(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 516 131 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.03.2025 Bulletin 2025/10

(21) Application number: **23194366.3**

(22) Date of filing: **30.08.2023**

(51) International Patent Classification (IPC):
A24D 1/20 *(2020.01)* ***A24F 40/50*** *(2020.01)*

(52) Cooperative Patent Classification (CPC):
A24F 40/50; A24D 1/20; A24F 40/20

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(71) Applicant: **IMPERIAL TOBACCO LIMITED**
Bristol BS3 2LL (GB)

(72) Inventor: **The designation of the inventor has not yet been filed**

(74) Representative: **Mewburn Ellis LLP**
Aurora Building
Counterslip
Bristol BS1 6BX (GB)

(54) AEROSOL-GENERATING DEVICE

(57) An aerosol-generating device comprising: a main body defining a consumable-receiving cavity for receiving an aerosol-generating consumable having a series of longitudinally-spaced indicators; a heater for heating the aerosol-generating consumable; a sensor configured to scan the series of longitudinally-spaced indicators as the aerosol-generating consumable is inserted into the consumable-receiving cavity; and a controller having a memory storing a predetermined series, wherein the controller is configured to make a comparison between the scanned series and the predetermined series and make a selection of an operation mode of the aerosol-generating device based on the comparison.

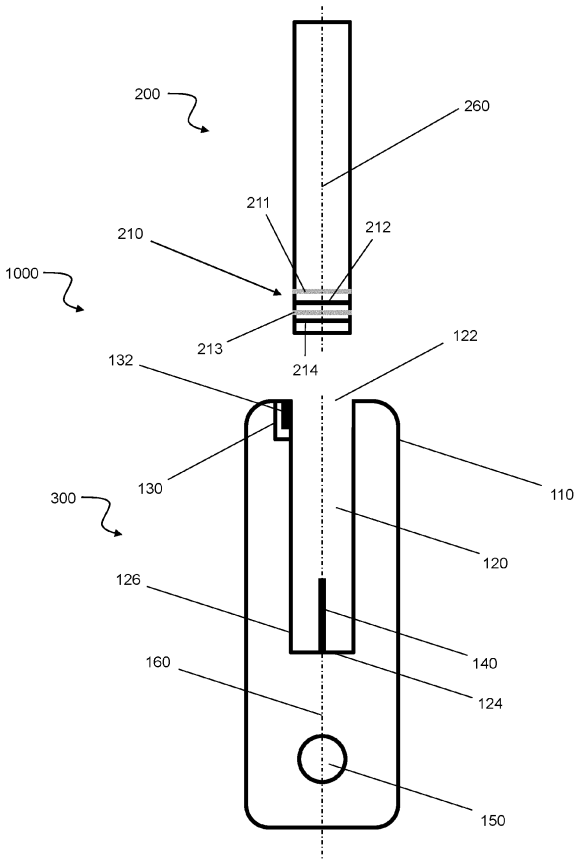

Fig. 4

EP 4 516 131 A1

Description

FIELD

[0001] The present disclosure relates to aerosol-generating devices, aerosol-generating systems and aerosol-generating consumables, for example smoking substitute devices, systems and consumables.

BACKGROUND

[0002] A typical aerosol-generating system may comprise an aerosol-generating device and an aerosol-generating consumable for use with the aerosol-generating device. The aerosol-generating device may include a power supply and an aerosol generator where the aerosol generator is powered by the power supply to aerosolise an aerosol precursor contained in the consumable.

[0003] A drawback with known aerosol-generating systems is that non-authentic aerosol-generating consumables may be used with authentic aerosol-generating devices which may cause harm to a user. Another drawback with known aerosol-generating systems is that different aerosol-generating consumables may benefit from different heating profiles for optimum aerosol generation but known aerosol-generating devices use the same heating profile for all aerosol-generating consumables which may result in sub-optimum aerosol generation. Hence, in spite of the effort already invested in the development of aerosol-generating systems further improvements are desirable.

SUMMARY

[0004] In a first aspect, the present disclosure provides an aerosol-generating device comprising:

a main body defining a consumable-receiving cavity for receiving an aerosol-generating consumable having a series of longitudinally-spaced indicators;
a heater for heating the aerosol-generating consumable;
a sensor configured to scan the series of longitudinally-spaced indicators as the aerosol-generating consumable is inserted into the consumable-receiving cavity; and
a controller having a memory storing a predetermined series,

wherein the controller is configured to make a comparison between the scanned series and the predetermined series and make a selection of an operation mode of the aerosol-generating device based on the comparison.

[0005] The sensor is configured to scan the series of longitudinally-spaced indicators i.e. the sensor is configured to scan each indicator in the series of indicators sequentially. In other words, as the consumable is inserted into the cavity, each indicator in the series of indicators moves past the sensor such that the sensor scans each indicator in the order in which each indicator appears on the consumable. In this way, a single sensor (e.g. a single sensor scanning substantially a single transverse plane i.e. a plane transverse to the longitudinal axis of the cavity in the main body) may be used to scan the entire series of indicators which may make the device more compact and cheaper to manufacture.

[0006] The series of indicators may encode details about a characteristic of the consumable. In this way, the operation mode of the aerosol-generating device may be selected based on the characteristic of the consumable inserted into the device e.g. device operation can be influenced by the consumable.

[0007] Optional features will now be set out. These are applicable singly or in any combination with any aspect.

[0008] In some examples, the main body is elongate having a longitudinal axis. The consumable-receiving cavity may be elongate having a longitudinal axis. The longitudinal axis of the cavity may be aligned (e.g. substantially co-axial) with the longitudinal axis of the main body. The cavity may be substantially cylindrical having a substantially circular cross-section transverse (i.e. perpendicular) to the longitudinal axis of the main body/-cavity.

[0009] In some examples, the cavity has an opening at a first axial end and a base at the opposing second axial end, the opening and base being spaced by a longitudinally-extending internal wall. The opening may be in an external surface of the main body and is configured to allow the consumable to be inserted through the opening into the cavity. The opening may be located at a first axial end (e.g. mouth end) of the main body e.g. a first axial end of the aerosol-generating device. The opening may have a centre aligned with the longitudinal axis of the cavity. The cavity may be delimited by the main body (e.g. the internal wall and base defining the cavity may be integrally formed with the main body of the device). In this way, simplicity and ease of assembly may be improved.

[0010] In some examples, the heater includes a heating element. The heating element is formed of a thermally conductive material such as a metal or ceramic. The heating element may be a rod or blade which may extend from the base of the consumable-receiving cavity (the base being at the opposing axial end of the cavity to the opening into which the consumable is inserted). In some examples, the heater is configured for engagement with the consumable e.g. the end of the heating element distal from the base is tapered. In this way, engagement of the heater with the consumable may be facilitated. In other examples, the heating element may be tubular or a coiled wire at least partially surrounding the cavity.

[0011] In other examples, the heater is an induction heater e.g. the aerosol-generating device may further comprise a susceptor configured to heat the consumable. The susceptor may be positioned within the cavity. Alternatively, the susceptor may be included in the aerosol-generating consumable. In this way, in the presence

of an alternating magnetic field generated by the induction heater, a current is induced in the susceptor such that the susceptor heats an aerosol-precursor in the consumable. In some examples, the induction heater includes a coil e.g. the coil encircles the cavity.

[0012] In other examples, the heater is an infrared (IR) heater e.g. the aerosol-generating device may further comprise an infrared emitter or infrared element to heat the consumable such that an aerosol is produced. The infrared emitter or infrared element may at least partially (e.g. fully) surround the consumable-receiving cavity.

[0013] The aerosol-generating device further comprises a power source. The power source may be a battery or a capacitor. The power source may be rechargeable. The power source is electrically connectable to the heater such that power can be supplied to the heater. The controller may be configured to control the supply of power from the power source to the heater.

[0014] In some examples, the sensor is located adjacent the consumable-receiving cavity e.g. the sensor is located proximal (e.g. embedded within) the internal wall of the cavity. In some examples, the sensor includes an activation trigger configured to detect when the consumable is inserted into the cavity e.g. when an end of the consumable first enters the cavity. For example, when the consumable is inserted into the cavity, the activation trigger may enable/activate the sensor such that the sensor sequentially scans the series of indicators as the consumable is inserted into the cavity. In this way, the power efficiency of the device may be improved by only enabling the sensor when a consumable is being inserted into the cavity. The sensor may be configured to deactivate automatically after scanning the series of indicators e.g. after a predetermined amount of time has elapsed e.g. since initial insertion.

[0015] In some examples, the sensor is configured to detect changes in a physical (e.g. material) property of a consumable (e.g. geometry, displacement, colour, reflectance, absorption or any combination thereof). For example, a displacement probe or ultrasonic sensor may detect changes in geometry/displacement. For example, a change in colour/reflectance/absorption may be detected by a light sensor. The sensor may detect the number of changes/variations, the relative strength of the changes/variations to one another and/or the order of changes/variations. These are applicable singly or in combination as required.

[0016] In some examples, the sensor comprises at least one receiver located distal to the base of the consumable-receiving cavity e.g. towards/proximal/at the opening of the cavity. In this way, the length of the consumable that can be scanned by the sensor (i.e. the at least one receiver) as the consumable is inserted into the cavity may be increased. This may allow the amount of information encoded onto the consumable via the series of indicators also to be increased e.g. a greater scannable length of consumable allows for a longer series of indicators.

