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(54) **ELECTRONICALLY AUGMENTED
CONTAINER FOR STORING AND
INTERFACING WITH VAPOR DELIVERY
DEVICES**

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(71) Applicant: **The Safe Cig, LLC, (US)**

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(72) Inventor: **Andre' Joseph LaMothe, Austin, TX
(US)**

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(73) Assignee: **The Safe Cig, LLC, Los Angeles, CA
(US)**

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(63) Continuation-in-part of application No. 13/615,542,
filed on Sep. 13, 2012, now abandoned.

(57) **ABSTRACT**

The disclosed device and apparatus provides a container for storing and interfacing with fluid vaporization devices, such as electronic cigarettes or fluid cartridges, which integrates computing devices to allow the user to perform many different functions and execute software on the container which enhances and simplifies the user's overall experience with the fluid vaporization devices and provides the user with a variety of different tools which can be used in conjunction with the fluid vaporization devices.

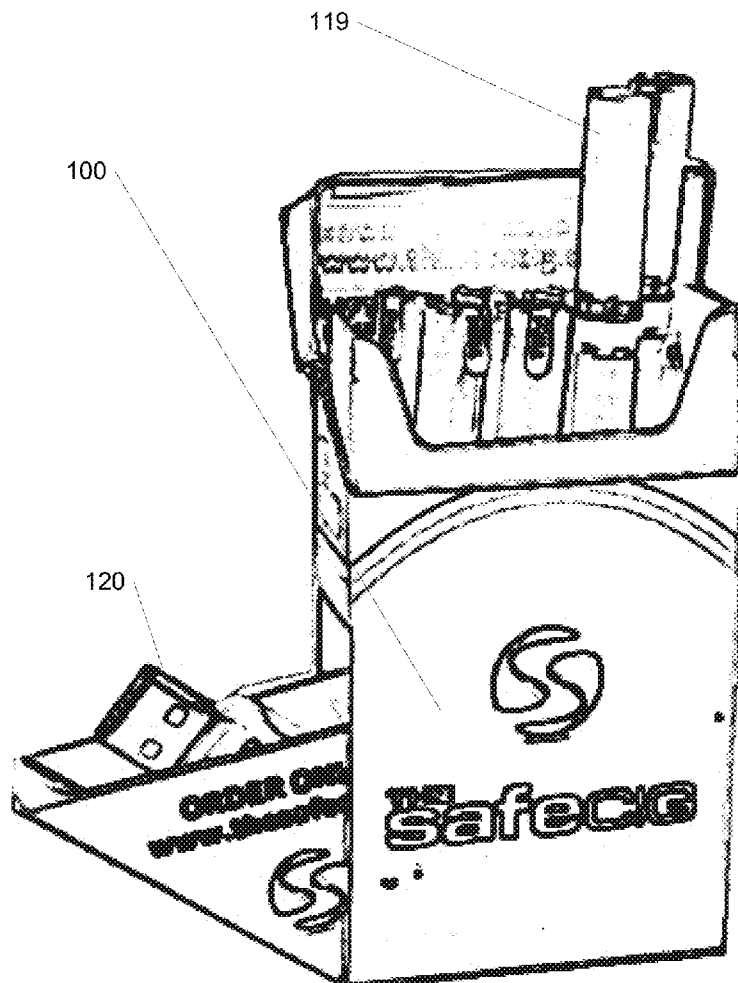




Fig. 1A

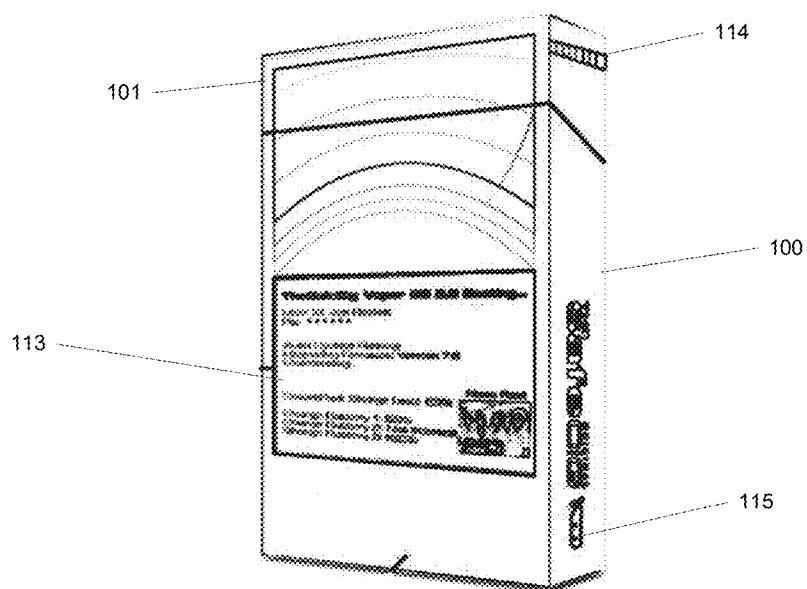


Fig. 1B

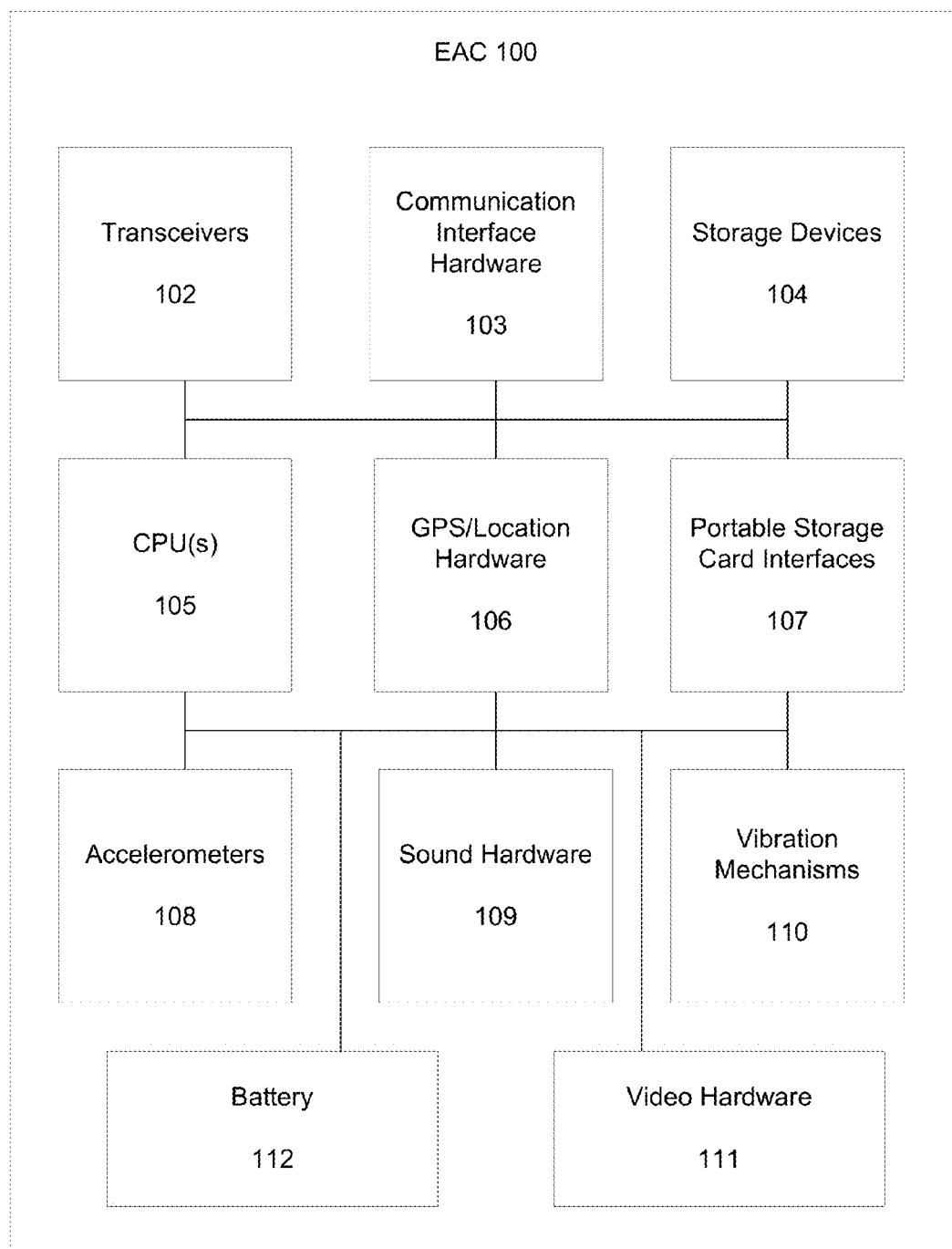


Fig. 2

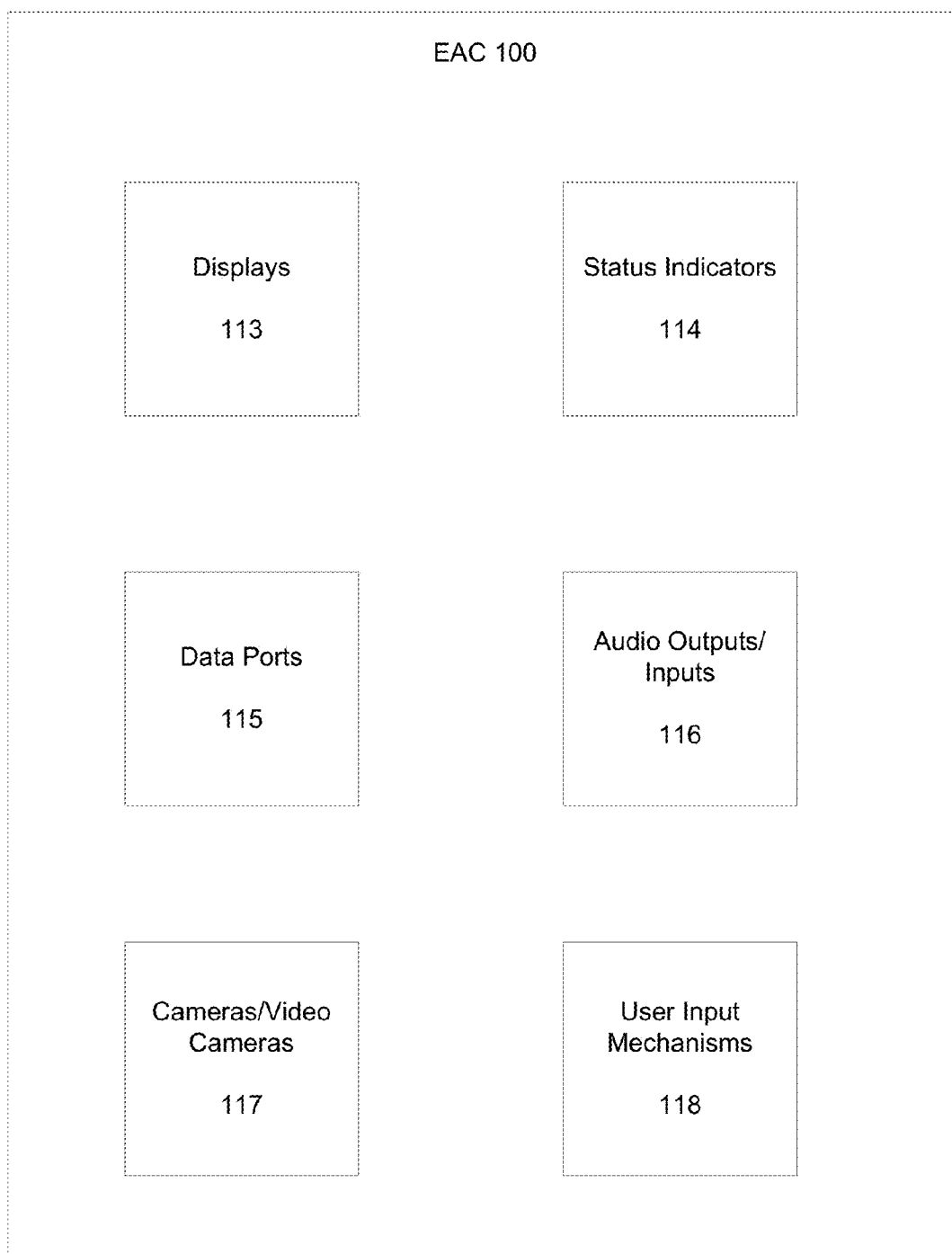


Fig. 3

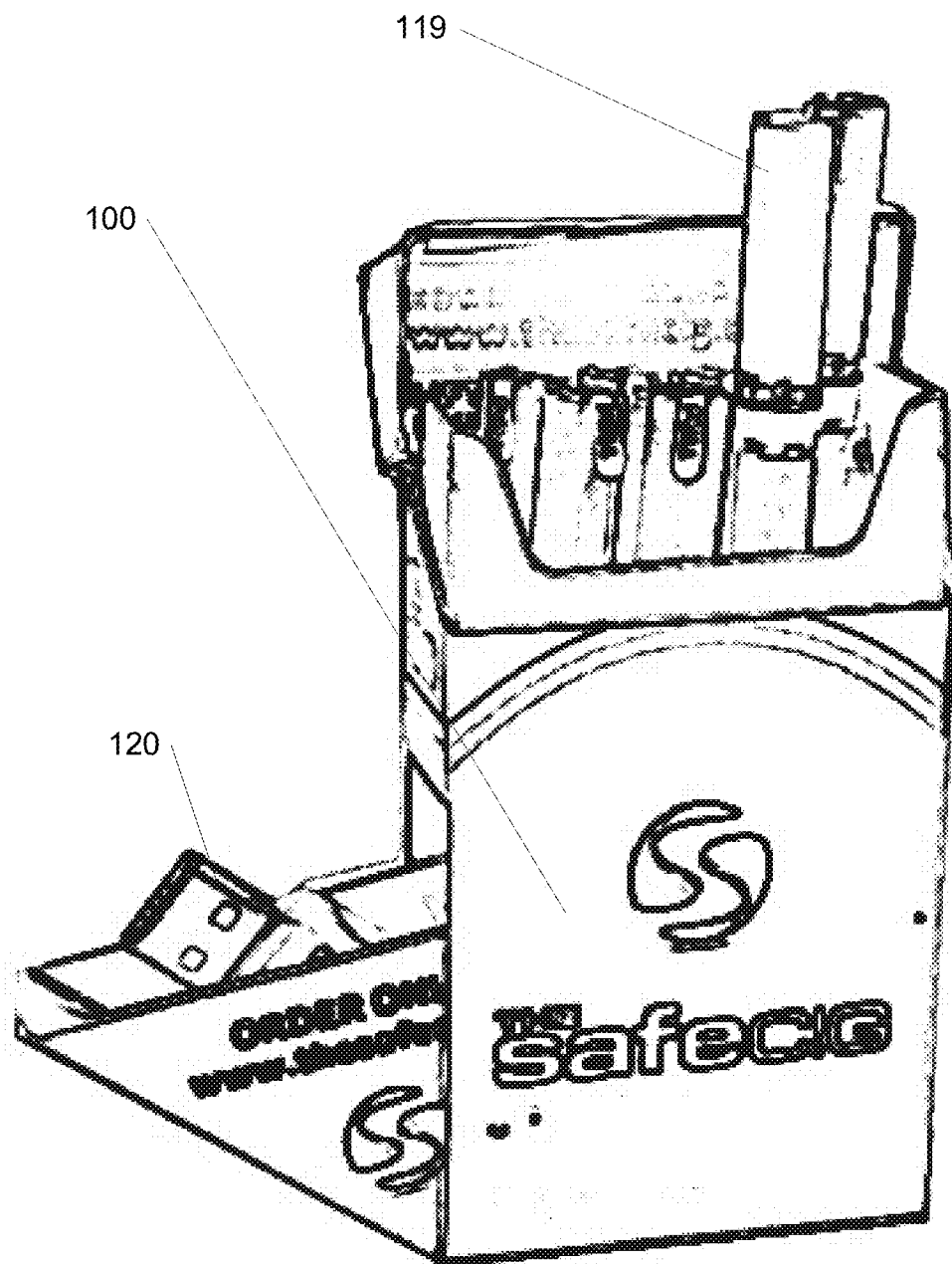


Fig. 4

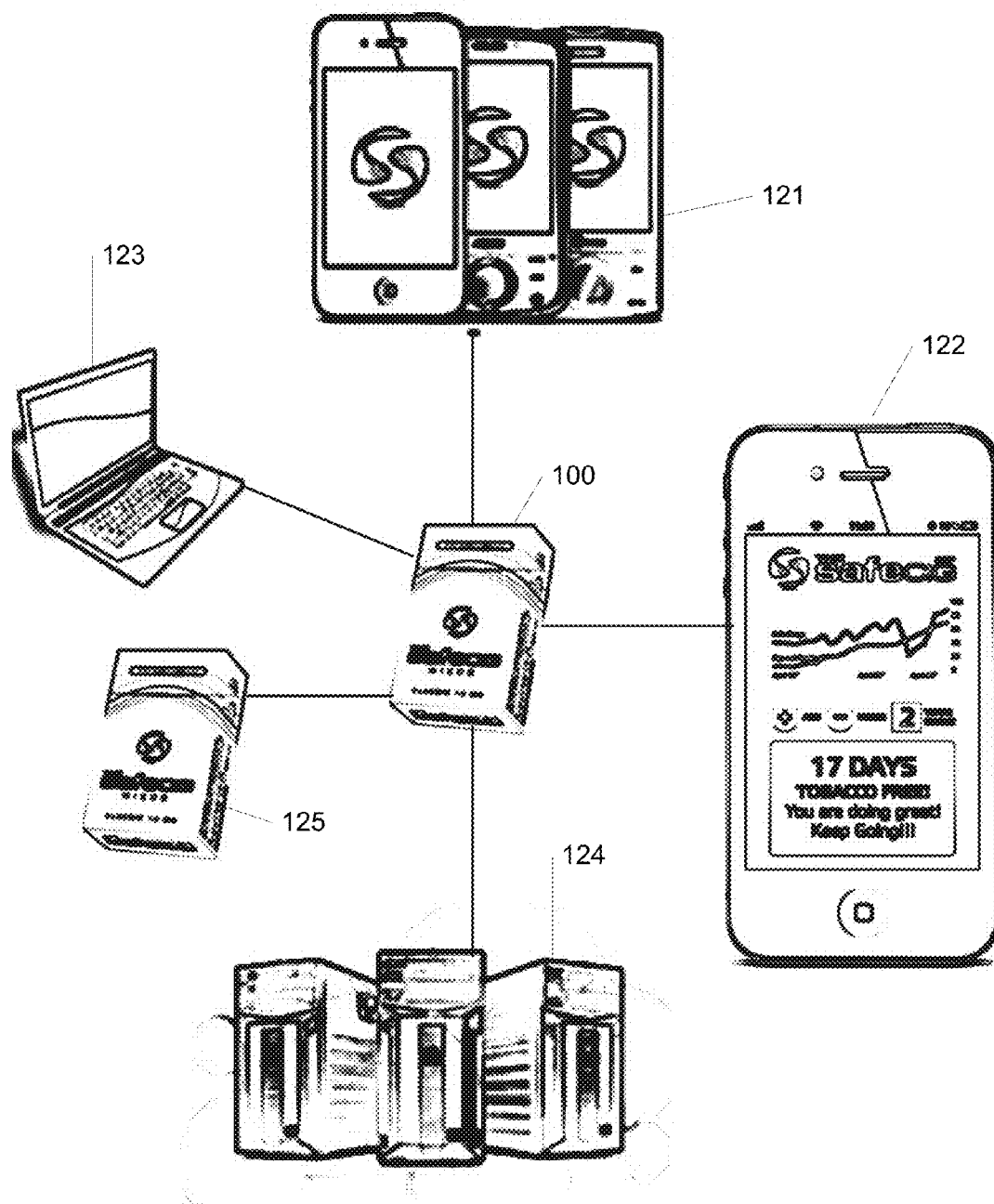


Fig. 6

ELECTRONICALLY AUGMENTED CONTAINER FOR STORING AND INTERFACING WITH VAPOR DELIVERY DEVICES

RELATED APPLICATION DATA

[0001] This application is a continuation-in-part of U.S. application Ser. No. 13/615,542, filed Sep. 13, 2012, which claims priority to U.S. Provisional Application No. 61/534,859, filed Sep. 14, 2011, the disclosures of which are incorporated herein in their entireties.

