20.

[0061] The mouthpiece portion 16 comprises a core 27 intended to act for example as a cooler to cool slightly the vapour before it is inhaled by the user. The core 27 may comprise for this purpose for example corrugated paper. The core 27 may be formed through an extrusion and/or rolling process into a stable shape. Advantageously, the core 27 is arranged inside the mouthpiece portion 16 to be entirely in contact with the internal surface of the wrapper 21 delimiting this mouthpiece portion 16. Additionally or alternatively, the core 27 acts as a filter.

[0062] The tobacco portion 15 comprises a vaporizable material and is intended to be heated by a heating chamber, as it will be explained in further detail below.

[0063] Referring again to Figure 1, the aerosol gener-

ating device 11 comprises a device body 40 extending along a device axis Y between an open end 41 and a closed end 42. The aerosol generating device 11 further comprises a mouthpiece 43 mounted on the open end 41 of the device body 40. According to the example described below, the mouthpiece 43 and the device body 40 form two different pieces. Particularly, according to this example, the mouthpiece 43 is designed to be fixed on a support 44 defined by the open end 41 of the device body 40, as it is shown in Figure 3. The support 44 defines for example a wall extending perpendicularly to the device axis Y and defining in its centre an opening to the heating chamber as it will be explained in further detail below. The support 44 may particularly extend inwardly from lateral walls forming the device body 40.

[0064] Referring to Figure 3, the mouthpiece 43 comprises a contact part 46, a support part 47 and a holding part 48. These parts 46 to 48 are arranged successively according to the device axis Y and define a central hole 49 extending through each of these parts 46 to 48. The contact part 46 and the holding part 48 protrude from different sides of the support part 47, according to the device axis Y.

[0065] The support part 47 of the mouthpiece 43 forms for example a collar covering partially the open end 41 of the device body 40. The collar defines an external surface extending for example substantially perpendicularly to the device axis Y and an internal surface opposite to the external surface and facing the open end 41 of the device body 40. The support part 47 is designed to be fixed on the support 44 of the device body 40 using any suitable fixing means 51. In the example of Figure 3, the fixing means 51 comprise a first magnetic element arranged at the periphery of the support 44 and a second magnetic element arranged for example on the internal surface of the support part 47 of the mouthpiece 43. At least one of the first and the second magnetic elements comprises for example a permanent magnet whereas the other element comprises a permanent magnet of opposed polarity and/or a ferromagnetic material. It is clear that the fixing means 51 can have any other appropriate structure suitable to fix the mouthpiece 43 to the device body 40.

[0066] The contact part 46 of the mouthpiece 43 is designed to be in contact with the user's lips and/or mouth. For this purpose, it can form an appropriate ergonomic shape. Advantageously, the contact part 46 has a narrowing shape from the support part 47 toward its top surface, along the device axis Y. For example, the contact part 46 can have a shape of truncated cone. On its top surface, the contact part 46 forms an air outlet extending the central hole 49 and adapted to deliver aerosol formed in the heating chamber as it will be explained in further detail below. Advantageously, as it can be seen in Figure 3, a thermal break 53 is formed between the contact part 46 and the support part 47 of the mouthpiece 43. The thermal break 53 is formed for example by a groove extending around the central hole 49 and formed in a con-

nection zone between the support part 47 and the contact part 46 of the mouthpiece 43. The thermal break 53 minimizes the contact area and/or connection part between the contact part 46 and the support part 47 of the mouthpiece 43.

[0067] The holding part 48 is designed to hold at least a part of the tobacco article 12 inside the heating chamber 60, as it is shown in Figure 3. Particularly, the holding part 48 is designed to receive in the central hole 49 at least a part of the mouthpiece portion 16 of the tobacco article 12, as it is shown in Figure 3. For this purpose, at least inside the holding part 48, the cross-section of the central hole 49 is complementary to the external shape of the mouthpiece portion 16 of the tobacco article 12. Particularly, in case of a flat-shape tobacco article 12, the central hole 49 has also a flat shape, advantageously a rectangular flat shape. Advantageously, as it is shown in Figure 3, the holding part 48 forms an air gap with walls of the heating chamber 60. For this purpose, the heating chamber 60 may define an enlarged section adjacent to an open end of the chamber 60. Particularly, this enlarged section has an enlarged cross-sectional shape in comparison with the cross-sectional shape of the part of the heating chamber 60 receiving the tobacco portion 15 of the tobacco article 12, i.e. in comparison with the part of the heating chamber 60 adjacent to its closed end.

[0068] The device body 40 delimits an internal space of the device 11 receiving various elements designed to carry out different functionalities of the device 11. This internal space can for example receive a battery for powering the device 11, a controller for controlling the operation of the device 11, a heating chamber 60 for heating the tobacco portion 15 of the tobacco article 12, etc. Among these elements, only the heating chamber 60 will be explained in further detail in reference to Figures 3 to 6.