[0017] The receiver may be longitudinally spaced from the base. In some examples, the receiver is located nearer to the opening than to the base e.g. the receiver is located at a distance greater than or equal to half the length of the consumable-receiving cavity from the base, more preferably, greater than or equal to two thirds the length of the consumable-receiving cavity from the base. In some examples, the at least one receiver is located at or adjacent the opening e.g. substantially closer to the opening than the base.

[0018] In some examples, the at least one receiver extends at least partially in a circumferential direction of the consumable-receiving cavity e.g. to at least partially surround the cavity. In this way, the sensor may be able to scan a greater circumferential extent of the consumable meaning the likelihood of the series of indicators being successfully scanned may increase. In some examples, the circumferential angle spanned by the receiver is greater than or equal to 30 or 45 degrees, such as greater than or equal to 90 degrees or 120 degrees, for example greater than or equal to 180 degrees, such as greater than or equal to 270 degrees and even up to 360 degrees (such that the receiver fully circumscribes the cavity).

[0019] In some examples, the sensor comprises a plurality of receivers spaced in a circumferential direction of the consumable-receiving cavity e.g. to at least partially surround the cavity. In this way, the sensor may be able to scan a greater circumferential area of the aerosol-generating consumable meaning the likelihood of the series of longitudinally-spaced indicators being successfully scanned may increase. Each of the plurality of receivers may extend at least partially in a circumferential direction e.g. each may extend through a circumferential angle greater than or equal to 30 or 45 degrees, such as greater than or equal to 90 degrees or 120 degrees, such as up to 180 degrees.

[0020] The plurality of receivers may be substantially aligned in a plane transverse (i.e. perpendicular) to the longitudinal axis of the main body/cavity. In some examples, the plurality of receivers are equally spaced in a circumferential direction of the cavity. In this way, the total circumferential view of the plurality of receivers may be increased which may increase the likelihood of the series of indicators being successfully scanned.

[0021] In some examples, the or each receiver is a light receiver. In this way, the sensor may be able to scan reflective indicators that are reflective portions, e.g. coloured reflective portions.

[0022] In some examples, the light receiver is configured to measure an intensity and/or a wavelength of reflected light e.g. light reflected from the indicators. In other words, the light receiver can detect the colour of indicators i.e. the predetermined series may require a particular combination of colours to be present on the consumable and may require the colours to appear in a particular order i.e. a colour sequence. In some examples, the sensor is a multi-spectral sensor e.g. capable of

measuring multiple wavelengths of light simultaneously. In this way, sensor compactness and accuracy may be improved.

[0023] In some examples, the sensor includes at least one transmitter comprising a light source e.g. a light emitting diode (LED). In this way, the likelihood of the series of longitudinally-spaced indicators being successfully scanned may increase, for example, because the sensor is not solely relying on ambient light to illuminate the indicators. In some examples, the light source is a white light emitting diode. The term "white light" in this context may be understood to mean light comprising a plurality of wavelengths from substantially across the visible spectrum. For example, white light may comprise red light, green light and blue light in substantially equal intensities.

[0024] In other examples, the or each receiver is a displacement probe. In this way, the sensor may be able to scan tactile indicators such as indents or protrusions on the surface of the consumable.

[0025] The term "displacement probe" in this context may be understood to mean an element that is capable of registering variations in surface displacement. In other words, as the aerosol-generating consumable is inserted into the consumable-receiving cavity, the displacement probe is capable of scanning tactile indicators on the surface of the aerosol-generating consumable. For example, the displacement probe may include a rod and a magnet wherein movement of the rod over the tactile indicators causes the magnet to move through a coil of wire thereby generating an electric current in the wire proportional to the movement of the rod.

[0026] In some examples, to measure tactile indicators, the or each receiver is an ultrasonic receiver and the sensor further comprises an ultrasonic transmitter. In this way, reliability of the sensor may be improved as contact with the aerosol-generating consumable may not be required to measure tactile indicators i.e. tactile indicators can be measured without contact using ultrasonic measurement.

[0027] The controller may comprise a microcontroller that may be mounted on a printed circuit board (PCB). The controller memory may be non-volatile memory. The memory may include instructions, which, when implemented, may cause the controller to perform certain tasks or steps of a method e.g. controlling the heater e.g. enabling/disabling the heater. The memory may store the predetermined series.

[0028] Operation modes of the aerosol-generating device may include at least one heating mode wherein the heater is enabled (i.e. power may be supplied to the heater) and a locked operation mode wherein the heater is disabled (i.e. power may not be supplied to the heater).

[0029] In some examples, if the scanned series does not match the predetermined series, the controller is configured to select the locked operation mode in which the heater is disabled (i.e. cannot be operational) e.g. the heater cannot be used to heat the aerosol-generating consumable. In this way, heating of the consumable may be disabled if the consumable is non-authentic.

[0030] The term "not operational" in this context may be understood to mean that the functionality of the heater is disabled such that the heater cannot heat the consumable inserted in the consumable-receiving cavity.

[0031] The term "non-authentic" in this context may be understood to mean that the consumable has not originated from a verified source e.g. the producer of the aerosol-generating device or an approved supplier.

[0032] In some examples, if the scanned series matches the predetermined series, the controller is configured to select a heating mode in which the heater is enabled (i.e. can be operational) e.g. the heater can be used to heat the aerosol-generating consumable. In this way, heating of the consumable may be enabled if the consumable is authentic.

[0033] The term "operational" in this context may be understood to mean that the functionality of the heater is enabled such that the heater can heat the consumable inserted in the consumable-receiving cavity.

[0034] The term "authentic" in this context may be understood to mean that the consumable has originated from a verified source. For example, the producers of an aerosol-generating device may only want approved consumables to be used with device so configure approved consumables to include the series of longitudinally-spaced indicators that, when scanned, produce a scanned series that matches the predetermined series stored in the memory of the device. In this context, only consumables approved by the producer of the device may be considered authentic. The terms authentic, official and genuine may be used interchangeably in this context to signify consumables approved by the producer of the aerosol-generating device to work with the aerosol-generating device.

[0035] In some examples, the device further comprises a user interface configured to allow a user to control (e.g. via the controller) the operation of the heater if a heating operation mode has been selected by the controller. For example, the user interface may be a button, a puff sensor, a touch screen or a switch. In this way, a user can control generation of an aerosol from the consumable.

[0036] In other examples, the controller is configured to control the heater to heat the consumable after a predetermined time has elapsed following the selection of a heating operation mode of the device. In this way, automatic heating of the consumable may be facilitated which may improve the user experience e.g. because the user does not have to further interact with the device following insertion of the aerosol-generating consumable.

[0037] In some examples, the memory stores a first predetermined series associated with a first heating profile and a second predetermined series associated with a second heating profile. If the scanned series matches the first predetermined series, the controller is configured to select the first heating mode in which the heater is opera-

tional according to the first heating profile. If the scanned series matches the second predetermined series, the controller is configured to select the second heating mode in which the heater is operational according to the second heating profile. In this way, specific heating profiles may be used depending on the type of authentic aerosol-generating consumable inserted into the consumable-receiving cavity. For example, a first variant of authentic aerosol-generating consumable may require a heating profile with a higher temperature for optimum aerosol generation whilst a second variant of authentic aerosol-generating consumable may require a heating profile with a lower temperature for optimum aerosol generation. Heating profiles may depend, for example, on the type of aerosol-precursor used in the consumable.

[0038] The term "heating profile" in this context may be understood to mean a predetermined temperature which may or may not vary as a function of time. In other words, when the heater is operational according to a heating profile, the temperature of the heater (and optionally its variation) with time is controlled in accordance with the heating profile. The temperature of the heater may be adjusted by varying the power delivery to the heater from the power source e.g. higher power delivery creates a higher temperature.

[0039] In some examples, the memory stores a plurality of (two or more) predetermined series, each one having an associated heating profile. In this way, a greater variety of genuine aerosol-generating consumables may be used with the aerosol-generating device e.g. different blends of reconstituted tobacco may all be used with the device to optimum effect as a specific heating profile can be used for each one.

[0040] In some examples, the main body includes an alignment marker located adjacent or within the consumable-receiving cavity e.g. on the main body in a position visible to a user of the aerosol-generating device. In some examples, the alignment marker indicates the position of the sensor (i.e. at least one the receiver) on the perimeter of the opening of the consumable-receiving cavity. In this way, a consumable (i.e. the series of indicators) may be more easily aligned with the sensor prior to insertion of the consumable into the cavity to facilitate accurate scanning of the series of indicators by the sensor (i.e. receiver).

[0041] The alignment marker may be an arrow or line e.g. embossed in an external surface of the main body. Alternatively, the alignment marker may be a sticker e.g. applied to an external and/or internal surface of the main body e.g. an internal wall of the cavity. Alternatively, the alignment marker may be printed onto the main body e.g. an external surface of the main body.

[0042] In a second aspect, the present disclosure provides an aerosol-generating system comprising: an aerosol-generating device according to the first aspect of the present disclosure; and an aerosol-generating consumable having a series of longitudinally-spaced indicators.

[0043] In this way, the sensor may sequentially scan the series of indicators as the aerosol-generating consumable is inserted into the aerosol-generating device. Also in this way, the operation of the device may be controlled based on a characteristic of the consumable inserted into the device.

[0044] In some examples, the aerosol-generating consumable is elongate having a longitudinal axis. A circumferential direction of the consumable may be defined as the perimeter of the transverse cross-section of the consumable (in a plane perpendicular to the longitudinal axis). The consumable may be substantially cylindrical, i.e. having a substantially circular cross section transverse to the longitudinal axis of the consumable.