BACKGROUND

[0002] An electronic cigarette, also referred to as an e-cigarette or e-cig, is a Personal Electronic Vaporizing Unit ("PEVU") that simulates the act of tobacco smoking by producing an inhaled vapor which can bear the appearance, flavor, and feel of inhaled tobacco smoke. Compared to tobacco smoking, electronic cigarettes provide an ostensibly safer "smoking" experience by reducing the combustion process that occurs when tobacco is burned, resulting in fewer toxins and carcinogens. This is accomplished through the use of heat to vaporize a liquid solution into an inhalable mist.

[0003] Many electronic cigarettes and other fluid vaporization devices include a fluid cartridge and a battery component. However, users have few options when it comes to customizing how they would like to utilize a particular cartridge, fluid vaporization device, or electronic cigarette. Different users may have different preferences regarding how they would like the vaporization process to be carried out. Additionally, users may want to incorporate these preferences into their electronic cigarettes and fluid vaporization devices with as little effort as possible and utilize advances in technology to provide more functionality to their fluid vaporization related devices. Therefore, improvements in fluid vaporization devices and related technology are needed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1A shows an external front view of an exemplary electronically augmented container (EAC) device according to the disclosed embodiment.

[0005] FIG. 1B shows an external back view of an exemplary EAC device according to the disclosed embodiment.

