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(54) **ELECTRONIC CIGARETTE ANTI-ROLL CASE**

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(71) Applicant: **FONTEM HOLDINGS 1 B.V.**,
Amsterdam (NL)

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(72) Inventors: **Ramon Alarcon**, Los Gatos, CA (US);
Dennis Rasmussen, Campbell, CA
(US); **Hitesh Bagai**, Bristol (GB);
Andreas Ingo Beer, Grasbrunn (DE)

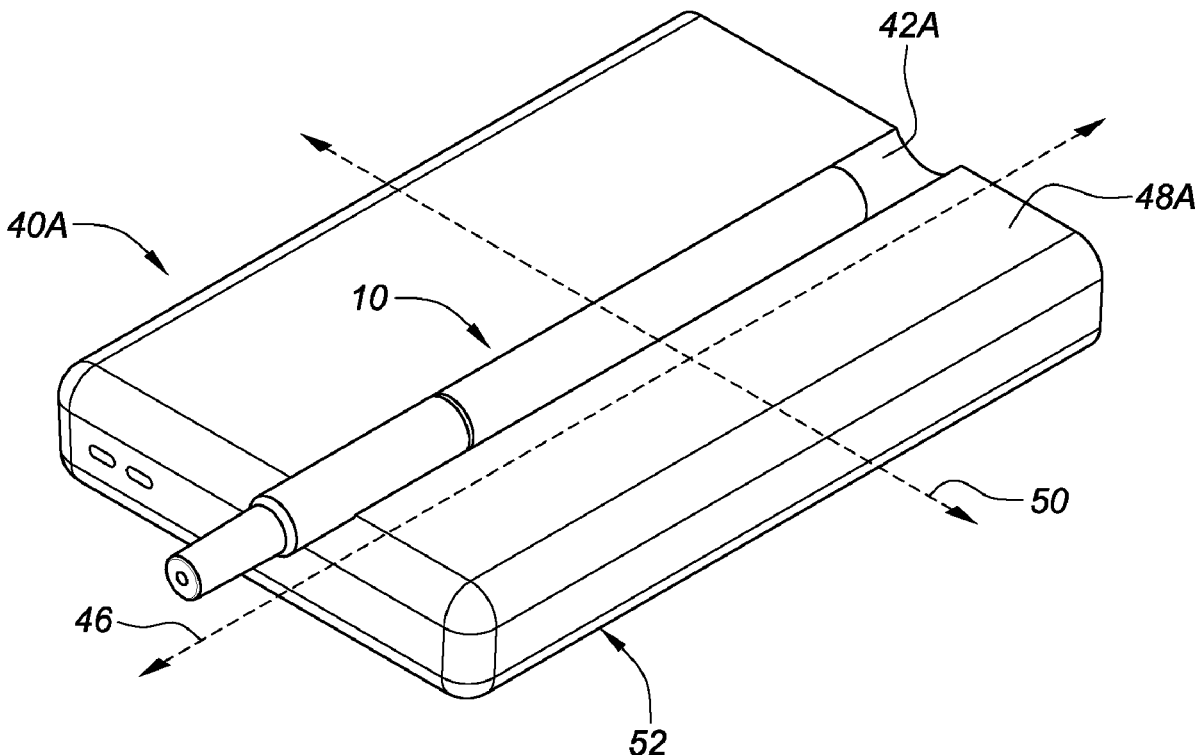
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(57) **ABSTRACT**

One or more features of an electronic cigarette or an electronic cigarette charging case is configured to hold the electronic cigarette in place and inhibit it from rolling and charge the electronic cigarette.



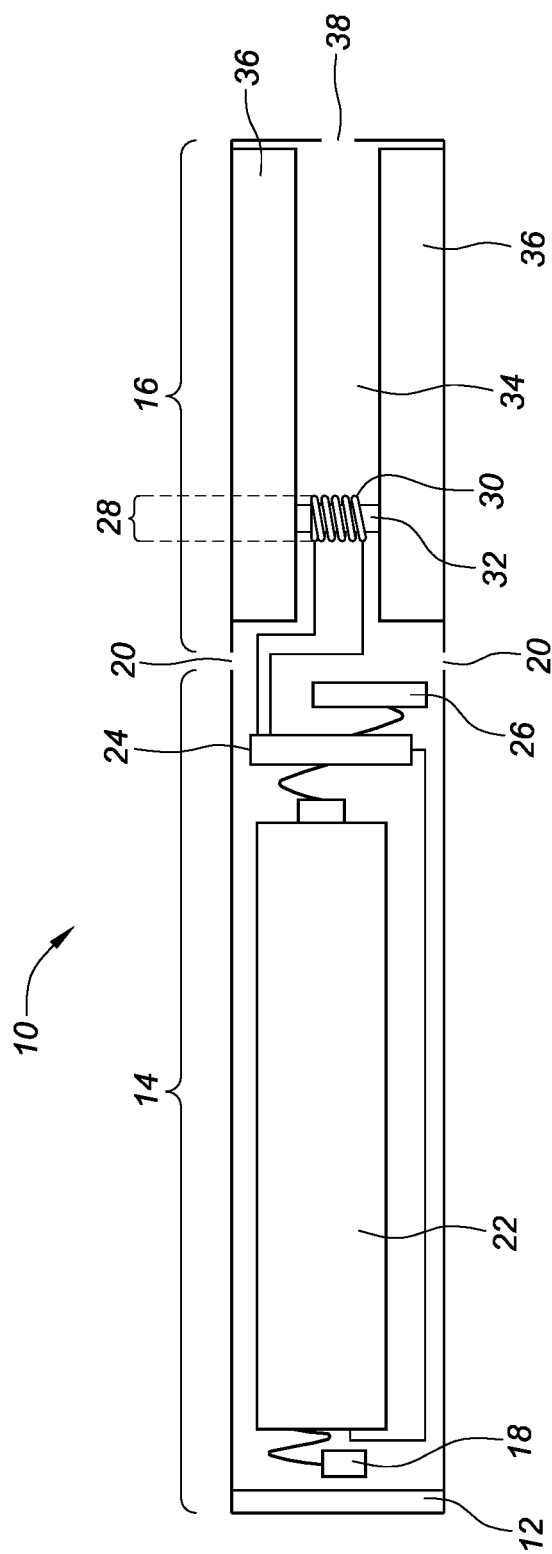
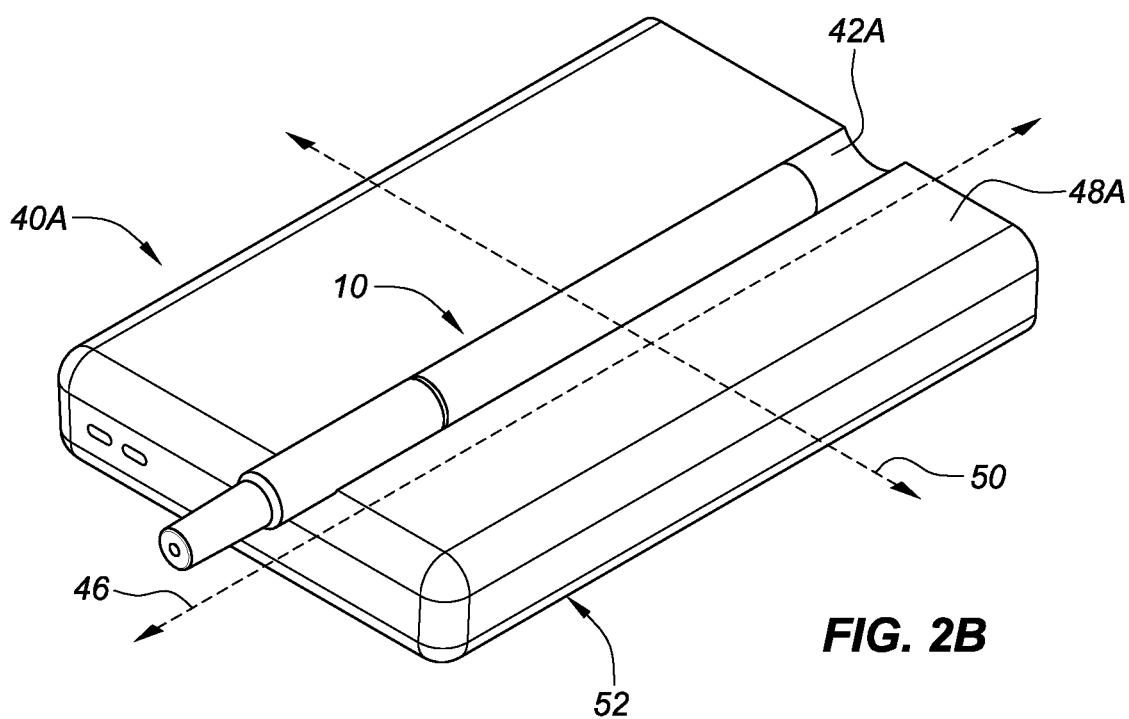
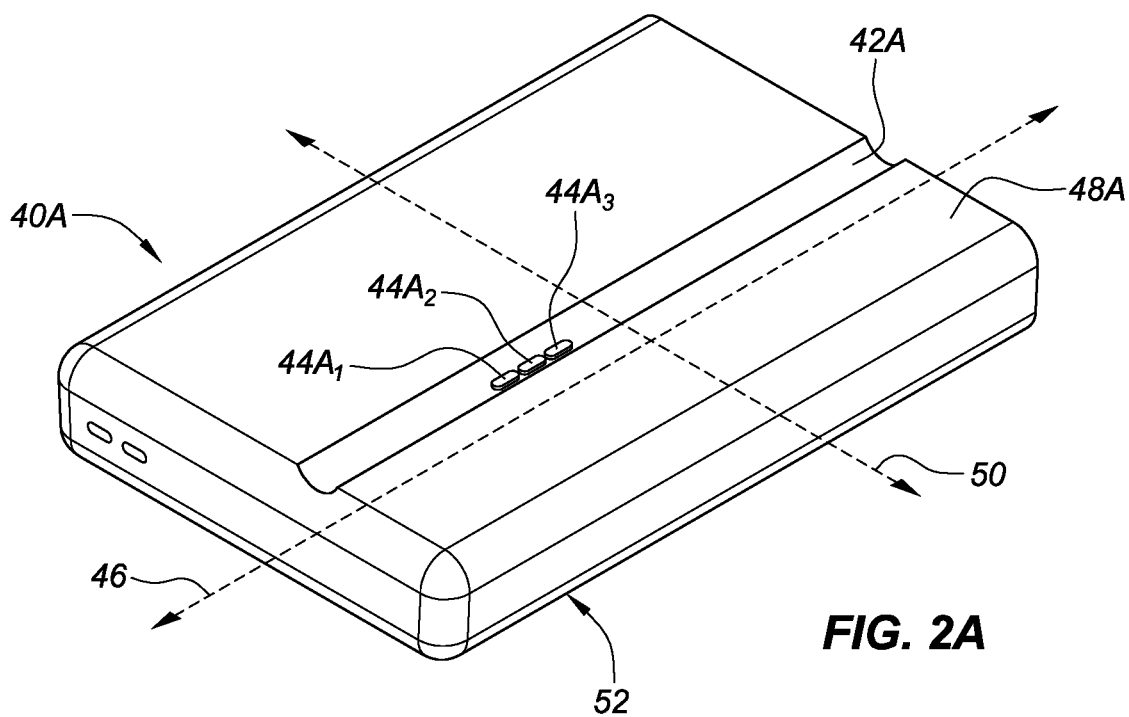


