



(51) International Patent Classification:

A24F 40/46 (2020.01) A24F 40/20 (2020.01)

(21) International Application Number:

PCT/EP2024/066669

(22) International Filing Date:

14 June 2024 (14.06.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

202310721914.6 16 June 2023 (16.06.2023) CN
2310319.5 05 July 2023 (05.07.2023) GB

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE,

(54) Title: AEROSOL PROVISION DEVICE

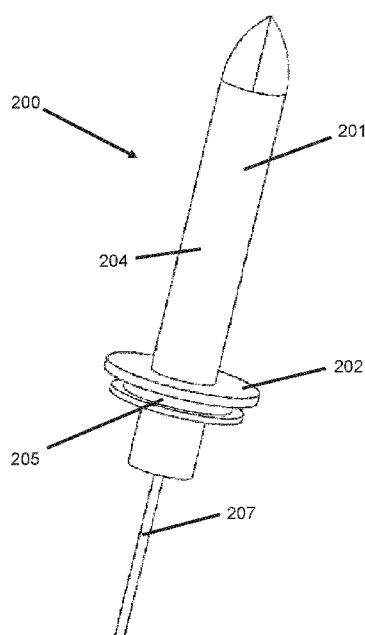


Fig. 2

(57) Abstract: There is provided an aerosol provision device (100). The aerosol provision device comprises a heater (200) and a base (300) supporting the heater. The heater comprises an elongate heater member (201) and an extension component (202), the extension component extending from the elongate heater member, the elongate heater member configured to produce heat to generate aerosol from aerosol generating material, and the base contacting the heater at the extension component, such that the extension component forms part of a heat conduction path between the elongate heater member and the base. There is also provided a method of manufacturing an aerosol provision device.



SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

AEROSOL PROVISION DEVICE

Technical Field

The present invention relates to a device for providing an aerosol, an aerosol provision system and a method of manufacturing a device.

5

Background

Smoking articles such as cigarettes, cigars and the like burn tobacco during use to create tobacco smoke. Attempts have been made to provide alternatives to these articles that burn tobacco by creating products that release compounds without burning. Examples of such products are heating devices which release compounds by heating, but not burning, the material. The material may be for example tobacco or other non-tobacco products, which may or may not contain nicotine.

Summary

In accordance with the first aspect, there is provided an aerosol provision device, the aerosol provision device comprising a heater and a base supporting the heater, the heater comprising an elongate heater member and an extension component, the extension component extending from the elongate heater member, the elongate heater member configured to produce heat to generate aerosol from aerosol generating material; and the base contacting the heater at the extension component, such that the extension component forms part of a heat conduction path between the elongate heater member and the base.

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The extension component may extend from the elongate heater member in a lateral direction.

The extension component may comprise a flange.

The extension component may be formed of metal or a metal alloy, optionally wherein the extension component is formed of steel.

25

The extension component may be fixed to the elongate heater member by welding.

The elongate heater member may comprise an outer shell, wherein the extension component is fixed to the outer shell.

The outer shell may be formed from metal or a metal alloy, optionally wherein the outer shell is formed of steel.

30

The elongate heater member may comprise a heater element, wherein the extension component is displaced from the heater element in a longitudinal direction.

The base may be formed of plastic, optionally wherein the base is formed of PEEK.

The extension component may be fixed to the base by insertion moulding.

An end face of the extension component may comprise a recess, wherein the base extends into the recess to fix the extension component to the base.

35

According to a second aspect, there is provided an aerosol provision system comprising the aerosol provision device of the first aspect, and an article comprising the aerosol generating material.

5 According to a third aspect, there is provided a method of manufacturing an aerosol provision device, the method comprising receiving a heater comprising an elongate heater member and an extension component, the extension component extending from the elongate heater member; receiving a base; and arranging the base with the heater such that the base supports the heater, the base contacting the heater at the extension component
10 such that the extension component forms part of a heat conduction path between the elongate heater member and the base.

Brief Description of the Drawings

Embodiments will now be described, by way of example only, and with reference to
15 the accompanying drawings in which:

Fig. 1 shows a perspective view of an aerosol provision system including an aerosol provision device located within a charging unit;

Fig. 2 shows a perspective view of a heater which forms part of the aerosol provision device;

20 Fig. 3 shows a schematic cross-sectional view of part of the heater;

Fig. 4 shows a perspective view of the heater fixed to a base;

Fig. 5 shows a schematic cross-sectional view of part of the heater and base shown;
and

25 Fig. 6 shows a schematic cross-sectional view of the heater and base shown with an outer cover.

Detailed Description

As used herein, the term "aerosol-generating material" is a material that is capable of generating aerosol, for example when heated, irradiated or energized in any other way.
30 Aerosol-generating material may, for example, be in the form of a solid, liquid or gel which may or may not contain an active substance and/or flavourants. Aerosol-generating material may include any plant based material, such as tobacco-containing material and may, for example, include one or more of tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco or tobacco substitutes. Aerosol-generating material also may include
35 other, non-tobacco, products, which, depending on the product, may or may not contain nicotine. Aerosol-generating material may for example be in the form of a solid, a liquid, a gel,

a wax or the like. Aerosol-generating material may for example also be a combination or a blend of materials. Aerosol-generating material may also be known as “smokable material”.