[0006] FIG. 2 is a diagram of electronic components in an exemplary EAC device according to the disclosed embodiment.

[0007] FIG. 3 is a diagram of input/output interfaces in an exemplary EAC device according to the disclosed embodiment.

[0008] FIG. 4 shows an external view of an exemplary EAC device containing a removable USB charger according to the disclosed embodiment.

[0009] FIG. 5A shows three views of an exemplary frictional and/or spring loaded interface and electronic cigarette for the EAC device according to the disclosed embodiment.

[0010] FIG. 5B shows a cross sectional view of the exemplary frictional and/or spring loaded interface and electronic cigarette for the EAC device according to the disclosed embodiment.

[0011] FIG. 6 shows a communication capabilities diagram of the EAC device according to the disclosed embodiment.

DETAILED DESCRIPTION

[0012] While devices and apparatuses are described herein by way of examples and embodiments, those skilled in the art recognize that such devices and apparatuses are not limited to the embodiments or drawings described. It should be understood that the drawings and description are not intended to be limited to the particular form disclosed. Rather, the intention is to cover all modifications, equivalents and alternatives falling within the spirit and scope of the appended claims. Any headings used herein are for organizational purposes only and are not meant to limit the scope of the description or the claims. As used herein, the word "may" is used in a permissive sense (i.e., meaning having the potential to) rather than the mandatory sense (i.e., meaning must). Similarly, the words "include," "including," and "includes" mean including, but not limited to.

