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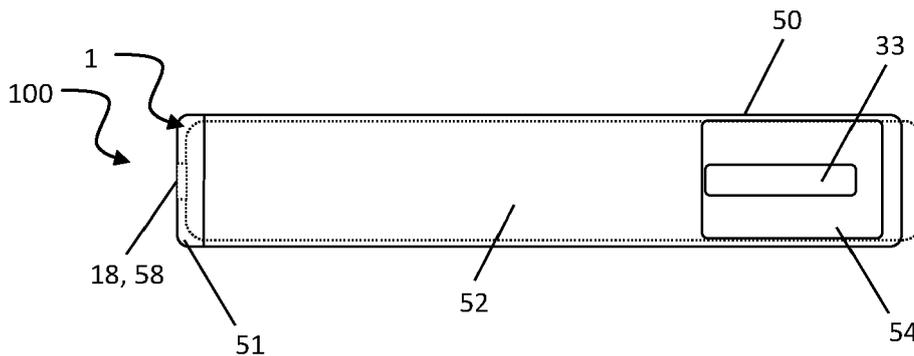
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(54) **AEROSOL GENERATING SYSTEM AND METHOD FOR DISPLAYING INFORMATION AND/OR A PATTERN**

(57) The invention refers to an aerosol generating system which comprises an aerosol generating apparatus for generating an aerosol to be inhaled, and a display

device for displaying information and/or a pattern. The display device is configured to be removably attached to the aerosol generating apparatus.



**Fig. 4b**

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## Description

### FIELD

[0001] The present disclosure relates to an aerosol generating system including an aerosol generating apparatus and to a method for displaying information and/or a pattern on a display device for an aerosol generating apparatus.

### BACKGROUND

[0002] A typical aerosol generating apparatus may comprise a power supply, an aerosol generating unit that is driven by the power supply, an aerosol precursor, which in use is aerosolised by the aerosol generating unit to generate an aerosol, and a delivery system for delivery of the aerosol to a user.

[0003] A drawback with known aerosol generating apparatuses is that they cannot be easily personalized.

[0004] In spite of the effort already invested in the development of aerosol generating apparatuses/systems further improvements are desirable.

### SUMMARY

[0005] The present disclosure provides an aerosol generating system that comprises an aerosol generating apparatus for generating an aerosol to be inhaled, and a display device for displaying information and/or a pattern.

[0006] In some examples, the display device is configured to be removably attached to the aerosol generating apparatus.

[0007] In this way, the display device may be used for several aerosol generating apparatuses, e.g., of the same type. For example, a single display device may be used for a single type of aerosol generating apparatus. In other words, the display device may be configured to be removably attached to a single type of aerosol generating apparatus. For example, the display device may have a shape or configuration which is adapted to or matches a shape or configuration of the aerosol generating apparatus.

[0008] The display device may include a display which displays information and/or a pattern. For example, the information displayed may relate to the battery status, any other status information, and/or any other information that may be gathered from an external source. The pattern may include one or more colours, one or more designs, and/or the arrangement of the one or more designs on the display. For example, the pattern may be used to personalise the aerosol generating system to the user. In an optional embodiment, the display device may display a colour and/or pattern that matches the colour and/or pattern of clothes or any other piece worn or carried by the user. The information and/or pattern may be stationary or may be a moving pattern/information.

[0009] The display device may be external to the aerosol generating apparatus, e.g., can be a separate component that can be attached to the aerosol generating apparatus and subsequently removed therefrom. For example, the display device may be sold or offered separate from the aerosol generating apparatus. The optional removal of the display device from the aerosol generating apparatus simplifies the recycling of the aerosol generating system since the display device is not permanently fixed to the aerosol generating apparatus. Further, the life span of the aerosol generating apparatus may be shorter than the lifespan of the display device so that a single display device may be employed over the life spans of several aerosol generating apparatuses. This reduces the amount of display devices that are needed overall. Thus, resources can be saved.

[0010] The display device may be powered and/or controlled by the aerosol generating apparatus. Thus, the display device may be free of a controller or electric circuitry that is configured to control the display of the display device. However, the display device may include a controller and/or electronic circuitry that is configured to transfer data received from the aerosol generating apparatus into information and/or a pattern displayed on a display of the display device. Further, the display device may be free of a power source, e.g., a battery. The display device may be powered by the aerosol generating apparatus. Both aspects may result in that the display device requires less space so that the display device can be slimmer or lighter compared to a configuration in which the display device includes a power source and/or a controller.

[0011] In some examples, the aerosol generating apparatus is a single-use aerosol generating apparatus. Optionally, the display device or the display of the display device cover a part or substantially an entire outer surface of the single-use aerosol generating apparatus.

[0012] In this way, a single display device may be used for a plurality of single-use aerosol generating apparatuses. This reduces the cost for manufacturing a single-use aerosol generating apparatuses and simplifies recycling of the single-use aerosol generating apparatuses because the display device is not permanently fixed to the single-use generating apparatus. Further, the single-use aerosol generating apparatus can be manufactured without display because the functionality of the display may be carried out by the display device.

[0013] The display device may cover a part of or substantially the entire outer surface of the aerosol generating apparatus. In this way, the appearance of substantially the entire aerosol generating apparatus can be changed/personalised by selecting a pattern to be displayed by the display device. So, the aerosol generating apparatus may have manufactured or sold having a single colour and any variation of the colour scheme of the aerosol generating apparatus may be provided by the display device. This again can simplify manufacturing and can reduce costs.

[0014] The display device or the display of the display

device may cover one or more side surfaces of the aerosol generating apparatus. For example, the display device covers the entire outer surface of the aerosol generating apparatus except for a mouthpiece of the aerosol generating apparatus and an input device or actuator for controlling the operation of the aerosol generating apparatus. The input device or actuator may include one or more buttons, switches, and /or dials. In this case, the display device does not cover the input device so that the user can still operate the input device when the display device is attached to the aerosol generating apparatus.

**[0015]** The single-use aerosol generating apparatus may be a unitary component including the components and/or features of the device body (described further below) and the consumable (described further below). For example, the components of the consumable (e.g., a tank for a liquid, a heater, a mouthpiece, etc.) are fixedly attached to the components of the device body (e.g., a battery, a controller, a user input, etc.). Optionally, the single-use aerosol generating apparatus may include a tank that is not refillable. For example, the tank of the single-use aerosol generating apparatus may be free from an opening or aperture which would provide an access for refilling a liquid into the tank. Further, a battery of the single-use aerosol generating apparatus may be not rechargeable. Further, the single-use aerosol generating apparatus may be free of a port for charging the battery of the single-use aerosol generating apparatus. The battery of the single-use aerosol generating apparatus may be designed that the electrical energy stored therein may be sufficient for vaporizing the liquid in the tank. However, further activation of the vaporizer may not be possible due to a lack of electrical energy stored in the battery.

**[0016]** In some examples, the aerosol generating apparatus includes a device body and a single-use consumable configured to be removably attached to the device body. Optionally, the display device is configured to be removably attached to the consumable and/or the device body.

**[0017]** The device body may have a device display for displaying information and/or a pattern that is permanently fixed to the device body because the device body is not a single-use component. In this case, the display device may only be attached to the consumable and/or covers only the consumable when attached to the consumable. Alternatively, the display device may be attached to both the device body and the consumable or only to the device body. In this case, the display device may mainly cover the consumable for personalising the consumable and/or for providing information on the consumable. In another optional embodiment, the device body does not include any display so that the display device may also partially and/or substantially entirely cover the device body for personalising the device body and/or for providing information on the device body.

