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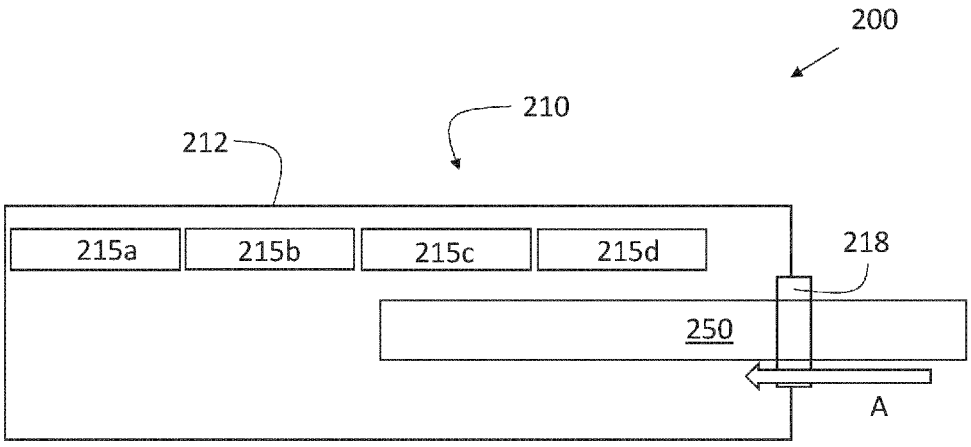

Figure 2

(57) Abstract: There is provided an aerosol provision device comprising: a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable; a communication element arranged on the elongate longitudinal portion; wherein the communication element is arranged to provide an indication to the user in relation to the status of the consumable arranged in use in the aerosol provision device.

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AEROSOL PROVISION DEVICE

Technical Field

The present invention relates to an aerosol provision device, an aerosol-generating system, a method of providing an aerosol for inhalation by a user, and aerosol provision means.

Background

Aerosol-generating systems are known. Common systems use heaters which are activated by a user to create an aerosol by an aerosol provision device from an aerosol generating material which is then provided for inhalation by the user. The device may be activated by a user at the push of a button or merely by the act of inhalation. Modern systems can use consumable elements containing the aerosol generating material. It can be desirable for the manufacturer to provide user control over the activation of the systems. This may avoid the activation of the system in undesirable circumstances.

Modern electronic aerosol-generating systems and aerosol provision devices and the like have been introduced as alternatives to other older or more traditional systems, such as systems relying on combustion of material to provide an aerosol.

The present invention is directed toward solving some of the above problems.

Summary

Aspects of the invention are defined in the accompanying claims.

In accordance with some embodiments described herein, there is provided an aerosol provision device comprising: a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable; a communication element arranged on the elongate longitudinal portion; wherein the communication element is arranged to provide an indication to the user in relation to the status of the consumable arranged in use in the aerosol provision device.

Such a system is able to provide users with indications in relation to relevant operational concerns. This may include indications that are visual, haptic and/or audio. While any indication may be possible, these are extremely user friendly for handheld devices and have been found to integrate well into such devices.

Consumables are used to provide aerosol generating material to aerosol provision devices. Consumables may be popular as they are a simple and easy way to insert aerosol generating material into the various aerosol provision devices and may already have a predetermined amount of aerosol generating material in the consumable. The user may insert (or provide in any other way) a consumable to an aerosol provision device prior to use. This process can be difficult as the user may not be able to fully see the consumable entering and moving into the device.

The status of the consumable may be at least one of: insertion status; lifetime; temperature; position; type; geolocation; and, authenticity.

Informing the user of the lifetime remaining in the consumable is particularly useful as the user is aware how many sessions are remaining prior to needing to change consumable. This is particularly useful as the user is provided with some advanced warning ahead of the device no longer functioning on the consumable.

Informing the user of the temperature of the consumable is particularly useful as the user may be informed when the aerosol provision device is about to provide aerosol (from a pre-use position) and when the aerosol provision device is safe to return to a stored condition (e.g. into a pocket after a use session). The user may also be informed if there is a problem in the heating hardware, for example, if the temperature of the consumable is too low or too high at any point during use or storage (when the heaters should not be activating).

Informing the user of the position of the consumable is particularly useful for users that are unable to see the position of the consumable in the device. This may be the case in examples wherein the device has a cavity for the consumable but has no window for tracking the consumable moving into the cavity. This may be the case when the user is using the device in low light conditions or when the user is partially sighted. Providing this allows the user to

ensure the consumable is safely provided to the aerosol provision device ahead of use and therefore reduces the likelihood of damage to the consumable due to incorrect insertion. This also provides an update to the user as to why the device is potentially not providing an aerosol when expected. The user understands why the device is not providing an aerosol and how to rectify the matter thereby increasing the overall user experience of the device.

Informing the user of the type of consumable is advantageous for improving the user's experience of the device by reducing the likelihood of activation with an unexpected consumable and/or aerosol generating material.

Informing the user of the geolocation status may be useful in restrictive use circumstances. In an example, the user may be intending to use the device in a restricted location, but be unaware of this. The user can be informed by the indications of the communication element that vaping in such circumstances, with a particular consumable, is not possible. For example, in a location wherein nicotine containing vapour cannot be used but a non-nicotine containing vapour can be used, the user may be informed accordingly and act accordingly.