[0045] In some examples, when the consumable is inserted into the cavity, the longitudinal axis of the consumable is parallel e.g. co-axial to the longitudinal axis of the cavity. When the consumable is inserted into the aerosol-generating device, the consumable moves parallel to the longitudinal axis of the cavity such that, when fully inserted, the consumable may abut the base of the cavity.

[0046] In some examples, the internal wall of the cavity conforms to an external surface of the consumable when the consumable is inserted into the cavity. In this way, the consumable-receiving cavity may better insulate the consumable e.g. to improve the power efficiency of the device when heating the aerosol-generating consumable. When the aerosol-generating device includes an induction heater, the consumable may include a susceptor to facilitate induction heating of the consumable. By providing a susceptor in the consumable, the device may need cleaning less regularly e.g. because less tobacco residue is deposited in the cavity e.g. on the heater after the consumable is removed.

[0047] In some examples, the series of indicators are a series of changes in a physical (e.g. material) property of the consumable (e.g. geometry, displacement, colour, reflectance, absorption or any combination thereof). For example, a series of tactile indicators may represent a change in geometry/displacement. For example, a series of coloured/reflective bands may represent a change in colour/reflectance/absorption. Information may be encoded in the number of changes/variations, the relative strength of the changes/variations to one another and/or the order of changes/variations. These are applicable singly or in combination as required.

[0048] In some examples, each indicator in the series of longitudinally-spaced indicators extends at least partially in the circumferential direction of the aerosol-generating consumable. For example, the series of indicators may be a series of coloured/reflective bands or a series of surface projections/indents with each band/projection/indent at least partially extending in the circumferential direction of the consumable. The series of indicators may include bands in a variety of different colours. In other words, the series of indicators may be a colour sequence. For example, a first coloured band may be a first colour, a second coloured band may be a second

colour and a third coloured band may be a third colour. It should be appreciated that the number of indicators and choice of colours means a large number of colour sequences are possible potentially allowing complex information to be encoded onto the consumable. The colour of the coloured bands may alternate along the length of the consumable. For example, a first and third coloured band may be a first colour and a second and fourth colour band may be a second colour wherein the first, second, third and fourth colour bands appear consecutively along the length of the consumable. The coloured bands may be spaced along the length of the consumable.

[0049] In some examples, the consumable includes a plurality of series of longitudinally-spaced indicators e.g. a first series and a second series. For example, first and second series of longitudinally-spaced indicators may be included on diametrically opposed surfaces of the aerosol-generating consumable. In other words, the first series of indicators may be circumferentially offset by 180 degrees from the second series of indicators. In some examples, the acute circumferential offset angle is greater than or equal to 30 or 60 degrees, more preferably greater than or equal to 90 or 120 degrees, more preferably greater than or equal to 150 degrees.

[0050] In some examples, the plurality of series of indicators are equally spaced in the circumferential direction of the aerosol-generating consumable e.g. if there are three series, then the circumferential angle between two circumferentially adjacent series would be 120 degrees. In this way, scanning of the plurality of series of longitudinally-spaced indicators may be facilitated e.g. by reducing the likelihood that one receiver mistakenly scans indicators belonging to two different series of longitudinally-spaced indicators e.g. causing the scanned series to be inaccurate.

[0051] In some examples, the plurality of series of longitudinally-spaced indicators are identical. In this way, the integrity of the information encoded into the plurality of series of indicators may be improved. For example, if one side of the aerosol-generating consumable was damaged causing one of the plurality of series of indicators to become unscannable, then one of the remaining series of indicators may still be scannable allowing the aerosol-generating consumable to be used with the aerosol-generating device e.g. if the consumable is determined to be authentic by the controller.

[0052] In some examples, the indicators are reflective (e.g. reflective coloured) portions of the surface of the consumable. The reflective (e.g. coloured) portions may be various shapes and sizes including circles, rectangles, polygons, bands and stars. The reflective coloured portions may include foil, plastic and/or paper e.g. bonded to the surface of aerosol-generating consumable or embedded within the surface of the consumable.

[0053] In this case, the sensor would include at least one light receiver e.g. to receive the light reflected from the reflective coloured portions. In this way, the amount of information that can be encoded onto the consumable may be increased e.g. by utilising a variety of colours and/or reflective properties to encode information. Also in this way, the manufacture of the aerosol-generating consumable may be facilitated e.g. by printing the reflective coloured portions onto the consumable.

[0054] In some examples, each indicator in the series of indicators is a reflective (coloured) band extending at least partially (e.g. fully, 360 degrees) in the circumferential direction of the consumable. The reflective/coloured bands may be printed on the surface of the consumable and/or embedded within the structure of the consumable. Printing the indicators may reduce the cost of manufacture whilst embedding the indicators may improve their robustness e.g. against wear and tear.

[0055] In some examples, the indicators are indents or protrusions in the surface of the consumable. In this case the sensor comprises at least one displacement probe. In this way, the complexity of the sensor may be reduced e.g. the sensor may not require a transmitter comprising a light source.

[0056] In some examples, the series of indicators are tactile indicators such as projections and/or indents (e.g. in the surface of the consumable). The projections and/or indents may be formed by embossing and/or debossing the consumable (e.g. an external surface of the consumable). For example, an external surface of the consumable may be made from paper (e.g. a wrapping paper). The (wrapping) paper may be embossed and/or debossed prior to being formed into the consumable (e.g. via rolling). Embossing and/or debossing may be used to create an array of tactile indicators on an external surface of the consumable (e.g. tactile bands). In this context the terms "embossing" and "debossing" may be understood to mean the processes of creating raised and/or recessed indications in paper or other materials.

[0057] In some examples, the indicators are indent rings or protrusion rings extending at least partially in the circumferential direction of the consumable e.g. optionally fully circumscribing the consumable. The axial extent of the rings (or reflective bands) may vary within the series as a means of encoding information within the series.

[0058] In other examples, the series of protrusions/indents may form part of an array of protrusions/indents i.e. an array made up of the longitudinally-extending series of indicators and a circumferentially-extending series of indicators. For example, the array may be made up of a series of discontinuous, axially and circumferentially spaced protrusions or indents.

[0059] In some examples, the consumable includes a reconstituted tobacco substrate. In this way, an aerosol containing nicotine may be generated upon the heating of the reconstituted tobacco by the heater. Reconstituted tobacco is one type of aerosol precursor/substrate. In some examples, information about the type of aerosol precursor/substrate used in the consumable may be encoded into the series of indicators. In this way, different heating profiles may be used with different types of

aerosol precursor/substrate to achieve optimum or improved aerosol production.

[0060] The aerosol-generating consumable may include a complimentary alignment marker e.g. affixed to, printed on and/or embedded in the surface of the consumable. In this way, the alignment of the series of longitudinally-spaced indicators with the sensor may be facilitated e.g. the complimentary alignment marker on the consumable may be aligned with the alignment marker on the device by a user prior to inserting the consumable into the consumable-receiving cavity.

[0061] In use, the consumable is inserted into the cavity of the aerosol-generating device whereby the series of longitudinally-spaced indicators on the consumable are scanned by the sensor (i.e. the at least one receiver). The controller then makes a comparison between the scanned series and a predetermined series and, based on the comparison, selects an operation mode of the device. If the operation mode is a heating operation mode, then the heater is operational allowing the consumable to be heated by the heater to produce an aerosol for inhalation by a user of the device. If the operation mode is a locked operation mode, then the heater is not operational preventing the consumable from being heated by the heater e.g. the specific consumable cannot be heater to produce an aerosol.

[0062] In a third aspect, the present disclosure provides an aerosol-generating consumable for use with an aerosol-generating device according to the first aspect of the present disclosure, wherein the aerosol-generating consumable has a series of longitudinally-spaced indicators. In this way, information relating to the consumable may be encoded onto the consumable such that the sensor (i.e. receiver) in the device can sequentially scan the series of indicators and select a mode of operation based on the information e.g. enter a locked operation mode if the consumable is non-authentic or enter a heating operation mode if the consumable is authentic. The consumable of the third aspect may be as described for the second aspect.

[0063] The preceding summary is provided for purposes of summarizing some examples to provide a basic understanding of aspects of the subject matter described herein. Accordingly, the above-described features should not be construed to narrow the scope or spirit of the subject matter described herein in any way. Moreover, the above and/or proceeding examples may be combined in any suitable combination to provide further examples, except where such a combination is clearly impermissible or expressly avoided. Other features, aspects, and advantages of the subject matter described herein will become apparent from the following text and the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

[0064] Aspects, features and advantages of the present disclosure will become apparent from the following description of examples in reference to the appended drawings in which like numerals denote like elements.

Fig. 1 is a block system diagram showing an example aerosol-generating system.

Fig. 2 is a block system diagram showing an example implementation of the system of Fig. 1, where the aerosol-generating system is configured to generate aerosol from a solid precursor.

Fig. 3 is a schematic diagram showing an example implementation of the system of Fig. 4.

Fig. 4 shows a first example of an aerosol-generating system according to the second aspect of the present disclosure.

Fig. 5 shows a top view of the aerosol-generating device of the aerosol-generating system of Fig. 4.

Fig. 6 shows a second example of an aerosol-generating system according to the second aspect of the present disclosure.

Fig. 7 shows a top view of the aerosol-generating device of the aerosol-generating system of Fig. 6.

DETAILED DESCRIPTION OF EMBODIMENTS

[0065] Before describing several examples implementing the present disclosure, it is to be understood that the present disclosure is not limited by specific construction details or process steps set forth in the following description and accompanying drawings. Rather, it will be apparent to those skilled in the art having the benefit of the present disclosure that the systems, apparatuses and/or methods described herein could be embodied differently and/or be practiced or carried out in various alternative ways.