[0013] The disclosed embodiment relates to a container for storing and interfacing with fluid vaporization items, such as PEVUs, or fluid cartridges or batteries for fluid vaporization items. The container integrates one or more computing devices that allow a user to perform many different functions and execute software on the container which enhances and simplifies the user's overall experience with the fluid vaporization items and provides the user with a variety of different tools which can be used in conjunction with the fluid vaporization items. This device will be referred to throughout this disclosure as the electronically augmented container or "EAC."

[0014] FIGS. 1A-1B illustrates an exemplary EAC 100 from two sides according to the disclosed embodiment. EAC 100 is shown as being a rectangular cuboid shaped figure with six faces, but can be any suitable shape and can have any number of faces. Furthermore, the opposite faces do not necessarily have to be flat parallel planes, but can lie on intersecting planes or be curved faces. For example, the EAC may be cubic, octagonal, or spherical. The EAC may also be a cylindrical tube, or a pyramid, or any other geometrical shape in accordance with the disclosed embodiment. Additionally, the faces do not have to meet at right angles as they do in a rectangular cuboid, and the shape may be a parallelepiped constructed with faces that meet at acute and/or obtuse angles.

[0015] The EAC 100 in FIGS. 1A-1B is shown having an indicator bar 114 on a side face, a data port 115 on a side face, and a display 113 on its back face. These features are discussed in greater depth below in the section on EAC input/output interfaces.

[0016] The EAC 100 and its components can be constructed out of any suitable material or combination of suitable materials, such as paper, cardboard, plastics, rubbers, metals, glass, foam, ceramics, metalloids such as silicone, or any other material that can be fashioned into a box or container shape. Different components can be used for different parts of the EAC. For example, the EAC can be mostly made of cardboard, with some parts made of plastic, or made out of plastic with covers made out of paper. The EAC may be disposable. Many different variations are possible.

[0017] A first compartment cover 101 is shown in FIG. 1. The cover 101 conceals a compartment that can be used to store items in the EAC. Numeral 101 references a cover which is formed as part of the EAC 100, but the cover can be a separate component that is attached to the EAC. Cover 101 is shown as including multiple faces of the EAC but may be designed differently. For example, cover 101 can be any one of the faces of the EAC, part of one of the faces, or only

include part of the top face. Cover **101** can be oriented to run along the longitudinal axis rather a transverse axis. If the EAC **100** is cylindrical, then the cover **100** can also be cylindrical, with circular bottom edge. Cover **101** does not necessarily have to touch any edges and may be entirely contained within one face of the EAC.

[0018] Additionally, the EAC is not necessarily limited to one compartment or one cover. For example, the EAC can have one compartment that is accessible through two covers in different areas, three covers and one compartment, or three covers and two compartments, such as an upper compartment accessible through one cover and a lower compartment accessible through the two remaining covers. The EAC can have three separate compartments and three separate covers, such as one cover on the top face to access a first compartment, a cover on the left face to access a second compartment, and a cover on the right face to access a third compartment. Any number of covers and/or compartments may be used.

[0019] Although many examples disclosed herein refer to the fluid vaporization devices as electronic cigarettes, the vaporization devices are not limited to such a purpose or shape. The vaporization device can be any PEVU, such as an electronic cigar or other “smoking” device, an anesthetic vaporizer, a nebulizer, or any other vaporization device which heats a fluid with a heating element to produce a vapor. Fluid vaporization devices can include different components which are combined to create a fluid vaporization device. For example, a fluid vaporization device can include a battery component and a cartridge component.

[0020] The vaporization devices can also take on any shape or form factor and are not limited to the physical dimensions disclosed herein. For example, if the fluid vaporization device is used as a medical device, it can be constructed to resemble an inhaler or other medical device that a user is accustomed to, and the dimensions of the EAC can be adapted to store and interface with the relevant vaporization device. For example, if an EAC is used for storing and interfacing with an inhaler, the battery can be positioned such that it will take the place of the medicine compartment that is attached to a traditional inhaler and the inhaler mouthpiece component can house the cartridge. Thus, the appearance of traditional inhalers or other vaporization device can be substantially maintained while still incorporating the advantageous features provided by the EAC's described herein.

[0021] FIG. 2 is a diagram of different electronic components that can be incorporated into the EAC **100** according to the disclosed embodiment. The components shown are only provided as an example of the electronics that can be incorporated according to the disclosed embodiment, and an EAC can be designed that includes only some of the components, greater numbers of one or more components, or different types of components. All of the components are shown connected by a bus or other internal communication means, but the actual components can be coupled and connected differently. Additionally, multiple components can be integrated into a single component or chip. For example, rather than having dedicated video hardware **112**, image and video processing can be done by a component which is part of the CPU **105**. The EAC may include one or more of the following components and may include one or more computing devices which incorporate one or more of the following components.

[0022] Transceiver **102** can be used for communication to and from the EAC **100**. Transceiver **102** can be a wireless network card or wireless transceiver that is used to commu-

nicate with a wireless network. Alternatively, or additionally, the transceiver **102** can include a mobile transceiver designed to communicate over cellular networks. The transceiver **102** can also be a network interface card such as a local area network card which enables the EAC to connect to a local network. The transceiver **102** can also be a short range transceiver, such as a Bluetooth transceiver.

[0023] The communication interface hardware **103** can be used to read data from a variety of different communication standards. For example, the communication interface hardware **103** can be a Peripheral Component Interconnect (PCI) card for allowing users to connect external computing device or peripherals to the EAC **100**. The communication interface card **103** can have a Universal Serial Bus (USB) interface for connecting with devices that utilize USB or for connecting the EAC **100** to a computing device through a USB cable or plug.

[0024] EAC **100** can include a storage device **104**. Storage device **104** can include any type of suitable storage. For example, storage device **104** can be comprised of NAND and/or NOR flash memory, EEPROM, one or more SD cards, micro SD cards, or other suitable memory. Additionally, storage device can further include volatile memory, such as RAM, SRAM, SDRAM, and the like.

[0025] The EAC **100** can include one or more microprocessors **105**. The microprocessors **105** can be of any make or model, and can include dual core or quad core processors and the like. Additionally, though not shown, the EAC **100** can also have one or more graphics processing units dedicated to processing images and/or video for display on the EAC **100**.

[0026] The EAC **100** may include dedicated GPS or location tracking hardware **106** which monitors and/or records the location of the EAC. This information can be utilized by the EAC **100** in a variety of different applications discussed herein.

[0027] The EAC **100** may also include a portable storage card interface **107**. This may include an interface adapted to receive an external storage card such as an SD card or micro-SD card. Such an interface would allow users to increase the storage space of the EAC **100** through the use of removable and replaceable storage.

[0028] The EAC **100** may include one or more accelerometers **108** built into the device. The accelerometers **108** can be used for a variety of purposes, such as giving commands to the device through motions, sending messages to other EACs or computing devices, or connecting and disconnecting from a network. For example, the user can activate a locking mechanism built into the EAC **100** through an action taken by the user, such as shaking the EAC vigorously. In this scenario, a passcode or password may be required to unlock it. Alternatively, the EAC could be unlocked through some other method, such as performing one or more motions, such as spinning the EAC along a certain axis. The one or more accelerometers **108** can be utilized in various ways and these examples are provided only to illustrate a few of the various functionalities.

[0029] The EAC **100** may also include some sound hardware **109** for producing audio output, such as a sound card. The sound card can also be used for interpreting sounds and audio, such as voice commands from a user. Additionally, a vibration mechanism **110** can be used as an additional or alternative mode of communicating messages, alerts, or warnings. Video hardware **111** can optionally be included in the EAC **100** to provide dedicated video processing and out-

put functionality. Video hardware **111** can include the aforementioned graphics processing units.