5 The aerosol-generating material may comprise a binder and an aerosol former. Optionally, an active and/or filler may also be present. Optionally, a solvent, such as water, is also present and one or more other components of the aerosol-generating material may or may not be soluble in the solvent. In some embodiments, the aerosol-generating material is substantially free from botanical material. In some embodiments, the aerosol-generating material is substantially tobacco free.

10 The aerosol-generating material may comprise or be an “amorphous solid”. The amorphous solid may be a “monolithic solid”. In some embodiments, the amorphous solid may be a dried gel. The amorphous solid is a solid material that may retain some fluid, such as liquid, within it. In some embodiments, the aerosol-generating material may, for example, comprise from about 50wt%, 60wt% or 70wt% of amorphous solid, to about 90wt%, 95wt% or 100wt% of amorphous solid.

15 The aerosol-generating material may comprise an aerosol-generating film. The aerosol-generating film may comprise or be a sheet, which may optionally be shredded to form a shredded sheet. The sheet may be a crimped sheet. The aerosol-generating sheet or shredded sheet may be substantially tobacco free.

20 According to the present disclosure, a “non-combustible” aerosol provision system is one where a constituent aerosol-generating material of the aerosol provision system (or component thereof) is not combusted or burned in order to facilitate delivery of at least one substance to a user.

In some embodiments, the delivery system is a non-combustible aerosol provision system, such as a powered non-combustible aerosol provision system.

25 In some embodiments, the non-combustible aerosol provision system is an electronic cigarette, also known as a vaping device or electronic nicotine delivery system (END), although it is noted that the presence of nicotine in the aerosol-generating material is not a requirement.

30 In some embodiments, the non-combustible aerosol provision system is an aerosol-generating material heating system, also known as a heat-not-burn system. An example of such a system is a tobacco heating system.

In some embodiments, the non-combustible aerosol provision system is a hybrid system to generate aerosol using a combination of aerosol-generating materials, one or a plurality of which may be heated. Each of the aerosol-generating materials may be, for

example, in the form of a solid, liquid or gel and may or may not contain nicotine. In some embodiments, the hybrid system comprises a liquid or gel aerosol-generating material and a solid aerosol-generating material. The solid aerosol-generating material may comprise, for example, tobacco or a non-tobacco product.

5 Typically, the non-combustible aerosol provision system may comprise a non-combustible aerosol provision device and an article, typically a consumable for use with the non-combustible aerosol provision device.

10 In some embodiments, the disclosure relates to consumables comprising aerosol-generating material and configured to be used with non-combustible aerosol provision devices. These consumables are sometimes referred to as articles throughout the disclosure.

15 In some embodiments, the non-combustible aerosol provision system, such as a non-combustible aerosol provision device thereof, may comprise a power source and a controller. The power source may, for example, be an electric power source or an exothermic power source. In some embodiments, the exothermic power source comprises a carbon substrate which may be energised so as to distribute power in the form of heat to an aerosol-generating material or to a heat transfer material in proximity to the exothermic power source.

In some embodiments, the non-combustible aerosol provision system may comprise an area for receiving the consumable, an aerosol generator, an aerosol generation area, a housing, a mouthpiece, a filter and/or an aerosol-modifying agent.

20 In some embodiments, the consumable for use with the non-combustible aerosol provision device may comprise aerosol-generating material, an aerosol-generating material storage area, an aerosol-generating material transfer component, an aerosol generator, an aerosol generation area, a housing, a wrapper, a filter, a mouthpiece, and/or an aerosol-modifying agent.

25 An aerosol generating device can receive an article comprising aerosol generating material for heating. An "article" in this context is a component that includes or contains in use the aerosol generating material, which is heated to volatilise the aerosol generating material, and optionally other components in use. A user may insert the article into the aerosol generating device before it is heated to produce an aerosol, which the user subsequently
30 inhales. The article may be, for example, of a predetermined or specific size that is configured to be placed within a heating chamber of the device which is sized to receive the article.

An aerosol generator is an apparatus configured to cause aerosol to be generated from the aerosol-generating material. In some embodiments, the aerosol generator is a heater configured to subject the aerosol-generating material to heat energy, so as to

release one or more volatiles from the aerosol-generating material to form an aerosol.

A consumable is an article comprising or consisting of aerosol-generating material, part or all of which is intended to be consumed during use by a user. A consumable may comprise one or more other components, such as an aerosol generating material storage
5 area, an aerosol-generating material transfer component, an aerosol generation area, a housing, a wrapper, a mouthpiece, a filter and/or an aerosol-modifying agent.

A consumable may also comprise an aerosol generator, such as a heater, that emits heat to cause the aerosol-generating material to generate aerosol in use. The heater may, for example, comprise combustible material, a material heatable by electrical conduction, or a
10 susceptor.