[0066] Unless otherwise defined herein, scientific and technical terms used in connection with the presently disclosed inventive concept(s) shall have the meanings that are commonly understood by those of ordinary skill in the art, and known techniques and procedures may be performed according to conventional methods well known in the art and as described in various general and more specific references that may be cited and discussed in the present specification.

[0067] Any patents, published patent applications, and non-patent publications mentioned in the specification are hereby incorporated by reference in their entirety.

[0068] All examples implementing the present disclosure can be made and executed without undue experimentation in light of the present disclosure. While particular examples have been described, it will be apparent to those of skill in the art that variations may be applied to the systems, apparatus, and/or methods and in the steps

or in the sequence of steps of the methods described herein without departing from the concept, spirit, and scope of the inventive concept(s). All such similar substitutions and modifications apparent to those skilled in the art are deemed to be within the spirit, scope, and concept of the inventive concept(s) as defined by the appended claims.

[0069] The use of the term "a" or "an" in the claims and/or the specification may mean "one," as well as "one or more," "at least one," and "one or more than one." As such, the terms "a," "an," and "the," as well as all singular terms, include plural referents unless the context clearly indicates otherwise. Likewise, plural terms shall include the singular unless otherwise required by context.

[0070] The use of the term "or" in the present disclosure (including the claims) is used to mean an inclusive "and/or" unless explicitly indicated to refer to alternatives only or unless the alternatives are mutually exclusive. For example, a condition "A or B" is satisfied by any of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

[0071] As used in this specification and claim(s), the words "comprising, "having," "including," or "containing" (and any forms thereof, such as "comprise" and "comprises," "have" and "has," "includes" and "include," or "contains" and "contain," respectively) are inclusive or open-ended and do not exclude additional, unrecited elements or method steps.

[0072] Unless otherwise explicitly stated as incompatible, or the physics or otherwise of the embodiments, examples, or claims prevent such a combination, the features of examples disclosed herein, and of the claims, may be integrated together in any suitable arrangement, especially ones where there is a beneficial effect in doing so. This is not limited to only any specified benefit, and instead may arise from an "ex post facto" benefit. This is to say that the combination of features is not limited by the described forms, particularly the form (e.g. numbering) of example(s), embodiment(s), or dependency of claim(s). Moreover, this also applies to the phrase "in one embodiment," "according to an embodiment," and the like, which are merely a stylistic form of wording and are not to be construed as limiting the following features to a separate embodiment to all other instances of the same or similar wording. This is to say, a reference to 'an,' 'one,' or 'some' embodiment(s) may be a reference to any one or more, and/or all embodiments, or combination(s) thereof, disclosed. Also, similarly, the reference to "the" embodiment may not be limited to the immediately preceding embodiment. Further, all references to one or more embodiments or examples are to be construed as non-limiting to the claims.

[0073] The present disclosure may be better understood in view of the following explanations, wherein the terms used that are separated by "or" may be used interchangeably:

As used herein, an "aerosol-generating system" (or "electronic(e)-cigarette") may be a system configured to deliver an aerosol to a user for inhalation by the user. The system may additionally/alternatively be referred to as a "smoking substitute system", if it is intended to be used instead of a conventional combustible smoking article. As used herein a combustible "smoking article" may refer to a cigarette, cigar, pipe or other article, that produces smoke (an aerosol comprising solid particulates and gas) via heating above the thermal decomposition temperature (typically by combustion and/or pyrolysis). An aerosol generated by the system may comprise an aerosol with particle sizes of 0.2 to 7 microns, or less than 10 microns, or less than 7 microns. This particle size may be achieved by control of one or more of: heater temperature; cooling rate as the vapour condenses to an aerosol; flow properties including turbulence and velocity. The generation of aerosol by the aerosol-generating system may be controlled by an input device. The input device may be configured to be user-activated, and may for example include or take the form of an actuator (e.g. actuation button) and/or an airflow sensor.

[0074] Each occurrence of the aerosol-generating system being caused to generate aerosol for a period of time (which may be variable) may be referred to as an "activation" of the aerosol-generating system. The aerosol-generating system may be arranged to allow an amount of aerosol delivered to a user to be varied per activation (as opposed to delivering a fixed dose of aerosol), e.g. by activating an aerosol-generating unit of the system for a variable amount of time, e.g. based on the strength/duration of a draw of a user through a flow path of the system (to replicate an effect of smoking a conventional combustible smoking article).

[0075] The aerosol-generating system may be portable. As used herein, the term **"portable"** may refer to the system being for use when held by a user.

[0076] As used herein, an **"aerosol"** may include a suspension of precursor, including as one or more of: solid particles; liquid droplets; gas. Said suspension may be in a gas including air. An aerosol herein may generally refer to/include a vapour. An aerosol may include one or more components of the precursor.

[0077] As used herein, a **"precursor"** may include one or more of a: liquid; solid; gel; loose leaf material; other substance. The precursor may be processed by an aerosol-generating unit of an aerosol-generating system to generate an aerosol. The precursor may include one or more of: an active component; a carrier; a flavouring. The active component may include one or more of nicotine; caffeine; a cannabidiol oil; a non-pharmaceutical formulation, e.g. a formulation which is not for treatment of a disease or physiological malfunction of the human body. The active component may be carried by the carrier, which may be a liquid, including propylene glycol and/or glycerine. The term "flavouring" may refer to a component that provides a taste and/or a smell to the user. The flavouring may include one or more of: Ethylvanillin (vanilla); menthol, Isoamyl acetate (banana oil); or other.

The precursor may include a substrate, e.g. reconstituted tobacco to carry one or more of the active component; a carrier; a flavouring.

[0078] As used herein, a **"storage portion"** may be a portion of the system adapted to store the precursor. It may be implemented as fluid-holding reservoir or carrier for solid material depending on the implementation of the precursor as defined above.

[0079] As used herein, a **"flow path"** may refer to a path or enclosed passageway through an aerosol-generating system, e.g. for delivery of an aerosol to a user. The flow path may be arranged to receive aerosol from an aerosol-generating unit. When referring to the flow path, upstream and downstream may be defined in respect of a direction of flow in the flow path, e.g. with an outlet being downstream of an inlet.

[0080] As used herein, a **"delivery system"** may be a system operative to deliver an aerosol to a user. The delivery system may include a mouthpiece and a flow path.

[0081] As used herein, a **"flow"** may refer to a flow in a flow path. A flow may include aerosol generated from the precursor. The flow may include air, which may be induced into the flow path via a puff by a user. As used herein, a **"puff"** (or **"inhale"** or **"draw"**) by a user may refer to expansion of lungs and/or oral cavity of a user to create a pressure reduction that induces flow through the flow path.

[0082] As used herein, an **"aerosol-generating unit"** may refer to a device configured to generate an aerosol from a precursor. The aerosol-generating unit may include a unit to generate a vapour directly from the precursor (e.g. a heater or other system) or an aerosol directly from the precursor (e.g. an atomiser including an ultrasonic system, a flow expansion system operative to carry droplets of the precursor in the flow without using electrical energy or other system). A plurality of aerosol-generating units to generate a plurality of aerosols (for example, from a plurality of different aerosol precursors) may be present in an aerosol-generating system.

[0083] As used herein, a **"heater"** may refer to an arrangement of at least one heating element, which is operable to aerosolise a precursor once heated. The at least one heating element may be electrically resistive to produce heat from the flow of electrical current therethrough. The at least one heating element may be arranged as a susceptor to produce heat when penetrated by an alternating magnetic field. The heater may be configured to heat a precursor to below 300 or 350 degrees Celsius, including without combustion.

[0084] As used herein, a **"consumable"** may refer to a unit that includes a precursor. The consumable may include an aerosol-generating unit, e.g. it may be arranged as a cartomizer. The consumable may include a mouthpiece. The consumable may include an information carrying medium. With liquid or gel implementations of the precursor, e.g. an e-liquid, the consumable may be referred to as a "capsule" or a "pod" or an "e-liquid consumable". The capsule/pod may include a storage portion, e.g. a reservoir or tank, for storage of the precursor. With solid material implementations of the precursor, e.g. tobacco or reconstituted tobacco formulation, the consumable may be referred to as a "stick" or "package" or "heat-not-burn consumable". In a heat-not-burn consumable, the mouthpiece may be implemented as a filter and the consumable may be arranged to carry the precursor. The consumable may be implemented as a dosage or pre-portioned amount of material, including a loose-leaf product.

[0085] As used herein, an **"information** carrying **medium"** may include one or more arrangements for storage of information on any suitable medium. Examples include: a computer readable medium; a Radio Frequency Identification (RFID) transponder; codes encoding information, such as optical (e.g. a bar code or QR code) or mechanically read codes (e.g. a configuration of the absence or presents of cut-outs to encode a bit, through which pins or a reader may be inserted).

[0086] As used herein **"heat-not-burn"** (or **"HNB"** or **"heated precursor**") may refer to the heating of a precursor, typically tobacco, without combustion, or without substantial combustion (i.e. localised combustion may be experienced of limited portions of the precursor, including of less than 5% of the total volume).

[0087] Referring to Fig. 1, an example aerosol-generating system 1 includes a power supply 2, for supply of electrical energy. The system 1 includes an aerosol-generating unit 4 that is driven by the power supply 2. The power supply 2 may include an electric power supply in the form of a battery and/or an electrical connection to an external power source. The aerosol-generating system 1 includes a precursor 6, which in use is aerosolised by the aerosol-generating unit 4 to generate an aerosol. The system 2 includes a delivery system 8 for delivery of the aerosol to a user.