[0069] Particularly, as it is shown in Figure 4, the heating chamber 60 defines a mounting zone 61 adapted to attach the heating chamber 60 to the device body 40 and a heating zone 62 adapted to heat the tobacco portion 15 of the tobacco article 12. Additionally, as it is shown in Figures 3 to 5, the mounting zone 61 is also adapted to receive at least partially the mouthpiece portion 16 of the tobacco article 12. In the preferred example, the heating chamber 60 has a flat shape. Particularly, as the tobacco article 12, the heating chamber 60 may also form a cuboid shape extending along the device axis Y and comprising a pair of parallel narrow walls 63A, 63B (shown in Figure 4) extending along the device axis Y, a pair of parallel wide walls 64A, 64B (partially shown in Figure 3) extending also along the device axis Y and a bottom wall 68 adjacent to each of said walls and extending perpendicularly to the device axis Y.

[0070] The bottom wall 68 forms thus a closed end of the chamber 60. The heating zone 62 of the heating chamber 60 is adjacent to the closed end of the heating chamber 60. Opposite to the bottom wall 58, the heating chamber 60 defines an open end configured to receive the tobacco article 12 so as the corresponding wide walls

14A, 14B of the tobacco article 12 face the corresponding wide walls 64A, 64B of the heating chamber 60, the corresponding narrow walls 13A, 13B of the tobacco article 12 face the corresponding narrow walls 63A, 63B of the heating chamber 60 and the abutting end 18 of the tobacco article 12 abuts against the bottom wall 68 or at least a rib extending from this bottom wall 68. Alternatively, the abutting end 18 faces the bottom wall 68 without being in contact with it. The flat-shaped heating chamber 60 is thus configured to receive the tobacco article 12 so as the narrow wall 13A (respectively 13B) of the tobacco article 12 faces the narrow wall 63B (respectively 63A) of the heating chamber 60, and the wide wall 14A (respectively 14B) of the tobacco article 12 faces the wide wall 64B (respectively 64A) of the heating chamber 60. The facing wide walls 14A, 14B, 64A, 64B and the facing narrow walls 13A, 13B, 63A, 63B can be at least partially in contact one with the other or spaced one from the other. In the preferred example, the facing narrow walls 13A, 13B, 63A, 63B form a gap between them suitable for conducting an airflow, as it will be explained in further detail below. The mounting zone 61 of the heating chamber 60 is adjacent to the open end of the heating chamber 60.

[0071] The narrow walls 63A, 63B and/or the wide walls 64A, 64B are shaped to form the enlarged section of the heating chamber 60 as explained above. For this purpose, the narrow walls 63A, 63B and/or the wide walls 64A, 64B can extend substantially parallel between them with a first distance d1 (respectfully D1) through the heating zone 62 of the heating chamber 60, then form a shoulder section enlarging this distance d1 (respectfully D1) to a distance d2 (respectfully D2) and then extend parallel between them with the distance d2 (respectfully D2) through the mounting zone 61 of the heating chamber 60. Thus, the enlarged section can substantially correspond to the mounting zone 61 of the heating chamber 60.

[0072] The heating chamber 60 together with the device body 40 and the mouthpiece 43 defines an airflow channel 70 passing through the device 11 and the tobacco article 12 between one or several air inlets 71 until an air outlet 72 extending the central hole 49 as explained above. Particularly, as it is shown in Figure 5, the airflow channel 70 comprises an upstream part extending between the air inlets 71 and the closed end of the heating chamber 60, and a downstream part extending between the closed end of the heating chamber 60 and the air outlet 72. The downstream part extends advantageously through both tobacco and mouthpiece portions 15, 16 of the tobacco article 12. It can also extend through the central hole 49 formed by the mouthpiece 43. The upstream part extends advantageously through the mouthpiece 43 and then inside the heating chamber 60, advantageously through the mounting zone 61 and the gaps formed between the facing narrow walls 13A, 13B, 63A, 63B, before achieving the closed end of the heating chamber 60. At the closed end, the upstream part of the

airflow channel turns at substantially 180° to join the downstream part. According to other embodiments, the upstream part of the airflow channel 70 passes entirely outside the heating chamber 60 and joins the downstream part for example through holes formed at the closed end of the heating chamber 60.

[0073] As it is shown in Figure 5, the air inlets 71 can be formed on the external surface of the support part 47 of the mouthpiece 43. Particularly, these air inlets 71 can be formed by holes extending through the support part 47 of the mouthpiece 43 and opening to the enlarged section of the heating chamber 60. For this purpose, the holes inside the support part 47 can for example be inclined in respect with the device axis Y. Advantageously, the support part 47 defines two holes forming the air inlets 71 on different sides of the contact part 46 having an elongated shape.

[0074] Advantageously, the mounting zone 61 forms the unique attaching zone of the heating chamber 60 to the device body 40. For this purpose, the mounting zone 61 comprises a pair of protruding parts 80A, 80B extending outwardly from the narrow walls 63A, 63B of the heating chamber 60 as it is shown in Figure 4. Each protruding part 80A, 80B is configured to be engaged with a pin 82A, 82B fixed to the device body 40. Particularly, each pin 82A, 82B can extend perpendicularly to the device axis Y, for example perpendicularly to a plane parallel to the wide walls 64A, 64B of the heating chamber 60. Each protruding part 80A, 80B can form a mounting ear defining a lateral opening configured to receive the corresponding pin 82A, 82B to attach the heating chamber 60. Thus, each mounting ear extends partially around the corresponding pin 82A, 82B, for example according to an angle comprised between 180° and 270°.