The user may be informed as to the authenticity of the consumable. An authentic consumable is contrasted with a non authentic consumable. Non authentic consumables may be produced by non licenced third parties and may not be rigorously tested for compatibility with the aerosol provision device, as such it is advantageous for the user to be made aware of this prior to use. The manufacturer is able to control the quality of the aerosol provided by the device by increasing the likelihood that authentic consumables are used rather than non authentic consumables. This has an impact on the lifetime of the device and the safety of the user. As such, the user may wish to know the authenticity of the consumable. The device does not need to prevent activation in instances when non authentic consumables are used, however the device may do. The indication allows the user to make an informed decision when activating the device.

The user is therefore highly prepared for actions that may be required (replacing the consumable, receiving an aerosol with a specific component, active or otherwise, moving the consumable within the device to correct the positioning of the consumable, checking, replacing

the heater, using or not using the aerosol provision device due to geolocation-based restrictions, etc).

The communication element may be an interactive screen. This may provide a human machine interface (HMI) or the like for interacting with the device. This may provide information to the user via a visual display. The user may be able to interact with this visual indications via touching the interactive screen.

The communication element may be elongate. This may increase familiarity of the device for users of older or more traditional systems. In particular, the communication element may show an illustration of burn down of a consumable during use (providing the lifetime of the consumable to the user). The remaining use time (which may be referred to as "lifetime" herein) for the consumable in the device may be represented on the communication element. As this is reduced, a burning down visual indication may be shown. This increases the familiarity of the newer aerosol provision device system for users of older combustible systems. As such, the confidence of these users is increased by the provision of this information by emulating the existing habits or rituals they have become accustomed to when using these products. Users of older systems may not be familiar with checking e-liquid levels (e.g.) or the like and therefore this system may be beneficial for such users.

In an example, the communication element is arranged to provide: a plurality of visual indications; a plurality of haptic indications; and at least one audio indications to the user. This may be a particularly advantageous arrangement as the one audio indication may be used for an emergency warning indication. As such, while the visual indications may be used to show general usage of the device (such as showing burn down of a consumable as the aerosol generating material in the device is being depleted), the haptic indication may be used to indicate that the temperature of the consumable is or is not within an acceptable region (e.g. the haptic indications when the temperature is not within an acceptable level, such that the user knows to take the device to a technician), the audio indication may be used to indicate a geolocation-based restriction such that the user is aware when they should not be using the device whether with a specific consumable or at all.

In this way, the indications may be used so as to clearly provide vast amounts of important data to a user for processing accordingly. This can improve user confidence with the device and increase the lifetime of the device as the user can respond proactively to e.g. repairs being required.

In accordance with some embodiments described herein, there is provided an aerosol-generating system for providing an aerosol for inhalation by a user, comprising: aerosol provision device comprising: a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable; a communication element arranged on the elongate longitudinal portion; wherein the communication element is arranged to provide indications to the user in relation to the status of the consumable arranged in use in the aerosol provision device.

In accordance with some embodiments described herein, there is provided a method of providing an aerosol for inhalation by a user, the method comprising: providing an aerosol provision device with a housing comprising an elongate longitudinal portion with a communication element arranged thereon, providing, by the communication element, at least one indication to a user in relation to the status of a consumable arranged in use in the aerosol provision device.

In accordance with some embodiments described herein, there is provided aerosol provision means comprising: a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable; communication means arranged on the elongate longitudinal portion; wherein the communication means is arranged to provide an indication to the user in relation to the status of the consumable arranged in use in the aerosol provision means.

Description of Drawings

The present teachings will now be described by way of example only with reference to the following figures:

Figure 1 is a schematic view of an aerosol provision device according to an example;

Figure 2 is a schematic view of an aerosol provision device according to an example; and,

Figure 3 is a flow diagram according to an example.

While the invention is susceptible to various modifications and alternative forms, specific embodiments are shown by way of example in the drawings and are herein described in detail. It should be understood, however, that the drawings and detailed description of the specific embodiments are not intended to limit the invention to the particular forms disclosed. On the contrary, the invention covers all modifications, equivalents and alternatives falling within the scope of the present invention as defined by the appended claims.

Detailed Description

Aspects and features of certain examples and embodiments are discussed / described herein. Some aspects and features of certain examples and embodiments may be implemented conventionally and these are not discussed / described in detail in the interests of brevity. It will thus be appreciated that aspects and features of apparatus and methods discussed herein which are not described in detail may be implemented in accordance with any conventional techniques for implementing such aspects and features.

The present disclosure relates to aerosol provision systems, which may also be referred to as aerosol provision systems, such as e-cigarettes. Throughout the following description the term “e-cigarette” or “electronic cigarette” may sometimes be used, but it will be appreciated this term may be used interchangeably with aerosol provision system / device and electronic aerosol provision system / device. Furthermore, and as is common in the technical field, the terms "aerosol" and "vapour", and related terms such as "vaporise", "volatilise" and "aerosolise", may generally be used interchangeably.