**[0018]** The single-use consumable may include a tank

that is not refillable. For example, the tank of the single-use consumable may be free from an opening or aperture which would provide an access for refilling a liquid into the tank. Further, the vaporizer of the single-use consumable may be designed to have a lifespan that reliably vaporizes the liquid contained in the tank. However, the vaporizer may not be configured to reliably vaporize further liquid.

**[0019]** In some examples, the display device includes a first electrical connector and the aerosol generating apparatus includes a second electrical connector. Optionally, the first electrical connector and the second electrical connector are configured to provide an electrical connection between the display device and the aerosol generating apparatus when the display device is attached to the aerosol generating apparatus.

**[0020]** The first electrical connector can include a plug and the second electrical connector can include a socket or vice versa. Other commonly known electrical means for providing an electrical connection between two mechanical components may be employed.

**[0021]** The first electrical connector and the second electrical connector can be used for providing an electrical or electronic connection between the aerosol generating apparatus and the display device. The first electrical connector and the second electrical connector can be used for powering the display device by the aerosol generating device and/or for sending data from the aerosol generating apparatus to the display device (or vice versa). The first electrical connector and the second electrical connector may be regarded as first interface and a second interface, respectively, for providing an electrical and/or electronic connection between the display device and the aerosol generating apparatus. Electrical power and/or (digital) data may be transmitted or sent from the aerosol generating apparatus to the display device (and/or vice versa) and via the first electrical connector and the second electrical connector.

**[0022]** The first electrical connector and the second electrical connector may include one or more electrical or electronic lines for providing the transmission of power and data.

**[0023]** Optionally, when attaching the display device to the aerosol generating apparatus, the first electrical connector is simultaneously electrically connected to the second electrical connector. In other words, the mechanical connection may simultaneously provide an electrical connection so that the display device does not need to be separately electrically connected to the aerosol generating apparatus.

**[0024]** In some examples, the first electrical connector and the second electrical connector further provide a mechanical connection between the display device and the aerosol generating apparatus for attaching the display device to the aerosol generating apparatus. In this way, the first electrical connector and the second electrical connector provide both a mechanical and electrical connection between the display device and the

aerosol generating apparatus. For example, a plug and a socket provide both a mechanical and electrical connection.

**[0025]** In some examples, the aerosol generating apparatus includes an electrical circuitry configured to control the display device when the display device is attached to the aerosol generating apparatus.

**[0026]** With this example, the display device may not include an electric circuitry for controlling what is displayed but may merely include the display, and an interface for electrical connection to the aerosol generating apparatus (e.g., the first electrical connector), and/or wires connecting the display to the interface. In other words, the control of what information and/or pattern are displayed on the display device is carried out by the aerosol generating apparatus. In this case, the display device may be free of a controller or electric circuitry which simplifies the manufacturing of the display device and can reduce costs.

**[0027]** In some examples, the aerosol generating apparatus may include an input device or actuator, such as a bottom, dial, and/or switch, which may be used for controlling the display device. This means, the control of the display device (e.g., what information and/or what pattern) can be done using or via the aerosol generating apparatus. For example, the display device may be free of an input device or actuator.

**[0028]** In some examples, the aerosol generating apparatus has an elongate body. Optionally, the display device includes an elongate display body having a hole. Further optionally, the aerosol generating apparatus is configured to be inserted into the hole for attaching the display device to the aerosol generating apparatus.

**[0029]** The display device may include a sleeve into which the aerosol generating apparatus can be inserted. For example, the display device includes a blind hole into which the aerosol generating apparatus is inserted. The length of the hole may be such that substantially the entire aerosol generating apparatus can be inserted into the hole. For example, only a mouthpiece protrudes from the hole when the aerosol generating apparatus is inserted into the hole of the display device. In this way, the display device may substantially completely surround the aerosol generating apparatus (e.g., except for the mouthpiece).

**[0030]** The aerosol generating apparatus may have the shape of a cylinder and the display device may have a shape of a hollow cylinder. An inner surface of the hole of the display device may match the outer surface of the aerosol generating apparatus. An outer surface of the display device may match the outer surface of the aerosol generating apparatus. However, it is also possible that an outer surface of the display device may have a different shape compared to the outer surface of the aerosol generating apparatus. For example, the aerosol generating apparatus may have an oval shape in a cross-sectional view whereas an outer surface of the display device may have a circular shape in a cross-sectional

view.

**[0031]** In some examples, the first electrical connector is arranged in the hole and the second electrical connector is arranged on an end portion of the aerosol generating apparatus that is configured to be inserted into the hole so that the first electrical connector is connected to the second electrical connector when inserting the aerosol generating apparatus into the display body. In this way, inserting the aerosol generating apparatus into the display device both mechanically attached the display device to the aerosol generating apparatus and provides an electrical or electronic connection between the display device and aerosol generating apparatus.

**[0032]** For example, the first electrical connector may be arranged on a bottom wall of the blind hole and/or includes a plug or pin. The second electrical connector may be arranged on a distal end face to be inserted into the hole and/or includes a socket. So, when inserting the aerosol generating apparatus into the hole of the display device, the plug or pin of the display device is inserted into the socket of the aerosol generating apparatus.

**[0033]** In some examples, the display device is configured to be screwed to the aerosol generating apparatus and/or the display device is configured to be removably attached to the aerosol generating apparatus using a snap-fit connection.

**[0034]** The display device and the aerosol generating apparatus could be physically coupled together in other ways, e.g., by screwing one onto the other, through a bayonet fitting, or through a snap engagement mechanism, for example. The snap-fit connection may include a hoop-strain to hold the display device onto the aerosol generating apparatus. The snap-fit connection may include cantilever snap-fit. For example, the cantilever is arranged on the display device and the aerosol generating apparatus includes an undercut.

**[0035]** In some examples, the display device or the display of the display device include an organic light-emitting diode (OLED) and/or liquid-crystal display (LCD).

**[0036]** For example, the display includes an OLED and/or an LCD. Optionally, the LCD is used to display information and/or the OLED is provided for displaying a pattern such as a uniform colour scheme.

**[0037]** In some examples, the display device is flexible. For example, the entire display device is flexible. Alternatively, the display of display device may be flexible except for portions for attaching display device to aerosol generating apparatus which are non-flexible or rigid. In some examples, the display device only includes the display (which is flexible) and a mechanical connection portion for attaching the display to the aerosol generating apparatus (the mechanical connection portion non-flexible or rigid). In this case, the display may be wrapped around the aerosol generating apparatus and fixed to the aerosol generating apparatus using the mechanical connection portion.

**[0038]** The flexibility of display device may be used for

wrapping the display device around the aerosol generating apparatus. Further, the flexibility of display device may allow to adapt a single display device to a plurality of different types of aerosol generating apparatuses.

**[0039]** In some examples, the display device includes a transparent portion so that a portion of the aerosol generating apparatus is visible through the transparent portion when the display device is attached to the aerosol generating apparatus.

**[0040]** The transparent portion of the display device may provide a window through which a user can directly see the underlying portion of the aerosol generating apparatus. For example, a dedicated portion or section of the display device may be permanently transparent. Alternatively or additionally, a portion or section of the display may be transparent when the display device is not powered or operated. In this way, the transparent portion of the display device can be switched between a transparent configuration/state in which the underlying portion of the aerosol generating apparatus is visible and a non-transparent configuration/state (e.g., during which the underlying portion of the aerosol generating apparatus is not visible).

**[0041]** In some examples, the aerosol generating apparatus includes a translucent or transparent section. Optionally, the transparent portion overlaps with the translucent or transparent section when the display device is attached to the aerosol generating apparatus.