[0075] According to some embodiments, the heating chamber 60 further comprises a thermal insulator arranged between the heating zone 62 and the mounting zone 61 for example on the external surface of the walls 63A, 63B, 64A, 64B delimiting the heating chamber 60. Such thermal insulator can for example comprise super-wool or aerogel. Alternatively, this thermal insulator can be formed by vacuum or an air chamber, a sheet(s), powders, etc.

[0076] Referring to Figure 6, the heating chamber 60 further comprises at least one heating surface 90 forming at least partially one of the wide walls 64A, 64B of the heating chamber 60. Preferably, the heating chamber 60 comprised two heating surfaces 90 (only one is visible in Figure 6) forming at least partially the opposite wide walls 64A, 64B of the heating chamber 60. Particularly, each heating surface 90 is designed to be in contact with or face the tobacco portion 15 of the tobacco article 12, in the heating zone 62 of the heating chamber 60. Advantageously, each heating surface 90 extends according to the whole area of the heating zone 62 in projection on a plane parallel to each of the wide walls 64A, 64B. In other words, the length of each heating surface 90 according to the device axis Y is at least equal to length L2

of the tobacco portion 15 and the width of each heating surface 90 is at least equal to the width W2 of the tobacco portion 15.

[0077] The or each heating surface 90 can be formed by a plate forming the corresponding wide wall 64A, 64B of the heating chamber 60. According to another embodiment, the or each heating surface 90 is formed by a flexible film attached for example to a plate forming the corresponding wall 64A, 64B of the heating chamber 60. According to still another embodiment, the or each heating surface 90 is formed by a long strip of flexible heater comprising two separate track patterns and wound around the heating chamber 90.

[0078] Each heating surface 90 comprises a pair of contacts 92 connected to the battery of the device and heating circuits 94 extending between the contacts along the whole heating surface 90.

[0079] In some embodiments, the aerosol generating device 11 further comprises a seal 95 arranged between the mounting zone 61 of the heating chamber 60 and the mouthpiece 43. The seal 95 can have an oval or rectangular shape and extend at the periphery of the opening formed by the opened end of the heating chamber 60. The seal 95 is advantageously arranged between a rib extending from the internal surface of the support part 47 and a protrusion extending outwardly from the walls 63A, 63B, 64A, 64B delimiting the heating chamber 60, in the mounting zone 61. This protrusion can include the protruding parts 80A, 80B explained above. The fixing means 51 of the mouthpiece 43 can be adapted to exert pressure to the seal 95 to fix securely the heating chamber 60 inside the device body 40.

Claims

1. An aerosol generating device (11) comprising a device body (40) and a heating chamber (60) configured to receive at least partially an aerosol generating article (12);

the device body (40) extending along a device axis (Y) between an open end (41) and a closed end (42), the open end (41) defining a support (44);