Figure 1 illustrates a schematic view of an example of an aerosol provision device 100 according to the present invention. The aerosol provision device 100 comprises an aerosol provision device housing 110. The aerosol provision device housing 110 has an elongate longitudinal portion 112. The housing 110 is arranged in use to house a consumable and/or aerosol generating material. The housing 110 may be a broadly cylindrical shape, with a longer longitudinal portion 112 than a corresponding transverse portion. The housing 110 may have a cross section that is not circular, it may be of any cross section, while maintaining an elongate

longitudinal portion 112. The elongate longitudinal portion 112 may have a communication element 115 arranged thereon. The communication element 115 may be a series of elements or one continuous element with multiple operating portions. The communication element 115 is arranged to provide at least one indication to the user in relation to the status of the consumable arranged in use in the aerosol provision device 100.

This arrangement may be able to provide information for the user in a manner that is non-intrusive but highly informative. The communications from the communication element 115 may increase familiarity for users more used to older combustible systems to increase the confidence of use of newer systems.

The elongate communication element 115 may be able to provide a visual indication that is reminiscent of burning down of a cigarette as the aerosol generating material in the consumable in the device 100 is depleted. The linear visual communications along the length of the device 100 enable showing the depletion as may be seen in a typical disposable combustible product. In an example, the consumable may be shown as a stick or the like, reminiscent of older combustible systems, which is shown as being burnt during use, the stick turning a darker colour as use occurs. The remaining visual of consumable indicates the amount of life (use) left in the consumable in the device 100, as would be the case for older combustible products. Encouraging users of such older systems to use newer re-useable systems may also reduce the total devices disposed and therefore provide an environmental benefit.

Provision of data along the elongate portion of the housing is a user friendly location for providing information, as the user is highly likely to view the information. Location along another portion of the device may lead to less easily visible information for the user. As such, the use of, e.g., visual indications and the location along the elongate portion of the device is synergistic in providing data readily to the user as well as increasing the confidence of users of older systems as indications mimic the effects associated with older or traditional combustible products, thereby emulating the existing habits or rituals they have become accustomed to when using these products.

The communication element may provide visual (as explained above), haptic and/or audio indications to a user. Each of these have advantages. The use of visual has been explained and

discussed above. Haptic indications are useful for users that are in low light conditions, wherein visual indications may be less effective. Furthermore, haptic indications are useful for users that are visually impaired and for whom the visual communications are not a viable data transmittal mechanism. The haptic indications may occur along the length of the device from distal end to proximal end in a manner to provide the burn down effect in a haptic manner. This may also provide a clear indication to a user as to sessions remaining (e.g. remaining lifetime of the consumable) by virtue of the user knowing where the indication is occurring in relation to the proximal end. Other haptic indications may be possible, such as a single whole device buzz when the position of the consumable is suitable for device activation. A series of haptic indications, such as a series of five short buzzes, may be used to indicate that the device requires a check up as the heater is not providing a temperature to the consumable as expected. A similar warning buzz may be provided to a user in the instance that the consumable inserted into the device is not authentic.

An audio indication may also be useful in situations that are low light or for users with limited visibility. Audio may also be useful for use in scenarios such as cold weather when users may be wearing additional layers over their hands or the like that may dampen haptic indications. As such, audio indications are highly useful. Emergency indications may be performed via audio as audio indication may be the most reliable form of indication. The user may not be in the same room as the device and therefore be unlikely to notice haptic or visual indications, however the user may receive audio indications. As such, audio indications are very useful for indications that may occur (such as expiry of lifetime of the heater, or urgent repairs required, or other similar emergency issues such as geolocation issues preventing usage of the device) during periods of non use.

In general, the communication element may provide each of the indication forms for different matters or aspects of data. Haptic indications may be used to indicate to the user that aerosol generating material or the consumable has been correctly/incorrectly inserted into the device, the consumable is or is not being heated as per expectations, the consumable is ready to emit a vapour. Visual indications may be used to indicate the type of the consumable or aerosol generating material that is present in the device, red for nicotine containing and green for non nicotine containing, for example. Other lighting choices may be made for any of age restricted, not age restricted; tobacco containing; menthol containing; cannabinoids; and, herbal. Visual

indications may also indicate the lifetime of the consumable, for example a series of red lights where lights go out according to the remaining lifetime of the consumable. Audio indications may be used for powering up (relevant in circumstances wherein the device incorrectly begins powering up when not in a user's hand, thereby improving safety), or other similar potentially dangerous moments during use such as overheating of the consumable likely due to a heater or power source issue. As mentioned above, audio may be useful for geolocation matters which the user may need to be made urgently aware of in case of restrictive policies in certain territories. In combination, the communication arrangement may be a highly effective and reliable system for communicating issues to the user.

Each of these may be programmable for the user, so that the user has an arrangement with their preferred indication system.

The communication element may in an example be an interactive screen. The screen may be able to provide indications with which the user may interact by interacting with the screen. For example, the screen may show burn down of a combustible product during use and the user may be able to flick away a burnt end of the combustible product shown on the screen by flicking the screen. The screen detects the interaction of the user and replicates it within the images shown on the screen. These further increase familiarity for users of older combustible systems with the newer re-useable systems by emulating the existing habits or rituals they have become accustomed to when using these products. As noted above, increasing familiarity leads to increased confidence of use for newer systems.

The communication element may be a human machine interface or the like for allowing the user to interact with data provisions on the device. This may provide the various data to the user in a user-friendly manner.

