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(54) **POWER GENERATOR TEMPERATURE REGULATION, AND ASSOCIATED SYSTEMS, DEVICES, MOBILE UNITS, AND METHODS**

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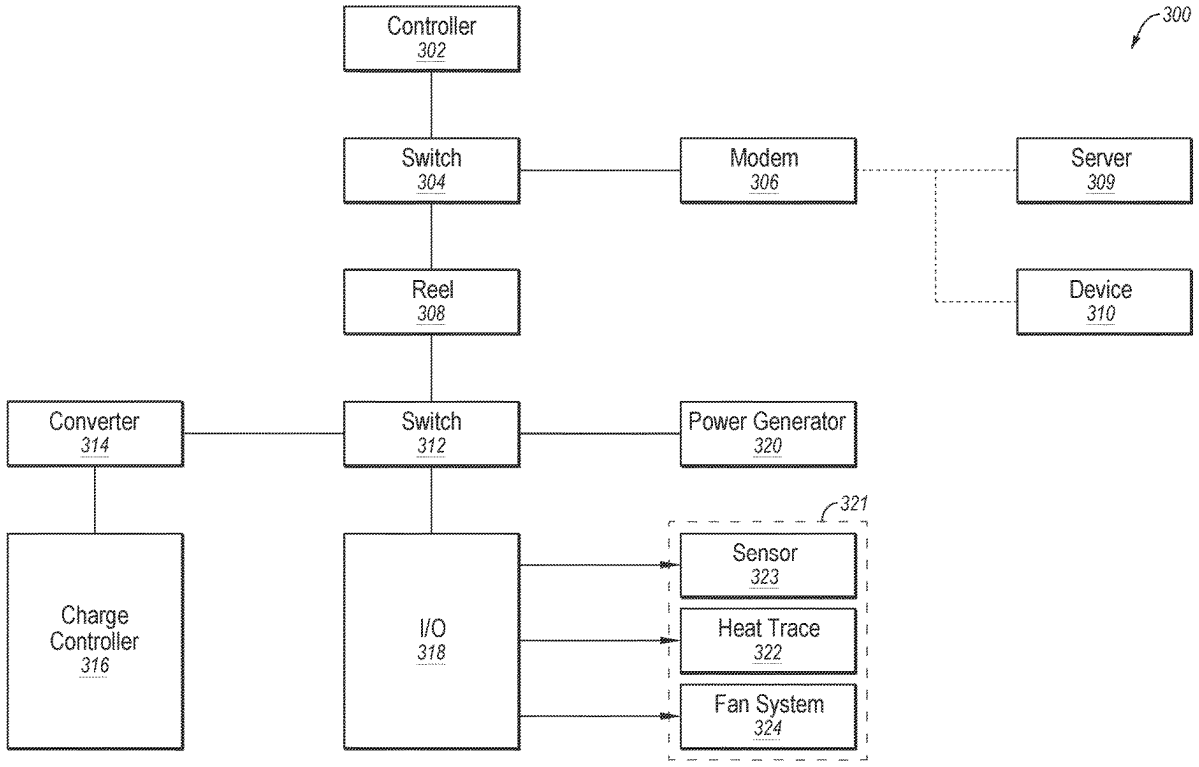
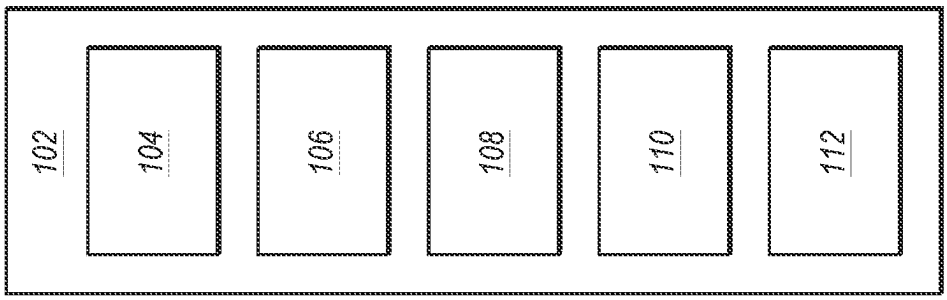
(57) **ABSTRACT**