FIG. 1



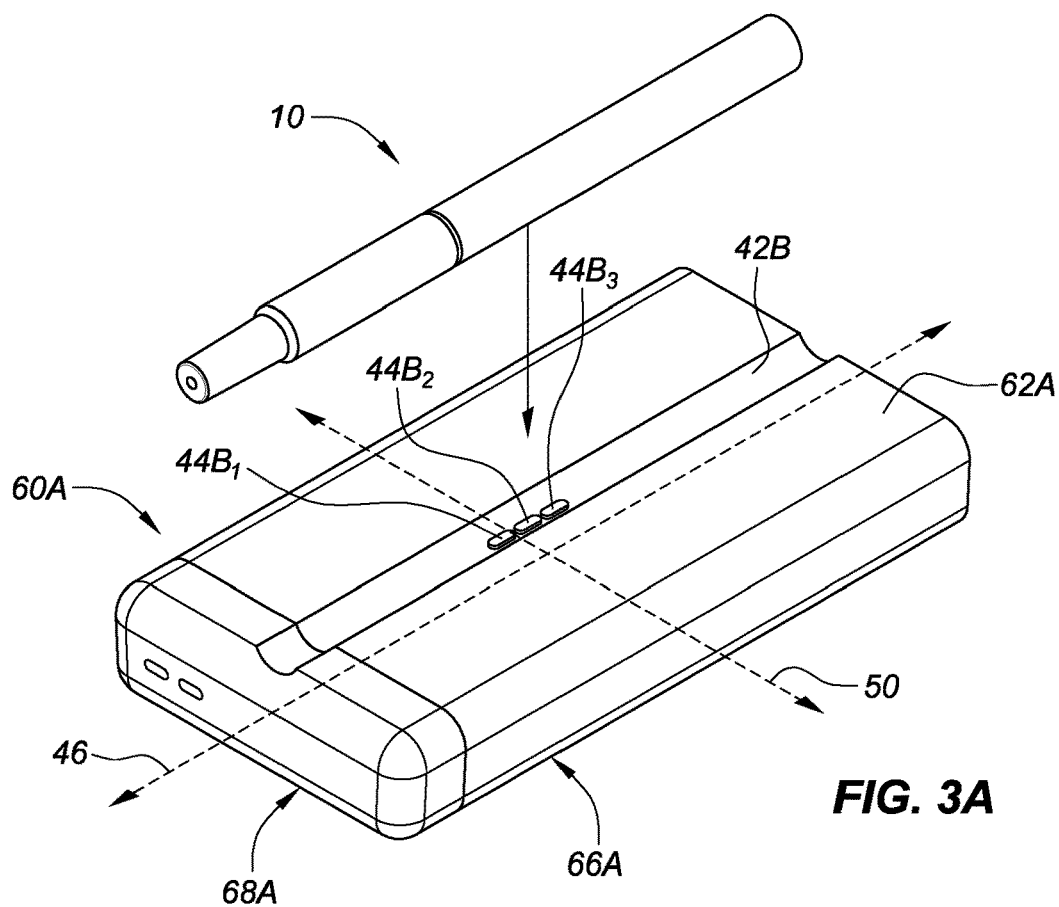


FIG. 3A

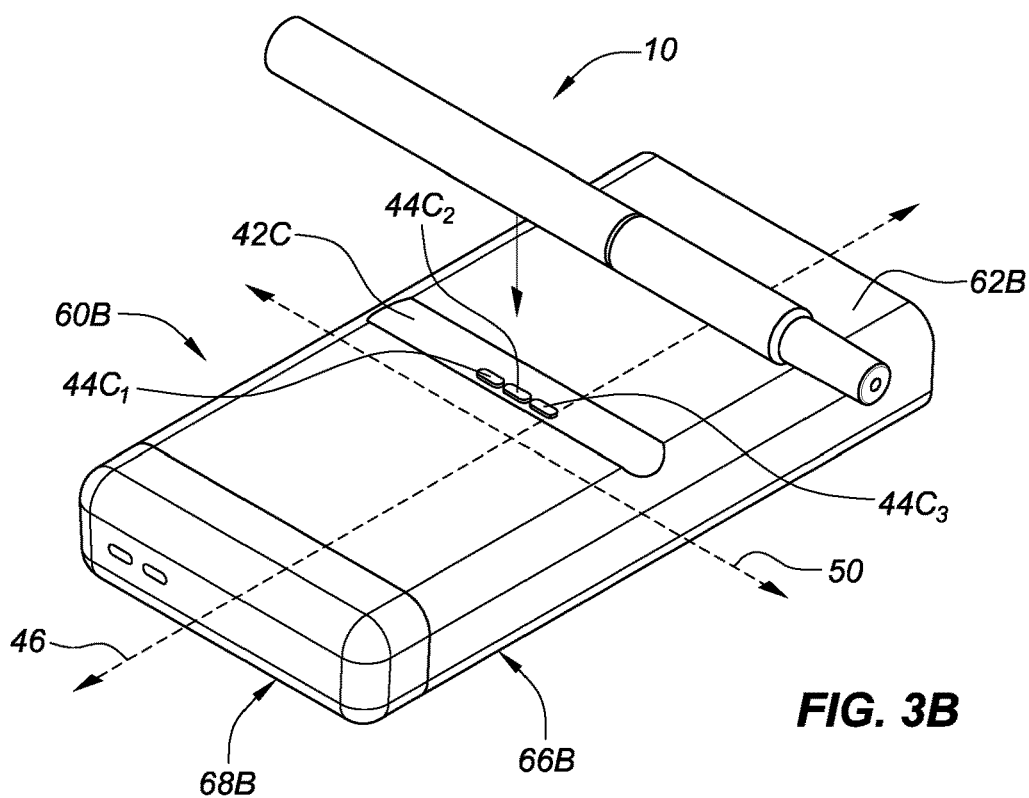


FIG. 3B

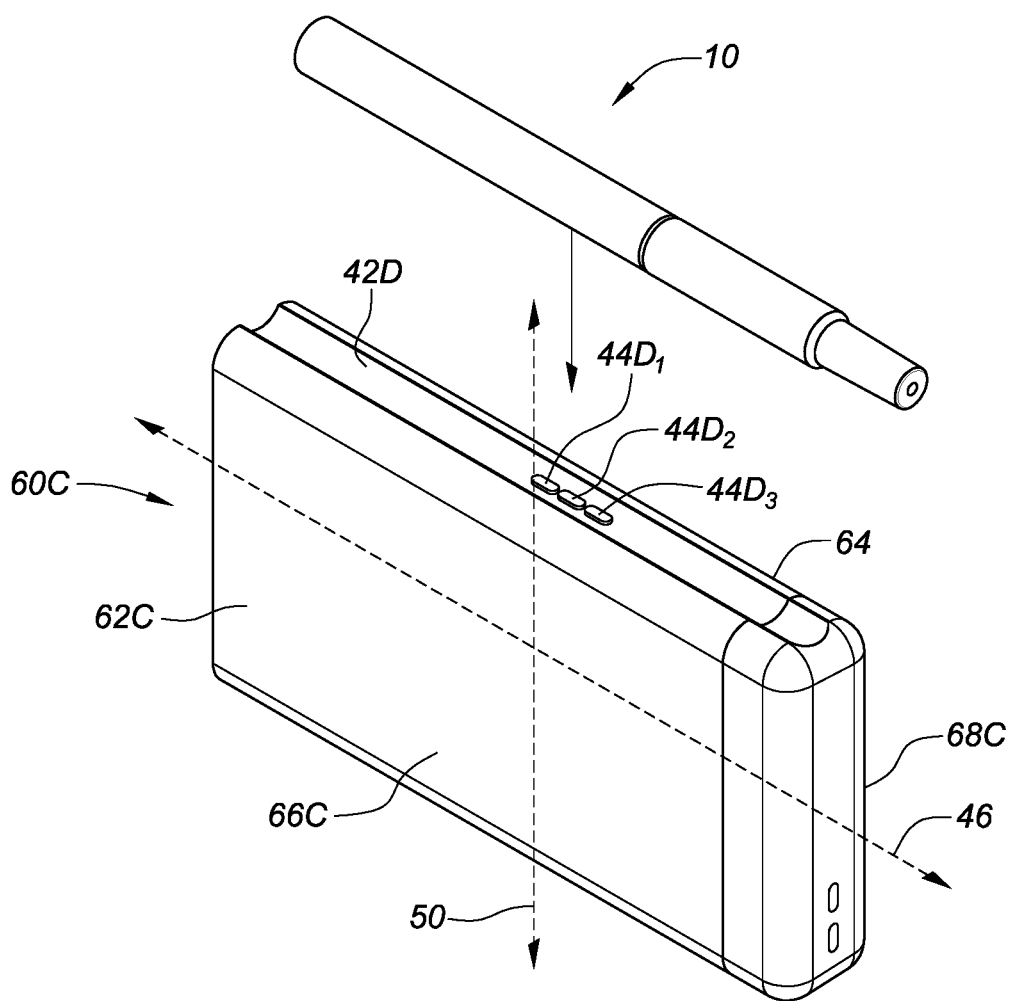


FIG. 3C

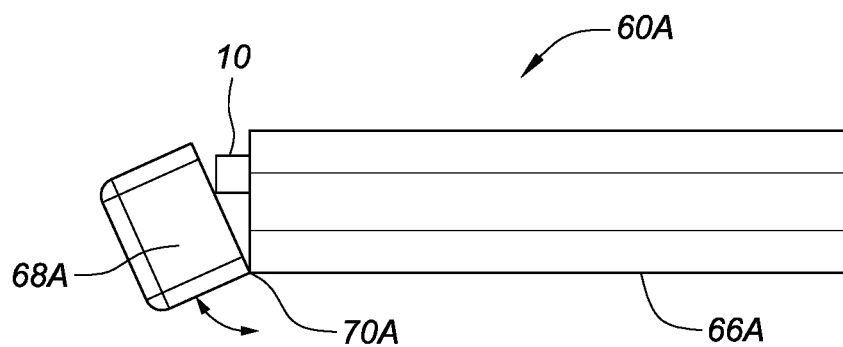


FIG. 4

FIG. 5A

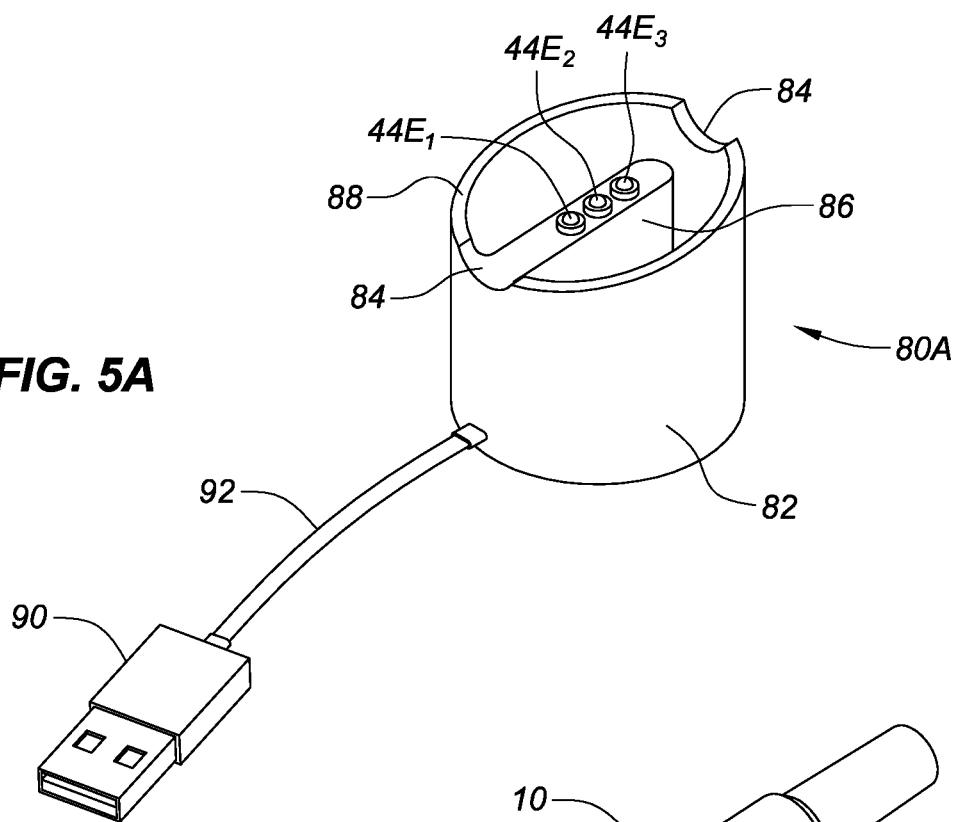
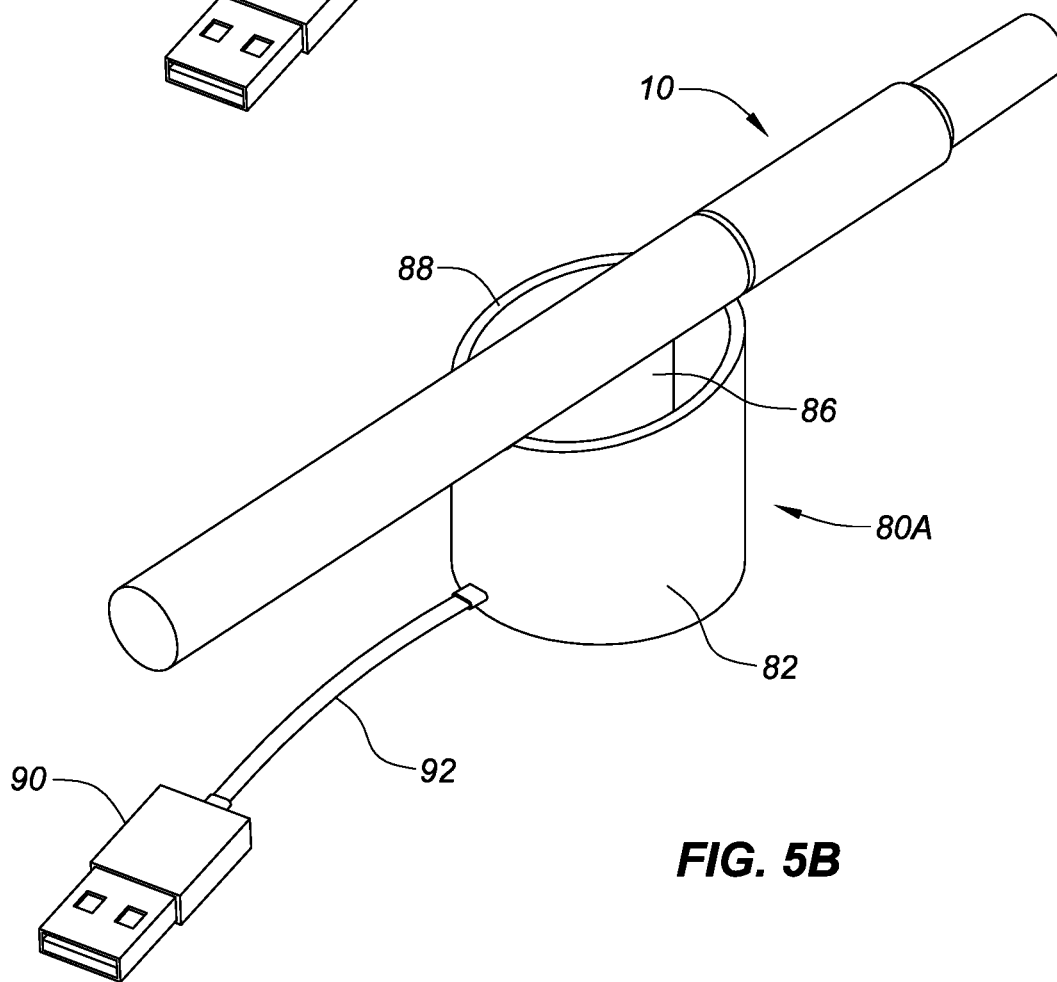


FIG. 5B



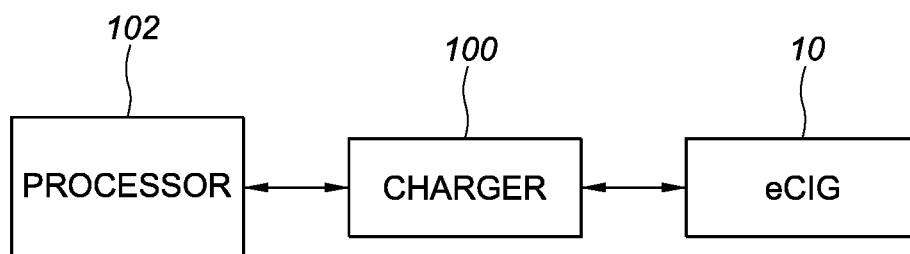


FIG. 6

ELECTRONIC CIGARETTE ANTI-ROLL CASE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of PCT application no. IB2017/050493, filed 30 Jan. 2017, now pending, which is hereby incorporated by reference as though fully set forth herein. This application claims priority to U.S. provisional patent application No. 62/288,945 titled “ANTI-ROLL SYSTEM, METHOD, AND DEVICE FOR ELECTRONIC CIGARETTES,” filed 29 Jan. 2016.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates to a system, a method, and a device for inhibiting a round electronic cigarette from rolling away when placed on a charging case.

BACKGROUND OF THE DISCLOSURE

[0003] Electronic cigarettes, also known as e-cigarettes (eCigs) and personal vaporizers (PVs), are a popular alternative to traditional tobacco-based cigarettes that must be burned in order to generate smoke for inhalation. Electronic cigarettes provide an aerosol for inhalation, but do not contain certain byproducts of combustion that may be harmful to human health. Electronic cigarettes are electronic inhalers that vaporize or atomize a liquid solution (smoke juice) into an aerosol mist that may then be delivered to a user. A typical eCig has two main parts—a battery and a cartomizer—contained within a cylindrical metal housing.

BRIEF SUMMARY

[0004] In accordance with one aspect of the present invention there is provided an anti-roll system comprising an electronic smoking device, and at least one anti-roll feature configured to inhibit the electronic smoking device from rolling away from the charging case and configured to charge or hold the electronic smoking device, wherein the charging case comprises a plurality of connectors configured to electrically couple the electronic smoking device and the charging case and.

[0005] In accordance with another aspect of the present invention there is provided an anti-roll system can comprise an electronic smoking device, and a charging stand configured to charge or hold the electronic smoking device, wherein the charging stand comprises a plurality of connectors configured to electrically couple with the electronic smoking device, at least one anti-roll feature configured to inhibit the electronic smoking device from rolling away from the charging stand, and a connector, where the connector electrically couples the plurality of connectors with external circuitry.