The communication element 115 in Figure 1 is elongate. It is matched somewhat to the portion of the housing 110 on which it is arranged. The elongate nature of the communication element 115 enhances the likeness to older combustible mechanisms that the communication element 115 may, to some extent, mimic. The technical consideration for this is to improve confidence for newer users to these devices. Linear visual communications enables this to provide high

levels of familiarity and therefore confidence to new users of modern devices by emulating the existing habits or rituals they have become accustomed to when using these products.

The communication element may be one extended communication element or comprise a series of communicating elements. An example of this is shown in Figure 2. Device 200 has housing 210, with an elongate portion 212. The communication element is shown in portions 215a, 215b, 215c, 215d along the portion 212.

Each may light up (provide a visual indication) when the consumable is full. Alternatively, or additionally, each may provide a haptic indication when the consumable is full. When the consumable is 25% depleted, the last portion of the communication element 215d may cease to be lit (or cease to vibrate, there is no requirement for the elements to provide visual indications only). In this way, using visual indications in this example, the user is informed of the lifetime of the consumable in a manner akin to burn down of a cigarette or the like. Again, this increases the similarity between the modern device and older combustible devices.

The device may have LEDs arranged along the length of the device which light according to various technical considerations. For example, the length of the device may be lit when the consumable is full and LEDs may cease to be lit as the consumable depletes accordingly. This provides a clear visual indication to the user how soon a replacement of the consumable will be needed. When 75% of the LEDs are lit, the user has a good amount of use time remaining in the consumable. When 10% are lit, the user may begin to look for a replacement consumable. The colours of the LEDs may also change accordingly, such that when the consumable is full (i.e. unused, fresh), the lights are white, at 80% full the LEDs may be blue, at 40% full the LEDs may be green and at 10% full the LEDs may be at red to provide a further indication that the consumable is likely to need changing soon.

The arrangement may be a series of LED, haptic or audio emitters in rings around the housing of the device. Each may light to indicate gradual changes in the use of the consumable, such as lifetime or insertion status etc.

Any combination of visual, haptic and audio may be used as is useful for a user. As noted above, one type of indication may be reserved (e.g. audio) for emergency notice to the user. In

this way, the user always associates one form of indication as requiring some immediate action. This improves user interaction with the alarm function disclosed herein and the user is not likely to ignore the indications of that type as may happen if the indication (e.g. haptic) is regularly used and a slightly different form of that indication (e.g. 5 buzzes) indicates a serious or severe problem.

The display screen may show thermal pigments along the length of the consumable when inserted into the device turning to a used colour as the consumable is depleted. This may be consumable is shown initially as white and the colour may change to black or transparent as it is depleted over use in the device. The indication of the consumable on the display screen may instead (or additionally) turn brown during use to mimic that of an older or traditional combustible product, thereby emulating the existing habits or rituals they have become accustomed to when using these products.

The system may note the position of the consumable being inserted into the device 200. The system may contain a detector or series of detectors to detect the data that is communicated to the user. The detectors may be any of a timer; a gyroscope; a magnetometer; a housing-located capacitor; a heat sensor; an accelerometer; an altimeter; a light gate; and, a pressure sensor. Each of these may help provide an assessment of the relevant aspects to be communicated to a user.

Figure 2 shows an example of a consumable 250 being inserted in the direction of arrow A, through an opening 218 into the housing 210. The consumable 250 may be inserted into a dedicated chamber or cavity or the like within the housing 210. A detector or detector array may detect the insertion of the consumable 250 and report this to a control circuitry element that provides the indications to the user via haptic, visual or audio indications or cues.

In an example, as the consumable 250 is being inserted correctly into the housing 210, the communication element 215 provides this indication to the user. For example, using visual as an example, the communication element 215d may indicate that the consumable 250 has successfully been inserted into the first portion of the housing 210. The communication element 215c may indicate that the consumable 250 has successfully been inserted into the next portion of the housing 210 as successful insertion continues. The visual indication may be that of a

consumable stick or the like entering a cavity to be most familiar to users of older devices, thus emulating the existing habits or rituals they have become accustomed to when using these products. Alternatively (or additionally), LEDs may simply light up a specific colour as the consumable is successfully inserted into that portion of the housing 210. In the example of Figure 2 then the indicators 215c and 215d may be lit white while indicators 215a, 215b are not lit. If the consumable 250 is then further moved in the direction shown by arrow A but snags on an element within the housing 210, the next indicator 215b may light up red to show an issue to the user. The user is then made aware of the issue and can try to remove and reinsert the consumable 250 until all lights are lit and show white.

The same system as above could be provided using haptic and or audio cues from the indicators 215. For example, the haptic indication may be that each indicator 215a-d buzzes as the consumable 250 is successfully inserted past the relevant portion of the housing 210. Once the consumable 250 is successfully fully inserted, the haptic system may provide a series of short buzzes to confirm to the user that the consumable 250 has been successfully inserted. Alternatively (or additionally), the system may buzz more frequently as the consumable gets closer to full successfully insertion. Once the system provides a continuous buzz (for a period of time) the user is aware that the consumable 250 has been successfully inserted. This may be particularly useful in low light situations, or particularly cold weather where the user may insert the consumable into the housing inside a pocket so that their hands are not outside in the cold. Each of these examples provides important functional data to the user and the user may act accordingly to ensure proper functioning of the device 200.

The device 200 may therefore provide the user with information regarding the insertion status of the consumable 250 whether not inserted (LEDs off or no haptic feedback), improperly inserted (some LEDs red or some haptic feedback indicating an error) and properly inserted (all LEDs white, or a continuous haptic feedback for a predetermined period of time).

