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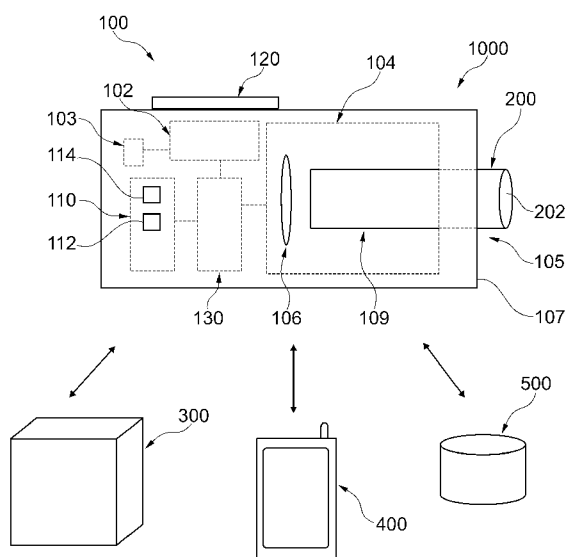


Fig. 1

(57) Abstract: An aerosol-generating device (100) is proposed, which comprises control circuitry (110) and an energy storage (102), the control circuitry being configurable to provide a set of device functions (421, 422, 423, 424) utilizing the energy storage, the aerosol-generating device being configured to receive an instruction to operate the energy storage in one of a plurality of energy storage management modes, each one of the plurality of energy storage management modes defining one or more device functions of the set of device functions, wherein at least one device function of each one of the plurality of energy storage management modes is different in each one of the energy storage management modes, and wherein the control circuitry is configured to provide the one or more device functions of the energy storage management mode of the received instruction.

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AEROSOL-GENERATING DEVICE

The present disclosure generally relates to the field of aerosol-generating devices and systems for generating aerosol, for example nicotine-containing aerosol. In particular, the present disclosure relates to electronic aerosol-generating devices and systems configured to generate aerosol based on heating at least a part of an aerosol-generating article or substrate. The present disclosure further relates to an external device communicatively couplable or coupled to the aerosol-generating device, a method for providing an instruction to operate an energy storage of the aerosol-generating device and to a corresponding computer program product, which may be a computer-readable medium storing a computer program or a computer program.

Aerosol-generating devices are typically designed as handheld devices that can be used by a user for consuming or experiencing, for instance in one or more usage sessions, aerosol generated by heating an aerosol-generating substrate or at least a portion of an aerosol-generating article comprising such substrate. It will be appreciated that aerosol-generating devices can generate aerosol by other means, such as for example by vibrating, by spraying or other means.

Exemplary aerosol-generating substrates can comprise solid substrate material, such as tobacco material or tobacco cast leaves ("TCL") material. The substrate material can, for example, be assembled, often with other elements or components, to form a substantially stick-shaped aerosol-generating article. Such a stick or aerosol-generating article can be configured in shape and size to be inserted at least partially into the aerosol-generating device, which, for example, can comprise a heating element for heating the aerosol-generating article and/or the aerosol-generating substrate. Alternatively, or additionally, aerosol-generating substrates can comprise one or more liquids and/or solids, which can for example be supplied to the aerosol-generating device in the form of a cartridge or container. Exemplary aerosol-generating articles can comprise a cartridge or container that contains or is fillable with the liquid and/or solid substrate, which can be vaporized during aerosol consumption by the user based on heating the substrate. Usually, such cartridge can be coupled to, attached to and/or at least partially inserted into the aerosol-generating device. Alternatively, the cartridge may be fixedly mounted to the aerosol-generating device and refilled by inserting liquid and/or solid substrate material into the cartridge.

For generating aerosol during use or consumption, a user typically actuates a user interface of the aerosol-generating device, thereby triggering supply of one or more aerosol-generating means or aerosol generators, such as one or more heating elements or heat sources, with electrical energy, for example to heat at least a portion of the aerosol-generating substrate or article. At least a part of the aerosol-generating means or aerosol generator, for example at least a part of the heating element, can be arranged in the aerosol-generating device. Alternatively, or additionally, at least a part of the aerosol-generating means or aerosol generator, for example at least a part of the heating element, can be arranged in the aerosol-generating article.

Exemplary heating elements can be based on one or more of resistive heating, inductive heating and microwave heating using electrical energy supplied via, drawn from or stored in an energy storage of the aerosol-generating device. Exemplary energy storages can include one or more batteries, one or more capacitors, one or more accumulators or other types of energy storage.

Alternatively, or additionally, the aerosol-generating device may be configured to supply electrical energy to one or more other aerosol-generating means, aerosol engines or aerosol generators to generate aerosol. For example, the aerosol-generating device and/or aerosol-generating article may comprise one or more vibrating elements, one or more vibrating meshes, one or more spraying devices, or other means for generating aerosol.

Generally, several settings having an effect on the energy storage or on an operation of the energy storage may be made available to users of aerosol-generating devices. Such settings may, for example, relate to device functions of the aerosol-generating device. The user may need to adjust the settings for a specific usage situation. This process may be complicated, in particular if a multitude of settings are available to the user. Also, the user may choose settings of adverse effect in a current usage situation, e.g., enable several device functions discharging the energy storage of the aerosol-generating device at low charge of the energy storage. Besides this, the process of the individual settings adjustment for every situation can be cumbersome for the user.

It may, therefore, be desirable to provide for an improved aerosol-generating device overcoming or at least mitigating one or more of the aforementioned drawbacks.

This is achieved by the subject-matter of the independent claims. Optional features are provided by the dependent claims and by the following description.

Aspects of the present disclosure relate to an aerosol-generating device and an aerosol-generating system configured to generate aerosol, for example nicotine-containing aerosol inhalable by the user, from at least a part of an aerosol-generating article or aerosol-generating substrate, for example based on supplying one or more aerosol generators with electrical energy. The present disclosure further relates to an external device communicatively couplable or coupled to an aerosol-generating device, a method for providing an instruction to operate an energy storage of the aerosol-generating device, and to a corresponding computer program product, which may be a computer program or a corresponding computer-readable medium, for example a non-transitory computer-readable medium, storing a computer program. Any disclosure presented hereinabove and hereinbelow with reference to one or an aspect of the present disclosure, equally applies to any other aspect of the present disclosure.

According to an aspect of the present disclosure, there is provided an aerosol-generating device, comprising control circuitry and an energy storage, the control circuitry being configurable to provide a set of device functions utilizing the energy storage, the aerosol-generating device being configured to receive an instruction to operate the energy storage in one of a plurality of energy storage management modes, each one of the plurality of energy storage management

modes defining one or more device functions of the set of device functions, wherein at least one device function of each one of the plurality of energy storage management modes is different in each one of the energy storage management modes, and wherein the control circuitry is configured to provide the one or more device functions of the energy storage management mode of the received instruction. Each one of the plurality of energy storage modes may define a sub-set of the set of device functions. The aerosol-generating device may be configured to configure the control circuitry to provide the sub-set of device functions of the energy storage management mode of the received instruction.

Accordingly, the aerosol-generating device of this disclosure provides for a plurality of different energy storage management modes, one of which is received for operating the energy storage in the one of the plurality of energy storage management modes. Each one of the energy storage management mode defining one or more of the device functions (or a sub-set thereof) makes it so that the user does not have to perform individual settings but instead, various device functions may be made available in conjunction with the received energy storage management mode, making the operation of the aerosol-generating device simpler, and helping to avoid inappropriate settings for certain situations and/or usage patterns that could lead to battery degradation. This may generally increase versatility, flexibility and functionality of the aerosol-generating device, in particular since the aerosol-generating device may be configured in accordance with specific demands, which can be reflected by or included in the energy storage management modes through user input or pre-set as described in more detail further below.

For example, the control circuitry being configurable to provide a set of device functions utilizing the energy storage may mean that the control circuitry is capable to provide a set of device functions, in other words, a plurality of device functions of the aerosol-generating device. Whether the control circuitry provides the device functions or not may be dependent on its configuration. In this regard, the aerosol-generating device is configured to configure the control circuitry to provide one or more of (or a sub-set of) the set device functions, which the control circuitry may be able to provide. The one or more (or sub-set of the) device functions, the provision of which is provided by configuration of the control circuitry, is of an energy storage management mode of an instruction, that the aerosol-generating device is configured to receive.

For example, the aerosol-generating device being configured to receive an instruction to operate the energy storage in one of a plurality of energy storage management modes may mean that the aerosol-generating device may comprise the plurality of energy storage management modes, e.g., on a data storage, the instruction indicating the one of the plurality of energy storage management modes to be used for operation of the energy storage. Alternatively, or additionally, one or more or all of the energy storage management modes may be received together with the instruction. In other words, the instruction may contain the one of a plurality of energy storage management modes for operation of the energy storage or it may contain the plurality of energy storage management modes.

For example, the instruction may be received by the control circuitry of the aerosol-generating device. Additionally, or alternatively, the instruction may be sent or transmitted for
5 receiving by the control circuitry based on an interaction of a user with a user interface, such as a graphical user interface, on the aerosol-generating device itself and/or an external device, such as a companion device, a mobile device and/or a computing device. The companion device, the mobile device and/or the computing device may be one of a smartphone, a personal computer, a stationary computer, a tablet computer, a notebook, a charging device for the aerosol-generating device, or similar, for example.

The one or more (or sub-set of) device functions defined by one of the energy storage
10 management modes may permit a different amount of energy consumption with respect to time and/or a different amount of degradation of the energy storage in comparison to the other energy storage management modes. For example, at least one device function of the one or more (or in the sub-set of) device functions being different in each one of the energy storage management modes may mean that one or more device functions of the one or more (or in the sub-set of)
15 device functions of the energy storage management modes are different from one another. In other words, the energy storage management modes are differentiated from one another, in that each one of the plurality of energy storage management modes contains at least one device function being different from the device functions in the other energy storage management modes. For example, different device functions may be enabled and/or disabled for different energy
20 storage management modes, as will be explained further below in more detail. Every energy storage management mode may comprise at least one unique device function in that this device function is only available in one of the plurality of energy storage management modes. For example, the device function may be unique in its function on the aerosol-generating device per se, e.g., a pause function as later explained herein in more detail, or by one or more device
25 parameters of its device function, e.g., a maximum number of allowed pauses per experience as later explained herein in more detail.

For example, there may be exactly two or exactly three or any limited number of energy storage management modes. One of such energy storage management modes may be an economic mode, for example. In the economic mode, the number and/or types of allowed device
30 functions may be limited for economic usage of the energy storage. Thereby, the usage time of the aerosol-generating device on a single or remaining charge and/or the life or lifetime of the energy storage may be extended. Another one of such energy storage management modes may be a performance mode. In the performance mode, the number and/or types of allowed device functions may be increased for maximum usage of the energy storage. Thereby, the user may
35 make use of the full potential of the device functions available on the aerosol-generating device independent from the energy storage. Further, there may be one or more energy storage management modes in between the aforesaid economic mode and performance mode. Such energy storage management mode may be a balance between extended energy storage charge

and/or life and full availability of all device functions. For example, there may be one or more balanced energy storage management modes. Such energy storage management modes may be preset, e.g., factory set, and/or based on user settings, for example and as will be described later herein in more detail. The energy management modes as disclosed herein may be referred to as user-selectable energy management modes. The energy management modes may be selectable by a user from a menu of energy management modes presented on a user interface as described herein.

For example, the number of device functions in the one or more of the device functions (or sub-set) may be less than the number of device functions in the set of the device functions. For example, the number of device functions in the one or more device functions (or sub-set) may be one, two, three or more. Accordingly, the energy storage management mode may only define some of the device functions of the aerosol-generating device, while other device functions, which may be available, may not be defined by the energy storage management mode, but instead be pre-set, for example.