[0030] The EAC **100** includes a battery **112** which powers the various electronics and functions of the device. The battery **112** may be any suitable battery, including a standard disposable battery such as an alkaline battery, or a longer lasting battery such as a lithium battery, nickel cadmium, or an advanced lithium ion battery. The battery **112** may be rechargeable. For example, the battery **112** can be inserted into a recharging station which refills the battery **112**. The battery **112** may be removable from the EAC **100**, so that it can be replaced or recharged. Alternatively, the battery **112** can stay in the EAC **100** and be recharged through a power cord or cable, or via a USB connection. The battery can be coupled to a USB plug which is built into the EAC and used to charge the battery. The battery may be used to charge devices plugged into the EAC and/or keep them trickle charged for long term storage. The EAC battery can be charged via a USB connection, direct external power adapter and/or via induction. The battery can be of any shape or construction, for example, a cylindrical, prismatic, or thin profile flexible construction.

[0031] The EAC **100** may contain a number of input and output interfaces, as shown in FIG. **3**. The interfaces shown are only provided as an example of the input and output mechanisms that can be incorporated into the EAC **100**, and a EAC can be designed that includes only some of the interfaces, greater numbers of one or more interfaces, or different types of interfaces.

[0032] One or more displays **113** can be incorporated into the EAC **100**. The displays **113** can be LCD's, LED's, OLED's, e-ink displays, vacuum florescent displays, or resistive or capacitive touch screens. Multiple types of displays can be utilized on a single EAC **100**. For example, a first display can be a touch screen for inputting information, and a second display can just be an LCD for reading facts related to the fluid vaporization product or receiving advertisements or offers. The one or more displays **113** do not necessarily have to be on the exterior of the EAC **100**. A display can be contained within a compartment such that it is only visible and activated when the user opens the compartment. For example, a display on an inside flap of a cover can show information relating to the fluid vaporization products that are stored in a compartment under the cover. Many variations and combinations of display types and display placements are possible.

[0033] The EAC **100** can also contain several status indicators **114**. Status indicators **114** may also be displays such as LCD's, LED's, OLED's, e-ink displays, and vacuum florescent displays, but can be implemented in other ways as well. A status indicator **114** can take the form of one or more LEDs, a light ring that glows a particular color, or a light bar to represent different levels of some quantity.

[0034] Status indicators **114** can display information regarding the status of one or more variables relating to the EAC **100** or fluid vaporization products which the EAC **100** contains. For example, status indicators **114** can display status information relating to EAC battery level, remaining fluid in a fluid vaporization device or cartridge, fluid vaporization device battery levels, remaining amounts of different types of fluid in a fluid cartridge or vaporization device that holds multiple types of fluids, and a variety of other information. Status indicators can also display status information relating to the user of the EAC **100**, such as frequency of usage of

vaporization products, intensity of usage, locations of usage, frequency of usage of specific products, and various other data.

[0035] Status indicators can convey messages through blink/display patterns or light colors. For example, flashing red can indicate a low battery on the EAC. Flashing yellow can indicate that the fluid levels in one or more fluid vaporization devices are low. Flashing green can indicate that the user has successfully connected to a nearby wireless network. Many variations are possible.

[0036] The EAC **100** can contain one or more data ports **115** for receiving or transmitting data. The one or more data ports **115** can include USB port which receives data from an attached USB device or from a computing device attached via USB cable. The data ports **115** can also include a built in USB plug which plugs into a USB port on another device. The data ports **115** can include slots for portable storage cards, such as SD or micro-SD cards or any other storage format.

[0037] A variety of audio input/output interfaces **116** can be included on the EAC **100**. The EAC **100** can have, for example, one or more audio output jacks, one or more built-in speakers, a microphone, or a microphone jack. Audio input/output can also be done over a device that is paired with the EAC over a wireless connection, such as Bluetooth.

[0038] The EAC can include one or more cameras and/or video cameras **117**. The cameras and video cameras **117** can be disposed on the outside of the box or revealed by opening a compartment or cover on the outside of the box. They can be used in various applications with the EAC. For example, if the user is interested in an item, such as a certain type of fluid vaporization device, they can take a picture of the fluid vaporization device and send the picture to a server or service where any special offers or discounts are forwarded to them and displayed on the one or more displays **113**.

[0039] A variety of user input mechanisms **118** can be included on the EAC. The user can input information using one or more touch screens, or touch pads or other touch sensitive interfaces. The user can enter information via one or more buttons, or directional pads, or joysticks, or other tactile interfaces. The user can also input information via voice commands or audio, either through a built-in microphone or through an attached microphone or a microphone on paired device. Additionally, as discussed above, the user can input information via the one or more accelerometers built into the device by the moving the device in certain patterns or directions.

[0040] An exemplary EAC according to the disclosed embodiment can be used to store and interface with a variety of items, such as fluid vaporization devices and related items, electronic devices, and electronic components or adapters.

[0041] The fluid vaporization devices and items can include medical devices, such as asthma inhalers, nebulizers, and anesthetic or medicinal vaporizers, and their corresponding batteries which can be rechargeable or disposable. Fluid vaporization devices and related items can also include electronic cigarettes, electronic cigarette batteries which can be rechargeable or disposable, electronic cigarette fluid cartridges, electronic cigarettes which include both a fluid cartridge and a battery, disposable electronic cigarettes, smart electronic cigarettes which include a microchip or microcontroller, and similar products.

[0042] The electronic devices which can be stored in the EAC or incorporated in the EAC can include chargers, transmitters, adapters or other electronics. For example, as is

shown in FIG. 4, a USB charger can be stored in the EAC which interfaces with the fluid vaporization devices also stored in the EAC so that users can recharge their fluid vaporization device batteries easily. The EAC 100 in FIG. 4 contains both fluid vaporization devices 119 and a USB charger 120 for those fluid vaporization devices which extends from a side pocket. Of course, the design of EAC 100 can be altered to allow storage of the USB charger 120 in different locations if preferred.

[0043] Exemplary USB chargers for the items can be plugged into any USB port and facilitate the charging of any item, such as an electronic cigarette, in addition to interfacing with a PC or other computing device, for example, to update any firmware or behavior relating to the EAC or the items stored therein. The USB charger can have embedded intelligence in the form of discrete electronics and/or a microprocessor which allows bi-directional communications with the plugged in item. This connection can pass thru to the USB host (PC or mobile device), to allow connection to the host and/or a network and network applications, such as the manufacturers website or online applications created by the manufacturer.

[0044] Additionally, the USB charger may have onboard nonvolatile storage to track charge patterns, record item unit identifications, charging times, as well as marketing and/or educational/entertainment media to market the product and/or educate or entertain the customer. This data can be accessed via the host that the charger is plugged into.

[0045] The USB charger can have display abilities to render charge state (0 to 100%), and other analytics via a display such as an LED, LCD, OLED, or other technologies or more advanced textual and graphical LCD displays.

[0046] The USB charger can also have communications ability to contact the user via the USB connection itself, and transmit messages and notifications to a mobile device, such as the user's phone or the EAC, when an item is charged.

[0047] There are a variety of possible interfaces which can be used to store or secure the electronics or fluid vaporization devices within the EAC. Additionally, interfaces can provide additional functionality, such as enabling communication between the items stored in the EAC and the EAC itself, charging any batteries in the items from the EAC's battery, or charging any batteries in the items from an external power source via the EAC.