Various embodiments relate to systems including a mobile surveillance unit. A system may include a mobile surveillance unit that includes at least one controller, a fuel cell generator coupled to the controller, and a temperature regulator proximate the fuel cell generator. The temperature regulator may include a temperature sensor for sensing a temperature in or near the fuel cell generator and a fan system including a fan. The at least one controller may be configured to receive a signal from the temperature sensor indicative of the sensed temperature. The controller may also be configured to generate a control signal to turn the fan on based on the sensed temperature being greater than or equal to a threshold temperature. Associated methods and mobile surveillance units are also disclosed.





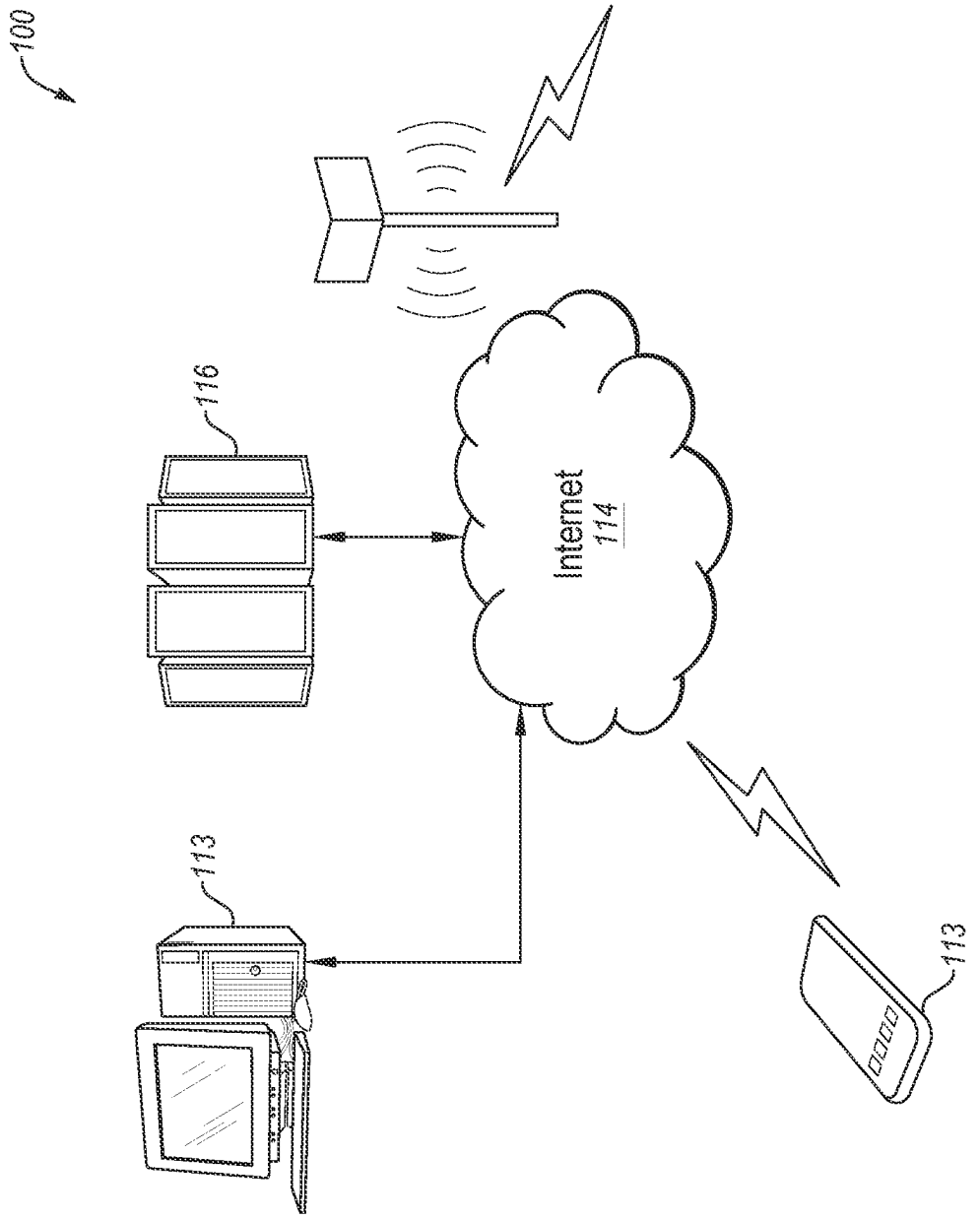


FIG. 1

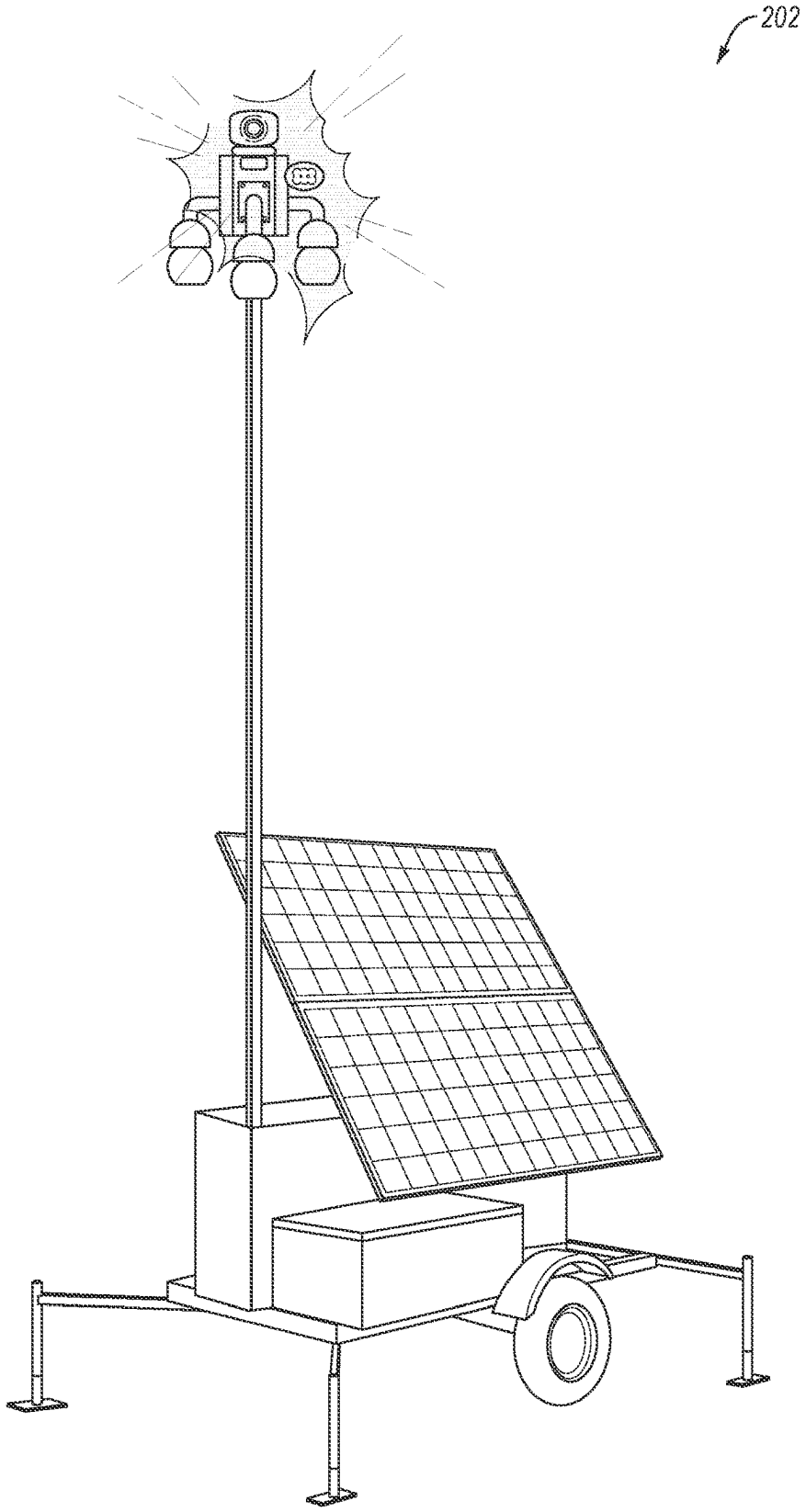


FIG. 2A

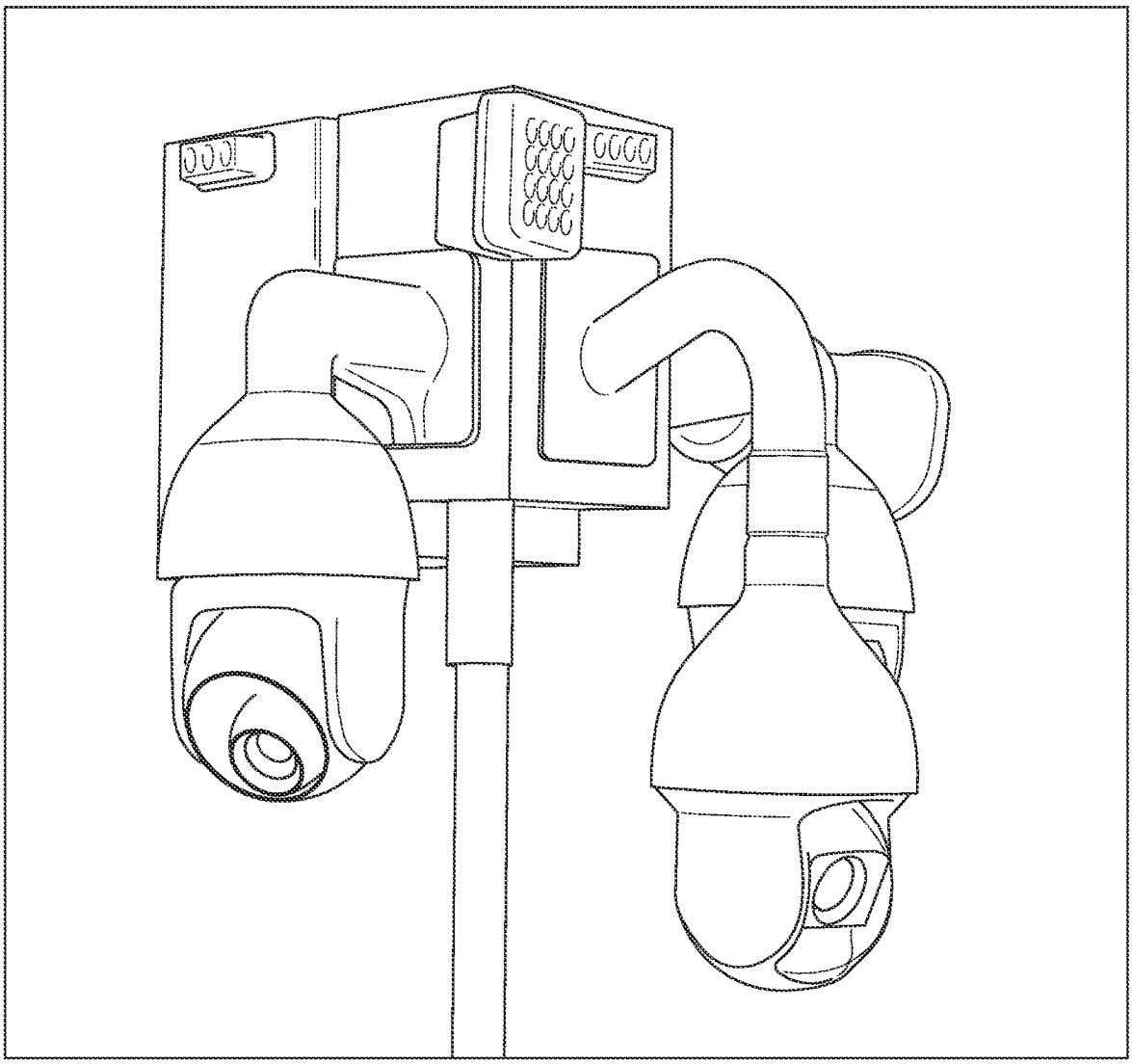


FIG. 2B

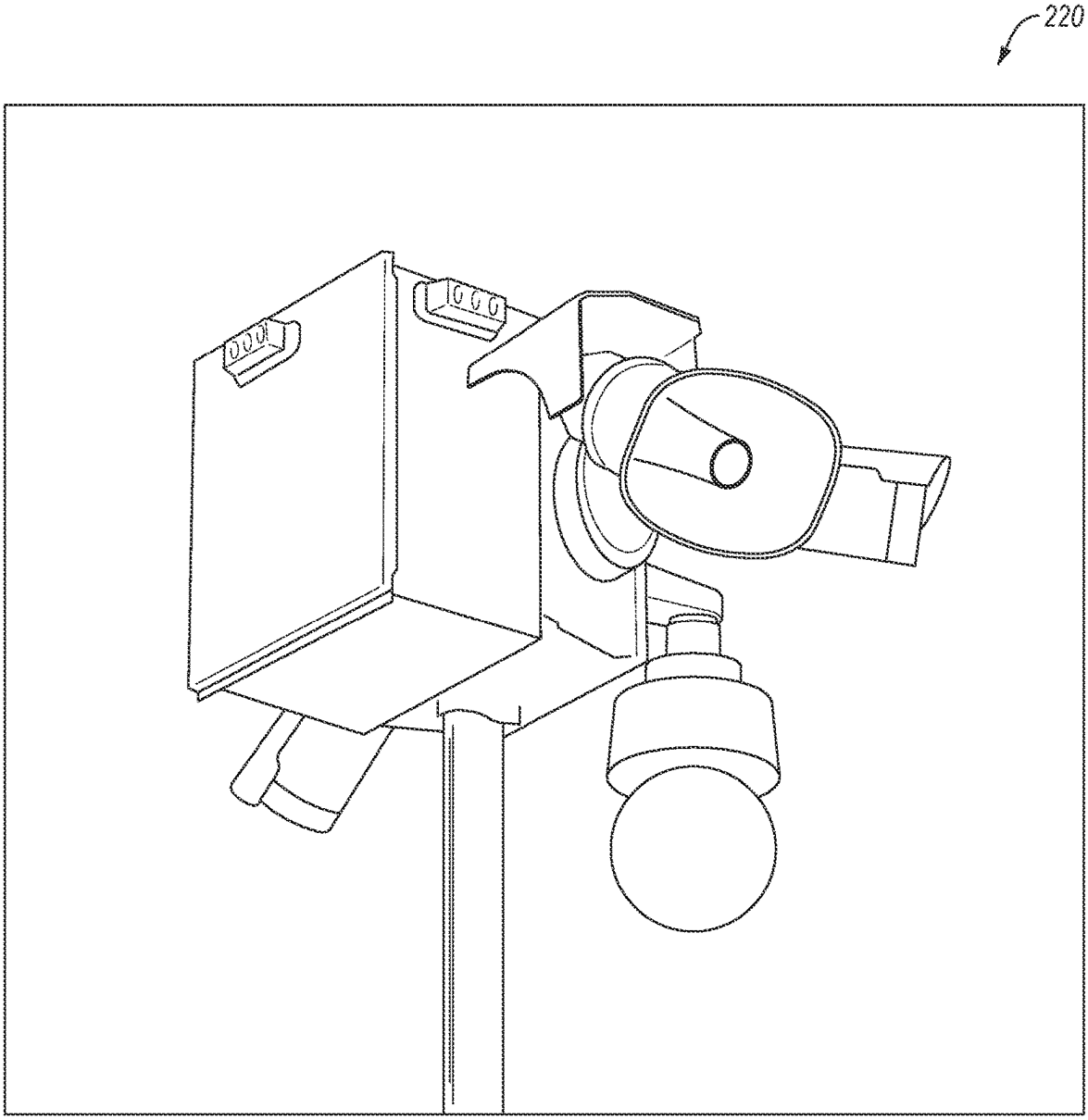