The user may also gain satisfaction from the insertion mechanism providing a feedback of successful insertion of the consumable.

In an example, the device has a display screen on which visual indications can be provided to a user during use. The display screen may represent the status of the consumable. The control

circuitry may control the display of the status on the display screen. The device may have an audio element to provide audio indications to a user. The screen may be OLED or contain LEDs or the like. This provides a more user friendly device and improves the overall safety of the device.

The user may be able to interact with the indications physically. For example, the display may show smoke when the device is being operated. The user may be able to swipe through the smoke using movements detected by the detector.

In an example, the display screen may be a display screen with a full wrap-around display. The device may be broadly cylindrical in shape and the screen may be wrapped somewhat or entirely around a portion of the housing. Such an arrangement improves the indications provided by the screen as the screen is more easily visible for a user. As such, indications are more likely to be seen.

Figure 3 shows a method 300 of use of an aerosol provision device. The method 300 is shown as a flow chart. In the method 300, the device may start in a default state 302, which may be with a consumable located within the device. Alternatively, the default operating state may be a consumable not located within the device. The lifetime of the consumable may be full or partially used.

When a user attempts to use, is using, or is not using, the device, the device detects the status of the consumable. This may be as described above. The device detects the status (or statuses for a device containing a plurality of consumables) using a detector (which may contain a number of individual sensors/detectors). The detector may detect 404 the status or statuses via any standard mechanism.

The detector sends a signal accordingly to control circuitry 406. The control circuitry may receive regular signals from the detector or detectors as to the status or statuses but may provide indications to the user as deemed relevant. A user would not require permanently informing that the consumable is located properly within the housing. Rather, a preferred method is that the user is informed when the consumable is initially located properly and then informed once this status changes to improper. However, consumable lifetime and sessions remaining may be

continually (or semi continually, i.e. at regular close intervals) informed to a user so that the user has an up to date understanding of the remaining use in the device.

When such an indication is deemed suitable for communication to the user, the control circuitry may provide an indication to the user 308 via the communication element which itself may be any or all of visual, haptic or audio indications as per the above description.

This method provides a user-friendly, indication process for the user that does not overload the user with information but keeps the user regularly informed as to the relevant matters at any one time during the lifetime of a consumable in the device. The method offers a balance between overloading the user and providing the user with little to no warning ahead of relevant use events (e.g. running out of aerosol generating material or the breakdown of a heater due to providing too much or too little heat to the aerosol generating material in the consumable). With clear indications for users in a variety of situations, the user is well informed and prepared during usage of the device. The method also increases user familiarity for users of older or more traditional combustible-type products by emulating the existing habits or rituals they have become accustomed to when using these products.

The detector as noted above may be a series of detectors. The detector may be one instrument or an array of instruments. The detector as disclosed herein may include a series of instruments that operate simultaneously or together to provide an accurate and informed assessment of the various consumable statuses within the device at any one moment. These are used to ensure correct and relevant indications are provided to the user.

The aerosol provision device may comprise heating arrangements or the like for providing an aerosol from a consumable – the consumable may contain an aerosol generating material or the like. The control circuitry may control the heating arrangement (or the like) according to use requests from a user. The activation and lifetime of the consumable are detected by detectors in the device and provided to control circuitry that links to the communication element or elements on the device for informing a user.

The device and system herein are described as comprising several components that enable several advantages. The components may be disclosed as on-board the device or within the

system. The components may be distributed and therefore not necessarily be located on-board the device. The functionality of the device can be provided by communicatively connected components, and such communication may be wireless, enabling such distribution. At which point it is reasonable to foresee that a distributed array of components will operate in the manner of the devices and systems disclosed herein. Components of the device or system may be contained in a further device such as a smartphone, computer, or remote server or the like.

The method and device disclosed herein enable the user to be informed as suitable as to condition of the consumable within the device. This improves the user experience of the device, the lifetime of the device and the safety of general use of the device.

The devices and systems disclosed herein may be used with consumables comprising aerosol generating material. Such consumables may be solid or liquid and may be cartridges or sticks or the like. The consumable may be refillable or may be replaceable.

In a particular example, the device disclosed herein may operate with a flavour pod which is replaceable in the device – this may be referred to as a consumable. The flavour may be any of tobacco and glycol and may include extracts (e.g., licorice, hydrangea, Japanese white bark magnolia leaf, chamomile, fenugreek, clove, menthol, Japanese mint, aniseed, cinnamon, herb, wintergreen, cherry, berry, peach, apple, Drambuie, bourbon, scotch, whiskey, spearmint, peppermint, lavender, cardamon, celery, cascarilla, nutmeg, sandalwood, bergamot, geranium, honey essence, rose oil, vanilla, lemon oil, orange oil, cassia, caraway, cognac, jasmine, ylang-ylang, sage, fennel, piment, ginger, anise, coriander, coffee, or a mint oil from any species of the genus Mentha), flavour enhancers, bitterness receptor site blockers, sensorial receptor site activators or stimulators, sugars and/or sugar substitutes (e.g., sucralose, acesulfame potassium, aspartame, saccharine, cyclamates, lactose, sucrose, glucose, fructose, sorbitol, or mannitol), and other additives such as charcoal, chlorophyll, minerals, botanicals, or breath freshening agents. They may be imitation, synthetic or natural ingredients or blends thereof.