[0006] In accordance with yet another aspect of the present invention there is provided a charging case for an electronic smoking device comprises an anti-roll feature, wherein the anti-roll feature is located on an exterior surface of the charging case body and is configured to inhibit the electronic smoking device from rolling away from the charging case, a plurality of connectors configured to electrically couple the electronic smoking device and the charging case when the electronic smoking device is engaged with the anti-roll feature.

[0007] Additional features, advantages, and embodiments of the disclosure may be set forth or apparent from consideration of the following detailed description, drawings, and claims. Moreover, it is to be understood that both the foregoing summary of the disclosure and the following detailed description are exemplary and intended to provide further explanation without limiting the scope of the disclosure as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The accompanying drawings, which are included to provide a further understanding of the disclosure, are incorporated in and constitute a part of this specification, illustrate embodiments of the disclosure and together with the detailed description serve to explain the principles of the disclosure. No attempt is made to show structural details of the disclosure in more detail than may be necessary for a fundamental understanding of the disclosure and the various ways in which it may be practiced. In the drawings:

[0009] FIG. 1 is a schematic cross-sectional illustration of an exemplary e-cigarette

[0010] FIGS. 2A and B are perspective views showing examples of charging cases that are constructed according to an aspect of the disclosure.

[0011] FIGS. 3A-3C are perspective views showing examples of charging cases with anti-roll features that are constructed according to an aspect of the disclosure.

[0012] FIG. 4 is a side view of the charging case of FIG. 3A.

[0013] FIGS. 5A and 5B are perspective views showing examples of a charging stand with anti-roll features that is constructed according to an aspect of the disclosure.

[0014] FIG. 6 is a block diagram depicting data exchange pathways between an eCig, a charger, and a processor.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0015] The disclosure and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments and examples that are described and/or illustrated in the accompanying drawings and detailed in the following. It should be noted that the features illustrated in the drawings are not necessarily drawn to scale, and features of one embodiment may be employed with other embodiments as the skilled artisan would recognize, even if not explicitly stated herein. Descriptions of well-known components and processing techniques may be omitted so as to not unnecessarily obscure the embodiments of the disclosure. The examples used herein are intended merely to facilitate an understanding of ways in which the disclosure may be practiced and to further enable those of skill in the art to practice the embodiments of the disclosure. Accordingly, the examples and embodiments herein should not be construed as limiting the scope of the disclosure. Moreover, it is noted that like reference numerals represent similar parts throughout the several views of the drawings.

[0016] Throughout the following, an electronic smoking device will be exemplarily described with reference to an e-cigarette. As is shown in FIG. 1, an e-cigarette (or eCig) 10 typically has a housing comprising a cylindrical hollow tube having an end cap 12. The cylindrical hollow tube may be a single-piece or a multiple-piece tube. In FIG. 1, the cylindrical hollow tube is shown as a two-piece structure

having a power supply portion **14** and an atomizer/liquid reservoir portion **16**. Together the power supply portion **14** and the atomizer/liquid reservoir portion **16** form a cylindrical tube which can be approximately the same size and shape as a conventional cigarette, typically about 100 mm with a 7.5 mm diameter, although lengths may range from 70 to 150 or 180 mm, and diameters from 5 to 28 mm.

[0017] The power supply portion **14** and atomizer/liquid reservoir portion **16** are typically made of metal (e.g., steel or aluminum, or of hardwearing plastic) and act together with the end cap **12** to provide a housing to contain the components of the e-cigarette **10**. The power supply portion **14** and the atomizer/liquid reservoir portion **16** may be configured to fit together by, for example, a friction push fit, a snap fit, a bayonet attachment, a magnetic fit, or screw threads. The end cap **12** is provided at the front end of the power supply portion **14**. The end cap **12** may be made from translucent plastic or other translucent material to allow a light-emitting diode (LED) **18** positioned near the end cap to emit light through the end cap. Alternatively, the end cap may be made of metal or other materials that do not allow light to pass.

[0018] An air inlet may be provided in the end cap, at the edge of the inlet next to the cylindrical hollow tube, anywhere along the length of the cylindrical hollow tube, or at the connection of the power supply portion **14** and the atomizer/liquid reservoir portion **16**. FIG. 1 shows a pair of air inlets **20** provided at the intersection between the power supply portion **14** and the atomizer/liquid reservoir portion **16**.

[0019] A power supply, preferably a battery **22**, the LED **18**, control electronics **24** and, optionally, an airflow sensor **26** are provided within the cylindrical hollow tube power supply portion **14**. The battery **22** is electrically connected to the control electronics **24**, which are electrically connected to the LED **18** and the airflow sensor **26**. In this example, the LED **18** is at the front end of the power supply portion **14**, adjacent to the end cap **12**; and the control electronics **24** and airflow sensor **26** are provided in the central cavity at the other end of the battery **22** adjacent the atomizer/liquid reservoir portion **16**.

[0020] The airflow sensor **26** acts as a puff detector, detecting a user puffing or sucking on the atomizer/liquid reservoir portion **16** of the e-cigarette **10**. The airflow sensor **26** can be any suitable sensor for detecting changes in airflow or air pressure, such as a microphone switch including a deformable membrane which is caused to move by variations in air pressure. Alternatively, the sensor may be, for example, a Hall element or an electro-mechanical sensor.

[0021] The control electronics **24** are also connected to an atomizer **28**. In the example shown, the atomizer **28** includes a heating coil **30** which is wrapped around a wick **32** extending across a central passage **34** of the atomizer/liquid reservoir portion **16**. The central passage **34** may, for example, be defined by one or more walls of the liquid reservoir and/or one or more walls of the atomizer/liquid reservoir portion **16** of the e-cigarette **10**. The coil **30** may be positioned anywhere in the atomizer **28** and may be transverse or parallel to a longitudinal axis of a cylindrical liquid reservoir **36**. The wick **32** and heating coil **30** do not completely block the central passage **34**. Rather an air gap is provided on either side of the heating coil **30** enabling air to flow past the heating coil **30** and the wick **32**. The atomizer may alternatively use other forms of heating ele-

ments, such as ceramic heaters, or fiber or mesh material heaters. Nonresistance heating elements such as sonic, piezo, and jet spray may also be used in the atomizer in place of the heating coil.

[0022] The central passage **34** is surrounded by the cylindrical liquid reservoir **36** with the ends of the wick **32** abutting or extending into the liquid reservoir **36**. The wick **32** may be a porous material such as a bundle of fiberglass fibers or cotton or bamboo yarn, with liquid in the liquid reservoir **36** drawn by capillary action from the ends of the wick **32** towards the central portion of the wick **32** encircled by the heating coil **30**.

[0023] The liquid reservoir **36** may alternatively include wadding (not shown in FIG. 1) soaked in liquid which encircles the central passage **34** with the ends of the wick **32** abutting the wadding. In other embodiments, the liquid reservoir may comprise a toroidal cavity arranged to be filled with liquid and with the ends of the wick **32** extending into the toroidal cavity.

[0024] An air inhalation port **38** is provided at the back end of the atomizer/liquid reservoir portion **16** remote from the end cap **12**. The inhalation port **38** may be formed from the cylindrical hollow tube atomizer/liquid reservoir portion **16** or may be formed in an end cap.