FIG. 2C

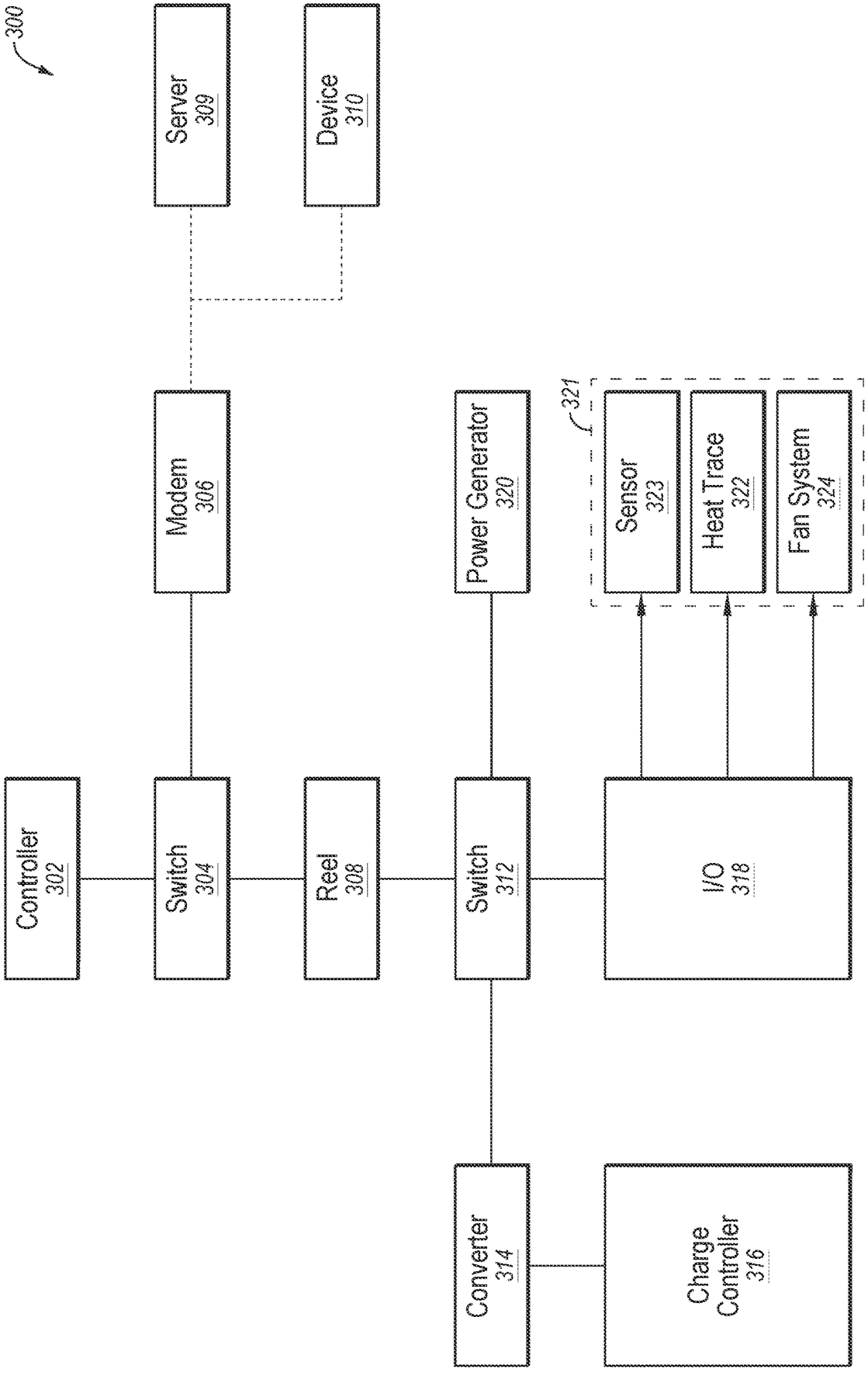

300
Server 309
Device 310
Modem 306
Power Generator 320
321
Sensor 323
Heat Trace 322
Fan System 324
Controller 302
Switch 304
Reel 308
Switch 312
I/O 318
Converter 314
Charge Controller 316