[0088] Electrical circuitry (not shown in figure 1) may be implemented to control the interoperability of the power supply 4 and aerosol-generating unit 6.

[0089] In variant examples, which are not illustrated, the power supply 2 may be omitted since, e.g. an aerosol-generating unit implemented as an atomiser with flow expansion may not require a power supply.

[0090] Fig. 2 shows an implementation of the aerosol-generating system 1 of Fig. 1, where the aerosol-generating system 1 is configured to generate aerosol by a-heat not-burn process.

[0091] In this example, the aerosol-generating system 1 includes an aerosol-generating device 50 and an aerosol-generating consumable 70.

[0092] In this example, the aerosol-generating device 50 includes the power supply 4 and a heater 52. The heater 54 includes at least one heating element 54. The aerosol-generating device 50 may additionally include any one or more of electrical circuitry 56, a memory 58, a wireless interface 60, one or more other components 62.

[0093] The electrical circuitry 56 may include a con-

troller for controlling one or more operations of the aerosol-generating device 50, e.g. based on instructions stored in the memory 58.

[0094] The wireless interface 60 may be configured to communicate wirelessly with an external (e.g. mobile) device, e.g. via Bluetooth.

[0095] The other component(s) 62 may include an actuator, one or more user interface devices configured to convey information to a user and/or a charging port, for example.

[0096] The aerosol-generating device 50 is configured to engage with the aerosol-generating consumable 70 such that the at least one heating element 54 of the heater 52 penetrates into the solid precursor 6 of the consumable. In use, a user may activate the aerosol-generating system 1 to cause the heater 52 of the aerosol-generating device 50 to cause the at least one heating element 54 to heat the solid precursor 6 of the aerosol-generating consumable 70 (without combusting it) by conductive heat transfer, to generate an aerosol which is inhaled by the user.

[0097] Fig. 3 shows an example implementation of the aerosol-generating system 1 of Fig. 2.

[0098] As depicted in Fig. 3, the aerosol-generating consumable 70 is implemented as a stick, which is engaged with the aerosol-generating device 50 by inserting the stick into an aperture at a top end 53 of the device 50, which causes the at least one heating element 54 of the heater 52 to penetrate into the solid precursor/substrate 6.

[0099] The aerosol-generating consumable 70 includes the solid precursor 6 proximal to the aerosol-generating device 50, and a filter distal to the aerosol-generating device 50. The filter serves as the mouthpiece of the consumable 70 and thus the aerosol-generating system 1 as a whole. The solid precursor 6 may be a reconstituted tobacco formulation.

[0100] In this example, the at least one heating element 54 is a rod-shaped element with a circular transverse profile.

[0101] In this example, the aerosol-generating device 50 includes a cap 51. In use the cap 51 is engaged at a top end 53 of the aerosol-generating device 50. Although not apparent from Fig. 2, the cap 51 is moveable relative to the aerosol-generating device 50. In particular, the cap 51 is slidable and can slide along a longitudinal axis of the aerosol-generating device 50.

[0102] The aerosol-generating device 50 also includes an actuator 55 on an outer surface of the aerosol-generating device 50. In this example, the actuator 55 has the form of a button.

[0103] The aerosol-generating device 50 also includes a user interface device configured to convey information to a user. Here, the user interface device is implemented as a plurality of lights 57, which may e.g. be configured to illuminate when the aerosol-generating system 1 is activated and/or to indicate a charging state of the power supply 4. Other user interface devices are possible, e.g. to convey information haptically or audibly to a user.

[0104] The aerosol-generating device 50 may also include an airflow sensor which detects airflow in the aerosol-generating system 1 (e.g. caused by a user inhaling through the aerosol-generating consumable 70). This may be used to count puffs, for example.

[0105] In this example, the aerosol-generating consumable 70 includes a flow path which transmits aerosol generated by the at least one heating element 54 to the mouthpiece of the aerosol-generating consumable.

[0106] In this example, the aerosol-generating unit 4 is provided by the above-described heater 52 and the delivery system 8 is provided by the above-described flow path and mouthpiece of the aerosol-generating consumable 70.

[0107] Referring to Fig. 4 (and Fig. 5) an aerosol-generating system 1000 comprises an aerosol-generating device 100 and an aerosol-generating consumable 200.

[0108] The aerosol-generating device 100 comprises a main body 110 defining a consumable-receiving cavity 120 for receiving the aerosol-generating consumable 200. The main body 110 is elongate having a longitudinal axis 160 and the consumable-receiving cavity 120 is cylindrical having a longitudinal axis substantially coaxial with the longitudinal axis 160 of the main body 110. The cavity 120 has an opening 122 at a first axial end and a base 124 at the opposing second axial end, the opening 122 and base 124 are spaced by a longitudinally-extending internal wall 126. The opening 122 is in an external surface of the main body 110 and is configured to allow the consumable 200 to be inserted through the opening 122 into the cavity 120. The opening 122 is located at a first axial end (mouth end) of the main body 110. The opening 122 has a centre aligned with the longitudinal axis 160 of the cavity/device. The cavity 120 is delimited by the main body 110. The main body 110 includes an alignment marker 112 (shown in Fig. 5) in the form of an arrow printed on the external surface of the main body 110 at the top end of the device 100 where the consumable 200 is inserted into the cavity 120 via the opening 122.

[0109] The device includes a heater 140 for heating the aerosol-generating consumable 200. The heater 140 includes a rod-shaped heating element extending from the base 124. The heating element is formed of a thermally conductive ceramic. The end of the rod-shaped heating element is tapered to facilitate engagement with the consumable 200.

[0110] The device also includes a sensor 130 configured to scan the series of longitudinally-spaced indicators 210 as the aerosol-generating consumable 200 is inserted into the consumable-receiving cavity 120. The sensor 130 is located adjacent the cavity 120 at the opening 122 proximal to the internal wall 126. The sensor 130 includes a receiver 132 located distal to the base 124 at the opening 122. The receiver 132 is located nearer to the opening 122 than the base 124. The receiver 132 extends partially in a circumferential direction of the

cavity 120 to partially surround the cavity 120. The receiver 132 is shown in greater detail in Fig. 5 which depicts a top view of the device 100. The circumferential angle spanned by the receiver 132 is approximately 90 degrees. The receiver 132 is a light receiver such that the sensor can scan the series of reflective coloured bands 210 on the consumable 200.

[0111] The device also includes a controller having a memory storing a predetermined series. The controller is configured to make a comparison between the scanned series and the predetermined series and make a selection of an operation mode of the aerosol-generating device 100 based on the comparison. The controller (not shown) comprises a microcontroller mounted to a printed circuit board (PCB). Operating modes of the device 100 include a locked operation mode wherein the heater 140 is disabled and a heating operation mode wherein the heater 140 is enabled. The controller is configured to select the locked operation mode if the scanned series does not match the predetermined series and select the heating operation mode if the scanned series matches the predetermined series.

[0112] The device 100 also comprises a rechargeable battery (not shown) to controllably supply power to the heater 140 and a button 150 to allow a user to control (via the controller) the operation 140 of the heater if the heating operation mode has been selected by the controller following the comparison.

[0113] The memory stores a heating profile associated with the heating operation mode associated with the predetermined series such that, when the controller selects the heating operation mode following the comparison, the heater 140 is controlled to heat the consumable 200 according to the heating profile when the user presses the button 150.

[0114] The consumable 200 is cylindrical having a longitudinal axis 260 such that when the consumable 200 is inserted into the device 100, the longitudinal axis 260 of the consumable is substantially co-axial with the longitudinal axis 160 of the cavity/device. When the consumable 200 is inserted into the cavity 120, part of the internal wall 126 substantially conforms to part of the surface of the consumable 200. The consumable 200 contains reconstituted tobacco and has a series of longitudinally-spaced indicators 210 in the form of reflective coloured bands. The reflective coloured bands 210 extend fully (360 degrees) around the consumable 200. The reflective coloured bands 210 include a first reflective coloured band 211 being a first colour, a second reflective coloured band 212 being a second colour, a third reflective coloured band 213 being the first colour and a fourth reflective coloured band 214 being the second colour. The reflective coloured bands 210 are spaced apart along the length of the consumable 200. The reflective coloured bands 210 may be understood to be a colour sequence.

[0115] Referring to Fig. 6 (and Fig. 7) an aerosol-generating system 3000 comprises an aerosol-generating device 300 and an aerosol-generating consumable 400. The aerosol-generating system 3000 is a variation of the aerosol generating-system 1000 shown in Fig. 4 where corresponding features have corresponding reference numerals. However, the aerosol-generating system 3000 differs from the aerosol-generating system 1000 in at least the following ways.

[0116] The aerosol-generating consumable 400 has a series of longitudinally-spaced indicators 410 in the form of tactile bands. Some tactile bands protrude from the surface of the consumable 400 whilst others recess into the surface of the consumable 400. The tactile bands 410 extend fully (360 degrees) around the consumable 400.

[0117] Regarding the aerosol-generating device 300, the memory stores both a first predetermined series and a second predetermined series, wherein the controller is configured to make a first comparison between the scanned series and the first predetermined series and make a second comparison between the scanned series and the second predetermined series and make a selection of an operation mode of the aerosol-generating device 300 based on either the first comparison or the second comparison or both.