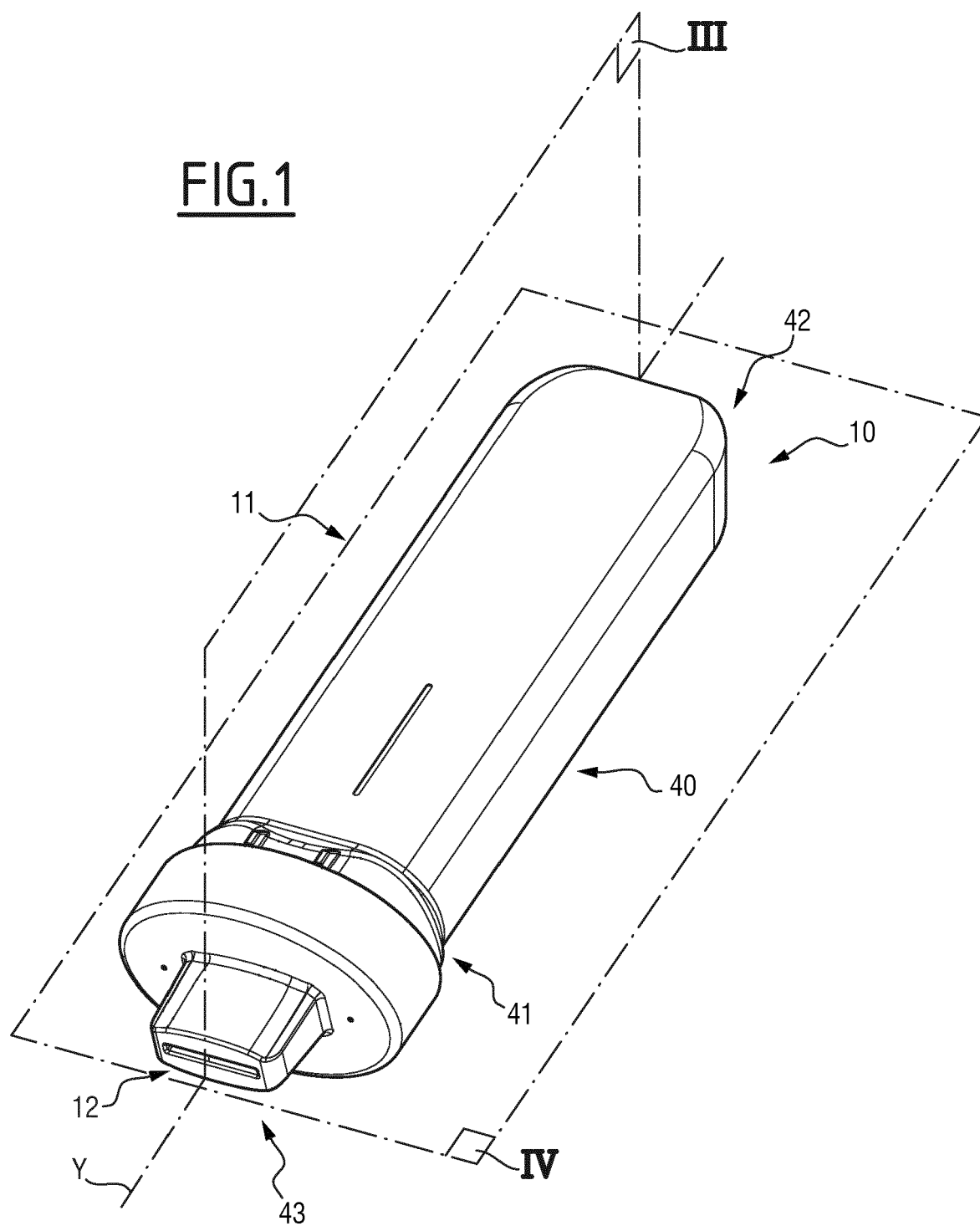
the heating chamber (60) extending along the device axis (Y) and comprising a heating zone (62) adapted to heat at least a part of the aerosol generating article (12) and a mounting zone (61) arranged successively with the heating zone (62) along the device axis (Y);

wherein the mounting zone (61) is engaged with the support (44) to form an attaching zone of the heating chamber (60) to the device body (40), said attaching zone being the only attaching zone of the heating chamber (60) to the device body (40);

wherein the mounting zone (61) is engaged with

- the support (44) by means of at least one protruding part (80A, 80B);
 wherein the heating chamber (60) forms a flat shape extending between two first parallel longitudinal planes; and
 wherein said at least one protruding part (80A, 80B) extends according to a central plane arranged between the first parallel longitudinal planes.
2. The aerosol generating device (11) according to claim 1, wherein the mounting zone (61) and the heating zone (62) form opposite ends of the heating chamber (60).
 3. The aerosol generating device (11) according to claim 1 or 2, wherein the mounting zone (61) is engaged with the support (44) by means of two protruding parts (80A, 80B), advantageously by means of only two protruding parts (80A, 80B).
 4. The aerosol generating device (11) according to any of the preceding claims, wherein the or each protruding part (80A, 80B) is engaged with a pin (82A, 82B).
 5. The aerosol generating device (11) according to claim 4, wherein the or each protruding part (80A, 80B) comprises a mounting ear configured to receive the corresponding pin (82A, 82B).
 6. The aerosol generating device (11) according to claim 4 or 5, wherein:
 - the mounting zone (61) forms said protruding part(s) (80A, 80B);
 - the support (44) forms said pin(s) (82A, 82B).
 7. The aerosol generating device (11) according to any one of the preceding claims, further comprising an airflow channel (70), the airflow channel (70) comprising an upstream part (71) extending through the mounting zone (61) and a downstream part (72) designed to extend through the aerosol generating article (12) when it is inserted into the heating chamber (60).
 8. The aerosol generating device (11) according to any one of the preceding claims, further comprises a mouthpiece (43) mounted on the open end (41) of the device body (40), and a seal (95) arranged between the mounting zone (61) and the mouthpiece (43).
 9. The aerosol generating device (11) according to claim 8, wherein the mouthpiece (43) comprises:
 - a support part (47) extending substantially perpendicularly to the device axis (Y) and mounted
- on the open end (41) of the device body (40); and
 - a contact part (46) extending along the device axis (Y) and designed to be in contact with user's lips and/or mouth;
 - a thermal break (53) being provided between the support part (47) and the contact part (46) of the mouthpiece (43).
10. The aerosol generating device (11) according to claim 9, wherein the mouthpiece (43) further comprises a holding part (48) designed to hold at least a part of the aerosol generating article (12) inside the heating chamber (60).
 advantageously, an air gap is formed between walls of the heating chamber (60) in the mounting zone (61) and the holding part (48) of the mouthpiece (43).
 11. The aerosol generating device (11) according to any one of claims 9 to 10, wherein the contact part (46) of the mouthpiece (43) presents a cross-section narrowing from the support part (47).
 12. The aerosol generating device (11) according to any one of the preceding claims, wherein the heating chamber (60) further comprises a thermal insulator arranged between the heating zone (62) and the mounting zone (61).
 13. The aerosol generating device (11) according to any one of the preceding claims, wherein the heating chamber (60) further comprises at least one heating surface (90) arranged adjacent to the heating zone (62).
 14. The aerosol generating device (11) according to any one of the preceding claims, wherein the heating chamber (60) further extends between two second parallel longitudinal planes perpendicular to the first parallel longitudinal planes, the distance between the second parallel longitudinal planes being at least 3 times, advantageously 5 times and preferably 10 times, greater than the distance between the first parallel longitudinal planes;
 advantageously, the central plane is arranged between the first parallel longitudinal planes at equal distances.
 15. The aerosol generating device (11) according to claim 14 taken in combination with claim 3, wherein the two protruding parts (80A, 80B) are arranged opposite to each other in the central plane.