[0025] In use, a user sucks on the e-cigarette **10**. This causes air to be drawn into the e-cigarette **10** via one or more air inlets, such as air inlets **20**, and to be drawn through the central passage **34** towards the air inhalation port **38**. The change in air pressure which arises is detected by the airflow sensor **26**, which generates an electrical signal that is passed to the control electronics **24**. In response to the signal, the control electronics **24** activate the heating coil **30**, which causes liquid present in the wick **32** to be vaporized creating an aerosol (which may comprise gaseous and liquid components) within the central passage **34**. As the user continues to suck on the e-cigarette **10**, this aerosol is drawn through the central passage **34** and inhaled by the user. At the same time, the control electronics **24** also activate the LED **18** causing the LED **18** to light up, which is visible via the translucent end cap **12**. Activation of the LED may mimic the appearance of a glowing ember at the end of a conventional cigarette. As liquid present in the wick **32** is converted into an aerosol, more liquid is drawn into the wick **32** from the liquid reservoir **36** by capillary action and thus is available to be converted into an aerosol through subsequent activation of the heating coil **30**.

[0026] Some e-cigarette are intended to be disposable and the electric power in the battery **22** is intended to be sufficient to vaporize the liquid contained within the liquid reservoir **36**, after which the e-cigarette **10** is thrown away. In other embodiments, the battery **22** is rechargeable and the liquid reservoir **36** is refillable. In the cases where the liquid reservoir **36** is a toroidal cavity, this may be achieved by refilling the liquid reservoir **36** via a refill port (not shown in FIG. 1). In other embodiments, the atomizer/liquid reservoir portion **16** of the e-cigarette **10** is detachable from the power supply portion **14** and a new atomizer/liquid reservoir portion **16** can be fitted with a new liquid reservoir **36** thereby replenishing the supply of liquid. In some cases, replacing the liquid reservoir **36** may involve replacement of the heating coil **30** and the wick **32** along with the replacement of the liquid reservoir **36**. A replaceable unit comprising the atomizer **28** and the liquid reservoir **36** may be referred to as a cartomizer.

[0027] The new liquid reservoir may be in the form of a cartridge (not shown in FIG. 1) defining a passage (or multiple passages) through which a user inhales aerosol. In other embodiments, the aerosol may flow around the exterior of the cartridge to the air inhalation port 38.

[0028] Of course, in addition to the above description of the structure and function of a typical e cigarette 10, variations also exist. For example, the LED 18 may be omitted. The airflow sensor 26 may be placed, for example, adjacent to the end cap 12 rather than in the middle of the e-cigarette. The airflow sensor 26 may be replaced by, or supplemented with, a switch which enables a user to activate the e cigarette manually rather than in response to the detection of a change in airflow or air pressure.

[0029] Different types of atomizers may be used. Thus, for example, the atomizer may have a heating coil in a cavity in the interior of a porous body soaked in liquid. In this design, aerosol is generated by evaporating the liquid within the porous body either by activation of the coil heating the porous body or alternatively by the heated air passing over or through the porous body. Alternatively the atomizer may use a piezoelectric atomizer to create an aerosol either in combination or in the absence of a heater

[0030] FIGS. 2A-B illustrate examples of a charging case 40A with one type of anti-roll feature configured to hold the eCig and inhibit it from rolling away and connectors configured to charge the eCig and/or communicate with external circuitry. The charging case 40A can include a groove 42A that is configured to hold the eCig 10 and inhibit it from rolling away. The groove 42A can also include connectors (e.g., “electrical connectors,” “electrical contacts” or “plurality of connectors”) 44A₁₋₃.

[0031] The groove 42A shown in FIG. 2A is parallel to a longitudinal axis 46 of the charging case 40A. The groove 42A can be centered or off-center from the longitudinal axis 46, and it can be located on either a posterior surface 48A or an anterior surface (not shown) of the charging case 40A.

[0032] FIG. 2B shows the eCig 10 coupled with the groove 42A of the charging case 40A. The eCig 10 can include electrical contacts (not shown) that can electrically couple with the connectors 44A₁₋₃ of the charging case 40A (hidden from view in FIG. 2B). The electrical coupling of the eCig 10 and the charging case 40A can, for example, facilitate charging of the battery 22 and/or electrical communication between the eCig 10 and external circuitry (not shown).

[0033] The groove 42A can also be angled rather than aligned with an axis or edge of the charging case 40A. The groove 42A can be configured to cover a specified portion of the eCig surface area (e.g., 20%, 25%, 40%, 50%, 60%, 75%, 80%).

[0034] The connectors 44A₁₋₃ can be electrically coupled with the control electronics 24 of the eCig 10 (see FIG. 1). As discussed in more detail below, the connectors 44A₁₋₃ can facilitate electrical communication between the control electronics 24 and external circuitry, as well as charging of the battery 22 by transmitting a current to the battery 22 from an external power source (e.g., external battery, charger, electronic device, among others).

[0035] The eCig 10 can utilize software, hardware, firmware, and/or logic to perform a number of functions described herein. The eCig 10 can include a combination of hardware and instructions to share information. The hardware, for example can include the control electronics 24

and/or a memory (not shown) (e.g., non-transitory computer-readable medium (CRM) database, etc.). The memory, as used herein, can include a number of processors capable of executing instructions stored by the memory resource. The memory can be integrated in a single device or distributed across multiple devices. The instructions (e.g., computer-readable instructions) can include instructions stored on the memory and executable by the memory for providing control over the eCig 10 and/or performing various steps discussed in relation to FIGS. 5A-B, in an example.

[0036] The charging case 40A can include a charging case body 52. A portion of the charging case body 52A can be configured to open to allow storage of the eCig 10 in the charging case 40A. In some embodiments, a portion of the posterior surface 48A can be connected to the case body 52A by a hinge (not shown). The hinge can allow the portion of the posterior surface 48A or the anterior surface to move to allow the charging case 40A to receive the eCig 10.

[0037] FIGS. 3A-3C illustrate examples of charging cases 60A, 60B, and 60C with a groove 42B, 42C and 42D in the corresponding charging case that is configured to hold the eCig 10 and inhibit it from rolling away. The grooves 42B, 42C, and 42D of the charging cases 60A, 60B, and 60C, respectively, can also include connectors (e.g., “electrical connectors,” “electrical contacts” or “plurality of connectors”) 44B₁₋₃, 44C₁₋₃, and 44D₁₋₃ in each corresponding groove. The connectors 44B₁₋₃, 44C₁₋₃, and 44D₁₋₃ can facilitate electrical communication between the control electronics 24 (see FIG. 1) and external circuitry, as well as charging of the battery 22 by transmitting a current to the battery 22 (see FIG. 1) from an external power source (e.g., external battery, charger, electronic device, among others).

[0038] The groove 42B shown in FIG. 3A is parallel to a longitudinal axis 46 of the pack 60A. The groove 42B can be centered or off-center from the longitudinal axis 46, and it can be located on either a posterior surface 62A or an anterior surface (not shown) of the pack 60A. The groove 42C shown in FIG. 3B is perpendicular to the longitudinal axis 46 and parallel to a transverse axis 50 of the pack 60B. The groove 42C can be centered or off-center from the transverse axis 50, and it can be located on either a posterior surface 62B or an anterior surface (not shown) of the charging case 60B. Finally, the groove 42D shown in FIG. 3C is located on a right side 64 of the pack 60C. The groove 42D can also be located on the left side (not shown) of the pack 60C. The groove 42D can be parallel to the longitudinal axis 46 of the pack 60C.

[0039] The charging cases 60A, 60B, 60C can each further comprise a corresponding charging case body 66A, 66B, 66C and a charging case lid 68A, 68B, 68C. The charging case lids 68A, 68B, 68C can be configured to open to allow storage of the eCig 10 in each respective charging case 60A, 60B, 60C. The charging case lid 68A, 68B, 68C can be connected to each respective case body 66A, 66B, 66C by a hinge (see FIG. 4 and related discussion for additional information). The hinge can allow the charging case lid 68A, 68B, 68C to move (e.g., pivot/rotate open) to allow the charging case 60A, 60B, 60C to receive the eCig 10.