A heating profile provided on or executed by the aerosol-generating device may be independent from or the same for every energy storage management mode. For example, the energy storage management modes may not define or not comprise a heating profile. Alternatively, for example, a heating profile or a plurality of heating profiles defined by or comprised in the energy storage management modes may be the same for each one of the energy storage management modes. Such heating profile may, for example, define heating properties or heating characteristics for heating an aerosol-generating article during aerosol generation by the aerosol-generating device as herein described. Such heating properties or heating characteristics may correspond to temperatures, temperature ranges, durations thereof and similar, during aerosol generation of the aerosol-generating article, e.g., by a heating element or similar as described herein, for example. The one or more (or sub-set of) device functions may accordingly not correspond to such heating profiles. Exemplary device functions for the energy storage management modes are given further below. Note that exemplary device functions as herein mentioned, however, may influence, e.g., set, the temperature or temperature ranges or durations thereof but these may not be during aerosol generation. Instead, such device functions may be during other modes or situations, which may prepare the aerosol generation or be in between aerosol generation sessions, for example. Such modes or situations may be, for example, when pausing an aerosol-generating session, as may be provided by a pause function as device function, or during pre-heating as may be provided by an auto-start function as device function, for example and as described further below.

In an example, the energy storage and/or control circuitry may be configured to supply electrical energy to at least one aerosol-generating means or at least one aerosol generator for generating aerosol from at least a portion of an aerosol-generating article couplable to the aerosol-generating device. Exemplary aerosol generators or means may include one or more

heating elements, one or more heat sources, one or more vibrating elements, one or more vibrating meshes, and one or more spraying devices.

For example, the energy storage and/or control circuitry may be configured to supply electrical energy to at least one heating element to generate aerosol from an aerosol-generating article couplable to the aerosol-generating device, for example based on heating at least a portion of the aerosol-generating article.

The aerosol-generating device of the present disclosure may particularly refer to an electronic aerosol-generating device configured to generate aerosol, for example which can be inhaled by a user of the aerosol-generating device in or during one or more usage sessions based on heating at least a part of a heating element, at least a part of the aerosol-generating article and/or at least a part of an aerosol-generating substrate contained in the aerosol-generating article to a temperature at or above a predetermined heating temperature. The aerosol-generating device of the present disclosure may also be referred to as heat-not-burn device.

As used herein the predetermined heating temperature may refer to or denote a temperature, level of temperature or temperature range above room temperature sufficient to generate aerosol and/or release aerosol from the aerosol-generating article or substrate, which released aerosol can be inhaled by the user during or in one or more usage sessions using one or more aerosol-generating articles.

Depending on the type and composition of the specific aerosol-generating article or substrate to be used with the device, the predetermined heating temperature may be in a range between 250 degree Celsius and 450 degree Celsius, particularly between 270 degree Celsius and 430 degree Celsius, more particularly between 315 degree Celsius and 355 degree Celsius. These temperatures may be suitable operating or heating temperatures sufficient to allow volatile compounds to be released from the aerosol-generating substrate.

The aerosol-generating article may comprise a solid and/or liquid comprising nicotine. Exemplary aerosol-generating articles or substrates usable with the aerosol-generating device of the present disclosure can be stick-like formed and at least partly inserted into the aerosol-generating device. Alternative exemplary aerosol-generating articles can comprise a container or cartridge, which can be fixedly attached or detachably coupled to the aerosol-generating device. Typically, a liquid, solid or a mixture of solid and liquid aerosol-generating substrate is contained in or can be inserted into such aerosol-generating article and heated to generate aerosol. Any such as well as other forms and designs of aerosol-generating articles can be used with the aerosol-generating device and system of the present disclosure.

Generally, the control circuitry, also referred to as device control circuitry herein, may be configured to control an entire set of device functions of the aerosol-generating device. In particular, the control circuitry may include one or more processors for data or signal processing. The control circuitry may be configured to operatively control the aerosol-generating device, its energy storage and/or one or more further components of the aerosol-generating device.

Operative control may involve controlling operation of the aerosol-generating device and/or one or more components thereof. Optionally, operative control of one or more device functions and/or of the energy storage may include generating and/or providing one or more control signals to one or more components of the aerosol-generating device, such as for example the energy storage.

5 As used herein, the energy storage of the aerosol-generating device may be configured to store or may store electrical energy that can be supplied to the at least one heating element to generate aerosol. Optionally, the energy storage may be re-chargeable, for example by connecting the aerosol-generating device to a power supply or a companion device. For example, the energy storage may be re-charged by connecting the aerosol-generating device to the
10 companion device or power supply via cable or inductive coupling.

It is noted that the aerosol-generating device may comprise a plurality of energy storages. Accordingly, any reference to a single energy storage herein includes a plurality of energy storages.

In an example, the energy storage may include one or more batteries, accumulators,
15 capacitors, or other types of energy storage for storing electrical energy, such as for example an energy storage configured to store potential energy associated with a change in configuration of internal chemical elements or molecules of the energy storage. Also, a combination of any of the afore-mentioned types of energy storages can be implemented in the aerosol-generating device of the present disclosure.

20 The at least one heating element may refer to or denote any one or more of an inductive heating element, a resistive heating element and a microwave heating element. In other words, the heating element can be configured to heat the aerosol-generating article based on one or more of inductive heating, microwave heating and resistive heating.

In an example, the heating element may be an inductive heating element, for example
25 including an inductive coil, configured to inductively heat a susceptor or susceptor material arranged in the aerosol-generating article or substrate. Alternatively, or additionally, the heating element may comprise one or more heating blades or resistive heating elements which may at least partly be inserted into the aerosol-generating article or substrate, and supplied with electrical energy for generating aerosol. Alternatively, or additionally, the heating element may include a
30 microwave generator configured to heat the aerosol-generating article based on microwave heating. Other forms, such as loop gap resonators may be used in addition or as alternative.

At least a part of or the entire at least one heating element can be arranged in the aerosol-generating device. Alternatively, or additionally, at least a part of or the entire heating element may be arranged in the aerosol-generating article. For example, the aerosol-generating device
35 may comprise a heating arrangement or heating circuit including at least one heating element. Optionally, a part of the heating element, circuit or heating arrangement may be arranged in the aerosol-generating device and a further part of the heating element, circuit or arrangement may be arranged in the aerosol-generating article. Further, it is noted that the aerosol-generating

device and/or the aerosol-generating article can comprise a plurality of heating elements. Accordingly, any reference to a single heating element hereinabove and hereinbelow can include a plurality of heating elements.

In an example, the aerosol-generating device may further comprise communication circuitry
5 or a communication interface for communicatively coupling the aerosol-generating device to an external device, such as a computing device, a mobile device and/or a companion device. Thus, the aerosol-generating device or control circuitry may be re-configured or configured by the user based on transmitting the instruction to operate the energy storage in one of a plurality of energy storage management modes from the external device to the aerosol-generating device. For
10 instance, the instruction may be transmitted from the computing and/or mobile device or companion device directly to the aerosol-generating device. Alternatively, or additionally, the instruction may be transmitted from the computing and/or mobile device to the companion device and from the companion device to the aerosol-generating device. Generally, the instruction may be transmitted or exchanged between one or more of the aerosol-generating device, the
15 computing and/or mobile device and the companion device, for example based on transmitting or exchanging corresponding data or data elements. Accordingly, the instruction or corresponding data may also be transmitted from the aerosol-generating device to the companion device and/or computing and/or mobile device.

One or more communication interface types or communication protocols may be
20 implemented in the aerosol-generating device and its communication interface or circuitry. In particular, the communication interface or circuitry may be configured for one or both wired and wireless communication with the external device. In a non-limiting example, the communication interface or circuitry of the aerosol-generating device may be based on one or more of a BUS communication, a cable communication, a Bluetooth communication, a Wireless Local Area
25 Network communication, an infrared communication, a nearfield communication, an internet communication or any other suitable type of communication or communication protocol.

In an example, the aerosol-generating device may comprise one or more user interfaces actuatable, controllable or operable by the user to activate or operate the aerosol-generating device to generate aerosol. Exemplary user interfaces may include a button, a switch, a touch
30 display, an acoustic interface, a gesture control interface, a haptic interface, a tactile interface or a combination thereof.

As used herein, the external device may refer to any device or apparatus with data processing capabilities, such as a server, a server network, a mobile device, a smart phone, a tablet, a smart device, and a smart wearable. The external device may be configured to
35 communicate or transmit the instruction, for example wirelessly or by wire, to the aerosol-generating device. Accordingly, the external device may include a communication interface or circuitry configured to transmit the instruction or corresponding data to the aerosol-generating device.

The aerosol-generating device may be couplable, for example operatively and/or communicatively couplable, to the companion device, in particular for supplying electrical energy to the energy storage. Optionally, the instruction may be received from the companion device upon coupling the aerosol-generating device to the companion device.

5 The companion device may be configured to at least partially receive the aerosol-generating device, for example for charging the aerosol-generating device and/or or for storing the aerosol-generating device. The aerosol-generating device may be configured for wireless charging by the companion device. For example, the companion device and the aerosol-generating device may be inductively coupled to charge the energy storage of the aerosol-generating device.
10 Alternatively, or additionally, the control circuitry may be configured to establish an electrical connection with the companion device to charge the energy storage. Accordingly, the aerosol-generating device may be configured for being operatively coupled to the companion device for charging the energy storage of the aerosol-generating device.

15 Alternatively, or additionally, the companion device may comprise a communication interface for communicatively coupling the companion device to the aerosol-generating device, and for example for transmitting the instruction or corresponding data from the companion device to the aerosol-generating device. Optionally, communicative coupling of the aerosol-generating device and the companion device may be established upon operative coupling of the aerosol-generating device with the companion device to charge the aerosol-generating device, and vice
20 versa.

25 The control circuitry may be operable to receive and/or process one or more user inputs from the user interface and operate or power the heating element, respectively a heating circuit or arrangement including the heating element, to generate aerosol in accordance with or based on the one or more user inputs. For instance, in response to an actuation of the user interface, electrical energy may be supplied to the at least one heating element to heat at least a part of the aerosol-generating article to or above the predetermined heating temperature to generate aerosol in a usage session.

30 In an example, the user interface may be configured for communicatively receiving the instruction based on a user selection on the user interface. For example, the user interface may indicate, in particular display, the plurality of energy storage management modes for selection by the user. For example, on a touch display as exemplary user interface, the user may thereby select an energy storage management mode for operating the energy storage of the aerosol-generating device by touching or clicking the respective energy storage management mode they wish to be used.

35 In an example, the aerosol-generating device comprises a communication circuitry for communicatively coupling the aerosol-generating device to an external device, in particular as described above, and receiving the instruction therefrom. Accordingly, in addition or alternatively to the receiving of the instruction based on a user selection on the user interface of the aerosol-

generating device, the instruction to operate the energy storage in a specific one of the energy storage management mode may be received from the external device. The received instruction from the external device may also be based on a user selection on a user interface of the external device, for example, which will be further explained in more detail below.

5 In an example, the control circuitry may be configured for controlling charging, discharging and/or idling of the energy storage based on the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction. Accordingly, the one or more (or sub-set of) device functions may influence the control circuitry in its control of the charging, discharging and/or idling of the energy storage. Thereby, the device functions of the
10 one or more (or sub-set of) device functions of the energy storage management mode may have a direct effect on the energy storage.

In an example, the control circuitry may be configured to control charging and/or discharging of the energy storage based on a charging and/or discharging device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received
15 instruction. In an additional or alternative example, the control circuitry may be configured for controlling idling of the energy storage based on an idling device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction. Accordingly, there may be charging and/or discharging device functions, i.e., influencing the charging and/or discharging process of the energy storage, and/or idling device
20 functions, i.e., stopping the discharging process of the energy storage.

In an example, the control circuitry may be configured to enable and/or disable the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction. By enabling and/or disabling the one or more (or sub-set of) device functions, in particular single device functions in the one or more (or sub-set of) device functions, the user
25 may be allowed or restricted to use the device functions of the one or more device functions or of that sub-set. Alternatively, or additionally, enabling a device function may include activating the device function, such that it can be performed, for example based on one or more user inputs or automatically. For instance, enabling or allowing a device function may include configuring the control circuitry, such that the device function is executable or can be performed. Alternatively, or
30 additionally, enabling a device function may include making or rendering the device function available to the user of aerosol-generating device. Similarly, disabling a device function may include deactivating the device function, such that it cannot be performed, for example based on one or more user inputs or automatically. Alternatively, or additionally, disabling a device function may include making or rendering the device function unavailable to the user of aerosol-generating
35 device. For instance, disabling or preventing a device function may include configuring the control circuitry, such that the device function and/or its execution is inhibited.