Figure 1 shows an aerosol provision system 10 comprising an aerosol provision device 100 and a charging unit 20. The device 100 is shown located within a cavity 21 of a charging unit 20. The cavity 21 has an open end 22 (also referred to as an opening). The charging unit embodiment of Figure 1 also comprises a longitudinal opening 23.

15 The aerosol provision device 100 is arranged to generate aerosol from an aerosol generating article (not shown) which may be inserted, in use, into the aerosol provision device 100. In embodiments, the article forms part of the aerosol provision system 10.

The aerosol provision device 100 is an elongate structure, extending along a longitudinal axis. The aerosol provision device 100 has a proximal end 100a, which will be closest to the user (e.g. the user's mouth) when in use by the user to inhale the aerosol
20 generated by the aerosol provision device 100, as well as a distal end 100b which will be furthest from the user when in use. The proximal end may also be referred to as the "mouth end". The aerosol provision device 100 also accordingly defines a proximal direction, which is directed towards the user when in use. Further, the aerosol provision device 100 also
25 likewise defines a distal direction, which is directed away from the user when in use. The terms proximal and distal as applied to features of the device 100 will be described by reference to the relative positioning of such features with respect to each other in a proximal-distal direction along a longitudinal axis. The aerosol provision device 100 comprises an opening at the proximal end 100a, leading into a receptacle. The receptacle may be a
30 heating chamber.

The aerosol provision device 100 may be removably inserted into the charging unit 20 in order to be charged. In the embodiment of Figure 1, the distal end 100b of aerosol provision device 100 is inserted into the cavity 21 via the opening 22.

A portion of the aerosol provision device 100 may comprise a first side 101. One or

more user-operable control elements 106, such as buttons, which can be used to operate the aerosol provision device 100 may be provided on the first side 101 of the aerosol provision device 100.

5 In embodiments the cavity of the charging unit 20 may have a cross-sectional profile which only permits that the aerosol provision device 100 be inserted into the charging unit 20 in a single orientation.

The charging unit 20 includes a slidable lid 25. When the aerosol provision device 100 is inserted into the charging unit 20 in order to be recharged, the slidable lid 25 may be closed so as to cover the opening into the aerosol provision device 100.

10 In other embodiments, the charging unit 20 may have an alternative lid configuration, such as a hinged or pivoted lid, or no lid may be provided.

The cavity 21 of the charging unit has a length that is substantially equal to or slightly greater than the length of the aerosol provision device 100 such that substantially the entire aerosol provision device 100 is received in the cavity of the charging unit. This means that
15 the device 100 is entirely enclosed within the cavity 21 and protected.

The charging unit 20 may include a user interface such as display 28, which can be provided at any convenient location, such as in the position shown in Figure 1.

With reference to Fig. 2 and Fig. 3, the aerosol provision device 100 comprises a heater 200. The heater 200 comprises an elongate heater member 201 and an extension
20 component 202.

The elongate heater member 201 is an elongate structure extending along a longitudinal axis. In the present embodiment, the elongate heater member 201 has a substantially cylindrical shape with a pointed tip at the proximal end closest to the user, forming an approximate pin shape. In alternative embodiments, the elongate heater member 201 may
25 take the form of a different elongate structure with a different cross-sectional shape, for example a blade.

The elongate heater member 201 comprises a heating element 203, a connecting wire 207 and an outer shell 204. The outer shell 204 is hollow and forms an external surface of the elongate heater member 201. The outer shell 204 surrounds the heating element 203. The
30 heating element 203 and connecting wire 207 are aligned with each other and both extend along the longitudinal axis at the centre of the elongate heater member 201. The heating element 203 and connecting wire 207 are electrically connected, wherein the connecting wire 207 provides power to the heating element 203 during use.

The distal end of the heating element 203 and the proximal end of the connecting wire 207 are displaced from the position of the extension component 202 along the elongate heater member 201 by a short distance in the longitudinal direction.

5 In some embodiments, the distal end of the heating element 203 and the proximal end of the connecting wire 207 may be approximately aligned with the position of the extension component 202 along the elongate heater member 201.

The elongate heater member 201 is configured to produce heat to generate aerosol from aerosol generating material. Aerosol generating material may be located in the aerosol forming article.

10 In the present embodiment, the outer shell 204 is formed of steel. In other embodiments, the outer shell 204 may be formed of a different metal or metal alloy.

Forming the outer shell 204 from a metal or metal alloy allows heat originating from the heating element 203 to be conducted efficiently into the aerosol forming article used in the device 100.

15 The extension component 202 extends from the elongate heater member 201 in a lateral direction. The extension component 202 extends around the circumference of the elongate heater member 201. The extension component 202 fully encircles the elongate heater member 201. The top face of the extension component 202 forms a circular ring shape.

20 The extension component is located at a position along the length of the elongate heater member 201, preferably closer to the distal end of the aerosol provision device 100 than the proximal end.

In the present embodiment, the extension component 202 comprises a flange 202.

In the present embodiment, the extension component 202 is formed of steel. In other embodiments, the extension component 202 may be formed of a different metal or metal alloy.