**[0042]** For example, the aerosol generating apparatus includes a translucent or transparent window in a storage portion for storing a precursor (e.g., a reservoir or tank) through which the fill level of the precursor is visible. The transparent portion of the display device may overlap with the translucent or transparent section (window) of the aerosol generating apparatus so that, for example, the fill level of the precursor in the storage portion is visible when the display device is attached to the aerosol generating apparatus. Of course, the transparent portion of the display device may overlap with other sections or portions of the aerosol generating apparatus which are helpful or important to be visible when the display device is attached to the aerosol generating apparatus. The respective translucent or transparent sections of the aerosol generating apparatus may not lie adjacent to each other so that the display device may include a plurality of transparent portions.

**[0043]** In some examples, the display device includes a display having transparent portion and a backlight for illuminating the transparent portion.

**[0044]** For example, the display includes an LCD (which is transparent) and the backlight for illuminating the LCD. The backlight may include one or more Light Emitting Diodes (LEDs) and/or an OLED: Alternatively, backlighting the LCD or any other type of display may be provided by a translucent or transparent portion of the aerosol generating apparatus, e.g., by ambient light that can pass the aerosol generating apparatus through the translucent or transparent portion.

**[0045]** In some examples, the aerosol generating system further comprises a mobile device. Optionally, the aerosol generating apparatus and/or the display device include a wireless interface for wireless data communication with the mobile device. Further optionally, the mobile device is configured to control the display device via the aerosol generating apparatus when the display device is connected to the aerosol generating apparatus.

**[0046]** The mobile device may also include a wireless interface for providing wireless data communication between the mobile device on the one hand and the aerosol generating apparatus and/or the display device on the other hand. For example, Bluetooth or other near field communication techniques may be employed. The mobile device may be configured to store and execute an application (app), program, and/or software which facilitates the control of the display device. For example, the information to be displayed and/or the pattern can be chosen, selected, and/or changed using the mobile device. Thus, the aerosol generating apparatus and/or display device may be free of an input device for controlling the display device.

**[0047]** Further, the mobile device may be used to gather the information to be displayed on the display device (e.g., weather, temperature, etc) and/or to store various patterns to be displayed on the display device. For example, the mobile device may be connected to a network and can provide various pieces of information and/or patterns to be displayed on the display device.

**[0048]** If the display device includes a wireless interface (e.g., a transceiver and/or antenna) and the aerosol generating apparatus is free of a wireless interface, the display device may be directly in data communication with the mobile device so that the mobile device can directly control the display device. This optional embodiment allows the aerosol generating device be free of a wireless interface so that the aerosol generating device includes less components and may be less costly. This may be used with a single-use aerosol generating device. In this case, the display device may include a battery for powering the display device so that the display device is self-sufficient.

**[0049]** If the display device is free of a wireless interface and the aerosol generating apparatus includes a wireless interface, the display device may be controlled by the mobile device via the aerosol generating apparatus. In other words, the display device may be electrically and/or electronically connected to the aerosol generating apparatus which receives the data from the mobile device and forwards the data to the display device. This configuration may be used with the optional embodiment in which the device body is not a single use component and may include a rechargeable battery. In this case, the display device may be powered by the device body and controlled by the device body via the mobile device. In this case, the display device may include less electrical components (e.g., no battery, no electrical circuitry) so that the display device may be less bulky providing a

particularly slim display device.

**[0050]** The present disclosure may provide methods for displaying information and/or a pattern on a display device for an aerosol generating apparatus, which may implement any one or more features disclosed herein.

**[0051]** A first method may comprise electrically connecting the display device to the aerosol generating apparatus, providing data-communication between a mobile device and the aerosol generating apparatus, and controlling the display device using the mobile device. This may correspond to the above-described configuration of controlling the display device by the mobile device via the aerosol generating apparatus.

**[0052]** A second method may comprise providing data-communication between a mobile device and the display device and controlling the display device using the mobile device. This may correspond to the above-described configuration of controlling the display device directly by the mobile device, i.e., not via the aerosol generating apparatus.

**[0053]** 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

**[0054]** 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 apparatus.

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

**Figs. 3a to 3c** are schematic diagrams showing an example implementation of an aerosol generating system including the aerosol generating apparatus of Fig. 1.

**Figs. 4a and 4b** are schematic diagrams showing a different example implementation of a second embodiment of an aerosol generating system.

**Fig. 5** is a block system diagram showing an example system for controlling an aerosol generating apparatus.

**Fig. 6** is a block diagram showing optional steps of a

first method for controlling a display device of an aerosol generating.

**Fig. 7** is a block diagram showing optional steps of a second method for controlling a display device of an aerosol generating.

#### DETAILED DESCRIPTION OF EMBODIMENTS

**[0055]** 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.

**[0056]** 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.

**[0057]** Any patents, published patent applications, and non-patent publications mentioned in the specification are hereby incorporated by reference in their entirety.

**[0058]** 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.

**[0059]** 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.

**[0060]** 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).

**[0061]** 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.

**[0062]** 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.

**[0063]** 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 apparatus" (or "electronic(e)-cigarette") may be an apparatus configured to deliver an aerosol to a user for inhalation by the user. The apparatus may additionally/alternatively be referred to as a "smoking substitute apparatus", 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 apparatus may comprise an aerosol with particle sizes of 0.2 - 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 apparatus 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.

**[0064]** Each occurrence of the aerosol generating apparatus 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 apparatus. The aerosol generating apparatus 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 apparatus 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 apparatus (to replicate an effect of smoking a conventional combustible smoking article).

**[0065]** The aerosol generating apparatus may be portable. As used herein, the term "portable" may refer to the apparatus being for use when held by a user.

**[0066]** As used herein, an "aerosol generating system" may be a system that includes an aerosol generating apparatus and optionally other circuitry/components associated with the function of the apparatus, e.g., one or more external devices and/or one or more external components (here "external" is intended to mean external to the aerosol generating apparatus).

**[0067]** As used herein, an "external device" and "external component" may include one or more of a: a charging device, a display device, a mobile device (which may be connected to the aerosol generating apparatus, e.g. via a wireless or wired connection); a networked-based computer (e.g. a remote server); a cloud-based computer; any other server system.

**[0068]** An example aerosol generating system may be a system including the aerosol generating apparatus, the display device, and/or the mobile device. The mobile device may be used for controlling the display device.

**[0069]** 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. 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 apparatus 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 components; a carrier; a flavouring.

**[0070]** As used herein, a "storage portion" may be a portion of the apparatus 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.

**[0071]** As used herein, a "flow path" may refer to a path or enclosed passageway through an aerosol generating apparatus, 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.

**[0072]** 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.

**[0073]** 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.

**[0074]** 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 heating system 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 apparatus.

**[0075]** As used herein, a "heating system" 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 there-through. The at least one heating element may be arranged as a susceptor to produce heat when penetrated by an alternating magnetic field. The heating system may be configured to heat a precursor to below 300 or 350 degrees C, including without combustion.

**[0076]** 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 pre-

cursor. 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.

**[0077]** 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 cutouts to encode a bit, through which pins or a reader may be inserted).