Accordingly, enabling or disabling a device function may include altering, modifying or changing a configuration of the control circuitry, such that the device function is available or

unavailable at the aerosol-generating device, for example available or unavailable to a user of the aerosol-generating device. Alternatively, or additionally, enabling or disabling a device function may include adapting the set of device functions available at the aerosol-generating device. For instance, enabling a device function may include expanding the set of device functions available at the aerosol-generating device by said device function. Alternatively, or additionally, disabling a device function may include reducing the set of device functions available at the aerosol-generating device by said device function. Alternatively, or additionally, disabling a device function may include removing said device function from the set of device functions available at the aerosol-generating device.

Accordingly, for example, device functions in an economic energy storage management mode may be disabled, which require large amounts of energy to reduce the discharging of the energy storage and/or to improve life or lifetime of the energy storage. "Large amounts of energy" may mean, for example, larger amounts of energy in comparison to one or more other device functions. Thereby, the usage time of the aerosol-generating device may be prolonged, or the user may be restricted in usage of the aerosol-generating device if they wish to limit their aerosol intake, for example. Also, or alternatively, for example, device functions in a performance energy storage management mode may be enabled, which require energy, but enhance the user experience.

In an example, at least one or at least two device functions in the enabled and/or disabled one or more (or sub-set of) device functions is or are selected from or relate(s) to:

- a pause function for pausing of a usage session of the aerosol-generating device,
- an auto-start function of the aerosol-generating device,
- a fast-charging function of the energy storage,
- a connectivity function of the aerosol-generating device for communicative coupling to an external device of the aerosol-generating device,
- a flexible aerosol generation function of the aerosol-generating device, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device, and
- a fixed aerosol generation function of the aerosol-generating device, the fixed aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

Also, or alternatively, a device function in the enabled and/or disabled one or more (or sub-set of) device functions may be any one of the afore-mentioned list or be selected as any one in the list or relate to any one of the list. One or more of the device functions in the afore-mentioned list may be referred to as auxiliary device functions, which may not be per se required for

generating aerosol. Accordingly, these auxiliary device functions may be enabled and/or disabled to limit discharge of the energy storage, if required.

Further auxiliary device functions, which may be added to the afore-mentioned list and/or enabled and/or disabled based on the one or more (or sub-set of) device functions may include one or more of operating the aerosol-generating device at reduced energy consumption with respect to operation during a usage session (or in an aerosol-releasing mode) to generate aerosol, heating the at least one heating element and/or the aerosol-generating article to a temperature below a heating temperature sufficient to generate aerosol, heating the at least one heating element and/or the aerosol-generating article to a temperature above room temperature and below a heating temperature sufficient to generate aerosol, heating the at least one heating element and/or the aerosol-generating article to a temperature above room temperature and below a heating temperature sufficient to generate aerosol for a predefined period of time, for example during a use pause, activating or deactivating haptic control of the aerosol-generating device, activating or deactivating one or more user interfaces of the aerosol-generating device, operating a user interface of the aerosol-generating device, operating a communication circuitry of the aerosol-generating device for communicatively coupling the aerosol-generating device to a computing device or receiving device, operating a sensor of the aerosol-generating device, and operating a biometric sensor of the aerosol-generating device for user authentication.

As used herein, an aerosol-releasing function may refer to an operational mode of the aerosol-generating device, which is the normal heating operational mode of the heating element, circuitry, and/or arrangement for aerosol generation, in which the heating element, the heating circuitry and/or a heating arrangement may be operated during use of the device by a user, that is, when a user experience or usage session takes place, in particular when aerosol generation takes place. In general, aerosol generation may take place continuously or on demand, in particular on a puff basis, that is, on demand of a user when taking a puff.

The pause function may refer to another operational mode (that is distinct from the aerosol-releasing function) of the aerosol-generating device, in which the heating element, the heating circuitry and/or a heating arrangement may be operated to heat at a lower temperature than a temperature during the aerosol-releasing function (or may be deactivated) during an operation pause, that is, a use pause of the aerosol-generating device, that is, when a user experience or usage session is paused and aerosol generation may not take place, or at least may be reduced to a minimum level in operation. That is, in the pause mode the aerosol-generating device is in a use pause. The pause function is convenient for the user of the aerosol-generating device to take a break from an experience or, in other words, usage session and continue the experience later. However, this may come at the cost of increased energy discharge from the energy storage because the heating element, the heating circuitry and/or a heating arrangement may need to be re-heated after the pause function is ended to continue the usage session.

A usage sessions or user experience, also referred to as experience of an aerosol-generating article herein, may be interrupted, for example by switching the device into the pause mode, and resumed by a user later, wherein the aerosol-generating article or substrate may be kept in pause mode of the aerosol-generating device at a temperature below the first temperature level and/or below the predetermined heating temperature used during normal use of the device (in particular during a user experience or usage session), but still above or well above room temperature. That is, the second temperature level preferably may be chosen such as to avoid degradation of the non-depleted substrate or aerosol-generating article. In particular, the second temperature level may be chosen such as to be sufficiently low in order to minimize depletion of the substrate or article during the pause mode, and at the same time to be sufficiently high in order to avoid vapor to condensate in the device which otherwise could affect the quality of the non-depleted aerosol-generating substrate or article.

During use of the device, in particular when a user experience or usage session is to take place, the heating element, the heating circuitry and/or the heating arrangement may be operated in the aerosol-releasing mode, whereas during a use pause of the device, that is, when no user experience or usage session is to take place and/or when a usage session is interrupted by a pause, the aerosol-generating device may be operated in the pause mode. During both, the aerosol-releasing mode and the pause mode of the aerosol-generating device, the heating element, a heating circuitry and/or a heating arrangement may be in operation, in particular in heating operation, yet at different temperature levels, namely, at a first temperature level during the aerosol-releasing mode, which may be chosen to be sufficiently high in order to generate an aerosol, and at a second temperature level below the first temperature level during the pause mode, which may be chosen to be sufficiently low in order to minimize depletion of the substrate, whilst avoiding degradation.

Depending on the type and composition of the specific aerosol-generating article or substrate to be used with the device, the predetermined heating temperature or first temperature level may be in a range between 250 degree Celsius and 450 degree Celsius, particularly between 270 degree Celsius and 430 degree Celsius, more particularly between 315 degree Celsius and 355 degree Celsius. These temperatures may be suitable operating or heating temperatures sufficient to allow volatile compounds to be released from the aerosol-generating article or substrate, for example during one or more usage sessions and/or when operating the device in the aerosol releasing mode. For example, the first temperature level and/or predetermined heating temperature for liquid aerosol-generating articles or substrates may be lower than the first temperature level for solid aerosol-generating articles or substrates.

In general, the second temperature level may be chosen to maintain a usability of the aerosol-generating article or substrate for a prolonged time. The second temperature level may also depend on the type and composition of the aerosol-generating article or substrate to be used with the device. Accordingly, the second temperature level may be in a range between 175 degree

Celsius and 225 degree Celsius, particularly between 185 degree Celsius to 215 degree Celsius, more particularly between 195 degree Celsius and 205 degree Celsius. These temperatures may be sufficiently low in order to minimize depletion of the substrate during the pause mode but at the same time sufficiently high in order to avoid vapor to condensate in the device, which could lead to degradation of the aerosol-generating article or substrate.

In order to avoid condensation effects in the device, in particular to avoid condensation of substances in the aerosol-generating article or substrate, the second temperature level may be at least 150 degree Celsius, in particular at least 175 degree Celsius, preferably at least 185 degree Celsius, more preferably at least 195 degree Celsius.

Vice versa, in order to minimize depletion of the substrate or article during the pause mode the second temperature level may be at most 220 degree Celsius, in particular at most 225 degree Celsius, preferably at most 215 degree Celsius, more preferably at least 205 degree Celsius. In particular, the second temperature level may be chosen such as to reduce the formation of aerosols by at least 50 percent compared to the aerosol-releasing mode.

In relative terms, the second temperature level may be lower than the first temperature level, for example by at least 50 degree Celsius, in particular at least 75 degree Celsius, more particularly at least 100 degree Celsius.

The temperature values given above preferably may be average temperatures of the aerosol-generating article or substrate during operation of the device. In addition, as already mentioned, the temperature values may depend, inter alia, on the type and composition of the aerosol-generating article or substrate to be used with the device.

The aerosol-generating device may optionally comprise at least one sensor configured to output a sensor signal indicative of the device being in operation by a user, that is, in use by a user, or in an operation pause, that is, a use pause. Advantageously, such a sensor may facilitate to automatically detect whether operation of the heating arrangement can be switched into the pause mode since the device is currently not in use and thus in an operation pause that is, a use pause. Thus, aerosol generation may be stopped in a timely manner in order to avoid an ongoing but undesired depletion of the aerosol-forming substrate. Likewise, such a sensor may facilitate to automatically detect whether operation of the heating arrangement is to be switched back into the aerosol-releasing mode, that is, back into the normal heating operational mode for aerosol generation when a user wants to resume a user experience or usage session.

As used herein, the auto-start function may refer to activating the aerosol-releasing function of the aerosol-generating device upon coupling an aerosol-generating article with the aerosol-generating device. At least, this may comprise pre-heating and/or heating of the heating element, circuitry, and/or arrangement for aerosol generation upon the coupling of the aerosol-generating article with the aerosol-generating device. This makes it so the aerosol-generating article is ready to be experienced as quick as possible once it is coupled with the aerosol-generating article. However, this may come at the cost of increased discharge of the energy storage in case the user

does not start the experience right away once the heating is done but delays the experience, in which case it may be necessary to maintain the heating for an extended period of time.

As used herein, the fast-charging function of the energy storage may refer to a function in which the energy storage is charged faster than according to a normal charging function. The fast-charging function may provide faster charging at the potential cost of reduced life of the energy storage. Accordingly, whether the fast-charging function is enabled or not may depend on whether the energy storage management mode is to be economic or performant.

As used herein, the connectivity function of the energy storage may refer to a function in which the aerosol-generating device, specifically its communication circuitry, is capable of communicatively coupling to an external device or not. By means of the external device, settings, configurations and/or customizations may be providable to the aerosol-generating device and/or live parameters of a usage session may be provided to the external device, such that the connectivity function may be desired by the user to enhance their experience. However, as the connectivity function requires energy supply to the communication circuitry, depending on the energy storage management mode, e.g., economic or performance, it may be desirable to disable this device function, e.g., when the charge of the energy storage is low.

The flexible aerosol generation function of the aerosol-generating device allows a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device. The maximum number of puffs may be in the range of 8 to 32, in particular 10 to 28, for example 12 to 24 or 14 to 18, for example. The maximum number of puffs may be limited to a maximum duration of time in which the maximum number of puffs must be taken, e.g., in the range of 4 to 12 minutes, for example 6 minutes. The flexible aerosol generation function allows the user to have an increased number of puffs per their puff behavior, which may be defined at least by the volume of aerosol the user is inhaling per puff. However, an increased amount of puffs during the flexible aerosol generation function may require more energy from the energy storage than a fixed aerosol generation function, where the fixed aerosol generation function allows a potentially lower maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

In an example, the control circuitry may be configured to modify at least one device parameter in at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction. The device parameter may be dependent from and/or at least partially defining the device function. For example, the device parameter may be a quantitative parameter of the device function. For example, the device parameter may be an allowed or, in other words, maximum number of interactions or actions of the aerosol-generating device, e.g., puffs per aerosol-generating article

or pauses per usage session of the aerosol-generating device, and/or a time parameter for the device function.

In an example, the at least one or at least two modified device parameter may be selected from or relate to:

- 5 - a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol,
- a maximum number of pauses per usage session of the aerosol-generating device,
- a maximum number of puffs per aerosol-generating article, and
- a maximum time for puffing or experiencing a single aerosol-generating article.

10 Also, or alternatively, a modified device parameter may be any one of the afore-mentioned list or selected as any one of the list or relate to any one of the list.