[0048] If the EAC itself contains smart items, such as smart electronic cigarettes, then it can preferably communicate with the smart items using a wireless communication protocol, such as Bluetooth, a wireless network, or cellular protocols. In one example, a user can purchase electronic cigarettes or electronic cigarette fluid cartridges, which can be "smart" items or just contain a near field communication chip, at a discounted price available only to those who own an EAC. The electronic cigarettes or cartridges can be configured to be in a locked state until they are brought close to the EAC, at which point they will be unlocked using near field communication or one of the above mentioned wireless technologies. Of course, this feature can be utilized with any of the items or devices which can be stored in the EAC, such as medical devices including anesthetic vaporizers.

[0049] Additionally, the EAC can be configured with standard or customized physical ports which mate with ports on fluid vaporization devices. For example, the fluid vaporization device can include a USB plug which plugs into a USB port on the EAC to facilitate communication between the

EAC and the fluid vaporization device. Of course, the possible physical connections between the EAC and the fluid vaporization device are not limited to such an interface, and can include any type of data port.

[0050] A magnetic locking interface can be used to hold items within the EAC. The magnetic interface can also provide a way to power or recharge the items being held in place. So, for example, an electronic cigarette made out of a magnetic material can be held to a portion of the interior of the EAC by a magnetic plate or pad or other coupling.

[0051] Items can also be held in place via a screw, threaded interface or bayonet receiver. For example, electronic cigarette fluid cartridges, which are many times screwed into electronic cigarette batteries, can be screwed into threaded openings in the EAC. These openings can be in an internal compartment of the EAC or be implemented as external threaded holes. Similarly, electronic cigarette batteries, disposable electronic cigarettes, or any other fluid vaporization related items can be customized to be screwed into/onto a threaded interface which is part of the EAC.

[0052] Items can also be held in the EAC by a frictional and/or spring loaded interface as shown in FIGS. 5A-5B. This can include a combination of a rubber and/or plastic sleeve 500 providing friction to the insertion or removal of the item 502 to and from a holding and/or charging cylinder 502. The primary contact points of the item 502 are made via mechanical receivers 503 in the insertion port and tension is provided via spring(s) 504. Multiple views of such an interface, which can be integrated into the EAC, are shown in FIGS. 5A-5B.

[0053] Additionally, all of the above interfaces can include couplings for charging any items inserted or attached to the EAC or for transferring data to and from the items inserted or attached to the EAC. For example, any of the interfaces can have electrical contacts which pair with an electrical contact on an item attached to the EAC. The EAC can support inductive coupling to charge the batteries of items, such as disposable or non-disposable electronic cigarettes, which have been inserted into or attached to the EAC. When the user charges an item, such as an electronic cigarette battery, from the EAC, the EAC's own battery can be used as the power source. The user may be able to toggle such a feature with a physical switch or button, or enter their preferences into a user interface on the one or more displays. Additionally, the user may be able to utilize additional accessories that plug into the EAC and allow the user to charge other devices from their EAC, such as their mobile phone. The EAC can have a standard phone charger built in for such a purpose. Such a feature would be useful in an emergency situation when the user's phone requires additional power.

[0054] FIG. 6 shows the communication capabilities of the EAC 100. EAC 100 can communicate with user computing devices 123, mobile devices 121 and 122, other EACs 125 and application or data servers 124. Any of these communications connections can be used to perform any downloading or uploading of data or applications discussed in the sections below, either wirelessly or via a physical interface. All data transferred to and from the EAC can also be encrypted for security and the EAC itself can have a password function or utilize biometric recognition techniques such as fingerprint analysis for confirming that a user is authorized.

[0055] The EAC can have a user interface and run software such as an operating system and/or firmware. Firmware may come pre-loaded or can be installed or modified by users. Additionally, the EAC can run an operating system designed

for mobile devices such as Android or the Blackberry operating system. Users can download or otherwise receive upgrades, modifications, or updates to firmware, software, operating systems, or applications running on the EAC via the one or more communications connections.

[0056] The EAC can be configured to download and run many kinds of applications, similar to mobile apps for mobile devices. Such applications may be downloaded to the device via a wireless connection or via a USB or other physical connection. Users can download apps using an app store or other similar environment. Many apps can be targeted to EAC users and take advantage of its functionality or abilities. Of course, such software can come pre-loaded on the EAC and does not have to be added by the user.

[0057] The EAC can have different profiles, themes, or skins. Such profiles can change the outer appearance and behavior of the EAC, such as what is displayed on the one or more displays and indicators, sounds the EAC makes, vibration themes, messages sent by the EAC, as well as the behavior the items the EAC contains or is communicatively coupled to. For example, a EAC user can download a theme called "nature." In response to downloading and installing the theme, the EAC can display trees on its display, and use bird sounds as alerts. If the EAC is used with smart electronic cigarettes, the downloaded theme can affect the settings of the electronic cigarettes. For example, if the user is utilizing a smart electronic cigarette that has multiple chambers and adjustable levels of nicotine, the user can download a theme called "extreme" which raises the nicotine output of each of the electronic cigarettes in their EAC so that the user gets a higher dosage of nicotine per drag when they are using the electronic cigarettes.

[0058] On the other hand, many applications can be targeted to smoking cessation and take advantage of the ability of the EAC to propagate updates to the fluid vaporization devices stored within. For example, a user can download an application to the EAC called "Quit in 10 weeks" which automatically reduces the nicotine output level of each of their electronic cigarettes stored in the EAC over a period of 10 weeks until their electronic cigarettes are releasing no nicotine. An example interface for such an application is shown on the screen of mobile device 122 in FIG. 6, offering the user a congratulatory message.

[0059] The EAC can take advantage of the communication it has with smart electronic cigarettes or other smart fluid vaporization devices and the tracking capabilities of the EAC and the smart electronic cigarettes to improve the user's experience. For example, the electronic cigarette or other fluid vaporization device can detect that the user is inhaling very hard when they use the electronic cigarette. This may result in the vaporization being carried out at too quickly or at too high a temperature and too much vapor being produced. The smart electronic cigarette can then communicate this information to the EAC, which can reprogram all the electronic cigarettes in the EAC and all future electronic cigarettes to automatically lower the default vaporization temperature of the fluid to compensate for the user's inhalation idiosyncrasies. The electronic cigarette or other fluid vaporization device does not need to be inserted into the EAC in order to communicate with the EAC, and can communicate via wireless transmission or through an intermediary server if the EAC and fluid vaporization device are at different locations. Additionally, all tracking information from the electronic cigarette or other fluid vaporization device, such as inhalation frequency, inha-

lation intensity, inhalation length, preferred fluid flavors, preferred fluid ratios in multi-fluid cartridges, preferred nicotine levels, and similar data, can be communicated to the EAC and/or data servers/computing devices which compile the information and provide it to the user in an easily readable format, either through a website or an application.

[0060] This bi-directional communication between a smart fluid vaporization device and the EAC can be used to customize the user's experience in a variety of ways. A smart electronic cigarette may detect that its battery is running low, and communicate this information to the EAC, which can display a message or send a text alert to the user to charge the battery. Similarly, the smart electronic cigarette may detect that its fluid cartridge is running low, query the EAC to determine whether the user has additional fluid cartridges, and if not, have the EAC send or display a similar alert.

[0061] Of course, the fluid vaporization device does not have to be a smart device or have bi-directional communication abilities in order to utilize tracking or recording features on the EAC. For example, the EAC can detect and record a battery level of a disposable or otherwise non-smart electronic cigarette or electronic cigarette battery. When the user removes the non-smart electronic cigarette, the EAC can detect the removal via one or more sensors. When the user reinserts the non-smart electronic cigarette, the EAC can once again check the battery level. Based on the reduction in battery level and some mapping of the battery usage required to produce a certain quantity of vapor, the EAC can approximate and record the user's vapor inhalation amount.