[0040] The grooves 42B, 42C, 42D can also be angled rather than aligned with an axis or edge of the pack. The grooves 42B, 42C, 42D can be configured to cover a specified portion of the eCig surface area (e.g., 20%, 25%, 40%, 50%, 60%, 75%, 80%).

[0041] FIG. 4 is a side view of the charging case 60A of FIG. 3A. As described above, the charging case 60A can include the charging case body 66A, the charging case lid 68A, and a hinge 70A. The hinge 70A allows the charging case lid 68A to be rotatably coupled with the charging case body 66A. The charging case 60A can comprise a plurality of regions, each of which is configured to receive a respective eCig 10, or a component of the eCig 10 (e.g., a power supply portion 14, a liquid reservoir portion 16, etc.) When the charging case lid 68A is opened (e.g., rotated about the hinge to allow access to an interior of the charging case 60A) the eCig 10 can be placed inside one of the plurality of regions of the charging case 60A. In other embodiments, the hinge can be located on the right side 64 of the charging case body 66A or the left side (not shown).

[0042] FIG. 5A is a perspective view of a charging stand 80A with groove portions 84 configured to hold the eCig 10 and inhibit it from rolling away (similar to grooves 42A-D described above). The charging stand 80A can comprise a charging stand body 82, groove portion 84, and a support portion 86. The charging stand 80A can be configured such that an anterior surface (hidden in FIG. 5A) can rest on another surface (e.g., a table, a counter, a desk, etc.).

[0043] The support portion 86 can include connectors 44E₁₋₃ that can facilitate electrical communication between the control electronics 24 and external circuitry, as well as charging of the battery 22 by transmitting a current to the battery 22 from an external power source (e.g., external battery, charger, electronic device, among others).

[0044] The groove portion 84 can be in multiple locations along an edge portion 88 with the support portion 86 as shown in FIG. 5A, or the groove portion 84 can be a continuous groove similar to the groove 42A-D in FIGS. 2A-B and 3A-C. As shown in FIG. 5A, the groove portions 84 can be in the edge portion 88 of the charging stand 80. The groove portions 84 in charging stand 80A can be integrally molded and can extend as deep as the diameter of eCig 10, or any percentage thereof (90%, 80%, 70%, 60%, 50%, 40%, 30%, 20%, 10%, etc.). In some embodiments, the groove portion 84 can be deeper than the diameter of the eCig 10.

[0045] The charging stand body 82 can be any suitable shape (e.g., round, oval, square, triangular, etc.) The charging stand body 82 can also be electrically coupled with a connector 90. The connector 90 can be coupled with the charging stand body 82 by, for example, a wire 92. The connector 90 can be connected to external circuitry, such as a computer (though a Universal Serial Bus (USB) connection), a wall outlet, another battery, etc.

[0046] FIG. 5B is a perspective view of an eCig coupled with the charging stand of FIG. 5A. The charging stand 80A can couple with the eCig 10 (see FIG. 1) as shown in FIG. 5B. The eCig 10 can couple with portions of the charging stand 80A including the groove portions 84. The eCig 10 can also contact the support portion 86.

[0047] As described above, the charging stand 80A can include the connectors 44E₁₋₃ that can facilitate electrical communication between the control electronics 24 and external circuitry, as well as charging of the battery 22 by transmitting a current to the battery 22 from an external power source (e.g., external battery, charger, electronic device, among others). The connectors 44E₁₋₃ can be located on the support portion 86 as shown in FIG. 4A. In some embodiments (not shown), the eCig 10 can electrically

couple with the connectors 44E₁₋₃ without contacting the support portion 86 where the eCig 10 couples with the groove portions 84 of the charging stand body 82.

[0048] The groove portions 84 can be aligned with the wire 92 as shown in FIG. 4B. In other embodiments, the groove portions (and, therefore, the eCig when coupled with the charging stand) can be at different angles with wire 92 (e.g., 30°, 45°, 60°, 90°, etc.).

[0049] FIG. 6 is a block diagram depicting data exchange pathways between the eCig 10, a charger 100, and a processor 102. The eCig 10 can electrically connect to a charger 100 in order to charge, for example, the battery 22 (see FIG. 1) of the eCig 10. In addition to this charging function, the charger 100 can exchange data with the eCig 10. The data exchange can occur, for example, through a dedicated data line or signals obtained from a power line connecting the charger 100 and the eCig 10 during charging (e.g., the connectors 44A₁₋₃, 44B₁₋₃, 44C₁₋₃, or 44D₁₋₃; see U.S. application Ser. No. 15/219,195, filed on 25 Jul. 2016, which is hereby incorporated by reference as if set forth fully herein, for additional information on the connectors 44 being used for charging and data exchange). When a data line is used to transfer data between the eCig 10 and the charger 100, the data line can be a physical wire connection (e.g., the connector 90 and the wire 92 in FIGS. 5A-B) or a wireless communication. In an embodiment, the data that can be transferred from the eCig 10 to the charger 100 includes identifying data, such as a serial number, a calibration parameter, a batch code, a line number, or a barcode associated with the eCig 10. In another embodiment, the data that can be transferred from the eCig 10 to the charger 100 includes usage data, such as a number of puffs taken, an average length of puffs taken, a smoke juice level, a smoke juice flavor, or a location of use.

[0050] The charger 100 can also exchange data with the processor 102 (e.g., control electronics 24 (FIG. 1) and/or external circuitry), such as through a dedicated data line (e.g., the connectors 44A₁₋₃, 44B₁₋₃, 44C₁₋₃, or 44D₁₋₃) or power line as described above. In an embodiment, the processor 102 can be a personal computer (PC), a tablet PC, or a mobile device, such as a smart phone. In another embodiment, the processor 102 can be a charging case, holding case or pack or a charging stand for the eCig 10 (e.g., the charging case 40A, the charging cases 60A-C, or the charging stand 80). The processor 102 may have a custom communication driver (e.g., an application) that enables it to exchange data with the charger 100. The data that can be transferred from the charger 100 to the processor 102 includes identifying and usage data from the eCig 10, for example, as described above. In an embodiment, data can also be transferred from the processor 102 to the charger 100, including, for example, data related to various charging protocols. Additional information regarding charging of electronic cigarettes can be found in U.S. application Ser. No. 14/711,593 (attorney docket no. 065887-000624) filed on 13 May 2015, and U.S. application Ser. No. 14/912,141 (attorney docket no. 065887-000825) filed on 15 Feb. 2016, which are hereby incorporated by reference in their entirety for all purposes as if fully set forth herein.

[0051] In summary, various embodiments of the present disclosure are directed to an anti-roll system comprising an electronic smoking device, and a charging case comprising at least one anti-roll feature configured to inhibit the electronic smoking device from rolling away from the charging

case. The plurality of connectors can also facilitate charging a battery coupled with the electronic smoking device and/or communication between the electronic smoking device and one or more of the charging case and external circuitry. The anti-roll feature comprises a groove configured to hold the electronic smoking device. The groove can be located on an exterior surface of the charging case, a posterior surface of the charging case, or a later surface of the charging case. The plurality of connectors can be located in the groove.