FIG.1



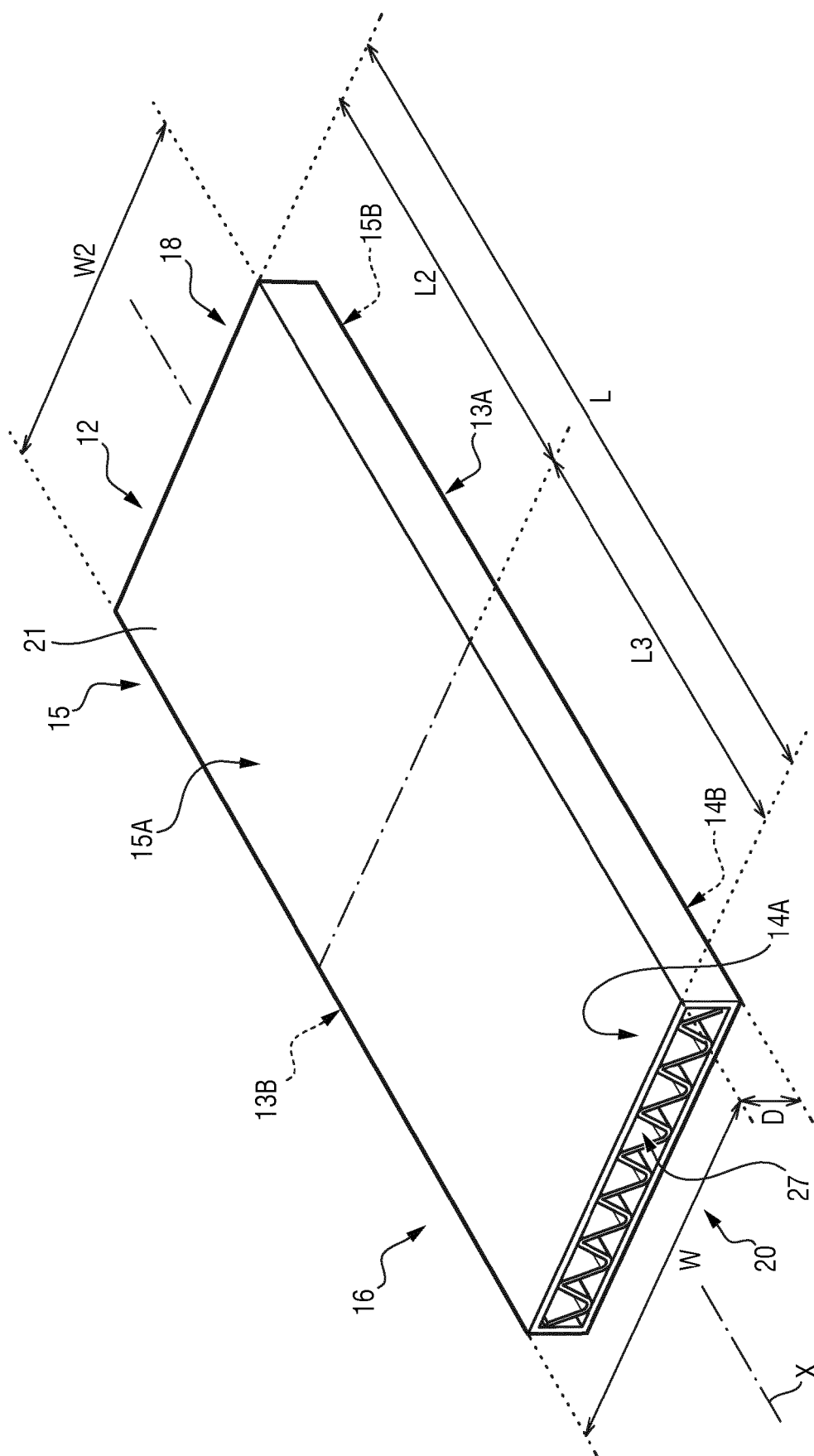


FIG. 2