 By allowing a limited maximum number and/or time of the exemplary above interactions or actions of the aerosol-generating article or aerosol-generating device, the discharge of the energy storage may be limited in accordance with an economic energy storage management mode. For
15 a performance energy storage management mode, on the other hand, the respective maximum number or numbers may be the technically feasible or possible maximum numbers and/or times, for example, so as to allow the user to make use of the full capabilities of the aerosol-generating article and/or aerosol-generating device independent from the discharge of the energy storage.

 The maximum number of usage sessions the aerosol-generating device is operable to
20 generate aerosol may be per charge of the storage unit, for example. Certain users may typically use the aerosol-generating device in only a few usage sessions after the last charging event, before the next charging event and/or between two consecutive charging events. Some users may even charge or re-charge the energy storage after each usage session. Limiting the maximum number of usage sessions per charge, in particular to be smaller than an energy
25 storage capacity-defined number, may allow to flexibly adapt the aerosol-generating device or operation thereof in accordance with the users' habits or demands. Alternatively, or additionally, excessive charging and/or discharging may be avoided or reduced, which may increase the lifetime of the energy storage. Additionally, or alternatively, the maximum number of usage sessions may be per time frame, e.g., hour(s), day(s), week(s), or month(s), for example.

30 Accordingly, for example, the control circuitry may be configured to limit, based on maximum number of usage sessions, operation of the aerosol-generating device to generate aerosol to a single, two or three usage sessions per charge of the energy storage, after the energy storage has been charged the last time, after the last charging event, before the energy storage is charged the next time and/or between two consecutive charging events. Accordingly, only a
35 discrete or single, only two or only three usage sessions may be allowed or granted to the user per charge of the energy storage.

 In an example, the at least one of the plurality of the energy storage management modes may comprise or define at least one time schedule and/or at least one geographical location for

operating the energy storage. Thereby, time and/or location based operation of the energy storage may be enabled. For example, the energy storage management modes may comprise different device functions in their one or more (or sub-set) of device functions for different times and/or locations. For example, a device function may be disabled for a certain time period and
5 enabled for another time period in accordance with the at least one time schedule. Similarly, a device function may be enabled and/or disabled in accordance with the at least one geographical location. Similarly, a modification of device parameters in the device functions in accordance with the at least one time schedule and/or geographical location is possible.

In an example, the at least one time schedule and/or the at least one geographical location
10 may be selectable by a user. The selection may be made possible via the user interface of the aerosol-generating device or a user interface of the external device as previously mentioned, for example.

In an example, the aerosol-generating device may be configured to select an energy storage management mode out of the plurality of energy storage management modes based on
15 the at least one time schedule and/or the at least one geographical location for operation of the energy storage. In particular, the selection by the aerosol-generating device may be automatically performed based on the at least one time schedule and/or the at least one geographical location for operation of the energy storage, which means that no further user input is required for the respective energy storage management mode to be selected. In this example, the energy storage
20 management mode is selected based on the at least one time schedule and/or the at least one geographical location for operation of the energy storage. This may mean that in certain time periods and/or for certain geographical locations, one of the plurality energy storage management modes is selected to be used for operation of the energy storage, while for other time periods and/or for other geographical locations, another one of the plurality of energy storage
25 management modes is selected to be used for operation of the energy storage. For example, there may be a time schedule for weekends and another time schedule for weekdays. For weekdays, an economic energy storage management mode may be selected, whereas for weekends, a performance energy storage management mode may be selected, or vice versa, for example. Instead of providing time schedules in full days per week, it may also be possible to
30 provide time schedules on a narrower time basis, e.g., minutes, hours, or broader time basis, e.g., weeks, months, etc. Similarly, for different geographical locations, e.g., a work place, a home, other significant locations, etc., different ones of the plurality of the energy storage management modes may be selected.

For example, the aerosol-generating device may comprise a clock, calendar and/or a GPS
35 unit and/or be configured to receive a current time, day and/or a geographical location from the external device, which may have one or more of a clock, calendar and/or GPS unit. Accordingly, the aerosol-generating device may compare the one or more time schedules and/or one or more

geographical locations to a current time and/or current location, and based upon the comparison, select an energy storage management mode to be operated by the control circuitry.

In an example, the aerosol-generating device may be configured to: provide the energy storage management modes, make the energy storage management modes selectable, by a user, and receive the instruction to operate the energy storage of the aerosol-generating device in a selected one of the energy storage management modes. The selection of an energy storage management mode by the user may be in addition or alternatively to the other selections of the energy storage management mode described herein, such as the above-described selection based on the at least one time schedule and/or the at least one geographical location. The provision of the energy storage management modes may occur on the user interface of the aerosol-generating device or any other interface of the aerosol-generating device, such as a display, for example. Similarly, the energy storage management modes may be made selectable by the user on the user interface or any other interface of the aerosol-generating device. Following the selection on such interface, the instruction may be received by the aerosol-generation device, in particular by the control circuitry, for execution thereof, i.e., operating the energy storage based thereupon.

In an example, the aerosol-generating device may be configured to: make the device functions in the one or more (or sub-set of) device functions defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions. Accordingly, the user may be provided with the possibility to enable and/or disable one or more of the device functions in the one or more (or sub-set of) device functions. Thereby, the user may customize the plurality of energy storage management modes. Similarly, the user may be provided with the possibility to create new energy storage management modes by enabling and/or disabling device functions out of the set of device functions that the control circuitry is configurable to provide.

In an example, the aerosol-generating device may be configured to make a device parameter of at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management modes modifiable by a user. Accordingly, the user may be provided with the possibility to modify one or more device parameters in one or more of the device functions in the one or more (or sub-set of) device functions. Thereby, the user may customize the plurality of energy storage management modes.

In an example, the at least one device function in the one or more (or sub-set of) device functions may be pre-enabled or pre-disabled. Accordingly, the one or more (or sub-set of) device functions may come with pre-settings. This makes it easy for the user to make use of the different energy storage management modes right away without requiring any enabling, disabling and/or modification from their side.

In an example, the at least one pre-enabled or pre-disabled device function may be pre-enabled or pre-disabled according to a health status of the energy storage. Thereby, the health

status of the energy storage may be used as a determinant for enablement or disablement of certain device functions to extend the life of the energy storage.

In an example, the health status may correspond to a maximum capacity of the energy storage. Thereby, the maximum capacity of the energy storage may be used as a determinant
5 for enablement or disablement of certain device functions to extend the life of the energy storage.

In an example, at least one device parameter of the device functions in the one or more (or sub-set of) device functions may be pre-selected. Accordingly, the one or more (or sub-set of) device functions may come with pre-settings. This makes it easy for the user to make use of
10 the different energy storage management modes right away without requiring any modification from their side.

In an example, the at least one modifiable device parameter may be selectable by a user from predefined device parameters or within a predefined parameter range. Thereby, the user may, in a limited range, which may correspond to technical or other limitations, according to the
15 predefined device parameters or within the predefined parameter range, modify the one or more device parameters. This increases the level of customization of the energy storage management modes accessible to the user to enhance the overall user experience with the aerosol-generating device.

In an example, the energy storage management modes may be provided by a
20 presetting, in particular factory settings. Factory settings relate to initial settings when the device is first used. This makes it easy for the user to make use of the different energy storage management modes right away without requiring any enabling, disabling and/or modification from their side.

In an alternative or additional example, the energy storage management modes may be
25 provided by user settings. Examples of user settings, e.g., enabling, disabling and/or modifying of device functions have been given above and increase the level of customization by the user to enhance the overall user experience with the aerosol-generating device.

In an example, the energy storage management modes may be defined based on usage information from the aerosol-generating device. For this purpose, the aerosol-generating device
30 may record usage information based on one or more usages of the aerosol-generating device. Thereby, the energy storage management modes may be automatically defined based on the usage information and different energy storage management modes may be provided to the user without them having to define the modes themselves. In particular, the user may not know about the different device functions and the modifications thereof. By defining the energy
35 storage management modes based on the usage information, the different energy storage management modes may be precisely customized to the actual user behavior of the user.

In an example, the usage information may comprise one or more of: a location of usage of the aerosol-generating device, a time of usage of the aerosol-generating device, a frequency

of using an energy storage management mode, a health status of the energy storage after usage of the aerosol-generating device, a number of usages of the aerosol-generating device on a single charge of the energy storage, a number of pausings of the aerosol-generating device, and a number and/or type of device functions being used on the aerosol-generating device. Of course, the afore-mentioned usage information is only exemplary and not limited. Different types of usage information relevant towards the herein mentioned device functions, time schedules, geographical locations and/or other aspects mentioned herein may be useful to provide a good fit of energy storage management modes for the user of the aerosol-generating device.

According to another aspect of the present disclosure, there is provided an aerosol generating system, comprising: an aerosol-generating device of this disclosure, and an aerosol-generating article couplable or coupled to the aerosol-generating device to generate aerosol from at least a portion of the aerosol-generating article. The aerosol-generating device may generate aerosol, for example, by supplying electrical energy to one or more aerosol generators for generating aerosol from the aerosol-generating article. Any disclosure presented hereinabove and hereinbelow with reference to the aerosol-generating device equally applies to the aerosol-generating system, and vice versa.

In an example, the aerosol-generating system may further comprise an external device communicatively couplable or coupled to the aerosol-generating device. The external device may be configured as described herein.

Yet another aspect of the disclosure relates to an external device, the external device being configured to: communicatively couple to an aerosol-generating device, and transmit or, in other words, send an instruction to operate an energy storage of the aerosol-generating device in one of a plurality of energy storage management modes to the aerosol-generating device, each one of the plurality of energy storage management modes defining one or more of (or a sub-set of) device functions, the one or more (or sub-set) of the device functions being of a set of device functions that a control circuitry of the aerosol-generating device is configurable to provide, wherein at least one device function of each one of the plurality of energy storage management modes (or at least one device function in the one or more (or sub-set of) device functions) is different in each one of the energy storage management modes.

In an example, the external device may be a computing device, a mobile device and/or a companion device of the aerosol-generating device. For example, the external device may be a smart phone, a personal computer, a laptop computer, a tablet computer, a stationary computer, or similar. The companion device may be configured as herein described.

The external device may comprise communication circuitry, a data storage and/or a user interface. These and other units of the external device may be configured as described herein with reference to the corresponding units of the aerosol-generating device, for example.

In an example, the external device may be configured to: provide the energy storage management modes, make the energy storage management modes selectable, by a user, and determine the instruction to operate the energy storage of the aerosol-generating device in a selected one of the energy storage management modes.

5 In an example, the external device may be configured to make the device functions in the one or more (or sub-set of) device functions defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions.

10 In an example, the external device may be configured to make a device parameter of at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management modes modifiable by a user.

Yet another aspect of the disclosure relates to a method for providing an instruction to operate an energy storage of the aerosol-generating device in one of a plurality of energy storage management modes, each one of the plurality of energy storage management modes defining one or more (or a sub-set) of device functions, the one or more device functions (or
15 sub-set) being of a set of device functions that a control circuitry of the aerosol-generating device is configurable to provide, wherein at least one device function of each one of the plurality of energy storage management modes (or at least one device function in the one or more (or sub-set of) device functions) is different in each one of the energy storage management modes, the method comprising: providing the energy storage management
20 modes, making the energy storage management modes selectable, determining the instruction to operate the energy storage of the aerosol-generating device in a selected one of the energy storage management modes, and providing the determined instruction for transmission to an aerosol-generating device. Any feature function and/or element described hereinabove and hereinbelow with reference to the aerosol-generating device and/or the external device may be
25 a feature, function, element and/or step of the method, and vice versa.

The method may be at least partially or fully computer implemented. This means that at least one, multiple or all steps of the method may be carried out by a computer. The computer may be a processor of the external device or the external device as such, for example.

30 The step of providing the determined instruction transmission or, in other words, sending it to an aerosol-generating device may be followed by the step of sending the instruction to the aerosol-generating device.

In an example, the method may comprise making the device functions in the one or more (or sub-set of) device functions defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions.