**[0078]** As used herein, "electrical circuitry" may refer to one or more electrical components, examples of which may include: an Application Specific Integrated Circuit (ASIC); electronic/electrical componentry (which may include combinations of transistors, resistors, capacitors, inductors etc); one or more processors; a non-transitory memory (e.g. implemented by one or more memory devices), that may store one or more software or firmware programs; a combinational logic circuit; interconnection of the aforesaid. The electrical circuitry may be located entirely at the apparatus, or distributed between the apparatus and/or on one or more external devices in communication with the apparatus, e.g., as part of a system

**[0079]** As used herein, a "processing resource" (or "processor" or "controller") may refer to one or more units for processing data, examples of which may include an ASIC, microcontroller, FPGA, microprocessor, digital signal processor (DSP) capability, state machine or other suitable components. A processing resource may be configured to execute a computer program, e.g., which may take the form of machine-readable instructions, which may be stored on a non-transitory memory and/or programmable logic. The processing resource may have various arrangements corresponding to those discussed for the circuitry, e.g., on-board and/or off board the apparatus as part of the system. As used herein, any machine executable instructions, or computer readable media, may be configured to cause a disclosed method to be carried out, e.g., by an aerosol generating apparatus or system as disclosed herein, and may therefore be used synonymously with the term method.

**[0080]** As used herein, an "external device" (or "peripheral device") may include one or more electronic components external to an aerosol generating apparatus. Those components may be arranged at the same location as the aerosol generating apparatus or remote from the apparatus. An external device may comprise electronic computer devices including: a display device, a smartphone; a PDA; a video game controller; a tablet; a

laptop; or other like device.

**[0081]** As used herein, a "computer readable medium/media" (or "memory" or "data storage") may include any medium capable of storing a computer program, and may take the form of any conventional non-transitory memory, for example one or more of: random access memory (RAM); a CD; a hard drive; a solid-state drive; a memory card; a DVD. The memory may have various arrangements corresponding to those discussed for the circuitry/processor. The present disclosure includes a computer readable medium configured to cause an apparatus or system disclosed herein to perform a method as disclosed herein.

**[0082]** As used herein, a "communication resource" (or "communication interface") may refer to hardware and/or firmware for electronic information/data transfer. The communication resource may be configured for wired communication ("wired communication resources") or wireless communication ("wireless communication resource" or "wireless interface"). Wireless communication resources may include hardware to transmit and receive signals by radio and may include various protocol implementations e.g. the 802.11 standard described in the Institute of Electronics Engineers (IEEE) and Bluetooth™ from the Bluetooth Special Interest Group of Kirkland Wash. Wired communication resources may include; Universal Serial Bus (USB); High-Definition Multimedia Interface (HDMI) or other protocol implementations. The apparatus may include communication resources for wired or wireless communication with an external device.

**[0083]** As used herein, a "network" (or "computer network") may refer to a system for electronic information/data transfer between a plurality of apparatuses/devices. The network may, for example, include one or more networks of any type, which may include: a Public Land Mobile Network (PLMN); a telephone network (e.g. a Public Switched Telephone Network (PSTN) and/or a wireless network); a local area network (LAN); a metropolitan area network (MAN); a wide area network (WAN); an Internet Protocol Multimedia Subsystem (IMS) network; a private network; the Internet; an intranet.

**[0084]** It will be appreciated that any of the disclosed methods (or corresponding apparatuses, programs, data carriers, etc.) may be carried out by either a host or client, depending on the specific implementation (i.e. the disclosed methods/apparatuses are a form of communication(s), and as such, may be carried out from either 'point of view', i.e. in corresponding to each other fashion). Furthermore, it will be understood that the terms "receiving" and "transmitting" encompass "inputting" and "outputting" and are not limited to an RF context of transmitting and receiving electromagnetic (e.g., radio) waves. Therefore, for example, a chip or other device or component for realizing embodiments could generate data for output to another chip, device or component, or have as an input data from another chip, device, or component, and such an output or input could be referred to as "transmit" and "receive" including gerund forms, that is,

"transmitting" and "receiving," as well as such "transmitting" and "receiving" within an RF context.

**[0085]** Referring to Fig. 1, an example aerosol generating apparatus 1 includes a power supply 2, for supply of electrical energy. The aerosol generating apparatus 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 apparatus 1 includes a precursor 6, which in use is aerosolised by the aerosol generating unit 4 to generate an aerosol. The apparatus 2 includes a delivery system 8 for delivery of the aerosol to a user.

**[0086]** Electrical circuitry (not shown in figure 1) may be implemented to control the interoperability of the power supply 2 and aerosol generating unit 4.

**[0087]** 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.

**[0088]** Fig. 2 shows an implementation of the aerosol generating apparatus 1 of Fig. 1, where the aerosol generating apparatus 1 is configured to generate aerosol from a liquid precursor.

**[0089]** In this example, the aerosol generating apparatus 1 includes a device body 10 and a consumable 30. In this example, the device body 10 includes the power supply 2. The device body 10 may additionally include any one or more of an electrical circuitry 12, a memory 14, a wireless interface 16, and/or a second electrical connector 18.

**[0090]** The electrical circuitry 12 may include a processing resource for controlling one or more operations of the device body 10 and consumable 30, e.g., based on instructions stored in the memory 14.

**[0091]** The wireless interface 16 may be configured to communicate wirelessly with an external (e.g., mobile) device, e.g., via Bluetooth.

**[0092]** The second electrical connector 18 may provide an electrical and/or electronic connection to a display device 50 (described below). The second electrical connector 18 may include a socket or recess (see Figs. 3a to 3c and corresponding description below).

**[0093]** The aerosol generating apparatus 1 may further include other component(s) which may include one or more user interface devices configured to convey information to a user and/or a charging port, for example (see e.g., Fig. 5).

**[0094]** The consumable 30 includes a storage portion implemented here as a tank 32 which stores the liquid precursor 6 (e.g., e-liquid). The consumable 30 also includes a heating system 34, one or more air inlets 36, and a mouthpiece 38. The consumable 30 may include one or more other components not shown in the figures.

**[0095]** The device body 10 and consumable 30 may each include a respective electrical interface (not shown) to provide an electrical connection between one or more

components of the device body 10 with one or more components of the consumable 30. In this way, electrical power can be supplied to components (e.g., the heating system 34) of the consumable 30, without the consumable 30 needing to have its own power supply.

**[0096]** In use, a user may activate the aerosol generating apparatus 1 when inhaling through the mouthpiece 38, i.e., when performing a puff. The puff, performed by the user, may initiate a flow through a flow path in the consumable 30 which extends from the air inlet(s) 36 to the mouthpiece 38 via a region in proximity to the heating system 34.

**[0097]** Activation of the aerosol generating apparatus 1 may be initiated, for example, by an airflow sensor in the device body 10 which detects airflow in the aerosol generating apparatus 1 (e.g., caused by a user inhaling through the mouthpiece 38), or by actuation of an actuator (or input device) included in the device body 10. Upon activation, the electrical circuitry 12 (e.g. under control of the processing resource) may supply electrical energy from the power supply 2 to the heating system 34 which may cause the heating system 32 to heat liquid precursor 6 drawn from the tank 32 to produce an aerosol which is carried by the flow out of the mouthpiece 38.

**[0098]** In some examples, the heating system 34 may include a heating filament and a wick, wherein a first portion of the wick extends into the tank 32 in order to draw liquid precursor 6 out from the tank 32, wherein the heating filament coils around a second portion of the wick located outside the tank 32. The heating filament may be configured to heat up liquid precursor 6 drawn out of the tank 32 by the wick to produce the aerosol.

**[0099]** In this example, the aerosol generating unit 4 is provided by the above-described heating system 34 and the delivery system 8 is provided by the above-described flow path and mouthpiece 38.

**[0100]** In variant embodiments (not shown), any one or more of the precursor 6, heating system 34, air inlet(s) 36 and mouthpiece 38, may be included in the device body 10. For example, the air inlet(s) 36 may be included in the device body 10 with the precursor 6 and heating system 34 arranged as a separable cartomizer.

**[0101]** Figs. 3a to 3c show an example implementation of an aerosol generating system 100 which includes the aerosol generating device 1 of Fig. 2 and a display device 50.