[0062] Applications can take advantage of time keeping functions on the EAC or location tracking on the EAC to provide information relating to when and where users utilize the items contained within. An app called "Where do I smoke?" can tell users the places where they most frequently use the fluid vaporization devices stored in the EAC. An app called "When do I smoke?" can tell users the times when they most frequently use the fluid vaporization devices in the EAC. These apps do not necessarily require a smart electronic cigarette or smart fluid vaporization device, as a sensor on the EAC can indicate when an item is removed and when it is returned.

[0063] Actual usage of the items in the pack can be presented to users in detail, and may be accessible either through a display on the pack itself, or via another computing or mobile device the pack is coupled to. The data relating to usage can be automatically transmitted to a server which tracks the data and makes it available to the user via a website. Application servers can run 24/7 and monitor all incoming connections from EAC, and EAC apps users. Servers can download and compile many kinds of analytics and event analyses.

[0064] Additionally, servers may target advertisements, marketing materials, promotions, discounts, or coupons to users. For example, the a GPS application or hardware may detect that the user is in a certain retail location and transmit a discount coupon code, such as a QR code, to the EAC which can be displayed on the one or more displays and scanned for a discount. The EAC may be distributed free of charge or at a discount and display a stream of advertisements on the one or more displays.

[0065] The EAC can detect that the user is running low on fluid for their fluid vaporization device and send a coupon to the user for a discount off their next purchase. The user can also configure the EAC to automatically perform functions,

such as order more fluid cartridges when the fluid cartridges held by the EAC are near empty.

[0066] Additionally, users with mobile devices can have their EAC monitored by an app running on the mobile device which can order new products and communicate with application servers, data servers, or commercial servers for electronic commerce transactions as well as product modifications and upgrades.

[0067] The EAC software can include an internet browser to navigate to different sites, watch online videos, or perform other online activities. The user may access a products store through an application and order more supplies or products for the EAC directly from the EAC. The EAC can have a music player application such as an mp3 player so that the user can listen to music through headphones or the external speaker.

[0068] Applications on the EAC can take advantage of peer-to-peer communications with other EACs. For example, users can transmit their preferred configuration settings or fluid vaporization device settings to the EACs of other users. Users can see what flavor or type of fluid cartridges friends are utilizing, and many social media applications can be integrated into the EAC. Communication with other EACs can be based on proximity and the user can be required to have permission to communicate with a particular EAC. Transmission or acceptance of data may be accomplished via any of the user input mechanisms.

[0069] Motion based applications can make use of the accelerometer built into the EAC. Users can use such application to define a set of commands based on different motions. This can even be integrated with other services like the peer to peer communication so a user can swing their EAC in the direction of another EAC to transfer information.

[0070] The EAC can have many alert applications, such as an alarm clock, a vaporization device fluid tracker, a charge tracker for the EAC and the fluid vaporization device, a calendar, and other similar applications. The alerts or notifications can be in the form of an SMS sent to the user's phone, an email sent to the user's email, an audible alert or notification, or a vibration. Notifications can be displayed or sent to the user regarding the status of EAC hardware or software or fluid vaporization devices, such as a "waiting for wireless network to respond," "accessing user account," and so on.

[0071] The user can utilize the camera or video camera in different applications. They can take a picture and set it as the "skin" for their EAC. They can use captured pictures and images in the context of e-commerce, to look up information or make purchases.

[0072] The GPS hardware can be utilized with many apps to provide directions or navigational directions such as walking or driving directions. Apps can utilize the GPS to give the user directions to the nearest electronic cigarette vendor if they are running low on fluid cartridges or other supplies.

[0073] Diagnostic applications can be included on the EAC to show the operating state of the EAC and any diagnostic information relating to the contents of the EAC. For example, a diagnostic program can show the programs installed on the EAC, the charge on each electronic cigarette, the fluid in each fluid cartridge, the different flavors of fluid cartridges, the breakdown of different fluids in a multi-fluid cartridge, and so on.

[0074] Location tracking can be used to provide special offers and incentives to users when they are at a location which has partnered with or otherwise supports a manufac-

turer, seller or distributor of certain types of electronic cigarettes. For example, a user with a EAC may walk into a particular restaurant and receive a message displayed on their EAC that states "Welcome EAC owner, display this message to your server for 10% off your check, and puff away!"

[0075] The EAC may have software that allows it to easily interface with a computing device. For example, a user can connect the EAC to a computing device and trigger an application initialization on the computing device (autorun), or have the EAC data automatically synchronized with the user's computing device, either through a physical connection, or wirelessly.

[0076] The EAC can have applications, software or firmware that detects unauthorized devices or cartridges. For example, the EAC can detect when the user is using an unauthorized brand of electronic cigarette or fluid cartridge and block communication or charging capabilities, or deactivate the unauthorized device so it is rendered unusable.

[0077] The EAC, fluid vaporization device and cartridges disclosed herein are not limited to nicotine related fluids and can be used for a variety of different medical applications. For example, inhalers are very common devices used to deliver medication to the body via the lungs. Cartridge components and battery components of fluid vaporization devices can be utilized to administer medication to an individual in the same way as an inhaler. For example, by using a multi-reservoir cartridge, a patient or a doctor can manage the doses for and/or administer multiple different or complementary medications with a single device. One example of this would be an asthma inhaler cartridge that utilizes multiple different types of steroids or a steroid and a bronchodilator to prevent an asthma attack. The user of such a cartridge can manually adjust the dosages of different medication fluids in the cartridge either through the cartridge, via a battery component attached to the cartridge, via the EAC which is in communication with the cartridge, or through another communication interface, so that they can tailor the dosage to their specific symptoms.

[0078] Additionally, the communication features of the EAC would enable users and their doctors to track usage, dosage, and effectiveness of different drug cocktails. For example, if the device is an inhaler which a patient is trying for the first time, the usage information, such as number of drags or amount of medication fluid used over a period of time can be logged and uploaded to a website, where the patient or their doctor can determine the effectiveness based on usage.

[0079] The ability to adjust vaporization settings remotely through the EAC would be useful in controlling dosage for patients. A doctor, pharmacist, nurse or other medical professional can send an instruction to the EAC to lower the amount of fluid that is vaporized per drag of a fluid vaporization device to lower the dosage of a particular drug when the patient is showing improvement, or if the patient is having adverse reactions. Similarly, the medical professional can send an instruction to the EAC to limit the number of inhales of fluid vaporization device in a specific time period to prevent abuse of potentially addictive drugs, such as opiates or other painkillers. The number of inhales, or doses, can be pre-authorized, and after a certain amount the device can deactivate until more doses are authorized.

[0080] In the case of a fluid cartridge with multiple reservoirs, the medical professional can remotely modify the ratios of the different drugs through the EAC to provide a different drug cocktail to the patient at each stage of illness or recovery.

Of course, all of these instructions or profiles can be entered directly into the EAC by the patient as well.

[0081] In one example, the EAC can be used as a medical appliance for the administration of drugs in a controlled fashion via vapor inhalation. The EAC can be permanently connected to a USB cable or other interface, and the user can attach new loads/refills to the fluid vaporization devices in the EAC. The wired connection can be used to provide power to the EAC, and the EAC can monitor user inhalation patterns of fluid vaporization devices and compute air flow as user inhales medicines. The EAC can be designed so that the user will not be able to use un-authorized medical fluids. Only fluid vaporization devices having doses, fluids, and fluid mixtures that have been enabled and authorized by the doctor or medical professional for the EAC will be able to communicate with or charge from the EAC. The EAC can have a feature that detects unauthorized devices and deactivates them.

[0082] Since the EAC is preferably able to log many operating and usage characteristics over time, the device may intelligently adapt to certain usage patterns or operating characteristics. Such operating characteristics and usage patterns can include, for example, the temperatures of the one or more combustion chambers in a fluid vaporization device, the user's drag intensity, the user's rate of fluid consumption and times of peak consumption, and/or the user's consumption of certain types of fluid cartridges or specific fluids in a multi-reservoir cartridge.