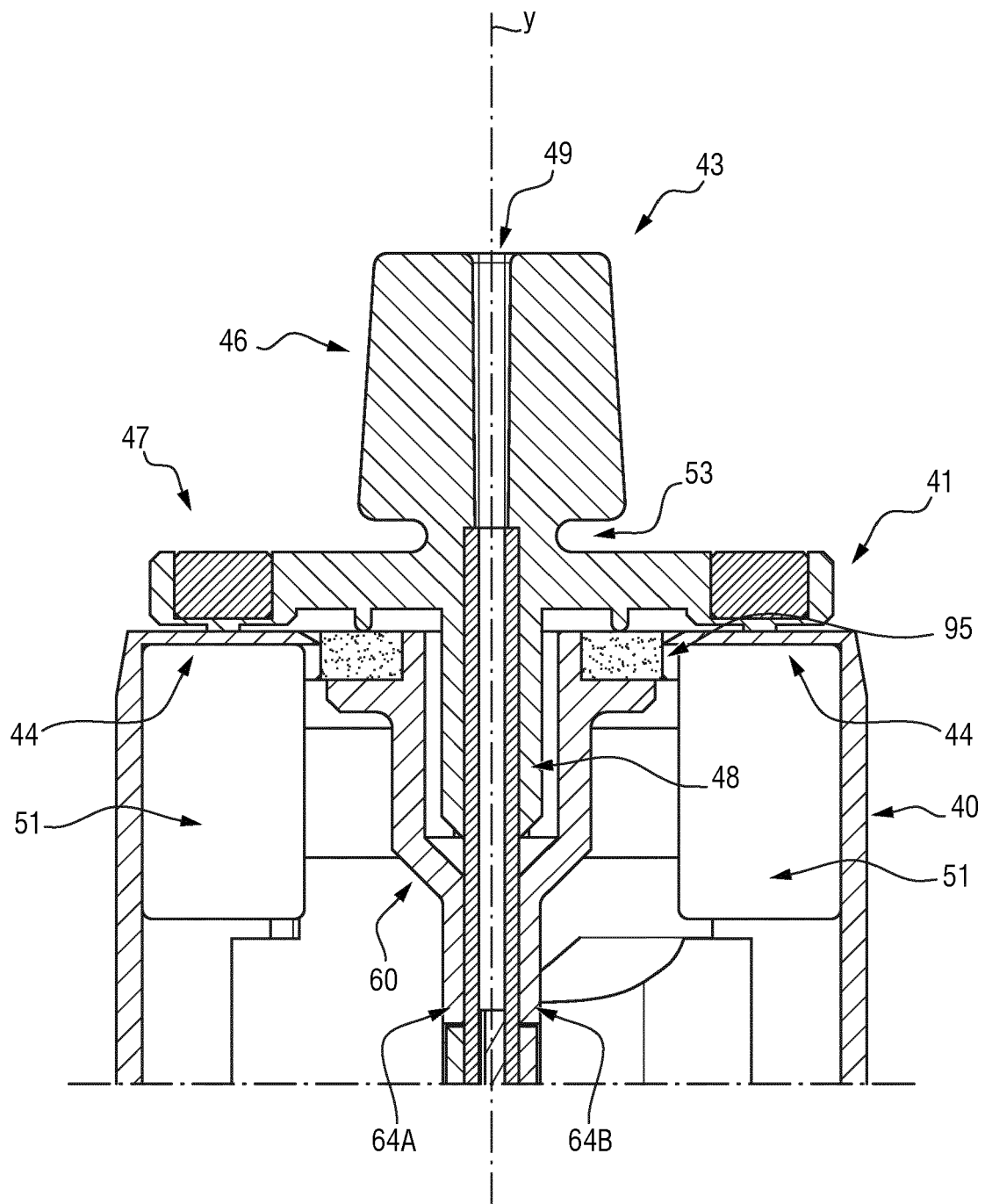


FIG.3

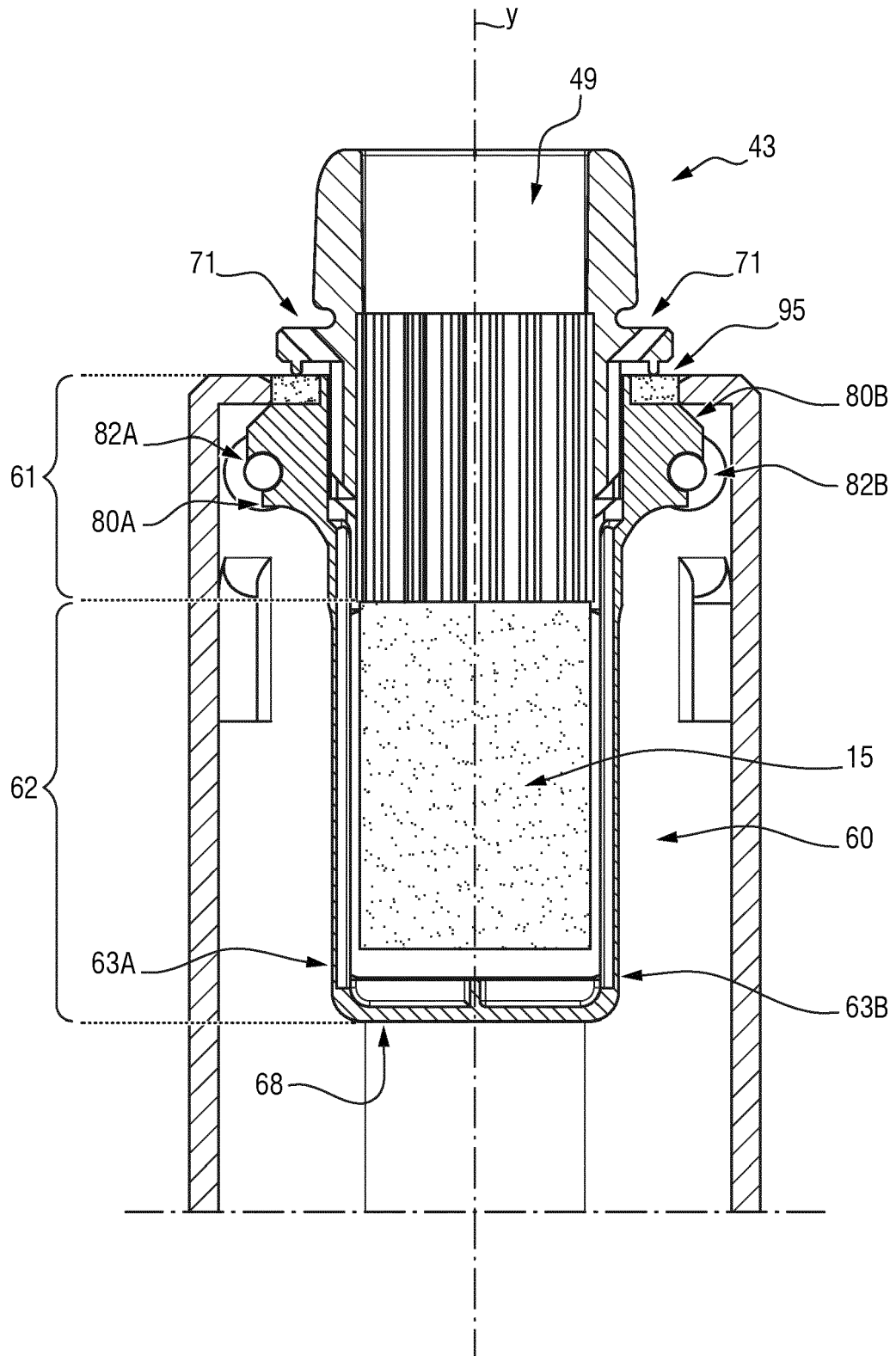


FIG.4