**[0102]** In this example, the consumable 30 is implemented as a capsule/pod, which is shown in Figs. 3a and 3c as being physically coupled to the device body 10 and is shown in Fig. 3b as being decoupled from the device body 10.

**[0103]** In this example, the device body 10 and the consumable 30 are configured to be physically coupled together by pushing the consumable 30 into an aperture in a top end 11 the device body 10, with the consumable 30 being retained in the aperture via an interference fit.

**[0104]** In other examples (not shown), the device body 10 and the consumable 30 could be physically coupled

together in other ways, e.g., by screwing one onto the other, through a bayonet fitting, or through a snap engagement mechanism, for example.

**[0105]** The device body 10 also includes a charging port (not shown) at a bottom end 13 of the device body 10.

**[0106]** The second electrical connector 18 is arranged on a side surface of the device body 10. The second electrical connector 18 includes an exposed section made from an electrically conductive material that can be contacted by a first electrical connector 58 when the display device 50 is attached to the aerosol generating apparatus 1. The second electrical connector 18 can be electrically connected to the power supply 2 for powering the display device 50. The second electrical connector 18 can also be electrically connected to the electrical circuitry 12, the memory 14, and/or the wireless interface 16 for controlling the display device 50.

**[0107]** The device body 10 also includes a user interface device configured to convey information to a user. Here, the user interface device is implemented as a light 12, which may e.g., be configured to illuminate when the apparatus 1 is activated. Other user interface devices are possible, e.g., to convey information haptically or audibly to a user.

**[0108]** In this example, the consumable 30 has an opaque cap 31, a translucent tank 32 and a translucent window 33. When the consumable 30 is physically coupled to the device body 10 as shown in Figs. 3a and 3c, only the cap 31 and window 33 can be seen, with the tank 32 being obscured from view by the device body 10. The device body 10 includes a slot 15 to accommodate the window 33. The window 33 is configured to allow the amount of liquid precursor 6 in the tank 32 to be visually assessed, even when the consumable 30 is physically coupled to the device body 10.

**[0109]** The display device 50 includes a display body 51 and a display 52. The display body 51 supports the display 52 and can be made from a flexible or nonflexible (i.e., rigid) material. This display body 51 may have the shape of a hollow cylinder and/or may include a hole 56. In the embodiment shown in Figs. 3a to 3c, the display body 51 may be regarded a sleeve and the hole 56 can be a through-hole so that the display body 51 may be pulled over the aerosol generating apparatus 1. For example, the display body 51 may include an elastic portion which can be expanded when the display device 50 is pulled over the aerosol generating apparatus 1 so that the display device 50 is attached by friction fit to the aerosol generating apparatus 1. The mouthpiece 38 may protrude from the display device 30 when the display device 50 is attached to the aerosol generating apparatus 1 so that the user can draw on the mouthpiece 38 without touching the display device 50.

**[0110]** The display 52 may include an LCD or OLED for displaying information and/or a pattern. The display 52 may include a transparent portion 54. The transparent portion 54 may be arranged over the window 33 when the display device 50 is attached to the aerosol generating

apparatus 1 so that the window 33 is visible through the transparent portion 54. For example, this allows to see the fill level of the tank 32 even when the display device 50 is attached to the aerosol generating apparatus 1.

**[0111]** The transparent portion 54 may correspond to the entire display 52. In other words, the display 52 may be transparent, for example if the display 52 is not powered. Of course, the transparent portion 54 may alternatively form only a part of the display 52 or may be offset to the display 52.

**[0112]** The display device 50 may also include a backlight (not shown in the figures) for illuminating the display 52. For example, the display 52 includes an LCD for providing information and the backlight includes one or more LEDs or OLEDs for providing a pattern and/or illuminating the LCD. Alternatively, the LCD can be illuminated from the back by the window 33.

**[0113]** The first electrical connector 58 is arranged on the inner surface of the hole 56. The first electrical connector 58 may include an elastic pin, arm, or spring that protrudes from the inner surface of the hole 56 when the display device 50 is not attached to the aerosol generating apparatus 1. The first electrical connector 58 may be deformed or compressed when the display device 50 is attached to the aerosol generating apparatus 1 so that the first electrical connector 58 is pressed against the second electrical connector 18 for providing a reliable electrical connection between the display device 50 and the aerosol generating apparatus 1.

**[0114]** The consumable 30 may be for single-use. The display device 50 may be used for providing further information (i.e., in addition to the information provided by the light 12) and/or for personalising the consumable 30, e.g., by display a pattern on the consumable 30.

**[0115]** Figs. 4a and 4b show a further example implementation of an aerosol generating system 100 which includes of the aerosol generating device 1 of Fig. 1 and a further example implementation of the display device 50. The aerosol generating system 100 of Figs. 4a and 4b may have the same configuration, features, and/or optional characteristics as the aerosol generating system 100 of Figs. 3a to 4c except for the following differences.

**[0116]** In example of Figs. 4a and 4b, the consumable 30 is not provided. Instead, the tank 32 (not visible in Figs. 4a and 4b) and the window 33 are part of the device body 10. The aerosol generating apparatus 1 may be for single-use.

**[0117]** The second electrical connector 18 may be on an end face of the device body 10 that is opposite to the mouthpiece 38. The second electrical connector 18 may be a socket and the first electrical connector 18 can be a plug.

**[0118]** The display device 50 may have a rigid cylindrical body that includes the hole 56 which may extend over substantially the entire length of the display body 51. The hole 56 may be a blind hole. The first electrical connector 58 may be arranged on the bottom wall of the blind hole 56. The end of the device body 10 that is

opposite to the mouthpiece 38 may be inserted into the hole 56 for attaching the display device 50 to the aerosol generating apparatus 1. At the same time, the first electrical connector 58 (e.g., the plug) is connected to the second electrical connector 18 (e.g., is inserted into the socket).

**[0119]** The mouthpiece 38 may protrude from the display device 50 when the aerosol generating apparatus 1 is fully inserted into the display device 50. In this configuration (see Fig. 4b), the transparent portion 54 overlaps with the window 33 so that the window 33 is visible even if the display device 50 covers the window 33. In fact, the display device 50 covers substantially the entire outer surface of the aerosol generating apparatus 1 except for the mouthpiece 38.

**[0120]** Fig. 5 shows an example aerosol generating system 100 including a mobile device 82 for controlling the display device 50 such as those described above with reference to any of Figs. 3a to 4b.

**[0121]** The aerosol generating system 100 as shown in Fig. 5 includes the mobile device 82, an optional charging station 86, as well as the aerosol generating apparatus 1 and the display device 50 (e.g., as described in connection with Figs. 4a and 4b).

**[0122]** In this example, the display device 50 is configured to communicate wirelessly, e.g., via Bluetooth™, with an application (or "app") installed on the mobile device 82, via a wireless interface included in the display device 50 and via a wireless interface included in the mobile device 82. The mobile device 82 may be a mobile phone, for example. The application on the mobile phone is configured to communicate an application server, via a network. The application server may utilise cloud storage, for example. The network may include a cellular network and/or the internet.

**[0123]** In an alternative or additional example, the aerosol generating apparatus 1 is configured to communicate wirelessly, e.g., via Bluetooth™, with an application (or "app") installed on the mobile device 82, via the wireless interface 16 included in the aerosol generating apparatus 1 and via a wireless interface included in the mobile device 82. As the display device 50 is in data-communication with the aerosol generating apparatus 1 via the first electrical connector 58 and the second electrical connector 18 (not shown in Fig. 5), the mobile device 82 can control the display device 50 via the aerosol generating apparatus 1.