35 In an example, the method may comprise making a device parameter of at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management modes modifiable by a user.

Yet another aspect of this disclosure relates to another method, namely a method for operating an aerosol-generating device, comprising control circuitry and an energy storage, the control circuitry being configurable to provide a set of device functions utilizing the energy storage, the method comprising: receiving an instruction to operate the energy storage in one of
5 a plurality of energy storage management modes, each one of the plurality of energy storage management modes defining one or more (or a sub-set) device functions of the set of device functions, wherein at least one device function of each one of the plurality of energy storage management modes (or at least one device function (or in the one or more (or sub-set of) device functions) is different in each one of the energy storage management modes, and
10 configuring the control circuitry to provide the one or more (or sub-set of) device functions of the energy storage management mode of the received instruction. Any feature function and/or element described hereinabove and hereinbelow with reference to the aerosol-generating device, the method for providing an instruction and/or the external device may be a feature, function, element and/or step of the method for operating the aerosol-generating device, and
15 vice versa.

A further aspect of the disclosure relates to a computer program product comprising instructions, which when executed by a computer, cause the computer to carry out any one of the methods of this disclosure. The computer program product may be a computer program or a computer-readable medium, storing the computer program, which when executed by the
20 computer, causes the computer to carry out any one of the methods according to the present disclosure, as described hereinabove and hereinbelow.

It is emphasized that any feature, step, function, element, technical effect and/or advantage described herein with reference to one aspect of the disclosure equally applies to any other aspect of the disclosure.

25 The invention is defined in the claims. However, below there is provided a non-exhaustive list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein.

Example 1: An aerosol-generating device, comprising control circuitry and an energy storage,

30 the control circuitry being configurable to provide a set of device functions utilizing the energy storage,

the aerosol-generating device being configured to receive an instruction to operate the energy storage in one of a plurality of energy storage management modes, each one of the plurality of energy storage management modes defining one or more device functions of the set
35 of device functions,

wherein at least one device function of each one of the plurality of energy storage management modes is different in each one of the energy storage management modes, and

wherein the control circuitry is configured to provide the one or more device functions of the energy storage management mode of the received instruction.

Example 1A: The aerosol-generating device of example 1, wherein the energy storage is configured to supply electrical energy to one or more aerosol generators for generating aerosol from at least a portion of an aerosol-generating article couplable to the aerosol-generating device.

Example 1B: The aerosol-generating device of any one of the preceding examples, wherein the energy storage is configured to supply electrical energy to at least one heating element to heat at least a portion of the aerosol-generating article couplable to the aerosol-generating device.

Example 1C: The aerosol-generating device of any one of the preceding examples, wherein the control circuitry is operatively coupled to the energy storage.

Example 1D: The aerosol-generating device of any one of the preceding examples, wherein the aerosol-generating device comprises a communication circuitry for communicatively coupling the aerosol-generating device to an external device and receiving the instruction therefrom.

Example 1E: The aerosol-generating device of any one of the preceding claims, wherein the aerosol-generating device comprises a user interface for communicatively receiving the instruction based on a user selection on the user interface.

Example 2: The aerosol-generating device of any one of the preceding examples, wherein each one of the plurality of the energy storage modes defines a sub-set of the set of device functions, and wherein the control circuitry is configured to provide the sub-set of device functions of the energy storage management mode of the received instruction.

Example 3: The aerosol-generating device of any one of the preceding examples, wherein the energy storage management modes are user-selectable, preferably from a menu of energy storage management modes.

Example 4: The aerosol-generating device of any one of the preceding examples, wherein the control circuitry is configured to control charging, discharging and/or idling of the energy storage based on the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction.

Example 5: The aerosol-generating device of any one of the preceding claims, wherein the control circuitry is configured to control charging and/or discharging of the energy storage based on a charging and/or discharging device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction.

Example 6: The aerosol-generating device of any one of the preceding examples, wherein the control circuitry is configured to control idling of the energy storage based on an

idling device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction.

Example 7: The aerosol-generating device of any one of the preceding examples, wherein the control circuitry is configured to enable and/or disable the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction.

Example 8: The aerosol-generating device of example 7, wherein at least one device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected from or relates to:

- a pause function for pausing of a usage session of the aerosol-generating device,
- an auto-start function of the aerosol-generating device,
- a fast-charging function of the energy storage,
- a connectivity function of the aerosol-generating device for communicative coupling to an external device of the aerosol-generating device,
- a flexible aerosol generation function of the aerosol-generating device, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device, and
- a fixed aerosol generation function of the aerosol-generating device, the fixed aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

Example 9: The aerosol-generating device of example 7 or 8, wherein at least two device functions in the enabled and/or disabled one or more (or sub-set of) device functions are selected from or relate to:

- a pause function for pausing of a usage session of the aerosol-generating device,
- an auto-start function of the aerosol-generating device,
- a fast-charging function of the energy storage,
- a connectivity function of the aerosol-generating device for communicative coupling to an external device of the aerosol-generating device,
- a flexible aerosol generation function of the aerosol-generating device, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device, and

- a fixed aerosol generation function of the aerosol-generating device, the fixed aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

Example 10: The aerosol-generating device of any one of examples 7 to 9, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a pause function for pausing of a usage session of the aerosol-generating device.

Example 11: The aerosol-generating device of any one of examples 7 to 10, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to an auto-start function of the aerosol-generating device.

Example 12: The aerosol-generating device of any one of examples 7 to 11, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a fast-charging function of the energy storage.

Example 13: The aerosol-generating device of any one of examples 7 to 12, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a connectivity function of the aerosol-generating device for communicative coupling to an external device of the aerosol-generating device.

Example 14: The aerosol-generating device of any one of examples 7 to 13, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a flexible aerosol generation function of the aerosol-generating device, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device.

Example 15: The aerosol-generating device of any one of examples 7 to 14, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a fixed aerosol generation function of the aerosol-generating device, the fixed aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

Example 16: The aerosol-generating device of any one of the preceding examples, wherein the control circuitry is configured to modify at least one device parameter in at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction.

Example 17: The aerosol-generating device of example 16, wherein the at least one modified device parameter is selected from or relates to:

- a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol,
- a maximum number of pauses per usage session of the aerosol-generating device,
- 5 - a maximum number of puffs per aerosol-generating article, and
- a maximum time for puffing or experiencing a single aerosol-generating article.

Example 18: The aerosol-generating device of example 16 or 17, wherein at least two modified device parameters are selected from or relate to:

- a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol,
- 10 - a maximum number of pauses per usage session of the aerosol-generating device,
- a maximum number of puffs per aerosol-generating article, and
- a maximum time for puffing or experiencing a single aerosol-generating article.

15 Example 19: The aerosol-generating device of any one of examples 16 to 18, wherein a modified device parameter is selected as or relates to a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol.

Example 20: The aerosol-generating device of any one of examples 16 to 19, wherein a modified device parameter is selected as or relates to a maximum number of pauses per
20 usage session of the aerosol-generating device.

Example 21: The aerosol-generating device of any one of examples 16 to 20, wherein a modified device parameter is selected as or relates to a maximum number of puffs per aerosol-generating article.

Example 22: The aerosol-generating device of any one of examples 16 to 21, wherein
25 a modified device parameter is selected as or relates to a maximum time for puffing or experiencing a single aerosol-generating article.

Example 23: The aerosol-generating device of any one of the preceding examples, wherein at least one of the plurality of the energy storage management modes comprises or defines at least one time schedule and/or at least one geographical location for operating the
30 energy storage.

Example 24: The aerosol-generating device of example 23, wherein the at least one time schedule and/or the at least one geographical location are selectable by a user.

Example 25: The aerosol-generating device of example 23 or 24, wherein the aerosol-generating device is configured to select an energy storage management mode out of the
35 plurality of energy storage management modes based on the at least one time schedule and/or the at least one geographical location for operation of the energy storage.

Example 26: The aerosol-generating device of any one of the preceding examples, wherein the aerosol-generating device is configured to:

provide the energy storage management modes,
make the energy storage management modes selectable, by a user, and
receive the instruction to operate the energy storage of the aerosol-generating device in
a selected one of the energy storage management modes.

5 Example 27: The aerosol-generating device of any one of the preceding examples,
wherein the aerosol-generating device is configured to:

make the device functions in the one or more (or sub-set of) device functions
defined by the energy storage management modes selectable, by a user, for enabling
and/or disabling the device functions.

10 Example 28: The aerosol-generating device of any one of the preceding examples,
wherein the aerosol-generating device is configured to:

make a device parameter of at least one device function in the one or more (or sub-set
of) device functions defined by the energy storage management modes modifiable by a
user.

15 Example 29: The aerosol-generating device of any one of the preceding examples,
wherein at least one device function in the one or more (or sub-set of) device functions is pre-
enabled or pre-disabled.

Example 30: The aerosol-generating device of example 29, wherein the at least one
pre-enabled or pre-disabled device function is pre-enabled or pre-disabled according to a health
20 status of the energy storage.

Example 31: The aerosol-generating device of example 30, wherein the health status
corresponds to a maximum capacity of the energy storage.

Example 32: The aerosol-generating device of any one of the preceding examples,
wherein at least one device parameter of the device functions in the one or more (or sub-set of)
25 device functions is pre-selected.

Example 33: The aerosol-generating device of any one of the preceding examples,
wherein at least one device parameter of the device functions in the one or more (or sub-set of)
device functions is selectable by a user from predefined device parameters or within a
predefined parameter range.

30 Example 34: The aerosol-generating device of any one of the preceding examples,
wherein the energy storage management modes are provided by a presetting, in particular
factory settings.

Example 35: The aerosol-generating device of any one of the preceding examples,
wherein the energy storage management modes are defined based on usage information from
35 the aerosol-generating device.

Example 36: The aerosol-generating device of example 35, wherein the usage
information comprises one or more of: a location of usage of the aerosol-generating device, a
time of usage of the aerosol-generating device, a frequency of using an energy storage

management mode, a health status of the energy storage after usage of the aerosol-generating device, a number of usages of the aerosol-generating device on a single charge of the energy storage, a number of pausings of the aerosol-generating device, and a number and/or type of device functions being used on the aerosol-generating device.

5 Example 37: An aerosol-generating system, comprising:

 an aerosol-generating device according to any one of the preceding claims, and
 an aerosol-generating article couplable or coupled to the aerosol-generating device to generate aerosol from at least a portion of the aerosol-generating article.

 Example 38: The aerosol-generating system of example 37, further comprising an
10 external device communicatively couplable or coupled to the aerosol-generating device.

 Example 38: An external device, the external device being configured to:
 communicatively couple to an aerosol-generating device, and
 transmit an instruction to operate an energy storage of the aerosol-generating device in one of a plurality of energy storage management modes to the aerosol-generating
15 device, each one of the plurality of energy storage management modes defining one or more device functions, the one or more device function being of a set of device functions that a control circuitry of the aerosol-generating device is configurable to provide, wherein at least one device function of each one of the plurality of energy storage management modes (or at least one device function in the one or more device functions or sub-set of device functions) is
20 different in each one of the energy storage management modes.

 Example 39: The external device of example 38, wherein the one or more device functions are a sub-set of the set of device functions that the control circuitry is configurable to provide.

 Example 40: The external device of example 38 or 39, wherein the external device is a
25 computing device, a mobile device and/or a companion device of the aerosol-generating device.

 Example 41: The external device of any one of examples 38 to 40, wherein the external device is configured to:

 provide the energy storage management modes,
 make the energy storage management modes selectable, by a user, and
30 determine the instruction to operate the energy storage of the aerosol-generating device in a selected one of the energy storage management modes.

 Example 42: The external device of any one of examples 38 to 41, wherein the external device is configured to:

 make the device functions in the one or more (or sub-set of) device functions
35 defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions.

 Example 43: The external device of any one of examples 38 to 42, wherein the external device is configured to:

make a device parameter of at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management modes modifiable by a user.