[0083] The continuous logging of usage information and operating characteristics can be used to adjust the user's experience by manipulating the operational settings of the fluid vaporization devices in real-time. The user's previous usage and experience can be used with the operating characteristics in a closed loop adaptive controller configuration to adapt to the user's usage patterns and optimize or otherwise alter the functionality of the fluid vaporization device.

[0084] Such changes can include elongating the maximum allowable drag lengths on a fluid vaporization device, changing the heating profile, and/or mixing ratios of fluids, and so forth. For example, if the EAC determines that the user puts a lot of vacuum pressure on the mouthpiece of a fluid vaporization device and thus tends to overheat the unit with its default settings, the EAC can adjust the heating temperature on the fluid vaporization device, so that the user won't overheat the device anymore. If the fluid vaporization device is a medical device, such as an asthma inhaler, the EAC may determine that the user requires too many inhalations to relieve an asthma attack and increase the dosage of the medicinal fluids in the reservoir of the inhaler to increase the effectiveness of the device in an emergency situation. Many variations are possible, and these examples are provided only to show the nature of the adaptive control feature.

[0085] The EAC technology and interface API's used to communicate with the different fluid vaporization devices and used for communication with other computing devices and other EACs can be stored and distributed as a software and/or firmware package, and can be adapted to different vaporization devices and EAC accessories so that other vendors can create products compatible with the EAC. For example, the API for communicating with the EAC can be licensed to a medical drug maker so that they can design cartridges or fluid vaporization devices which can be manipulated by the commands sent from the EAC.

[0086] Many variations of the EAC are disclosed herein. However, various modifications can be made without depart-

ing from the scope of the disclosed embodiment as defined by the appended claims and legal equivalents.

What is claimed is:

1. A computer-implemented method executed by one or more computing devices integrated with a container which is configured to house one or more vaporizer components, the method comprising:

receiving, by at least one of the one or more computing devices, information relating to the operation of a fluid vaporizer;

determining, by at least one of the one or more computing devices, an instruction to transmit to a vaporizer component based on the received information, wherein the instruction involves the operation of the fluid vaporizer; and

transmitting, by at least one of the one or more computing devices, the instruction to the vaporizer component.

2. The computer-implemented method of claim 1, wherein the information is received from a user through an input interface on the container.

3. The computer-implemented method of claim 1, wherein the information is received from one or more second computing devices.

4. The computer-implemented method of claim 1, wherein the received information comprises a request for usage data regarding the operation of the fluid vaporizer, and the transmitted instruction comprises an instruction to return the requested usage data.

5. The computer-implemented method of claim 1, wherein the received information comprises a request for the operational status of one or more components of the fluid vaporizer, and the transmitted instruction comprises an instruction to return the requested operational status.

6. The computer-implemented method of claim 5, wherein the requested operational status comprises at least one of a remaining battery level of a battery in the fluid vaporizer and a remaining fluid level in a fluid reservoir of the fluid vaporizer.

7. The computer-implemented method of claim 1, wherein the transmitted instruction comprises an instruction to adjust an operational parameter of the fluid vaporizer.

8. The computer-implemented method of claim 7, wherein the fluid vaporizer comprises a plurality of fluid compartments containing a plurality of fluids and the operational parameter comprises the proportion of each fluid in each of the fluid compartments that is vaporized during the vaporization process.

9. The computer-implemented method of claim 7, wherein the operational parameter is the vaporization temperature of the fluid vaporizer.

10. The computer-implemented method of claim 1, wherein the information is received from the vaporizer component and comprises usage data regarding the operation of the fluid vaporizer.

11. The computer-implemented method of claim 1, wherein the information is received from the vaporizer component and comprises status data regarding the operational status of one or more components of the fluid vaporizer.

12. The computer-implemented method of claim 1, further comprising:

receiving, by at least one of the one or more computing devices, response data from the vaporizer component; and

displaying, by at least one of the one or more computing devices, the response data on one or more external displays integrated with the container.

13. The computer-implemented method of claim 1, wherein the vaporizer component is one of a plurality of vaporizer components that comprise the fluid vaporizer.

14. The computer-implemented method of claim 13, wherein the vaporizer component is a first vaporizer component and comprises:

- a housing configured to mate with a housing of a second vaporizer component, the second vaporizer component comprising a fluid reservoir and a heating element;
- a battery configured to power the heating element; and
- hardware configured to operate the heating element to vaporize a fluid in the fluid reservoir.

15. The computer-implemented method of claim 1, wherein the fluid vaporizer comprises:

- a fluid reservoir;
- a heating element configured to vaporize a fluid in the fluid reservoir;
- a battery configured to power the heating element; and
- a housing configured to house the reservoir, the heating element, the battery, and the vaporizer component.

16. A container apparatus configured to house one or more vaporizer components and comprising:

- one or more processors; and
- one or more memories operatively coupled to at least one of the one or more processors and having instructions stored thereon that, when executed by at least one of the one or more processors, cause at least one of the one or more processors to:
 - receive information relating to the operation of a fluid vaporizer;
 - determine an instruction to transmit to a vaporizer component based on the received information, wherein the instruction involves the operation of the fluid vaporizer; and
 - transmit the instruction to the vaporizer component.

17. The container apparatus of claim 16, wherein the information is received from a user through an input interface on the container.

18. The container apparatus of claim 16, wherein the information is received from one or more second computing devices.

19. The container apparatus of claim 16, wherein the received information comprises a request for usage data regarding the operation of the fluid vaporizer, and the transmitted instruction comprises an instruction to return the requested usage data.

20. The container apparatus of claim 16, wherein the received information comprises a request for the operational status of one or more components of the fluid vaporizer, and the transmitted instruction comprises an instruction to return the requested operational status.

21. The container apparatus of claim 20, wherein the requested operational status comprises at least one of a remaining battery level of a battery in the fluid vaporizer and a remaining fluid level in a fluid reservoir of the fluid vaporizer.

22. The container apparatus of claim 16, wherein the transmitted instruction comprises an instruction to adjust an operational parameter of the fluid vaporizer.

23. The container apparatus of claim 22, wherein the fluid vaporizer comprises a plurality of fluid compartments containing a plurality of fluids and the operational parameter comprises the proportion of each fluid in each of the fluid compartments that is vaporized during the vaporization process.

24. The container apparatus of claim 22, wherein the operational parameter is the vaporization temperature of the fluid vaporizer.

25. The container apparatus of claim 16, wherein the information is received from the vaporizer component and comprises usage data regarding the operation of the fluid vaporizer.

26. The container apparatus of claim 16, wherein the information is received from the vaporizer component and comprises status data regarding the operational status of one or more components of the fluid vaporizer.

27. The container apparatus of claim 16, wherein the one or more memories have further instructions stored thereon, that, when executed by at least one of the one or more processors, cause at least one of the one or more processors to:

- receive response data from the vaporizer component; and
- display the response data on one or more displays integrated with the container.

28. The container apparatus of claim 16, wherein the vaporizer component is one of a plurality of vaporizer components that comprise the fluid vaporizer.

29. The container apparatus of claim 28, wherein the vaporizer component is a first vaporizer component and comprises:

- a housing configured to mate with a housing of a second vaporizer component, the second vaporizer component comprising a fluid reservoir and a heating element;
- a battery configured to power the heating element; and
- hardware configured to operate the heating element to vaporize a fluid in the fluid reservoir.

30. The container apparatus of claim 16, wherein the fluid vaporizer comprises:

- a fluid reservoir;
- a heating element configured to vaporize a fluid in the fluid reservoir;
- a battery configured to power the heating element; and
- a housing configured to house the reservoir, the heating element, the battery, and the vaporizer component.

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