**[0124]** In other examples, the aerosol generating apparatus 1 and/or the display device 50 may be configured to communicate with the application server via a connection that does not involve the mobile device 82, e.g., via a narrowband internet of things ("NB-IoT") or satellite connection. In some examples, the mobile device 82 may be omitted from the aerosol generating system 100.

**[0125]** A skilled person would readily appreciate that the mobile device 82 may be configured to communicate via the network according to various communication channels, preferably a wireless communication channel

such as via a cellular network (e.g., according to a standard protocol, such as 3G or 4G) or via a WiFi network.

**[0126]** The app installed on the mobile device 82 may be configured to assist a user with managing their aerosol generating apparatus 1, based on information communicated between the aerosol generating apparatus 1 and the app, information communicated directly between the aerosol generating apparatus 1 and the application server, and/or information communicated between the app and the application server. Similarly, the app installed on the mobile device 82 may be configured to assist a user with managing and/or controlling the display device 50. For example, the user may set, change, and/or select the information that is displayed on the display 52 (e.g., temperature, time, etc). Further, the user may set, change, and/or select a pattern that is displayed on the display 52. For example, the display 52 may display one or more colours that matches the outfit of the user.

**[0127]** The charging station 86 (if present) may be configured to charge (and optionally communicate with) the aerosol generating apparatus 1 and/or the display device 50, via a charging port on the aerosol generating apparatus 1. The charging port on the device body 10 may be a USB port, for example, which may allow the aerosol generating apparatus 1 to be charged by any USB-compatible device capable of delivering power to the aerosol generating apparatus 1 via a suitable USB cable (in this case the USB-compatible device would be acting as the charging station 86). Alternatively, the charging station 86 could be a docking station specifically configured to dock with the aerosol generating apparatus 1 and charge the aerosol generating apparatus 1 via the charging port on the aerosol generating apparatus 1.

**[0128]** The second electrical connector 18 may also include the functionality of the charging port or vice versa. Referring to Fig. 6, a method for controlling the display device 50 of the aerosol generating system 100, which may be implemented in any of the preceding examples, optionally of Figs. 3a to 3c, comprises step S1 of electrically connecting the display device 50 to the aerosol generating apparatus 1. This may be done by electrically connecting the first electrical connector 58 to the second electrical connector 18. The electrical connection between the display device 50 and the aerosol generating apparatus 1 may be provided when the display device 50 is attached to the aerosol generating apparatus 1 (see Figs. 3c and 4b).

**[0129]** In step S2, a data-communication between the mobile device 82 and the aerosol generating apparatus 1 is established, for example using the wireless interface 16 of the aerosol generating apparatus 1 and the wireless interface on the mobile device 82 as for example described above in connection with Fig. 5.

**[0130]** In step S3, the display device 50, optionally the display 52, is controlled using the mobile device 82. Due to the electrical connection of the mobile device 82 with the aerosol generating apparatus 1, the data received by the aerosol generating apparatus 1 from the mobile

device 82 can be directly forwarded to the display device 50, e.g., to the display 52. In this case, the aerosol generating apparatus 1 can act as an interface or antenna for providing the communication between the mobile device 82 and the display device 50 which may include a separate controller for converting the data received from the mobile device 82 into electrical signals for controlling the display 52.

**[0131]** Alternatively, the electric circuitry 12 of the aerosol generating apparatus 1 receives the data from the mobile device 82 and converts the data received from the mobile device 82 into electrical signals for controlling the display 52. In this case, the display device 50 does not include a separate controller. Instead, the electric circuitry 12 of the aerosol generating apparatus 1 is used for converting the data from the mobile device 82 into electric signals. The electric signals are transmitted to the display 52 via the second electrical connector 18 and the first electrical connector 58 to the display 52.

**[0132]** Thus, the display device 50 can only be controlled by the mobile device 82 when the display device 50 is electrically connected to the aerosol generating apparatus 1.

**[0133]** Referring to Fig. 7, another method for controlling the display device 50 of the aerosol generating system 100, which may be implemented in any of the preceding examples, optionally of Figs. 4a and 4b, comprises step S1 of providing a data-communication between the mobile device 82 and the display device 50, for example using a wireless interface of the display device 50 (which may have the same features and/or characteristics as the wireless interface 16 of the aerosol generating apparatus 1 as described above) and the wireless interface on the mobile device 82 as for example described above in connection with Fig. 5.

**[0134]** In step S2, the display device 50, optionally the display 52, is controlled using the mobile device 82. The display device 50 may include a separate controller for converting the data received from the mobile device 82 into electrical signals for controlling the display 52.

**[0135]** Thus, the display device 50 can be controlled by the mobile device 82 even when the display device 50 is not electrically connected to the aerosol generating apparatus 1. This may be helpful if the aerosol generating apparatus 1 may not include a controller for controlling a display, e.g., with a single-use aerosol generating apparatus 1.

## Claims

1. An aerosol generating system, comprising

an aerosol generating apparatus for generating an aerosol to be inhaled, and  
 a display device for displaying information and/or a pattern,  
 wherein the display device is configured to be

- removably attached to the aerosol generating apparatus.
2. The aerosol generating system of claim 1, wherein the aerosol generating apparatus is a single-use aerosol generating apparatus, and wherein the display device covers a part or substantially an entire outer surface of the single-use aerosol generating apparatus.
  3. The aerosol generating system of claim 1, wherein the aerosol generating apparatus includes a device body and a single-use consumable configured to be removably attached to the device body, and wherein the display device is configured to be removably attached to the consumable and/or the device body.
  4. The aerosol generating system of any preceding claim, wherein the display device includes a first electrical connector and the aerosol generating apparatus includes a second electrical connector, and wherein the first electrical connector and the second electrical connector are configured to provide an electrical connection between the display device and the aerosol generating apparatus when the display device is attached to the aerosol generating apparatus.
  5. The aerosol generating system of claim 4, wherein the first electrical connector and the second electrical connector further provide a mechanical connection between the display device and the aerosol generating apparatus for attaching the display device to the aerosol generating apparatus.
  6. The aerosol generating system of any preceding claim, wherein the aerosol generating apparatus includes an electrical circuitry configured to control the display device when the display device is attached to the aerosol generating apparatus.
  7. The aerosol generating system of any preceding claim, wherein the aerosol generating apparatus has an elongate body,
 

wherein the display device includes an elongate display body having a hole, and  
 wherein the aerosol generating apparatus is configured to be inserted into the hole for attaching the display device to the aerosol generating apparatus.
  8. The aerosol generating system of claim 9, wherein the first electrical connector is arranged in the hole and the second electrical connector is arranged on an end portion of the aerosol generating apparatus that is configured to be inserted into the hole so that
 

the first electrical connector is connected to the second electrical connector when inserting the aerosol generating apparatus into the display body.
  9. The aerosol generating system of any preceding claim, wherein the display device is configured to be screwed to the aerosol generating apparatus and/or the display device is configured to be removably attached to the aerosol generating apparatus using a snap-fit connection.
  10. The aerosol generating system of any preceding claim, wherein the display device includes an organic light-emitting diode (OLED) and/or liquid-crystal display (LCD).
  11. The aerosol generating system of any preceding claim, wherein the display device is flexible.
  12. The aerosol generating system of any preceding claim, wherein the display device includes a transparent portion so that a portion of the aerosol generating apparatus is visible through the transparent portion when the display device is attached to the aerosol generating apparatus.
  13. The aerosol generating system of claim 12, wherein the aerosol generating apparatus includes a translucent or transparent section, and wherein the transparent portion overlaps with the translucent or transparent section when the display device is attached to the aerosol generating apparatus.
  14. The aerosol generating system of any one of the claims 1 to 11, wherein the display device includes a display having transparent portion and a backlight for illuminating the transparent portion.
  15. The aerosol generating system of any preceding claim, further comprising a mobile device,
 

wherein the aerosol generating apparatus and/or the display device include a wireless interface for wireless data communication with the mobile device,  
 wherein the mobile device is configured to control the display device via the aerosol generating apparatus when the display device is connected to the aerosol generating apparatus.
  16. Method for displaying information and/or a pattern on a display device for an aerosol generating apparatus,
 

wherein the display device is configured to be removably attached to the aerosol generating apparatus,

wherein the method comprises the steps of electrically connecting the display device to the aerosol generating apparatus, and providing data-communication between a mobile device and the aerosol generating apparatus, 5  
controlling the display device using the mobile device.