When combined with an aerosol generating medium, the aerosol provision device as disclosed herein may be referred to as an aerosol provision system.

Thus there has been described an aerosol provision device comprising: a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable; a communication element arranged on the elongate longitudinal portion; wherein the communication element is arranged to provide an indication to the user in relation to the status of the consumable arranged in use in the aerosol provision device.

The aerosol provision system may be used in a tobacco industry product, for example a non-combustible aerosol provision system.

In one embodiment, the tobacco industry product comprises one or more components of a non-combustible aerosol provision system, such as a heater and an aerosolizable substrate.

In one embodiment, the aerosol provision system is an electronic cigarette also known as a vaping device.

In one embodiment the electronic cigarette comprises a heater, a power supply capable of supplying power to the heater, an aerosolizable substrate such as a liquid or gel, a housing and optionally a mouthpiece.

In one embodiment the aerosolizable substrate is contained in or on a substrate container. In one embodiment the substrate container is combined with or comprises the heater.

In one embodiment, the tobacco industry product is a heating product which releases one or more compounds by heating, but not burning, a substrate material. The substrate material is an aerosolizable material which may be for example tobacco or other non-tobacco products, which may or may not contain nicotine. In one embodiment, the heating device product is a tobacco heating product.

In one embodiment, the heating product is an electronic device.

In one embodiment, the tobacco heating product comprises a heater, a power supply capable of supplying power to the heater, an aerosolizable substrate such as a solid or gel material.

In one embodiment the heating product is a non-electronic article.

In one embodiment the heating product comprises an aerosolizable substrate such as a solid or gel material, and a heat source which is capable of supplying heat energy to the aerosolizable

substrate without any electronic means, such as by burning a combustion material, such as charcoal.

In one embodiment the heating product also comprises a filter capable of filtering the aerosol generated by heating the aerosolizable substrate.

In some embodiments the aerosolizable substrate material may comprise an aerosol or aerosol generating agent or a humectant, such as glycerol, propylene glycol, triacetin or diethylene glycol.

In one embodiment, the tobacco industry product is a hybrid system to generate aerosol by heating, but not burning, a combination of substrate materials. The substrate materials may comprise for example solid, liquid or gel which may or may not contain nicotine. In one embodiment, the hybrid system comprises a liquid or gel substrate and a solid substrate. The solid substrate may be for example tobacco or other non-tobacco products, which may or may not contain nicotine. In one embodiment, the hybrid system comprises a liquid or gel substrate and tobacco.

In order to address various issues and advance the art, the entirety of this disclosure shows by way of illustration various embodiments in which the claimed invention(s) may be practiced and provide for a superior electronic aerosol provision system. The advantages and features of the disclosure are of a representative sample of embodiments only, and are not exhaustive and/or exclusive. They are presented only to assist in understanding and teach the claimed features. It is to be understood that advantages, embodiments, examples, functions, features, structures, and/or other aspects of the disclosure are not to be considered limitations on the disclosure 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 the scope and/or spirit of the disclosure. Various embodiments may suitably comprise, consist of, or consist essentially of, various combinations of the disclosed elements, components, features, parts, steps, means, etc. In addition, the disclosure includes other inventions not presently claimed, but which may be claimed in future.

CLAIMS

1. An aerosol provision device comprising:

a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable;

a communication element arranged on the elongate longitudinal portion;

wherein the communication element is arranged to provide an indication to the user in relation to the status of the consumable arranged in use in the aerosol provision device.

2. An aerosol provision device according to claim 1, wherein the consumable comprises aerosol generating material.

3. An aerosol provision device according to claim 1 or 2, wherein the communication element is arranged to provide at least one of visual, haptic and/or audio indications to the user.

4. An aerosol provision device according to any preceding claim, wherein the status of the consumable comprises at least one of: insertion status; lifetime; temperature; position; type; geolocation; and, authenticity.

5. An aerosol provision device according to claim 4, wherein the insertion status comprises at least one of: not inserted; improperly inserted; and, properly inserted.

6. An aerosol provision device according to claim 4 or 5, wherein the type comprises at least one of: age restricted, not age restricted; tobacco containing; menthol containing; cannabinoids; and, herbal.

7. An aerosol provision device according to any preceding claim, wherein the communication element is elongate.

8. An aerosol provision device according to any preceding claim, wherein the communication element comprises a series of communicating elements arranged on the elongate longitudinal portion.

9. An aerosol provision device according to any preceding claim, wherein the communication element is arranged to provide:

a plurality of visual indications;

a plurality of haptic indications; and

at least one audio indications to the user.

10. An aerosol-generating system for providing an aerosol for inhalation by a user, comprising:

aerosol provision device comprising:

a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable;

a communication element arranged on the elongate longitudinal portion;

wherein the communication element is arranged to provide indications to the user in relation to the status of the consumable arranged in use in the aerosol provision device.

11. An aerosol-generating system according to claim 10, wherein the consumable comprises aerosol generating material.

12. An aerosol-generating system according to claim 10 or 11, wherein the communication element is arranged to provide at least one of visual, haptic and/or audio indications to the user.