25 The extension component 202 is fixed to the elongate heater member 201 by welding, such that the extension component 202 is fixed to the outer shell 204. The extension component 202 and elongate heater member 201 are arranged such that a top face of the extension component 202 is approximately perpendicular to the longitudinal axis. The extension component 202 is displaced from the heating element 203 in a longitudinal direction.

30 The extension component 202 comprises a recess 205. The recess 205 is located in an end face of the extension component 202. The recess 205 comprises an axially symmetric opening in the end face of the extension component 202, wherein the opening faces in a lateral

direction. The recess 205 extends around the circumference of the extension component 202, such that it fully encircles the elongate heater member 201.

With reference to Fig. 4 and Fig. 5, the aerosol provision device 100 comprises the heater 200 and a base 300.

5 The base 300 is a substantially cylindrical shape, wherein the diameter of the base 300 is greater than the diameter of the elongate heater member 201. The base 300 is configured such that it can be connected to the aerosol provision device 100. For example, the base 300 may comprise fittings which allow it to be fixed to the outer cover 208 (see Fig. 6) and other components of the aerosol provision device 100. The base 300 may comprise
10 other cavities and protrusions on its outer surface, for example a trough configured to hold a sealant ring 206.

In the present embodiment, the base 300 is formed of PEEK (polyetheretherketone). In other embodiments, the base 300 may be formed of a different plastic or material.

The base 300 contacts the heater 200 at the extension component 202, such that the
15 base 300 supports the elongate heater member 201. The extension component 202 is fixed to the base 300 using insertion moulding. The base 300 extends into the recess 205 of the extension component 202 to support the heater 200. Insertion moulding may readily permit the base 300 to extend into the recess 205 in this way.

The base 300 and heater 200 are connected such that extension component 202 forms
20 part of a heat conduction path between the elongate heater member 201 and the base 300. In other words, thermal energy emitted from the elongate heater member 201 by conduction passes through the extension component 202 before being absorbed by the base 300. In the present example 300, the base 300 does not contact the outer shell 204 of the heater 200. The base 300 contacts the heater 200 only at the extension component 202.

25 By having the extension component 202 form part of the heat conduction path, the heat from the heating element 203 that reaches the base 300 is reduced, reducing the temperature reached by the base 300 in use. In some embodiments, the heating element 203 is configured to reach a temperature of 380°C when the device 100 is in use, which may be higher than the melting point of the material of the base 300. The temperature of the base 300
30 may be further reduced when an extension component 202 of particular dimensions is used. This is beneficial as overheating of the base 300 can lead to a number of issues, for example reducing the stability and general safety of the device 100.

With reference to Fig. 6, the base 300 and heater 200 may be surrounded by a cylindrical outer cover 208. The outer cover may form part of the heating chamber of the device 100, wherein the heater 200 upstands from the distal end of the heating chamber.

5 The outer cover 208 surrounds the circumference of the base 300. The outer cover 208 is attached to the base using, for example, catches located on the circumference of the base 300.

10 The elongate heater member 201 may be inserted into the distal end of an aerosol forming article (not shown in the figures) during use of the device 100. The aerosol forming article is received into the heating chamber, such that the outer cover 208 surrounds the circumference of the article.

By using an elongate shape such as a pin for the heater member 201, the aerosol forming article can be internally heated along a substantial portion of its length during use.

15 The various embodiments described herein are presented only to assist in understanding and teaching the claimed features. These embodiments are provided as a representative sample of embodiments only, and are not exhaustive and/or exclusive. It is to be understood that advantages, embodiments, examples, functions, features, structures, and/or other aspects described herein are not to be considered limitations on the scope of the invention as defined by the claims or limitations on equivalents to the claims, and that other embodiments may be utilised and modifications may be made without departing from
20 the scope of the claimed invention. Various embodiments of the invention may suitably comprise, consist of, or consist essentially of, appropriate combinations of the disclosed elements, components, features, parts, steps, means, etc, other than those specifically described herein. In addition, this disclosure may include other inventions not presently claimed, but which may be claimed in future.

25

CLAIMS

1. An aerosol provision device comprising:
a heater comprising an elongate heater member and an extension component, the extension component extending from the elongate heater member, the elongate heater
5 member configured to produce heat to generate aerosol from aerosol generating material;
and
a base supporting the heater, the base contacting the heater at the extension component such that the extension component forms part of a heat conduction path between the elongate heater member and the base.
10
2. An aerosol provision device according to claim 1, wherein the extension component extends from the elongate heater member in a lateral direction.
3. An aerosol provision device according to claim 2, wherein the extension component
15 comprises a flange.
4. An aerosol provision device according to any of claims 1 to 3, wherein the extension component is formed of metal or a metal alloy, optionally wherein the extension component is formed of steel.
20
5. An aerosol provision device according to any of claims 1 to 4, wherein the extension component is fixed to the elongate heater member by welding.
6. An aerosol provision device according to any of claims 1 to 5, wherein the elongate
25 heater member comprises an outer shell, wherein the extension component is fixed to the outer shell.
7. An aerosol provision device according to claim 6, wherein the outer shell is formed from metal or a metal alloy, optionally wherein the outer shell is formed of steel.
30
8. An aerosol provision device according to any of claims 1 to 6, wherein the elongate heater member comprises a heater element, wherein the extension component is displaced from the heater element in a longitudinal direction.
- 35 9. An aerosol provision device according to any of claims 1 to 8, wherein the base is formed of plastic, optionally wherein the base is formed of PEEK.