5 Example 44: A method for providing an instruction to operate an energy storage of the aerosol-generating device in one of a plurality of energy storage management modes, each one of the plurality of energy storage management modes defining one or more device functions, the one or more device functions being of a set of device functions that a control circuitry of the aerosol-generating device is configurable to provide, wherein at least one device function of each one of the plurality of energy storage management modes (or at least one device function
10 in the one or more device functions or sub-set of device functions) is different in each one of the energy storage management modes, the method comprising:
providing the energy storage management modes,
making the energy storage management modes selectable,
determining the instruction to operate the energy storage of the aerosol-generating
15 device in a selected one of the energy storage management modes, and
providing the determined instruction for transmission to an aerosol-generating device.

Example 45: The method of example 44, wherein the one or more device functions are a sub-set of the set of device functions that the control circuitry is configurable to provide.

Example 46: The method of example 44 or 45, wherein the method comprises:
20 making the device functions in the one or more (or sub-set of) device functions defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions.

Example 47: The method of any one of examples 44 to 46, wherein the method comprises:
25 making a device parameter of at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management modes modifiable by a user.

Example 48: A computer program product comprising instructions, which when executed by a computer, cause the computer to carry out the method of any one of examples
30 44 to 47.

Example 49: A method for operating an aerosol-generating device, comprising control circuitry and an energy storage, the control circuitry being configurable to provide a set of device functions utilizing the energy storage, the method comprising:
receiving an instruction to operate the energy storage in one of a plurality of
35 energy storage management modes, each one of the plurality of energy storage management modes defining one or more of the set of device functions, wherein at least one device function of each one of the plurality of energy storage management modes (or at least one device

function in the one or more device functions or sub-set of device functions) is different in each one of the energy storage management modes, and

configuring the control circuitry to provide the one or more device functions of the energy storage management mode of the received instruction.

5 Example 50: The method of example 49, wherein the one or more device functions of the set of device function are a sub-set of the set of device functions.

Example 51: The method of example 49 or 50, the method further comprising:

 providing one or more device functions of the one or more (or sub-set of) device functions of the energy storage management mode of the received instruction, in particular by
10 the control circuitry.

Example 52: The method of example 51, wherein the provision of the one or more device functions of the one or more (or sub-set of) device functions of the energy storage management mode of the received instruction is automatic and/or based on user input.

Example 53: The method of any one of examples 49 to 52, wherein charging,
15 discharging and/or idling of the energy storage is controlled, in particular by the control circuitry, based on the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction.

Example 54: The method of any one of examples 49 to 53, wherein charging and/or
20 discharging of the energy storage is controlled, in particular by the control circuitry, based on a charging and/or discharging device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction.

Example 55: The method of any one of examples 49 to 54, wherein idling of the energy storage is controlled, in particular by the control circuitry, based on an idling device function in the one or more (or sub-set of) device functions defined by the energy storage management
25 mode of the received instruction.

Example 56: The method of any one of examples 49 to 55, wherein the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction is enabled and/or disabled, in particular by the control circuitry.

Example 57: The method of example 56, wherein at least one device function in the
30 enabled and/or disabled one or more (or sub-set of) device functions is selected from or relates to:

- a pause function for pausing of a usage session of the aerosol-generating device,
- an auto-start function of the aerosol-generating device,
- 35 - a fast-charging function of the energy storage,
- a connectivity function of the aerosol-generating device for communicative coupling to an external device of the aerosol-generating device,

- a flexible aerosol generation function of the aerosol-generating device, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device, and

5 - a fixed aerosol generation function of the aerosol-generating device, the fixed aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

10 Example 58: The method of example 56 or 57, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a pause function for pausing of a usage session of the aerosol-generating device.

Example 59: The method of any one of examples 56 to 58, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or
15 relates to an auto-start function of the aerosol-generating device.

Example 60: The method of any one of examples 56 to 59, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a fast-charging function of the energy storage.

Example 61: The method of any one of examples 56 to 60, wherein a device function
20 in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a connectivity function of the aerosol-generating device for communicative coupling to an external device of the aerosol-generating device.

Example 62: The method of any one of examples 56 to 61, wherein a device function in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or
25 relates to a flexible aerosol generation function of the aerosol-generating device, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device.

Example 63: The method of any one of examples 56 to 62, wherein a device function
30 in the enabled and/or disabled one or more (or sub-set of) device functions is selected as or relates to a fixed aerosol generation function of the aerosol-generating device, the fixed aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

35 Example 64: The method of any one of examples 49 to 63, wherein at least one device parameter in at least one device function in the one or more (or sub-set of) device functions defined by the energy storage management mode of the received instruction is modified, in particular by the control circuitry.

Example 65: The method of example 64, wherein the at least one modified device parameter is selected from or relates to:

- a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol,
- 5 - a maximum number of pauses per usage session of the aerosol-generating device,
- a maximum number of puffs per aerosol-generating article, and
- a maximum time for puffing or experiencing a single aerosol-generating article.

Example 66: The method of example 64 or 65, wherein at least two modified device parameters are selected from or relate to:

- a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol,
- a maximum number of pauses per usage session of the aerosol-generating device,
- 15 - a maximum number of puffs per aerosol-generating article, and
- a maximum time for puffing or experiencing a single aerosol-generating article.

Example 67: The method of any one of examples 64 to 66, wherein a modified device parameter is selected as or relates to a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol.

Example 68: The method of any one of examples 64 to 67, wherein a modified device parameter is selected as or relates to a maximum number of pauses per usage session of the aerosol-generating device.

Example 69: The method of any one of examples 64 to 68, wherein a modified device parameter is selected as or relates to a maximum number of puffs per aerosol-generating article.

Example 70: The method of any one of examples 64 to 69, wherein a modified device parameter is selected as or relates to a maximum time for puffing or experiencing a single aerosol-generating article.

Example 71: The method of any one of examples 64 to 70, wherein at least one of the plurality of the energy storage management modes comprises or defines at least one time schedule and/or at least one geographical location for operating the energy storage.

Example 72: The method of example 71, wherein the at least one time schedule and/or the at least one geographical location are selectable by a user.

Example 73: The method of example 72, wherein an energy storage management mode out of the plurality of energy storage management modes is selected based on the at least one time schedule and/or the at least one geographical location for operation of the energy storage.

Example 74: The method of any one of examples 49 to 73, wherein the method is configured to:

provide the energy storage management modes,

make the energy storage management modes selectable, by a user, and

5 receive the instruction to operate the energy storage of the aerosol-generating device in a selected one of the energy storage management modes.

Example 75: The method of any one of examples 49 to 74, wherein the method is configured to:

make the device functions in the one or more (or sub-set of) device functions

10 defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions.

Example 76: The method of any one of examples 49 to 75, wherein the method is configured to:

make a device parameter of at least one device function in the one or more (or sub-set

15 of) device functions defined by the energy storage management modes modifiable by a user.

Example 77: The method of any one of examples 49 to 76, wherein at least one device function in the one or more (or sub-set of) device functions is pre-enabled or pre-disabled.

Example 78: The method of example 77, wherein the at least one pre-enabled or pre-disabled device function is pre-enabled or pre-disabled according to a health status of the

20 energy storage.

Example 79: The method of example 78, wherein the health status corresponds to a maximum capacity of the energy storage.

Example 80: The method of any one of examples 49 to 79, wherein at least one device parameter of the device functions in the one or more (or sub-set of) device functions is pre-

25 selected.

Example 81: The method of any one of examples 49 to 80, wherein at least one device parameter of the device functions in the one or more (or sub-set of) device functions is selectable by a user from predefined device parameters or within a predefined parameter range.

Example 82: The method of any one of examples 49 to 81, wherein the energy storage

30 management modes are provided by a presetting, in particular factory settings.

Example 83: The method of any one of examples 49 to 82, wherein the energy storage management modes are defined based on usage information from the aerosol-generating device.

Example 84: The method of example 83, wherein the usage information comprises one

35 or more of: a location of usage of the aerosol-generating device, a time of usage of the aerosol-generating device, a frequency of using an energy storage management mode, a health status of the energy storage after usage of the aerosol-generating device, a number of usages of the aerosol-generating device on a single charge of the energy storage, a number of pausings of

the aerosol-generating device, and a number and/or type of device functions being used on the aerosol-generating device.

Example 85: A computer program product comprising instructions, which when executed by a computer, cause the computer to carry out the method of any one of examples 49 to 84.

Examples will now be further described with reference to the Figures in which:

Figure 1 shows an aerosol-generating device and an aerosol-generating system;

Figure 2 shows a plurality of energy storage management modes on a user interface of the aerosol-generating system; and

Figure 3 illustrates a method for providing an instruction to operate an energy storage of the aerosol-generating device of Fig. 1 in one of a plurality of energy storage management modes.

The Figures are schematic only and not true to scale. In principle, identical or like parts, elements and/or steps are provided with identical or like reference numerals in the Figures.

Figure 1 shows an exemplary aerosol-generating device 100. The aerosol-generating device 100 of Figure 1 is exemplary shown as part of an aerosol-generating system 1000, which includes optional components, such as an aerosol-generating article 200, and one or more external devices, such as a companion device 300, a mobile device 400, and/or a computing device 500, for example. It is noted that the aerosol-generating device 100 may be operated as standalone device 100 without any of the optional components 200, 300, 400, 500 of the system 1000.

The aerosol-generating device 100 includes one or more energy storages 102 for storing electrical energy and/or for providing electrical energy to generate aerosol. The one or more energy storages may be one or more batteries (e.g. a lithium-ion battery). When the energy storage(s) 102 is/are a battery/batteries the cathode material may comprise lithium-cobalt-oxide (LCO), lithium-manganese-oxide (LMO), lithium-nickel-manganese-cobalt-oxide (NMC), lithium-iron-phosphate (LFP), and/or lithium-nickel-cobalt-aluminium-oxide (NCA). The anode material may comprise carbon (e.g. graphite), silicon and/or lithium-titanate-oxide (LTO).

The exemplary aerosol-generating device 100 shown in Figure 1 includes at least a part of a heating circuit 104 with at least one heating element 106 for heating at least a part of an aerosol-generating article 200 couplable or coupled to the aerosol-generating device 100. It should be noted that the heating circuit 104 and heating element 106 are optional only. Alternatively, or additionally, at least a part of or the entire heating circuit 104, heating arrangement 104 and/or heating element 106 may be integrated or arranged in the aerosol-generating article 200. Alternatively, or additionally, at least a part of the heating circuit 104 may be integrated into a control circuitry 110 of the aerosol-generating device 100.

It should be noted that the heating element 106 is merely for illustrative purposes shown in Figure 1 as inductive coil configured to inductively heat at least a part of the aerosol-generating article 200, for example a susceptor material (e.g. one or more susceptors) arranged in an

aerosol-generating substrate 202 of the aerosol-generating article 200. Alternatively, or additionally, the at least one heating element 106 may be configured for one or more of resistive heating and microwave heating.

Further, it should be noted that the aerosol-generating article 200 is only exemplary shown in Figure 1 as having a stick-like or tubular shape and as being at least partially insertable through an opening 105 of a housing 107 of the aerosol-generating device 100, for example into a heating chamber 109 of the aerosol-generating device 100. In other exemplary designs, the aerosol-generating article 200 may be shaped as container or cartridge that may be fixedly integrated in the aerosol-generating device 100 or that may be couplable to the aerosol-generating device 100.

The aerosol-generating device 100 further comprises control circuitry 110 or device control circuitry 110 operatively coupled to the energy storage 102. The control circuitry 110 may optionally include one or more processors 112, controllers 112 and/or microcontrollers 112 for data processing. The control circuitry 110 may comprise a microcontroller comprising a processor, memory and input/output means.

Further optionally, the aerosol-generating device 100 and/or the control circuitry 110 includes a data storage 114 for storing data, such as for example one or more energy storage management modes.

Alternatively, or additionally, software instructions may be stored in the data storage 114, which when executed by the control circuitry 110 instruct the aerosol-generating device 100 to perform one or more device functions of the aerosol-generating device 100, as described hereinabove and hereinbelow.

The aerosol-generating device 100 optionally includes a user interface 120 for receiving one or more user inputs from a user, for example to operate the aerosol-generating device 100 to generate aerosol. The user interface 120 is exemplary shown as a button in Figure 1. Any other type of user interface 120, such as an acoustic interface, a haptic interface, a touch interface, a display, a tactile interface, an arrangement of one or more LEDs or other means can be optionally included in the aerosol-generating device 100 in the alternative or in addition.