13. An aerosol-generating system according to any of claims 10 to 12, wherein the status of the consumable comprises at least one of: insertion status; lifetime; temperature; position; type; geolocation; and, authenticity.

14. An aerosol-generating system according to claim 13, wherein the insertion status comprises at least one of: not inserted; improperly inserted; and, properly inserted.

15. An aerosol-generating system according to claim 13 or 14, wherein the type comprises at least one of: age restricted, not age restricted; tobacco containing; menthol containing; cannabinoids; and, herbal.

16. An aerosol-generating system according to any of claims 10 to 15, wherein the communication element is elongate.

17. An aerosol-generating system according to any of claims 10 to 16, wherein the communication element comprises a series of communicating elements arranged on the elongate longitudinal portion.

18. An aerosol-generating system according to any of claims 10 to 17, wherein the communication element is arranged to provide:

a plurality of visual indications;

a plurality of haptic indications; and

at least one audio indications to the user.

19. A method of providing an aerosol for inhalation by a user, the method comprising:

providing an aerosol provision device with a housing comprising an elongate longitudinal portion with a communication element arranged thereon,

providing, by the communication element, at least one indication to a user in relation to the status of a consumable arranged in use in the aerosol provision device.

20. The method of claim 19, wherein providing at least one indication comprises at least one of: providing a visual indication; providing a haptic indication; and, providing an audio indication.

21. The method of claim 19 or 20, wherein

wherein the status of the consumable comprises at least one of: insertion status; lifetime; temperature; position; type; and, authenticity.

22. The method of any of claims 19 to 21, wherein the communication element is interactive screen and wherein the communication element is elongate.

23. The method of any of claims 19 to 22, wherein providing at least one indication comprises:

providing a plurality of visual indications;

providing a plurality of haptic indications; and,

providing one audio indication.

24. Aerosol provision means comprising:

a housing comprising an elongate longitudinal portion, the housing arranged to, in use, house a consumable;

communication means arranged on the elongate longitudinal portion;

wherein the communication means is arranged to provide an indication to the user in relation to the status of the consumable arranged in use in the aerosol provision means.