**17. Method for displaying information and/or a pattern on a display device for an aerosol generating apparatus, 10**

wherein the display device is configured to be removably attached to the aerosol generating apparatus, 15  
wherein the method comprises the steps of providing data-communication between a mobile device and the display device, and 20  
controlling the display device using the mobile device. 20

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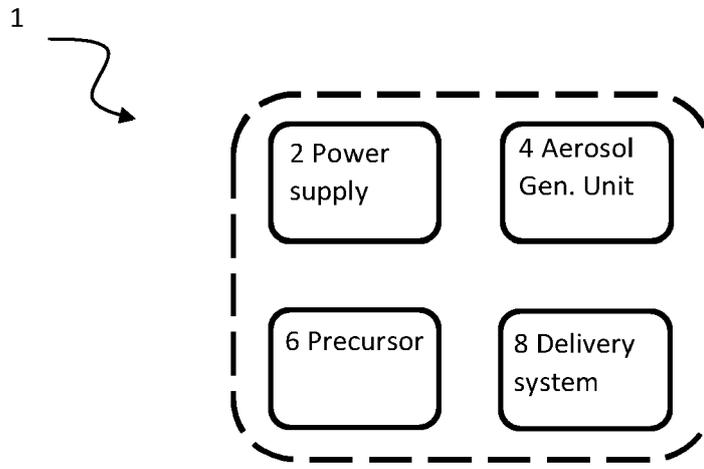