[0118] The heater 340 is an induction heater and includes a coil encircling the cavity 320. To facilitate induction heating, the consumable 400 contains a susceptor (not shown) such that the coil in the device can heat the consumable 400 via electromagnetic induction. The device 300 comprises a rechargeable battery (not shown) to controllably supply power to the heater 340, that is, to supply current to the coil to indirectly heat the consumable 400 via the susceptor.

[0119] The sensor 330 includes a first receiver 332, a second receiver 334 and a third receiver 336 which are depicted in Fig. 6 which shows a top view of the device 300. The first, second and third receivers are all located distal to the base 324 at the opening 322. The receivers are located nearer to the opening 322 than the base 324. Each receiver extends partially in a circumferential direction of the cavity 320 to partially surround the consumable-receiving cavity 320. The circumferential angle spanned by each receiver is approximately 35 degrees and the three receivers are spaced equally in a circumferential direction of the cavity 320 such that the angle between two circumferentially adjacent receivers is approximately 120 degrees. The three receivers are substantially aligned in a plane transverse to the longitudinal axis 360 of the main body/cavity. Each receiver 332, 334, 336 is a displacement probe such that the sensor can scan the series of tactile bands 410 on the consumable 400 sequentially as the consumable 400 is inserted into the cavity 320.

[0120] The controller (not shown) comprises a microcontroller mounted to a printed circuit board (PCB). Operating modes of the device 300 include a locked operation mode wherein the heater 340 is disabled and first and second heating operation modes wherein the heater 340 is enabled. The controller is configured to select the

locked operation mode if the scanned series does not match the first predetermined series or the second predetermined series. The controller is configured to select the first heating mode associated with the first predetermined series if the scanned series matches the first predetermined series. The controller is configured to select the second heating mode associated with the second predetermined series if the scanned series matches the second predetermined series.

[0121] The controller is configured to automatically start heating the consumable 400 after a predetermined time if a heating operation mode has been selected by the controller following either the first or second comparisons.

[0122] The controller stores a first heating profile associated with the first heating mode associated with the first predetermined series such that, if the controller selects the first heating operation mode following the first comparison, then the heater 340 is controlled to heat the consumable 200 (via induction) according to the first heating profile when the predetermined time has elapsed since selection.

[0123] The controller stores a second heating profile associated with the second heating mode associated with the second predetermined series such that, if the controller selects the second heating operation mode following the second comparison, then the heater 340 is controlled to heat the consumable 200 (via induction) according to the second heating profile when the predetermined time has elapsed since selection.

Claims

1. An aerosol-generating device comprising:

a main body defining a consumable-receiving cavity for receiving an aerosol-generating consumable having a series of longitudinally-spaced indicators;
a heater for heating the aerosol-generating consumable;
a sensor configured to scan the series of longitudinally-spaced indicators as the aerosol-generating consumable is inserted into the consumable-receiving cavity; and
a controller having a memory storing a predetermined series, wherein the controller is configured to make a comparison between the scanned series and the predetermined series and make a selection of an operation mode of the aerosol-generating device based on the comparison.

2. The aerosol-generating device of claim 1, wherein, if the scanned series does not match the predetermined series, the controller is configured to select a locked operation mode in which the heater is disabled.

3. The aerosol-generating device of claim 1 or 2, wherein, if the scanned series matches the predetermined series, the controller is configured to select a heating operation mode in which the heater is enabled.

4. The aerosol-generating device of any one of the preceding claims, wherein the memory stores a first predetermined series associated with a first heating profile and a second predetermined series associated with a second heating profile, wherein:

if the scanned series matches the first predetermined series, the controller is configured to select a first heating mode in which the heater is operational according to the first heating profile; and
if the scanned series matches the second predetermined series, the controller is configured to select a second heating mode in which the heater is operational according to the second heating profile.

5. The aerosol-generating device of any preceding claim, wherein the consumable-receiving cavity has an opening at a first axial end and a base at the opposing second axial end wherein the sensor comprises at least one receiver located distal to the base.

6. The aerosol-generating device of claim 5, wherein the at least one receiver is located at or proximal to the opening.

7. The aerosol-generating device of any preceding claim, wherein the sensor comprises at least one receiver extending at least partially in a circumferential direction of the consumable-receiving cavity to at least partially surround the consumable-receiving cavity.

8. The aerosol-generating device of any preceding claim, wherein the sensor comprises a plurality of receivers spaced in a circumferential direction of the consumable-receiving cavity.

9. The aerosol-generating device of any one of claims 5 to 8, wherein the or each receiver is a light receiver.

10. The aerosol-generating device of claim 9, wherein the sensor includes at least one transmitter comprising a light source.

11. The aerosol-generating device of any one of claims 5 to 8, wherein the or each receiver is a displacement probe or ultrasonic receiver.

12. An aerosol-generating system comprising:

the aerosol-generating device of any one of the preceding claims; and
an aerosol-generating consumable having a series of longitudinally-spaced indicators.

13. The aerosol-generating system of claim 12, wherein the indicators are reflective coloured portions of the surface of the consumable and wherein the sensor comprises at least one light receiver.

14. The aerosol-generating system of claim 12, wherein the indicators are indents or protrusions in the surface of the consumable and wherein the sensor comprises at least one displacement probe.

15. An aerosol-generating consumable for use with the aerosol-generating device of any one of claims 1 to 11, wherein the aerosol-generating consumable has a series of longitudinally-spaced indicators.

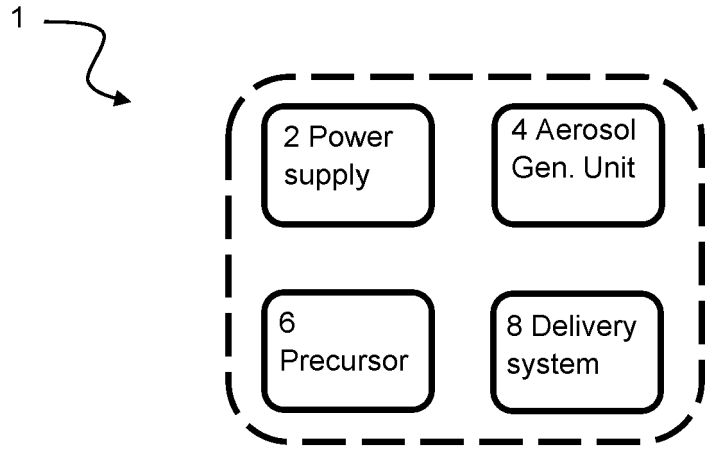
1
2 Power supply
4 Aerosol Gen. Unit
6 Precursor
8 Delivery system

Fig. 1

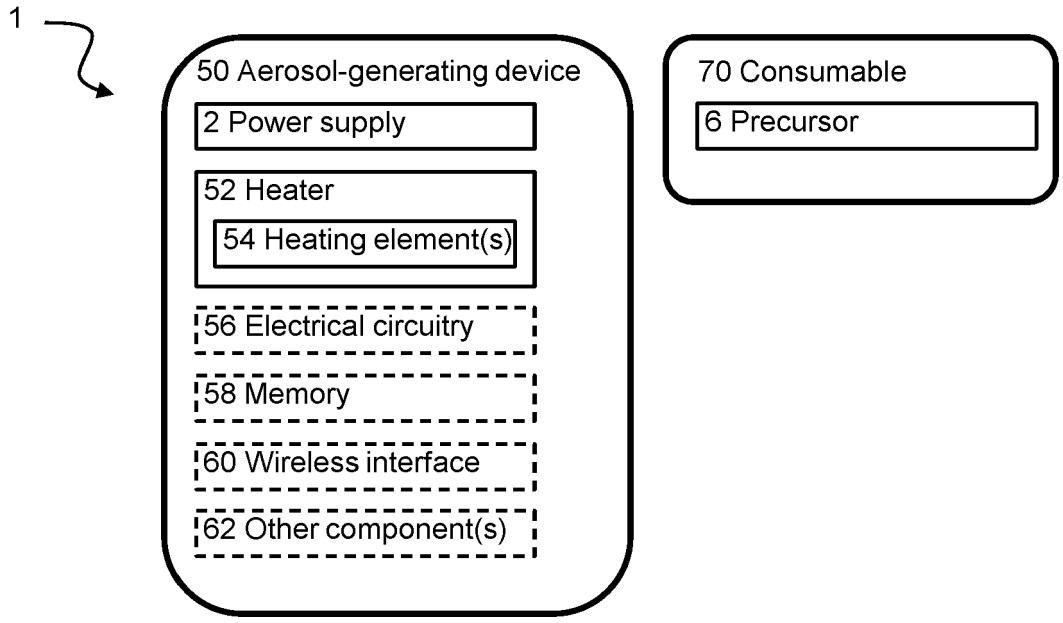
1
50 Aerosol-generating device
2 Power supply
52 Heater
54 Heating element(s)
56 Electrical circuitry
58 Memory
60 Wireless interface
62 Other component(s)
70 Consumable
6 Precursor