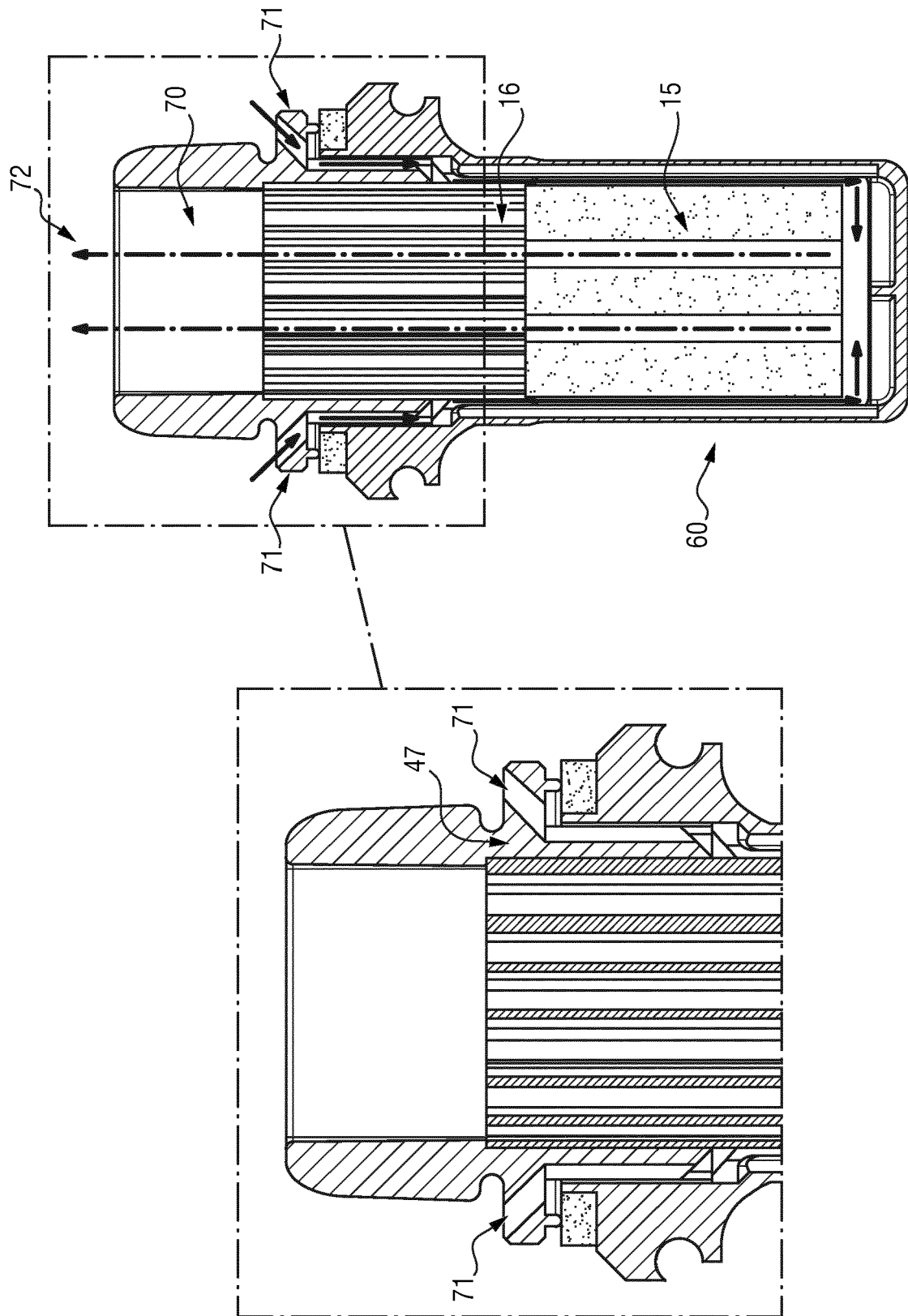


FIG. 5

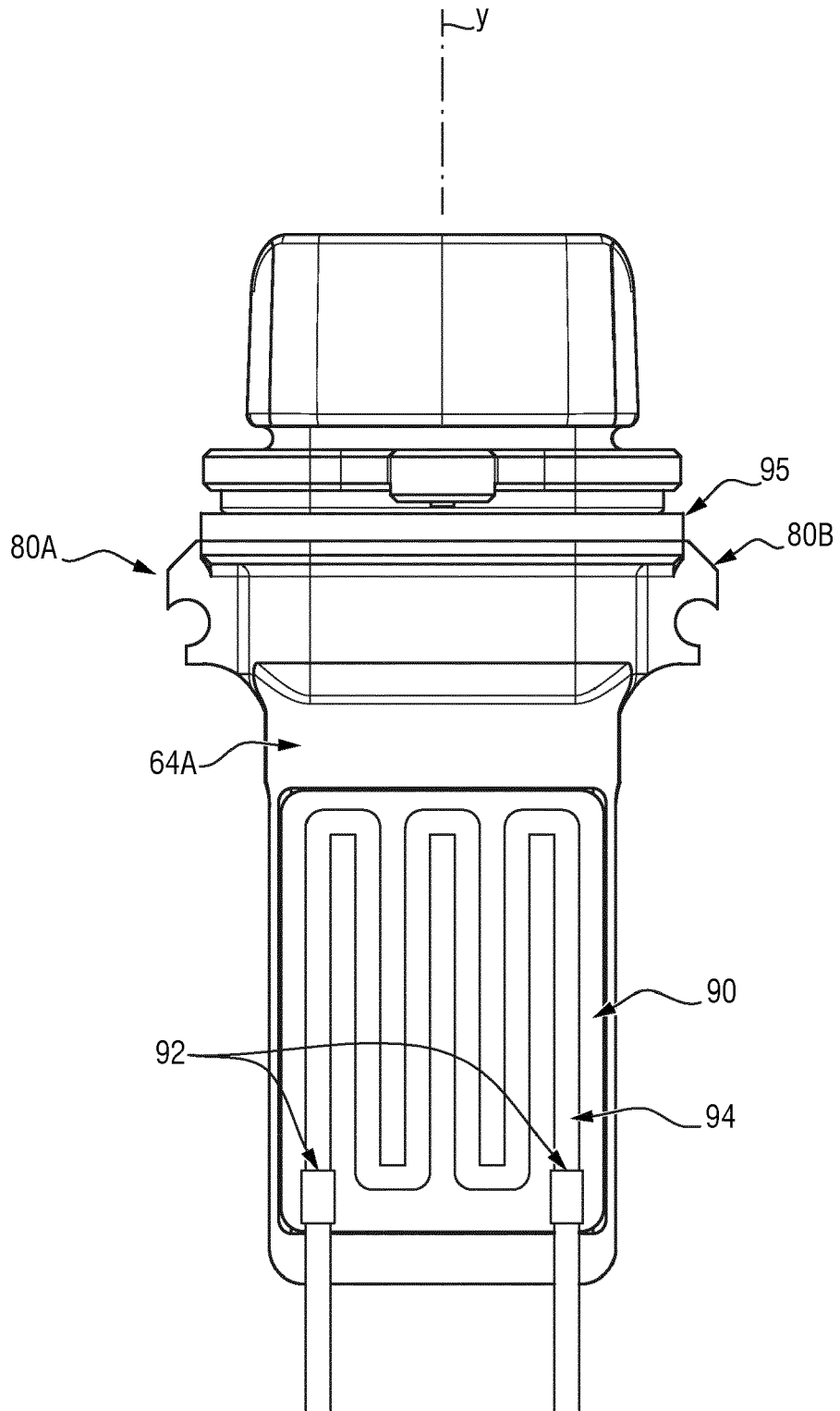


FIG. 6



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