Further optionally, the aerosol-generating device 100 includes a communication interface or circuitry 130 for communicatively coupling the aerosol-generating device 100 to one or more optional components of the aerosol-generating system 1000, in particular to one or more of the companion device 300, the mobile device 400, and the computing device 500.

One or more communication interface types or communication protocols may be implemented in the aerosol-generating device 100 and its communication interface or circuitry 130. In particular, the communication interface or circuitry 130 may be configured for one or both wired and wireless communication with one or more of the computing device 500, the mobile device 400 and the companion device 300. For example, the communication interface 130 may be based on one or more of a BUS communication, a cable communication, a Bluetooth communication, a Wireless Local Area Network communication, an infrared communication, a

nearfield communication, an internet communication or any other suitable type of communication or communication protocol.

The aerosol-generating device 100 may optionally be coupled to, for example physically coupled and/or at least partly inserted into, the companion device 300 for charging the energy storage 102 and/or for storing the aerosol-generating device 100. Charging may, for example, be based on inductive charging or via electrical connections.

The aerosol-generating device 100 and/or the control circuitry 110 is configured to supply electrical energy to the at least one heating element 106 to heat at least a portion of the aerosol-generating article 200 to or above the predetermined heating temperature to generate aerosol, as described hereinabove.

Figure 2 illustrates the user interface 120 of the aerosol-generating device 100 or, alternatively, a user interface 120 in exemplary form of a display, in particular as a touch display, of the external device, in particular of the mobile device 400. On the user interface 120, a graphical user interface is being displayed in this example. The graphical user interface shows a plurality of energy storage management modes with their sub-sets 420 of device functions 421, 422, 423, 424. In this exemplary case, only two energy storage management modes are shown by virtue of the sub-sets 420. In the alternative to a sub-set 420 of device functions 421, 422, 423, 424 being defined by each one of the energy storage management modes, one or more device functions 421, 422, 423, 424 may be defined by each one of the energy storage management modes, which may be of a set of device functions 421, 422, 423, 424 that the control circuitry 110 may be configurable to provide utilizing the energy storage, e.g., using energy from the energy storage.

In this example, the left energy storage management mode represented by the left sub-set 420 in Fig. 2 may be a performance energy storage management mode, whereas the right energy storage management mode represented by the right sub-set 420 in Fig. 2 may be an economic energy storage management mode. In one example, the user of the aerosol-generating system 1000 may select any one of the plurality of energy storage management modes by interacting with the user interface 120, e.g., by touching or clicking any one of the energy storage management modes. By doing so, the user may initiate that instructions to operate the energy storage 102 in the selected one of the plurality of energy storage management modes are being transmitted to the control circuitry 110. In an example where the user interface 120 is the one of the external device 400, this may be done via a communicative coupling between the external device 400 and the aerosol-generating device 100. In one example, the instructions may comprise the selected or the plurality of energy storage management modes or, alternatively, these may be stored on the data storage 114 of the aerosol-generating device 100 and the instruction may be an instruction to choose the one corresponding to the user selection. Also, or alternatively, the instruction may modify one or more energy storage management modes stored on the data storage 114.

Upon receipt of the instruction, the aerosol-generating device 100 may configure the control circuitry 110 to provide the sub-set 420 of device functions 421, 422, 423, 424 of the selected one of the plurality of energy storage management modes or, in other words, the energy storage management mode of the received instruction. Accordingly, it may be provided that the user now may make use of the device functions 421, 422, 423, 424 in the sub-set 420 of the energy storage management mode of the received instruction when using the aerosol-generating device 100.

As may be seen from Fig. 2, the two sub-sets 420 of the energy storage management modes comprise different device functions 421, 422, 423, 424. In this example, the right sub-set 420 is missing the device function 424 as opposed to the left sub-set 420. For example, the device function 424 may be disabled as indicated by the dashed line surrounding it. Also, the device functions 422 in the two sub-sets 420 are different in that a device parameter 425 associated with each one of the device functions 422 is different in each one of them. In this example, the device parameter 425 of the device function 422 in the left sub-set 420 is 3, whereas the device parameter 425 of the device function 422 in the right sub-set 420 is 1. The device functions 421, 422, 423, 424 are exemplary described in the following.

In this example, the device function 421 may be an auto-start function of the aerosol-generating device 100. The auto-start function is enabled by the control circuitry 110 for both energy storage management modes or sub-sets 420, i.e., independent of which one is being selected by the user.

Of course, the device function 421 or any of the other device functions 422, 423, 424 may alternatively be any of the above or below explained device functions 421, 422, 423, 424. Also, the number of device functions 421, 422, 423, 424 in each sub-set 420 is chosen merely exemplary and may be more or less than shown in Fig. 2.

Further, in this example, the device function 422 is an operation function comprising a device parameter 425. The device parameter 425 in this example is a maximum number of usage sessions or, in other words, experiences of the aerosol-generating device 100 that the aerosol-generating device 100 is operable to generate aerosol. When the user of the aerosol-generating system 1000 selects the left sub-set 420, they are limited to a maximum number of 3 usage sessions, in particular per charge of the energy storage 102. Correspondingly, the energy storage 102 may be charged to a state, e.g., a full charging state, where the energy storage 102 may allow the 3 usage sessions without requiring the energy storage 102 to be charged in between the usage sessions. However, when the user selects the right sub-set 420, they are limited to a maximum number of 1 usage session per charge of the energy storage 102. Correspondingly, the energy storage 102 may be charged to a state, e.g., a partial charging state, where the energy storage 102 may allow only one usage session, requiring the user to recharge the energy storage 102 for further usage sessions. The number of usage sessions may, additionally or alternatively to the limitation per charge of the energy storage 102, be limited with respect to a timeframe, such

as per hour or per day, a time schedule and/or a geographical location, for example. The device parameters 425 being different from one another makes the respective device functions 422 of the sub-sets 420 different from one another.

Further, in this example, the device function 423 is a flexible aerosol generation function of the aerosol-generating device 100, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article 200 usable in the aerosol-generating device 100 based on a puff behavior of the user when using the aerosol-generating device 100. The flexible aerosol generation function being enabled by the control circuitry 110 may disable a fixed aerosol generation function of the aerosol-generating device 100 (not shown in Fig. 2), where the fixed aerosol generation function would allow a maximum number of puffs per aerosol-generating article 200 usable in the aerosol-generating device 100 and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article 200 used in the aerosol-generating device 100.

Further, in this example, the device function 424, only being enabled by the control circuitry 110 of the aerosol-generating device 100 if the energy storage management mode of the left sub-set 420 is being received as instruction by the control circuitry 110, corresponds to a pause function for pausing of a usage session of the aerosol-generating device 100. When the device function 424 is enabled, the user may, for example by interacting with the user interface 120 or based on a sensor of the aerosol-generating device 100, pause the aerosol generation. For the right sub-set 420, the device function 424 is disabled as illustrated by the dashed lines of the device function 424. For pausing the usage session, the control circuitry 110 may control the energy storage 102 to be put into an idle mode of reduced energy consumption, in particular by the heating element 106.

As mentioned above, the left energy storage management mode may be a performance energy storage management mode, in which all four exemplary device functions 421, 422, 423, 424 are being enabled by the control circuitry 110 when receiving a corresponding instruction to operate according to this energy storage management mode. The right energy storage management mode, on the other hand side, may be an economic energy storage management mode, in which the exemplary device function 424 is disabled and the device parameter 425 is smaller, so as to reduce usage of the energy storage 102 to prolong its life and/or to restrict the user in their experiencing behavior, e.g., to reduce the number of experienced aerosol-generating articles 200.

The energy storage management modes with their sub-sets 420 may be pre-set, in particular factory-set, for example. However, it may also be provided that the energy storage management modes may be based on user settings.

Accordingly, in one example, the user may choose to modify the energy storage management modes. For example, it may be provided that the user may enable or disable certain or all device functions 421, 422, 423, 424 in one or both of the energy storage management modes. In the example of Fig. 2, the user may be allowed to enable the device function 424 in the

right sub-set 420, whereas they may disable the device function 424 or any other device functions 421, 422, 423 in the left sub-set 420, for example. It may also be provided that the user can add further device functions, as mentioned herein, or create new energy storage management modes.

In a further example, the aerosol-generating device 100 may be configured to select an energy storage management mode out of the plurality of energy storage management modes based on at least one time schedule and/or at least one geographical location for operation of the energy storage 102. This selection of an energy storage management mode may be alternative or additional to the above explained selection based on the user input. The user may predefine one or more energy storage management modes to be used in accordance with one or more time schedules and/or one or more geographical locations, which may also be predefined by the user, via the user interface 120, for example. Alternatively, or additionally, the aerosol-generating device 100 or the external device may, based on usage information of the aerosol-generating device 100, predefine the one or more energy storage management modes for one or more time schedules and/or one or more geographical locations.

For example, the aerosol-generating device 100 may comprise a clock, calendar and/or a GPS unit (not shown) and/or be configured to receive a current time, day and/or a geographical location from one of the external devices, e.g., the mobile device 400, which may have one or more of a clock, calendar and/or GPS unit. Accordingly, the aerosol-generating device 100 may compare the one or more time schedules and/or one or more geographical locations to a current time and/or current location, and based upon the comparison, select an energy storage management mode to be operated by the control circuitry 110.

Figure 3 illustrates a method for providing an instruction to operate the energy storage 102 of the aerosol-generating device 100 in one of the plurality of energy storage management modes described with reference to Figure 2.

In step S1, the aerosol-generating device 100 and/or the external device, e.g., the mobile device 400, provides the energy storage management modes as shown in Fig. 2. In this example, the user interface 120 in form of a display of the aerosol-generating device 100 and/or the external device displays the plurality of energy storage management modes.

In step S2, the energy storage management modes are made selectable to the user, e.g., via interaction with the user interface 120. Step S2 may be carried out simultaneously to step S1.

In step S3, the instruction to operate the energy storage 102 of the aerosol-generating device 100 in one of the plurality of energy storage management modes, which has been selected by the user on the user interface 120, is determined.

In step S4, the determined instruction is provided for transmission to the aerosol-generating device 100. Consequently, the instruction may be transmitted or, in other words, send to the aerosol-generating device 100, where it may be received, e.g., by the control circuitry 110, and consequently be used for configuring the control circuitry 110 to provide the sub-set 420 of device

functions of the selected energy storage management mode, which corresponds to the one of the received instruction.

Besides the above steps, the method may further comprise making the device functions in the sub-set 420 of device functions defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions. Accordingly, as described above, the user may enable and/or disable the device functions in any of the plurality of the energy storage management modes for customization of their aerosol-generating device 100. Also, or alternatively, the method may comprise making a device parameter of at least one device function in the sub-set of device functions defined by the energy storage management modes modifiable, by the user. Allowing the user to modify the device parameter or device parameters further allows for customization of the aerosol-generating device 100.

For the purpose of the present description and of the appended claims, except where otherwise indicated, all numbers expressing amounts, quantities, percentages, and so forth, are to be understood as being modified in all instances by the term "about" or "substantially". Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein. In this context, therefore, a number A is understood as $A \pm 20\%$ of A. Within this context, a number A may be considered to include numerical values that are within general standard error for the measurement of the property that the number A modifies. The number A, in some instances as used in the appended claims, may deviate by the percentages enumerated above provided that the amount by which A deviates does not materially affect the basic and novel characteristic(s) of the claimed invention. Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein.

While the invention has been illustrated and described in detail in the drawings and foregoing description, such illustration and description are to be considered illustrative or exemplary and not restrictive; the invention is not limited to the disclosed embodiments. Other variations to the disclosed embodiments can be understood and effected by those skilled in the art and practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims.

In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage. Any reference signs in the claims should not be construed as limiting the scope.