Fig. 1

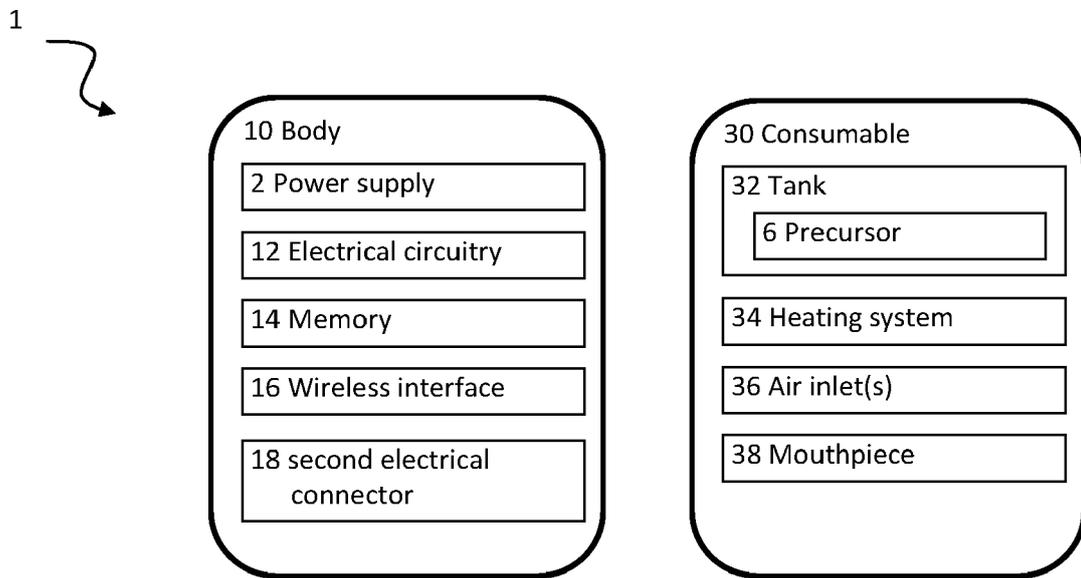


Fig. 2

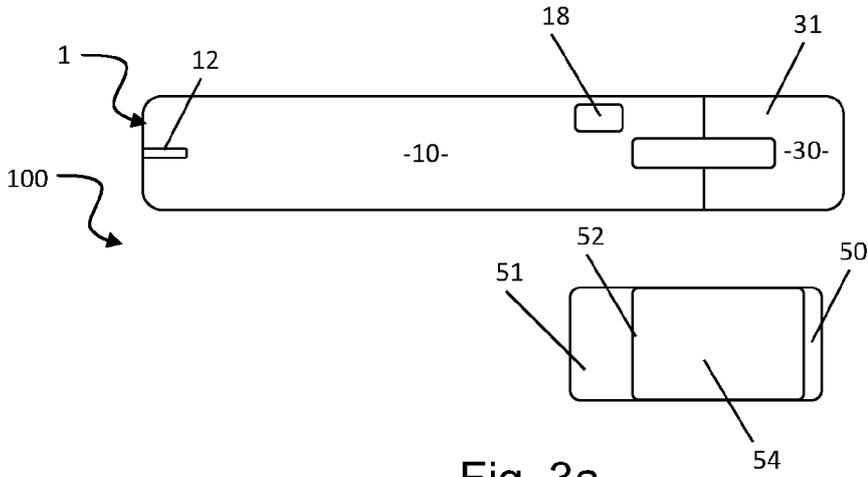


Fig. 3a

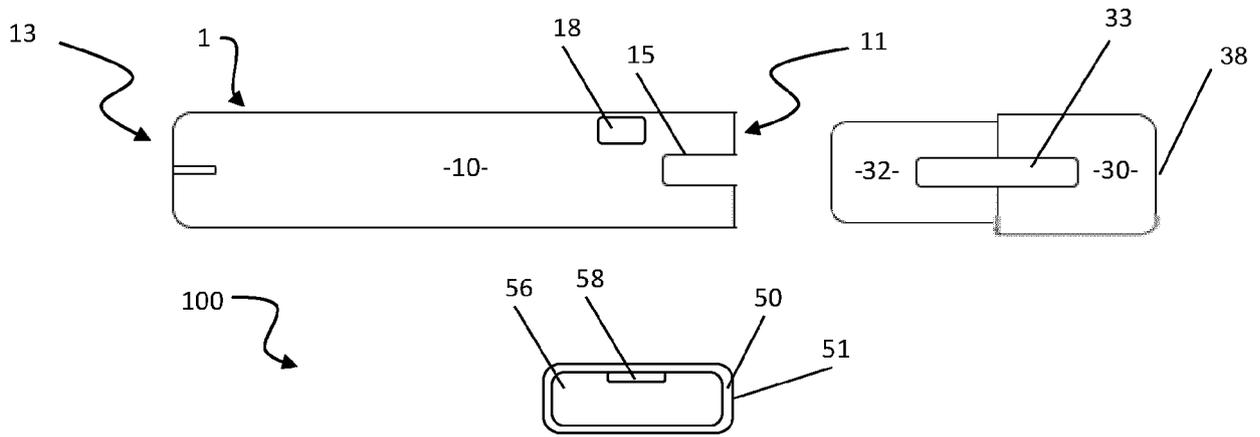


Fig. 3b

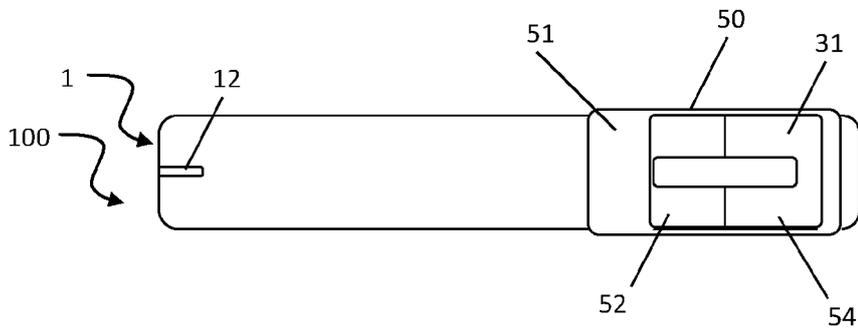
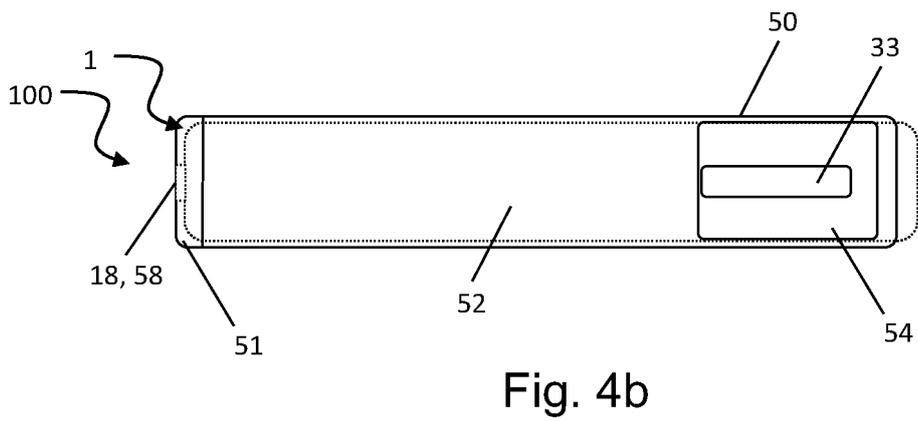
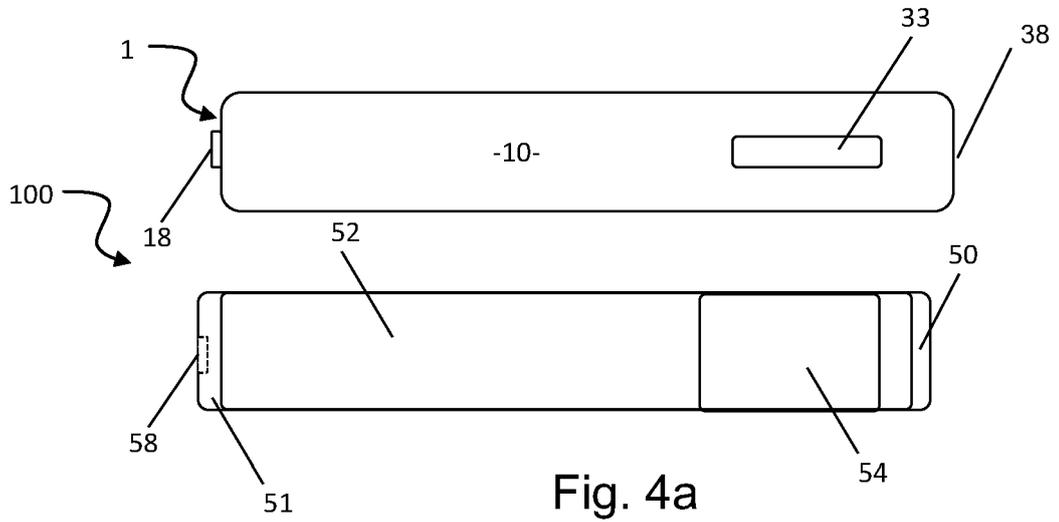


Fig. 3c



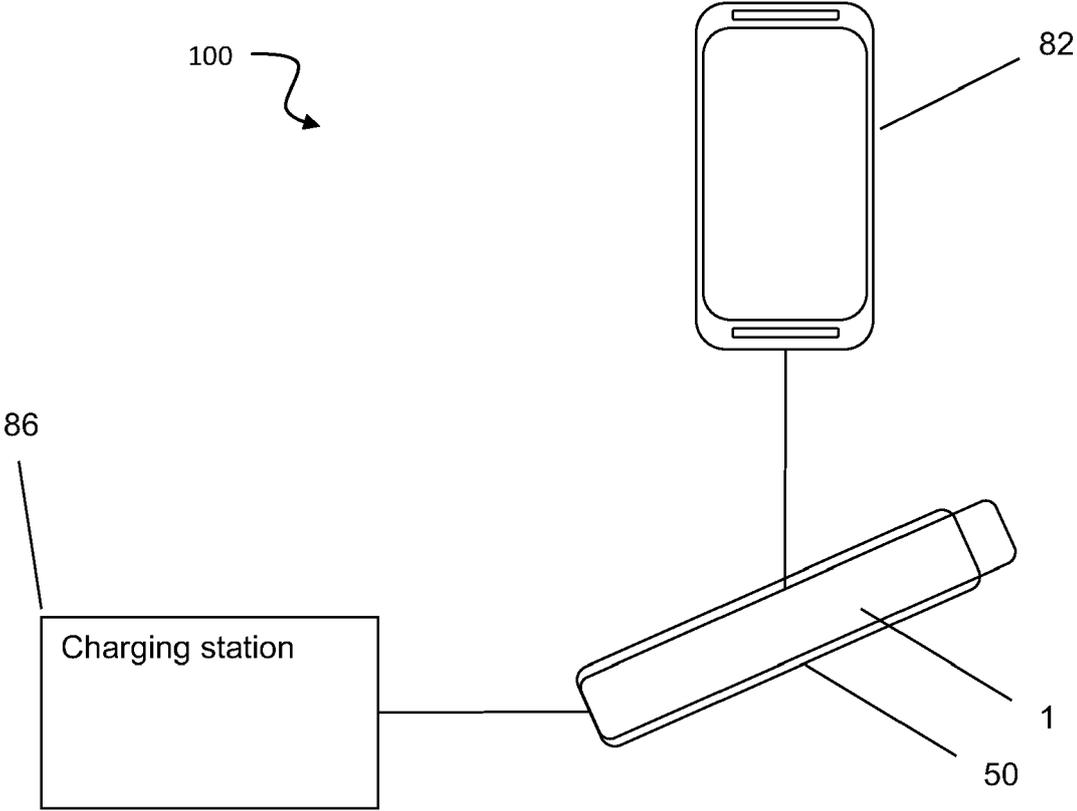


Fig. 5

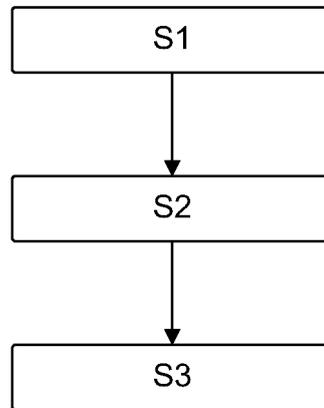


Fig. 6

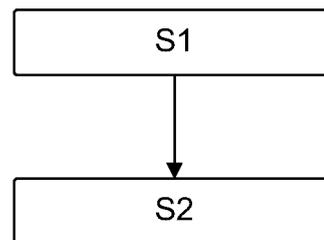


Fig. 7



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