10. An aerosol provision device according to any of claims 1 to 9, wherein the extension component is fixed to the base by insertion moulding.
- 5 11. An aerosol provision device according to any of claims 1 to 10, wherein an end face of the extension component comprises a recess, wherein the base extends into the recess to fix the extension component to the base.
- 10 12. An aerosol provision system comprising the aerosol provision device according to any of claims 1 to 13 and an article comprising the aerosol generating material.
13. A method of manufacturing an aerosol provision device, the method comprising:
receiving a heater comprising an elongate heater member and an extension component, the extension component extending from the elongate heater member;
15 receiving a base; and
arranging the base with the heater such that the base supports the heater, the base contacting the heater at the extension component such that the extension component forms part of a heat conduction path between the elongate heater member and the base.

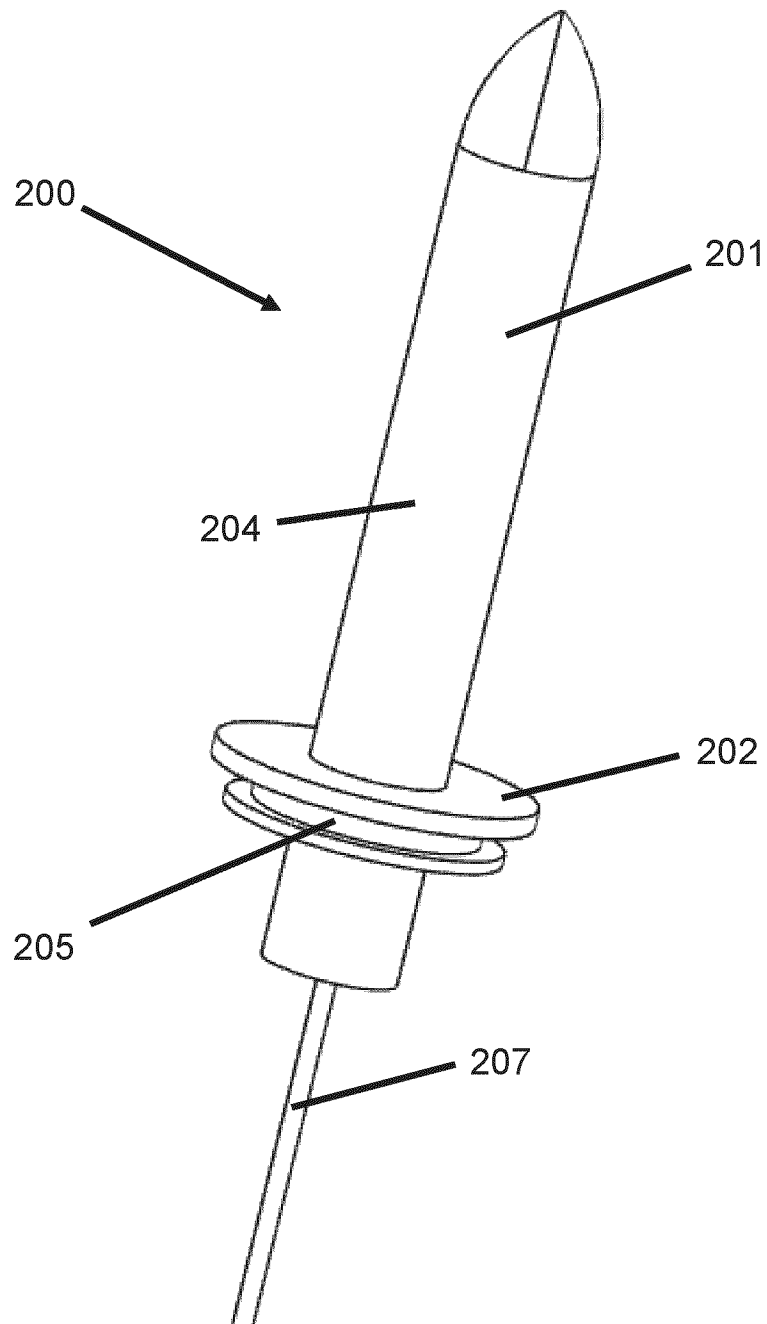


Fig. 2

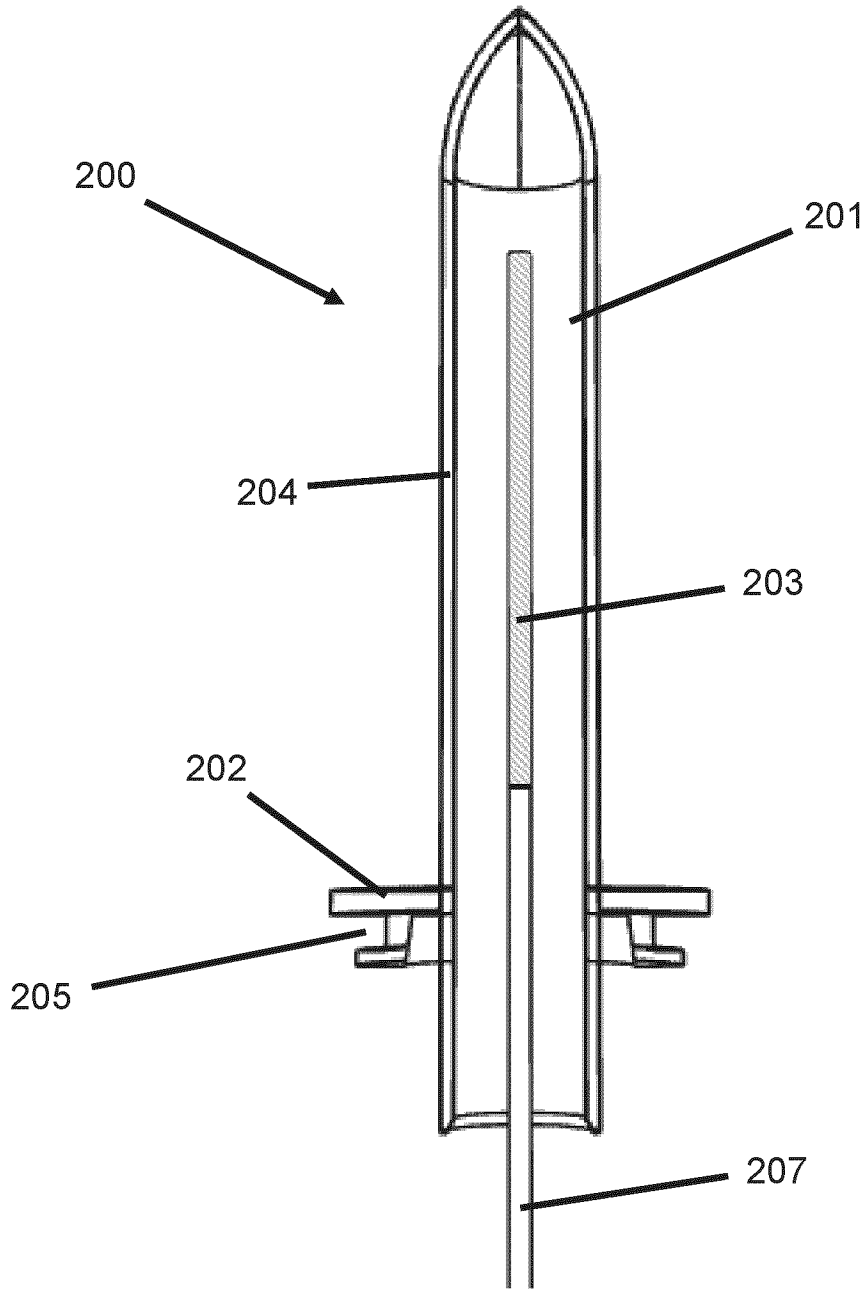


Fig. 3

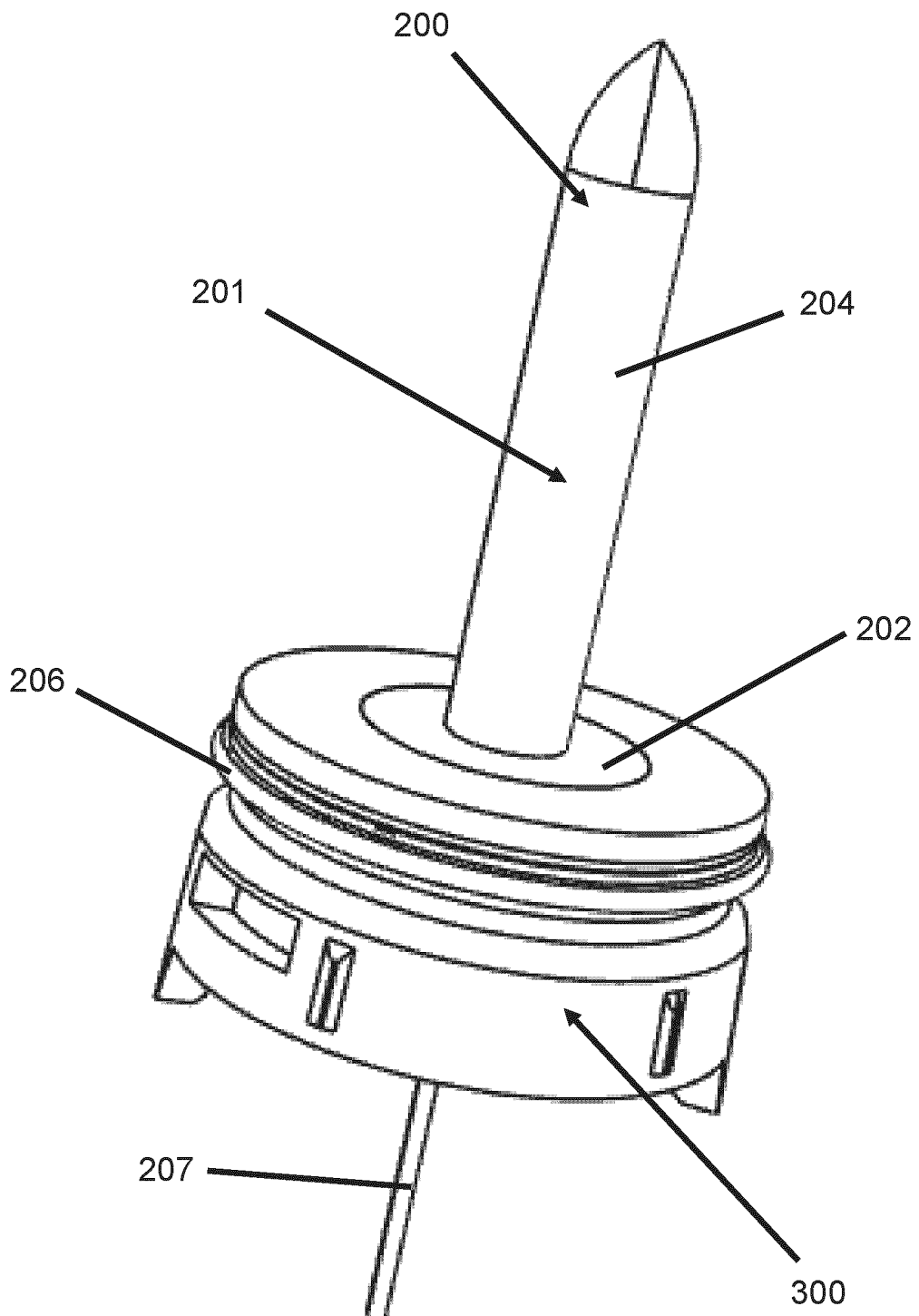


Fig. 4

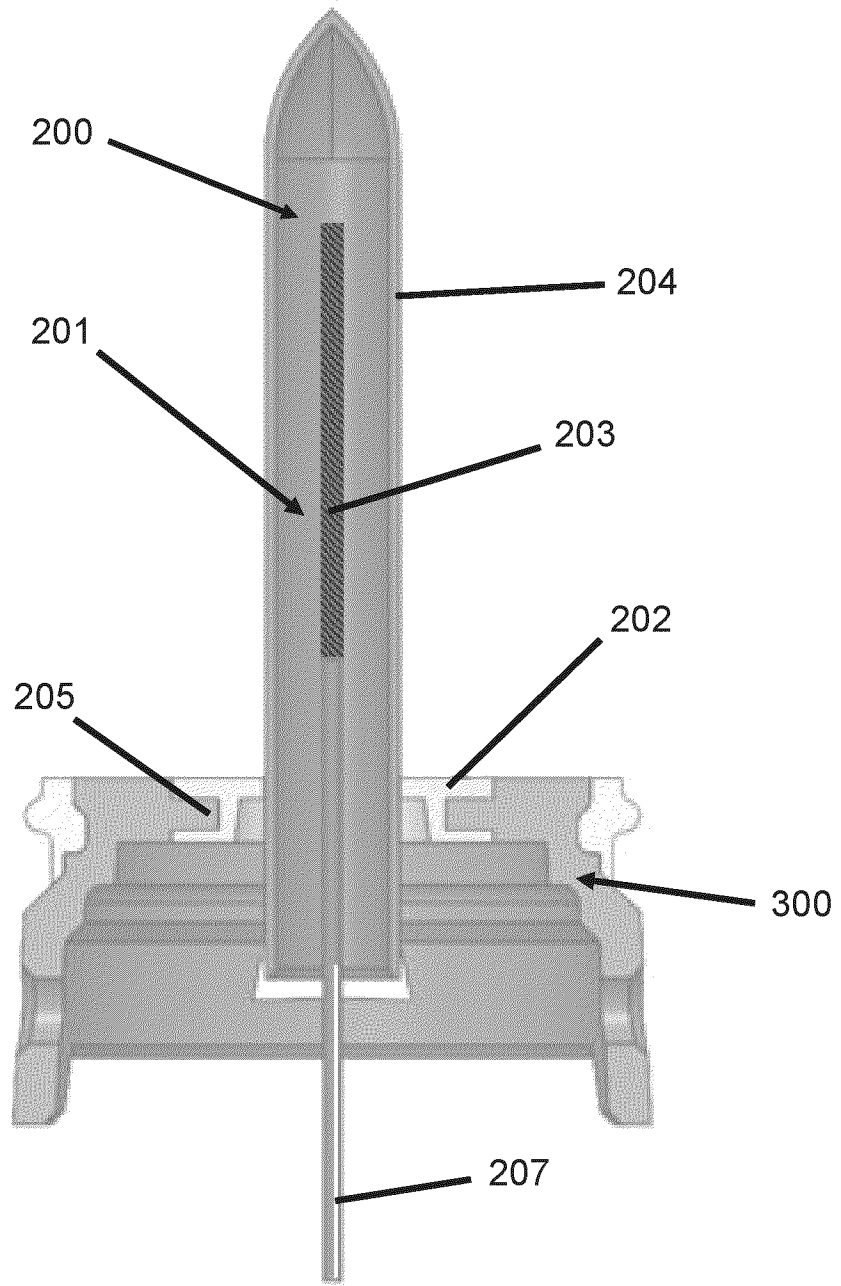


Fig. 5

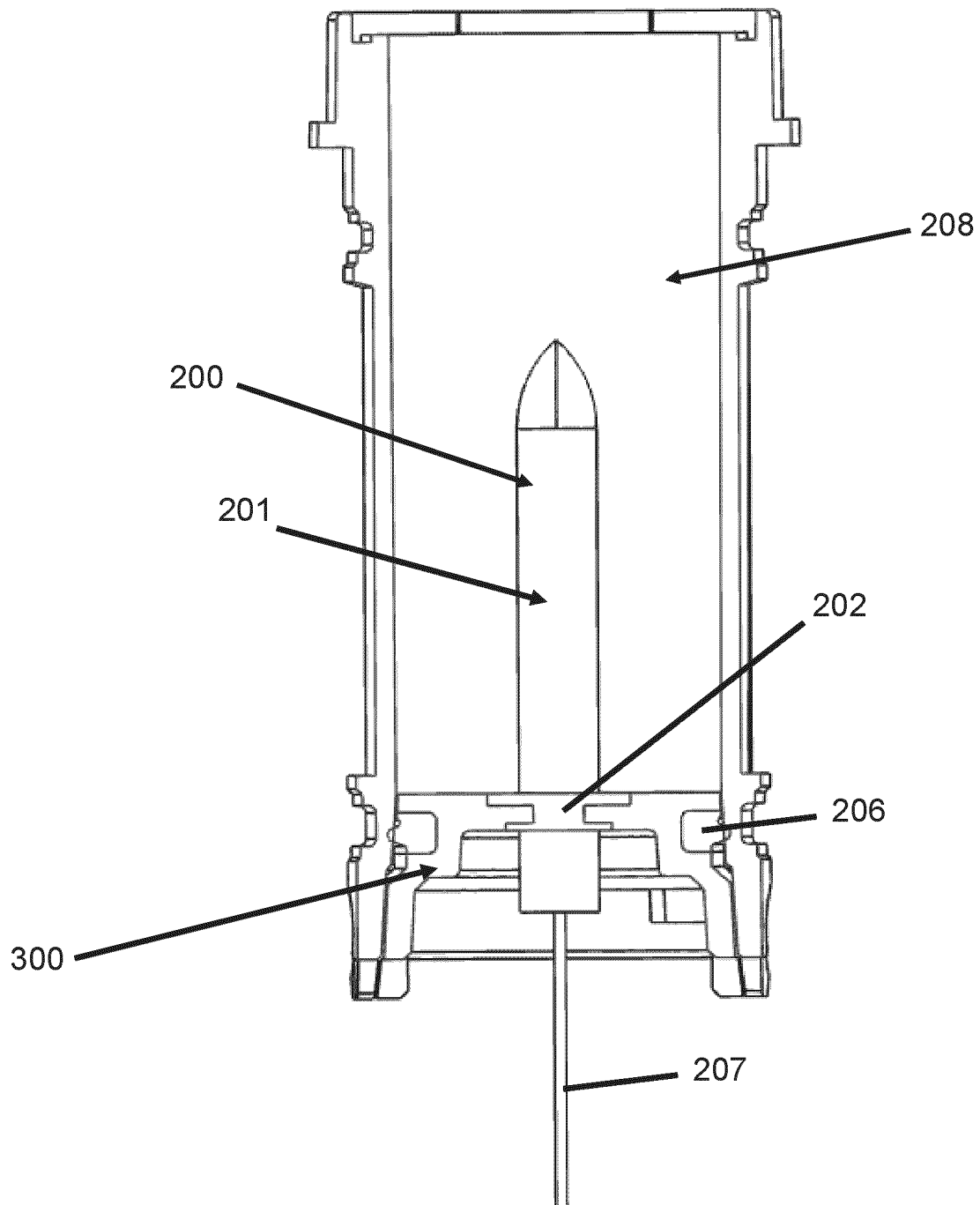


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/066669

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A24F40/46
 ADD. A24F40/20

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

B. FIELDS SEARCHED

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

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

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

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	figures 3-6 paragraph [0016] - paragraph [0018] paragraph [0021] paragraph [0031]	5-8
X	US 2020/086068 A1 (LEE JONG SUB [KR] ET AL) 19 March 2020 (2020-03-19)	1-3,9, 12,13
A	figures paragraph [0019] paragraph [0071] - paragraph [0073] paragraph [0075] - paragraph [0076] paragraph [0083] paragraph [0085]	4-8,10, 11
	----- -/-	

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"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</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search	Date of mailing of the international search report
9 September 2024	01/10/2024

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 Kirchmayr, Katrin
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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2024/066669

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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A	figures 1, 2, 6, 7, 10, 11, 27, 28 paragraphs [0025] - [0028], [0047], [0066] - [0068], [0076], [0077] -----	5
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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