CLAIMS

1. An aerosol-generating device, comprising control circuitry and an energy storage,
the control circuitry being configurable to provide a set of device functions utilizing the energy storage,
the aerosol-generating device being configured to receive an instruction to operate the energy storage in one of a plurality of energy storage management modes, each one of the plurality of energy storage management modes defining one or more device functions of the set of device functions,
wherein at least one device function of each one of the plurality of energy storage management modes is different in each one of the energy storage management modes, and
wherein the control circuitry is configured to provide the one or more device functions of the energy storage management mode of the received instruction.
2. The aerosol-generating device of claim 1, wherein each one of the plurality of the energy storage modes defines a sub-set of the set of device functions, and wherein the control circuitry is configured to provide the sub-set of device functions of the energy storage management mode of the received instruction.
3. The aerosol-generating device of claim 1 or 2, wherein the energy storage management modes are user-selectable, preferably from a menu of energy storage management modes.
4. The aerosol-generating device of any one of the preceding claims, wherein the control circuitry is configured to control charging, discharging and/or idling of the energy storage based on the one or more device functions defined by the energy storage management mode of the received instruction.
5. The aerosol-generating device of any one of the preceding claims, wherein the control circuitry is configured to enable and/or disable the one or more device functions defined by the energy storage management mode of the received instruction.
6. The aerosol-generating device of claim 5, wherein at least one device function in the enabled and/or disabled one or more device functions is selected from or relates to:
 - a pause function for pausing of a usage session of the aerosol-generating device,
 - an auto-start function of the aerosol-generating device,
 - a fast-charging function of the energy storage,

- a connectivity function of the aerosol-generating device for communicative coupling to an external device of the aerosol-generating device,
- a flexible aerosol generation function of the aerosol-generating device, the flexible aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device based on a puff behavior of a user when using the aerosol-generating device, and
- a fixed aerosol generation function of the aerosol-generating device, the fixed aerosol generation function allowing a maximum number of puffs per aerosol-generating article usable in the aerosol-generating device and/or a fixed amount of time for puffing or experiencing a single aerosol-generating article used in the aerosol-generating device.

7. The aerosol-generating device of any one of the preceding claims, wherein the control circuitry is configured to modify at least one device parameter in at least one device function in the one or more device functions defined by the energy storage management mode of the received instruction.

8. The aerosol-generating device of claim 7, wherein the at least one modified device parameter is selected from or relates to:

- a maximum number of usage sessions the aerosol-generating device is operable to generate aerosol,
- a maximum number of pauses per usage session of the aerosol-generating device,
- a maximum number of puffs per aerosol-generating article, and
- a maximum time for puffing or experiencing a single aerosol-generating article.

9. An aerosol-generating system, comprising:

an aerosol-generating device according to any one of the preceding claims, and
an aerosol-generating article couplable or coupled to the aerosol-generating device to generate aerosol from at least a portion of the aerosol-generating article.

10. An external device, the external device being configured to:

communicatively couple to an aerosol-generating device, and
transmit an instruction to operate an energy storage of the aerosol-generating device in one of a plurality of energy storage management modes to the aerosol-generating device, each one of the plurality of energy storage management modes defining one or more device functions, the one or more device function being of a set of device functions that a control circuitry of the aerosol-generating device is configurable to provide, wherein at least one device

function of each one of the plurality of energy storage management modes is different in each one of the energy storage management modes.

11. The external device of claim 10, wherein the external device is a computing device, a mobile device and/or a companion device of the aerosol-generating device.

12. The external device of claim 10 or claim 11, wherein the external device is configured to:
provide the energy storage management modes,
make the energy storage management modes selectable, by a user, and
determine the instruction to operate the energy storage of the aerosol-generating device in a selected one of the energy storage management modes.

13. The external device of any one of claims 10 to 12, wherein the external device is configured to:
make the device functions in the one or more device functions defined by the energy storage management modes selectable, by a user, for enabling and/or disabling the device functions.

14. A method for providing an instruction to operate an energy storage of the aerosol-generating device in one of a plurality of energy storage management modes, each one of the plurality of energy storage management modes defining one or more device functions, the one or more device functions being of a set of device functions that a control circuitry of the aerosol-generating device is configurable to provide, wherein at least one device function of each one of the plurality of energy storage management modes is different in each one of the energy storage management modes, the method comprising:

providing the energy storage management modes,
making the energy storage management modes selectable,
determining the instruction to operate the energy storage of the aerosol-generating device in a selected one of the energy storage management modes, and
providing the determined instruction for transmission to an aerosol-generating device.

15. A computer program product comprising instructions, which when executed by a computer, cause the computer to carry out the method of claim 14.

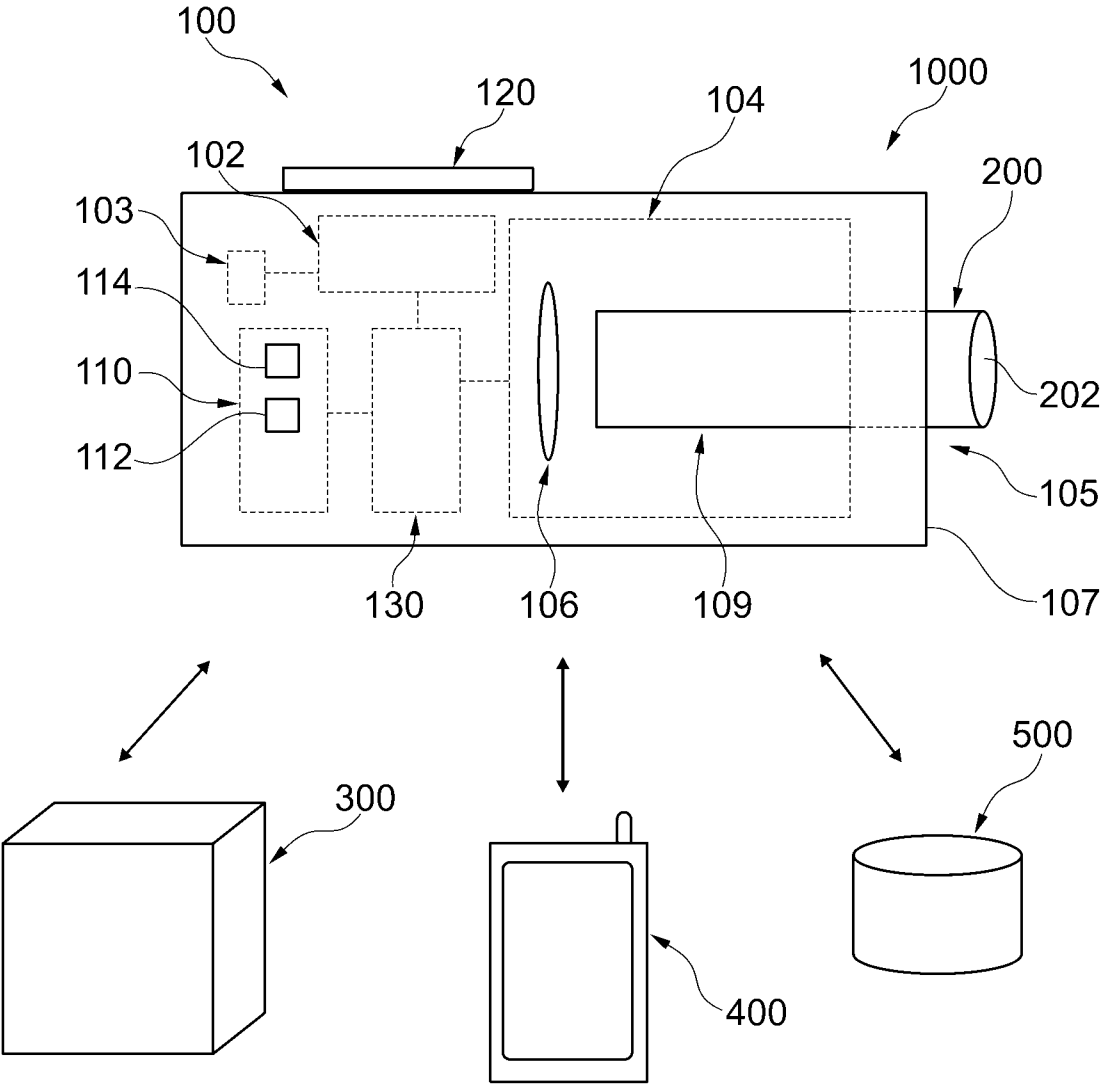


Fig. 1

2/2

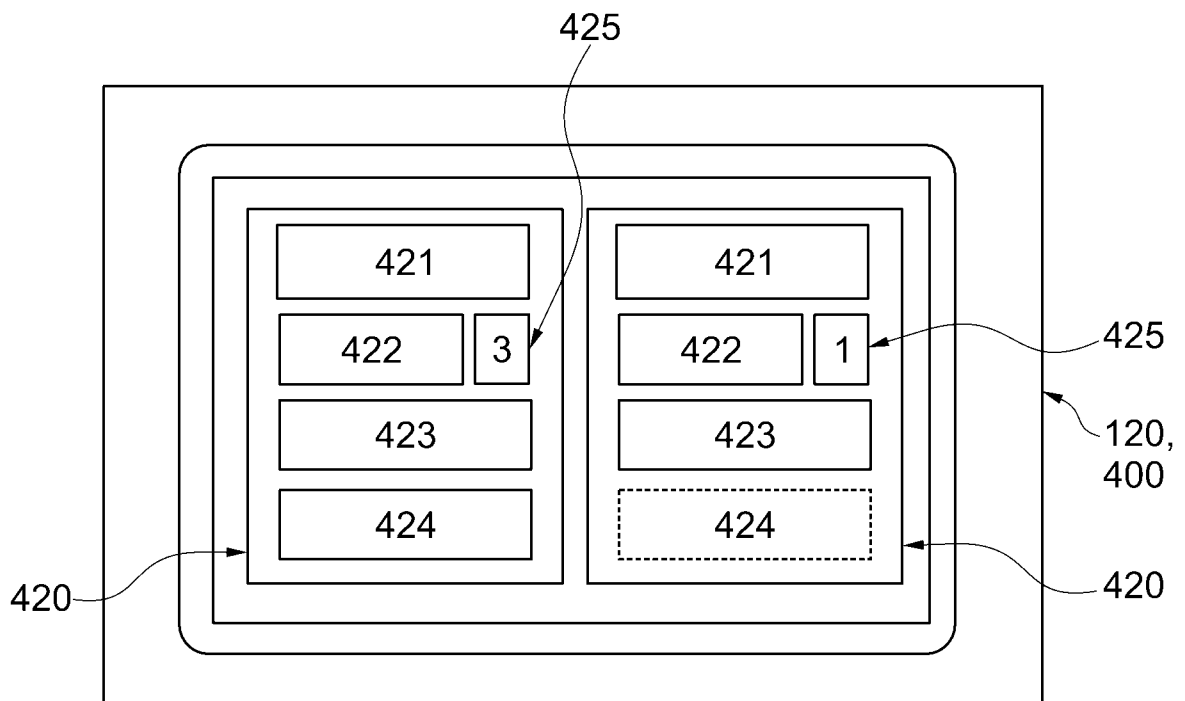


Fig. 2

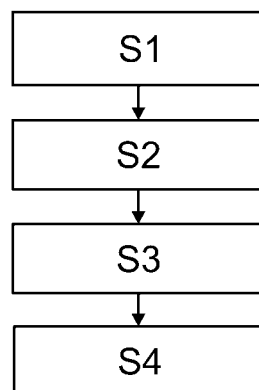


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/CN2023/112578

A. CLASSIFICATION OF SUBJECT MATTER INV. A24F40/50 A24F40/65 ADD. A24F40/95		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A24F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2022/214829 A1 (NICOVENTURES TRADING LTD [GB]) 13 October 2022 (2022-10-13) figures paragraph [0009] paragraph [0013] - paragraph [0014] paragraph [0026] paragraph [0030] paragraph [0033] - paragraphs [0037], [0039] paragraph [0043] - paragraph [0056] paragraph [0058] - paragraph [0069] -----	1-15
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☒ 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 5 February 2024		Date of mailing of the international search report 04/03/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Kirchmayr, Katrin

INTERNATIONAL SEARCH REPORT

International application No

PCT/CN2023/112578

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

International application No

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