Fig. 2

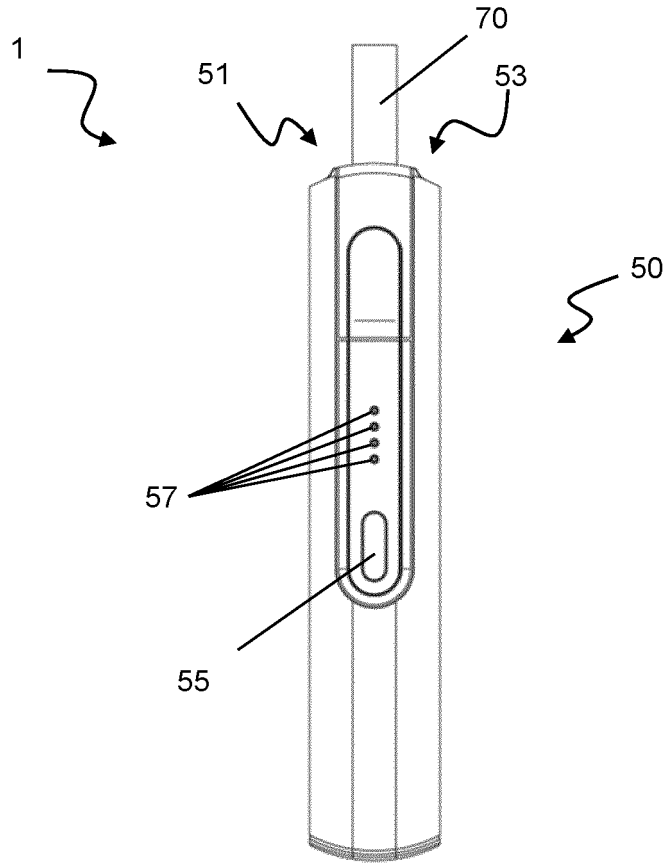
1
51
70
53
50
57
55

Fig. 3

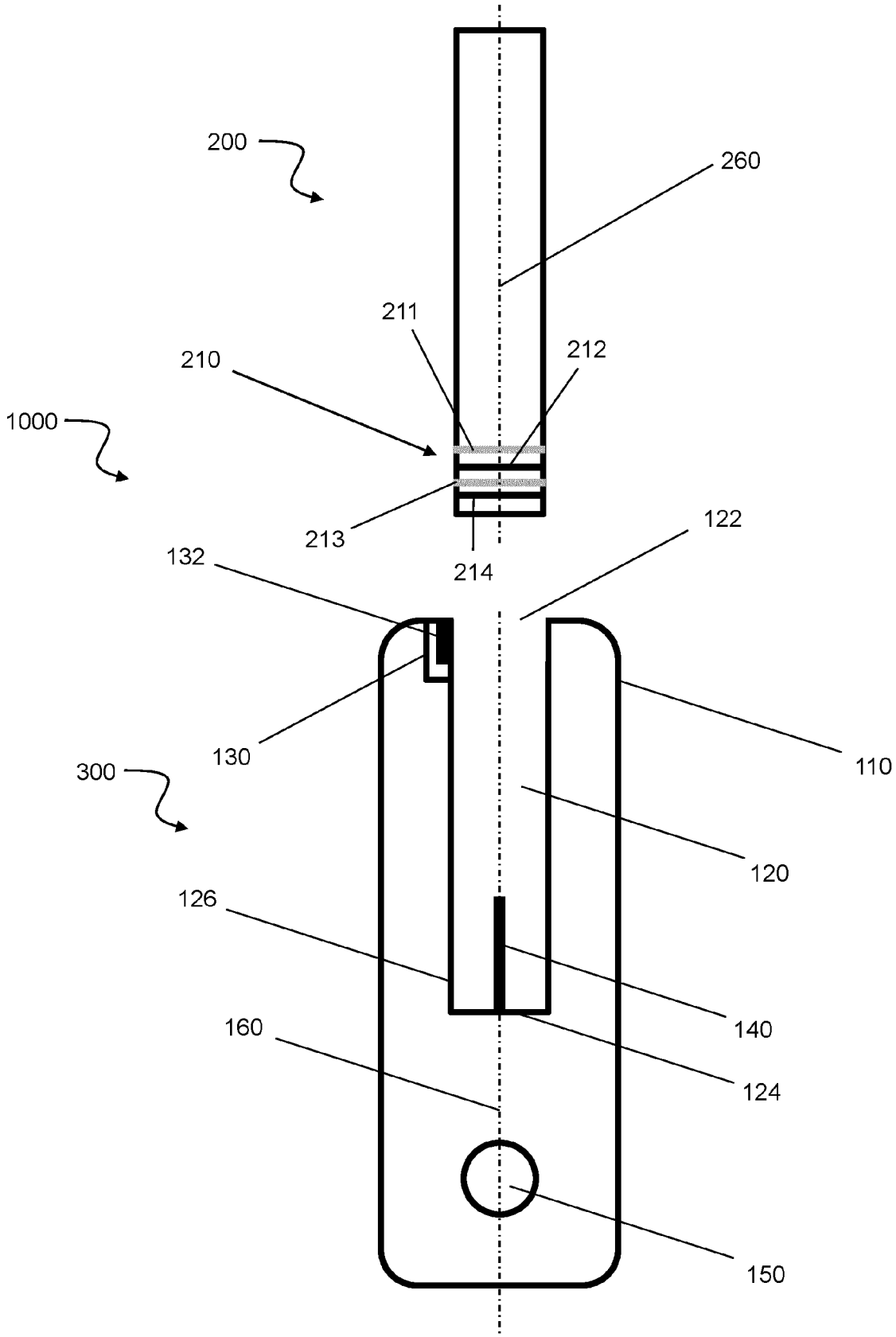
200
260
211
210
212
1000
213
214
122
132
130
110
300
120
126
140
160
124
150