[0052] In other embodiments, an anti-roll system can comprise an electronic smoking device, and a charging stand configured to charge or hold the electronic smoking device, wherein the charging stand comprises a plurality of connectors configured to electrically couple with the electronic smoking device, at least one anti-roll feature configured to inhibit the electronic smoking device from rolling away from the charging stand, and a connector, where the connector electrically couples the plurality of connectors with external circuitry. The plurality of connectors can facilitate charging a battery coupled with the electronic smoking device and/or facilitate communication between the electronic smoking device and one or more of the charging stand and external circuitry. The anti-roll feature can comprise a groove portion configured to hold the electronic smoking device, and wherein the groove portion is located on an exterior surface of the charging stand and the plurality of connectors are located in the groove portion. The charging stand can comprise a circular element with two notches aligned with the groove portion. The charging stand can comprise notches proximal an edge of the charging stand. The charging stand can also comprise a support portion, where the plurality of connectors are located on the support portion.

[0053] In still other embodiments, a charging case for an electronic smoking device comprises an anti-roll feature, wherein the anti-roll feature is located on an exterior surface of the charging case body and is configured to inhibit the electronic smoking device from rolling away from the charging case, a plurality of connectors configured to electrically couple the electronic smoking device and the charging case when the electronic smoking device is engaged with the anti-roll feature. The plurality of connectors can facilitate charging a battery coupled with the electronic smoking device and/or facilitate communication between the electronic smoking device and one or more of the charging case and external circuitry. The anti-roll feature can comprise a groove configured to hold the electronic smoking device and the plurality of connectors are located in the groove. The groove can be located on an exterior surface of the charging case, a posterior surface of the charging case, or a later surface of the charging case.

[0054] Although several embodiments have been described above with a certain degree of particularity, those skilled in the art could make numerous alterations to the disclosed embodiments without departing from the present disclosure. It is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative only and not limiting. Changes in detail or structure may be made without departing from the present teachings. The foregoing description and following claims are intended to cover all such modifications and variations.

[0055] Various embodiments are described herein of various apparatuses, systems, and methods. Numerous specific

details are set forth to provide a thorough understanding of the overall structure, function, manufacture, and use of the embodiments as described in the specification and illustrated in the accompanying drawings. It will be understood by those skilled in the art, however, that the embodiments may be practiced without such specific details. In other instances, well-known operations, components, and elements have not been described in detail so as not to obscure the embodiments described in the specification. Those of ordinary skill in the art will understand that the embodiments described and illustrated herein are non-limiting examples, and thus it can be appreciated that the specific structural and functional details disclosed herein may be representative and do not necessarily limit the scope of the embodiments, the scope of which is defined solely by the appended claims.

[0056] Reference throughout the specification to “various embodiments,” “some embodiments,” “one embodiment,” “an embodiment,” or the like, means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. Thus, appearances of the phrases “in various embodiments,” “in some embodiments,” “in one embodiment,” “in an embodiment,” or the like, in places throughout the specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, or characteristics may be combined in any suitable manner in one or more embodiments. Thus, the particular features, structures, or characteristics illustrated or described in connection with one embodiment may be combined, in whole or in part, with the features structures, or characteristics of one or more other embodiments without limitation.

[0057] Any patent, publication, or other disclosure material, in whole or in part, that is said to be incorporated by reference herein is incorporated herein only to the extent that the incorporated materials does not conflict with existing definitions, statements, or other disclosure material set forth in this disclosure. As such, and to the extent necessary, the disclosure as explicitly set forth herein supersedes any conflicting material incorporated herein by reference. Any material, or portion thereof, that is said to be incorporated by reference herein, but which conflicts with existing definitions, statements, or other disclosure material set forth herein will only be incorporated to the extent that no conflict arises between that incorporated material and the existing disclosure material.

LIST OF REFERENCE SIGNS

[0058]	10	electronic smoking device/electronic cigarette
[0059]	12	end cap
[0060]	14	power supply portion
[0061]	16	atomizer/liquid reservoir portion
[0062]	18	light-emitting diode (LED)
[0063]	20	air inlets
[0064]	22	battery
[0065]	24	control electronics
[0066]	26	airflow sensor
[0067]	28	atomizer
[0068]	30	heating coil
[0069]	32	wick
[0070]	34	central passage
[0071]	36	liquid reservoir
[0072]	38	air inhalation port
[0073]	40	charging case
[0074]	42	groove

[0075] 44 electrical connectors or contacts
 [0076] 46 longitudinal axis
 [0077] 48 posterior surface
 [0078] 50 transverse axis
 [0079] 52 charging case body
 [0080] 60 charging case
 [0081] 62 posterior surface
 [0082] 64 right side
 [0083] 66 charging case body
 [0084] 68 charging case lid
 [0085] 70 hinge
 [0086] 80 charging stand
 [0087] 82 charging stand body
 [0088] 84 groove portions
 [0089] 86 support portion
 [0090] 88 edge portion
 [0091] 90 connector
 [0092] 92 wire
 [0093] 100 charger
 [0094] 102 processor

What is claimed is:

1. An anti-roll system comprising:
 an electronic smoking device; and
 a charging case comprising at least one anti-roll feature configured to inhibit the electronic smoking device from rolling away from the charging case and configured to charge or hold the electronic smoking device; wherein the charging case comprises a plurality of connectors configured to electrically couple the electronic smoking device and the charging case.
2. The anti-roll system of claim 1, wherein the plurality of connectors facilitate charging of a battery coupled with the electronic smoking device.
3. The anti-roll system of claim 1, wherein the plurality of connectors facilitate communication between the electronic smoking device and one or more of the charging case and external circuitry.
4. The anti-roll system of claim 1, wherein the anti-roll feature comprises a groove configured to hold the electronic smoking device, and wherein the groove is located on an exterior surface of the charging case and, wherein the plurality of connectors are located in the groove.
5. The anti-roll system of claim 4, wherein the groove is located on one of an anterior surface of the charging case, a posterior surface of the charging case, or a lateral surface of the charging case.
6. An anti-roll system comprising:
 an electronic smoking device; and
 a charging stand configured to charge or hold the electronic smoking device;
 wherein the charging stand comprises
 a plurality of connectors configured to electrically couple with the electronic smoking device,

at least one anti-roll feature configured to inhibit the electronic smoking device from rolling away from the charging stand, and

a connector, where the connector electrically couples the plurality of connectors with external circuitry.

7. The anti-roll system of claim 6, wherein the plurality of connectors facilitate charging a battery coupled with the electronic smoking device.

8. The anti-roll system of claim 6, wherein the plurality of connectors facilitate communication between the electronic smoking device and one or more of the charging stand and external circuitry.

9. The anti-roll system of claim 6, wherein the anti-roll feature comprises a groove portion configured to hold the electronic smoking device, and wherein the groove portion is located on an exterior surface of the charging stand and the plurality of connectors are located in the groove portion.

10. The anti-roll system of claim 9, wherein the charging stand comprises a circular element with two notches aligned with the groove portion.

11. The anti-roll system of claim 6, wherein the charging stand comprises notches proximal an edge of the charging stand.

12. The anti-roll system of claim 11, wherein the charging stand further comprises a support portion, wherein the plurality of connectors are located on the support portion.

13. A charging case for an electronic smoking device comprising:

an anti-roll feature, wherein the anti-roll feature is located on an exterior surface of the charging case and is configured to inhibit the electronic smoking device from rolling away from the charging case;

a plurality of connectors configured to electrically couple the electronic smoking device and the charging case when the electronic smoking device is engaged with the anti-roll feature.

14. The charging case of claim 13, wherein the plurality of connectors facilitate charging a battery coupled with the electronic smoking device.

15. The charging case of claim 13, wherein the plurality of connectors facilitate communication between the electronic smoking device and one or more of the charging case and external circuitry.

16. The charging case of claim 13, wherein the anti-roll feature comprises a groove configured to hold the electronic smoking device and the plurality of connectors are located in the groove.

17. The charging case of claim 16, wherein the groove is located on one of an anterior surface of the charging case, a posterior surface of the charging case, or a lateral surface of the charging case.

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