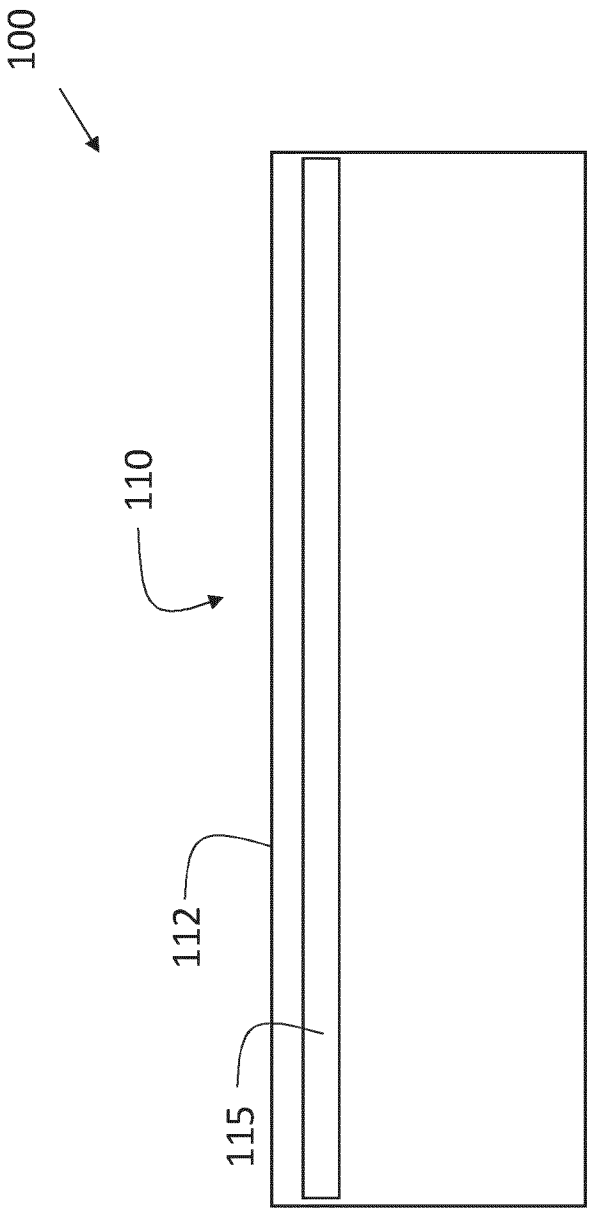

Figure 1

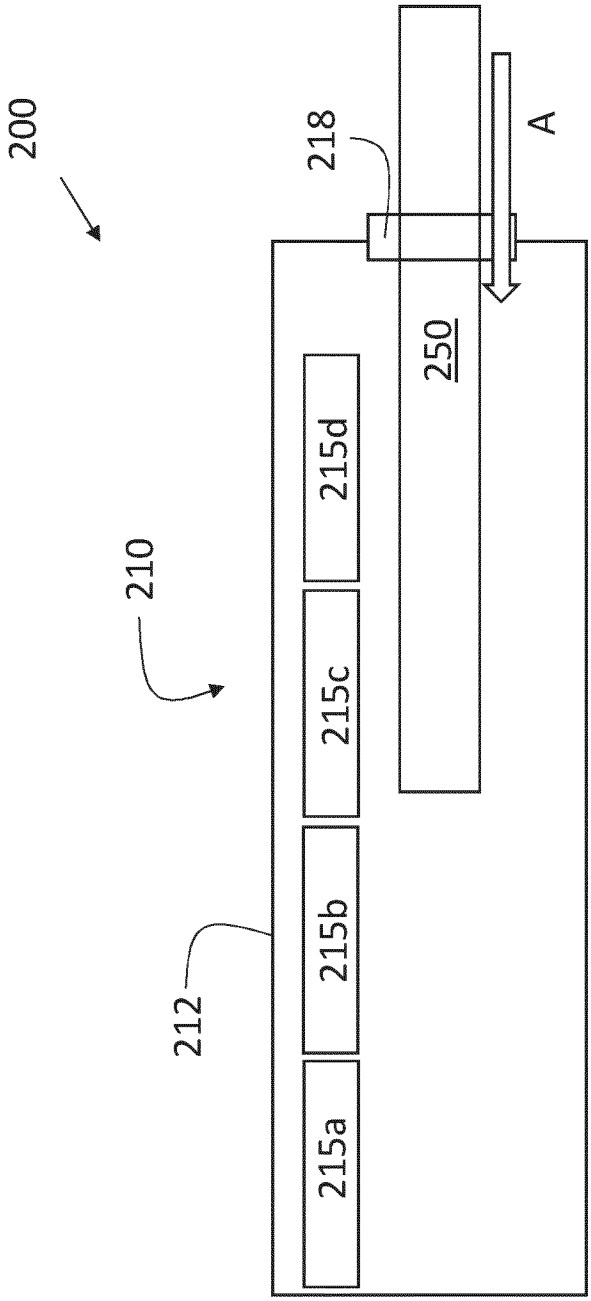

Figure 2

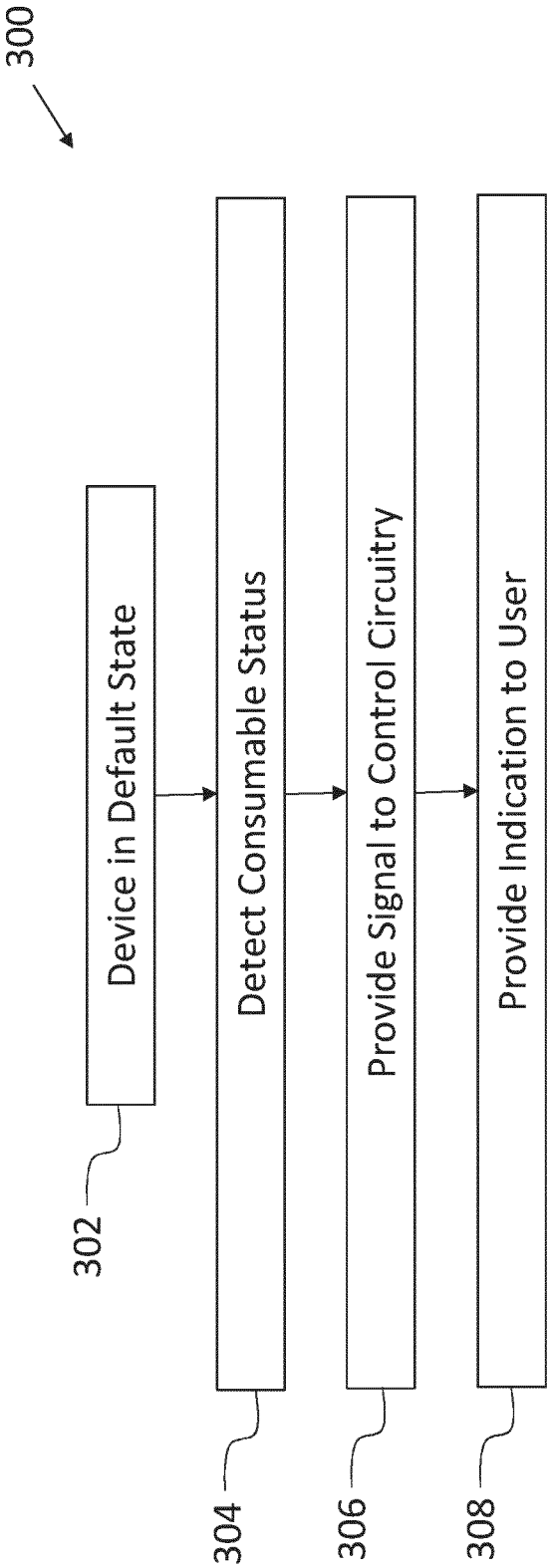
300
Device in Default State
Detect Consumable Status
Provide Signal to Control Circuitry
Provide Indication to User
302
304
306
308

Figure 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/054804

A. CLASSIFICATION OF SUBJECT MATTER

INV. A24F40/60
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 A61M

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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2015/020825 A1 (GALLOWAY MICHAEL RYAN [US] ET AL) 22 January 2015 (2015-01-22) paragraph [0001] - paragraph [0011] paragraph [0019] - paragraph [0043] -----	1-24

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 May 2024	06/06/2024

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Anticoli, Claud

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2024/054804

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		PL 4018858 T3	15-04-2024
		US 2015020825 A1	22-01-2015
		US 2022104552 A1	07-04-2022
		WO 2015009838 A2	22-01-2015