Fig. 4

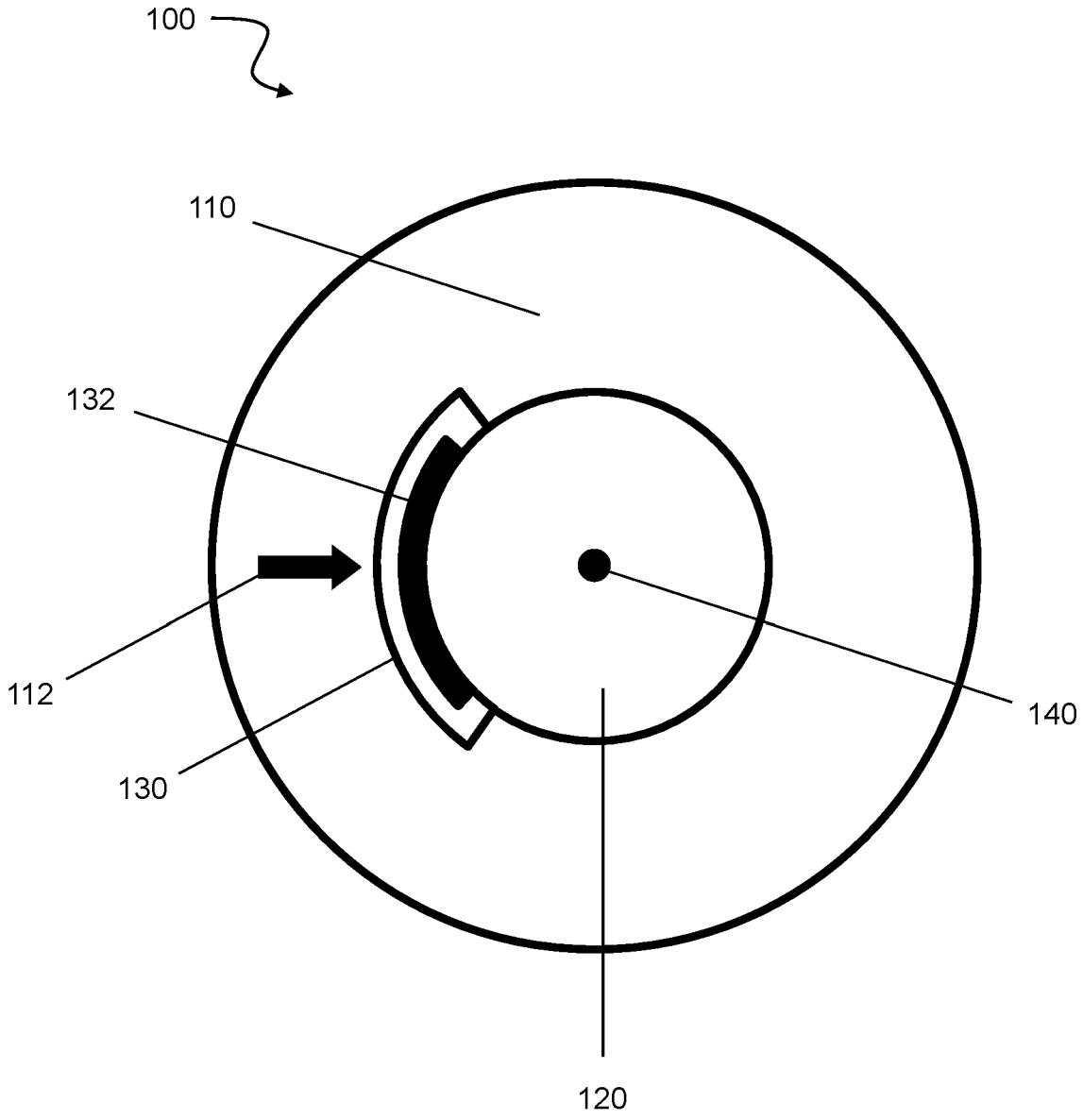

Fig. 5

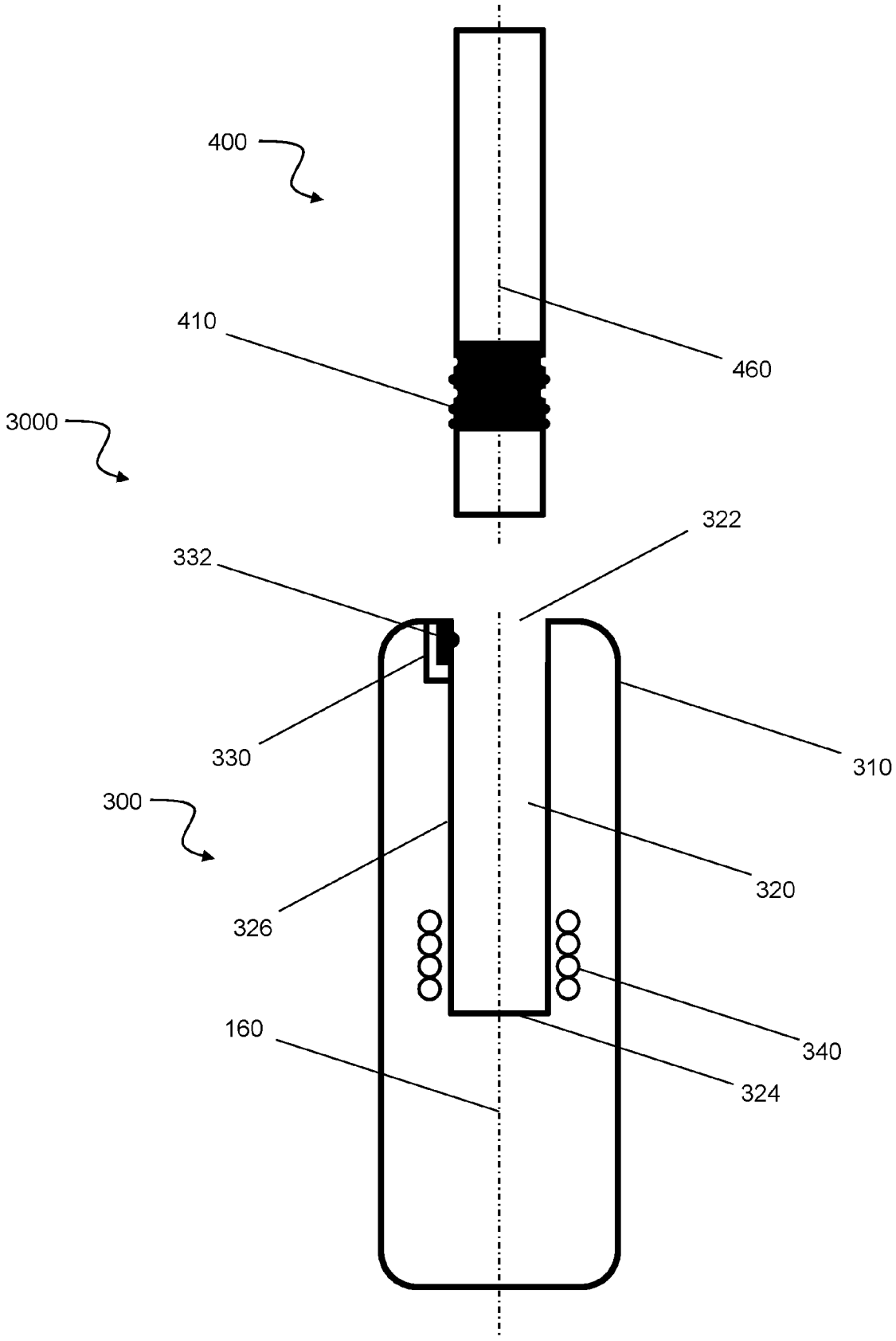

Fig. 6

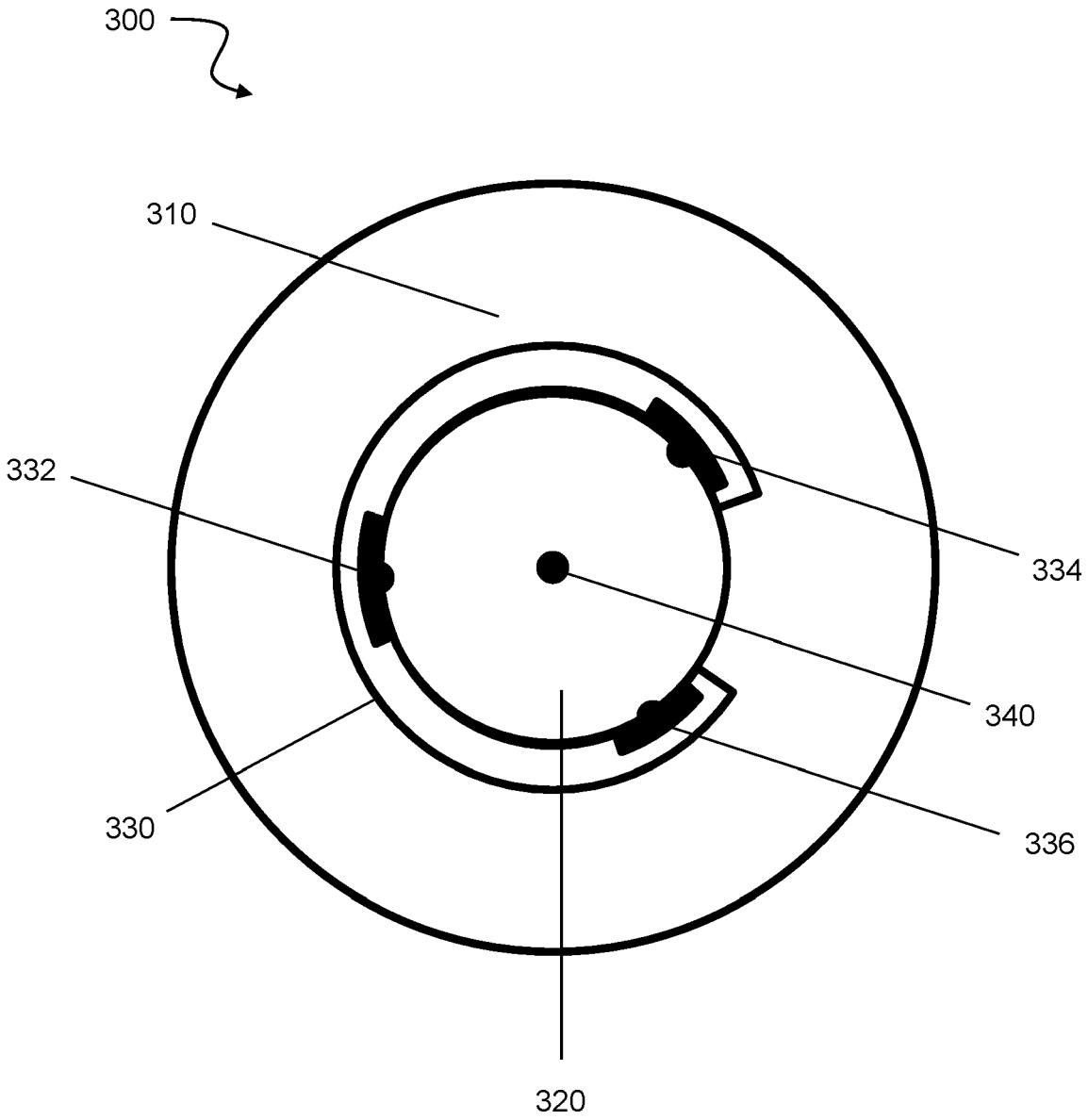

Fig. 7

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 23 19 4366

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2021/122525 A1 (JT INT SA [CH]) 24 June 2021 (2021-06-24) * page 11, line 23 - page 33, line 5; figures 1-22 *	1-15	INV. A24D1/20 A24F40/50
X	WO 2019/185748 A1 (NICOVENTURES TRADING LTD [GB]) 3 October 2019 (2019-10-03) * page 4, line 4 - page 20, line 25; figures 1-10 *	1-15	
X	WO 2020/152289 A1 (NICOVENTURES TRADING LTD [GB]) 30 July 2020 (2020-07-30) * page 9, line 14 - page 20, line 21; figures 1-8 *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

A24D
A24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 February 2024	Klintebäck, Daniel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 23 19 4366

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-02-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2021122525 A1	24-06-2021	CN 114845591 A	02-08-2022
		EP 4076069 A1	26-10-2022
		JP 2023505939 A	14-02-2023
		KR 20220119612 A	30-08-2022
		US 2023079458 A1	16-03-2023
		WO 2021122525 A1	24-06-2021
WO 2019185748 A1	03-10-2019	AU 2019241464 A1	08-10-2020
		AU 2022206728 A1	11-08-2022
		BR 112020020014 A2	05-01-2021
		CA 3095111 A1	03-10-2019
		CN 111918569 A	10-11-2020
		EP 3773032 A1	17-02-2021
		IL 277513 A	30-11-2020
		IL 305043 A	01-10-2023
		JP 2021519077 A	10-08-2021
		KR 20200122393 A	27-10-2020
		KR 20230065364 A	11-05-2023
		NZ 768114 A	30-09-2022
		RU 2763286 C1	28-12-2021
		US 2021015160 A1	21-01-2021
		WO 2019185748 A1	03-10-2019
WO 2020152289 A1	30-07-2020	AU 2020210843 A1	22-07-2021
		CA 3127462 A1	30-07-2020
		CN 113347897 A	03-09-2021
		EP 3914111 A1	01-12-2021
		IL 284563 A	31-08-2021
		JP 7248366 B2	29-03-2023
		JP 2022517777 A	10-03-2022
		KR 20210101320 A	18-08-2021
		NZ 777822 A	30-06-2023
		TW 202031152 A	01-09-2020
		US 2022087323 A1	24-03-2022
		WO 2020152289 A1	30-07-2020

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82