FIG. 3

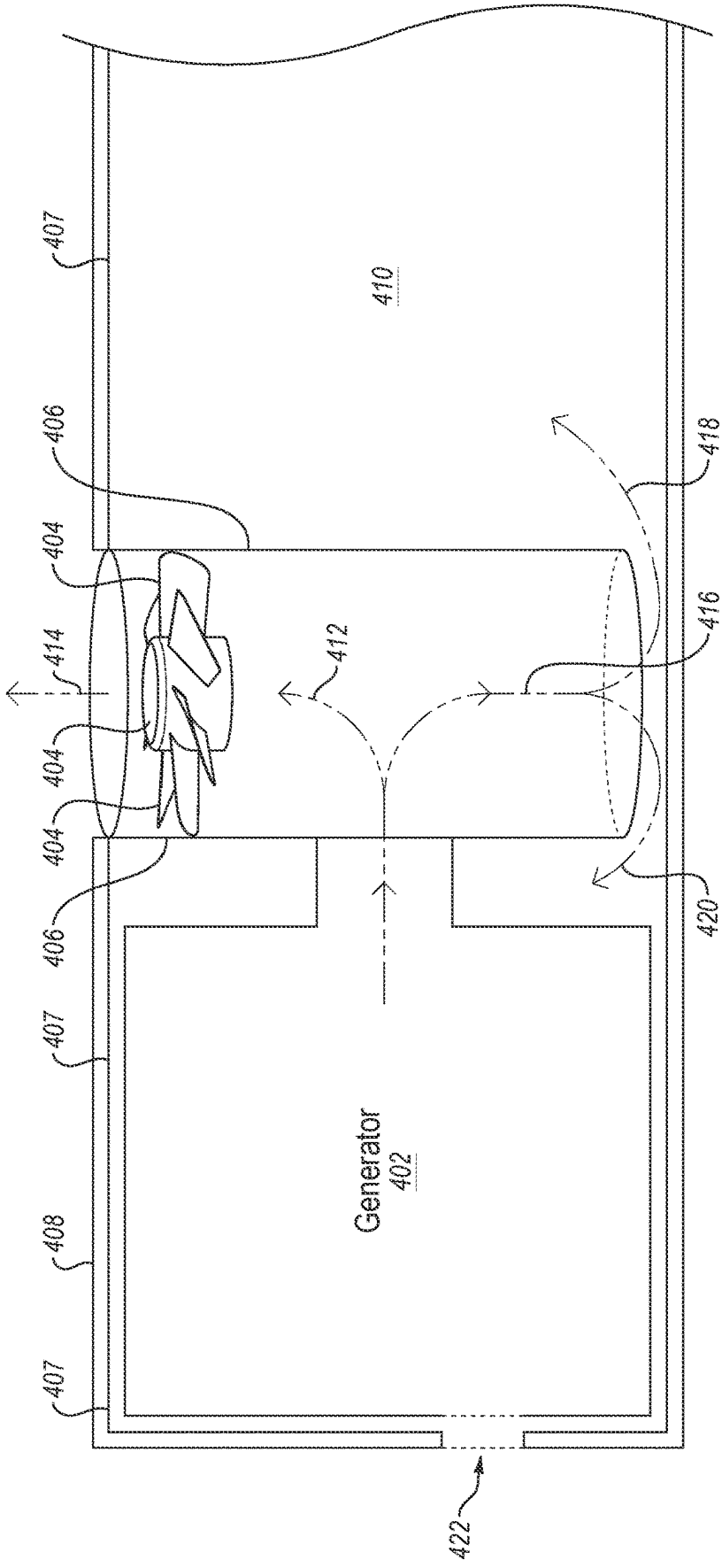

400
407
410
406
418
404
414
412
416
404
404
406
420
407
Generator
402
408
407
422

FIG. 4

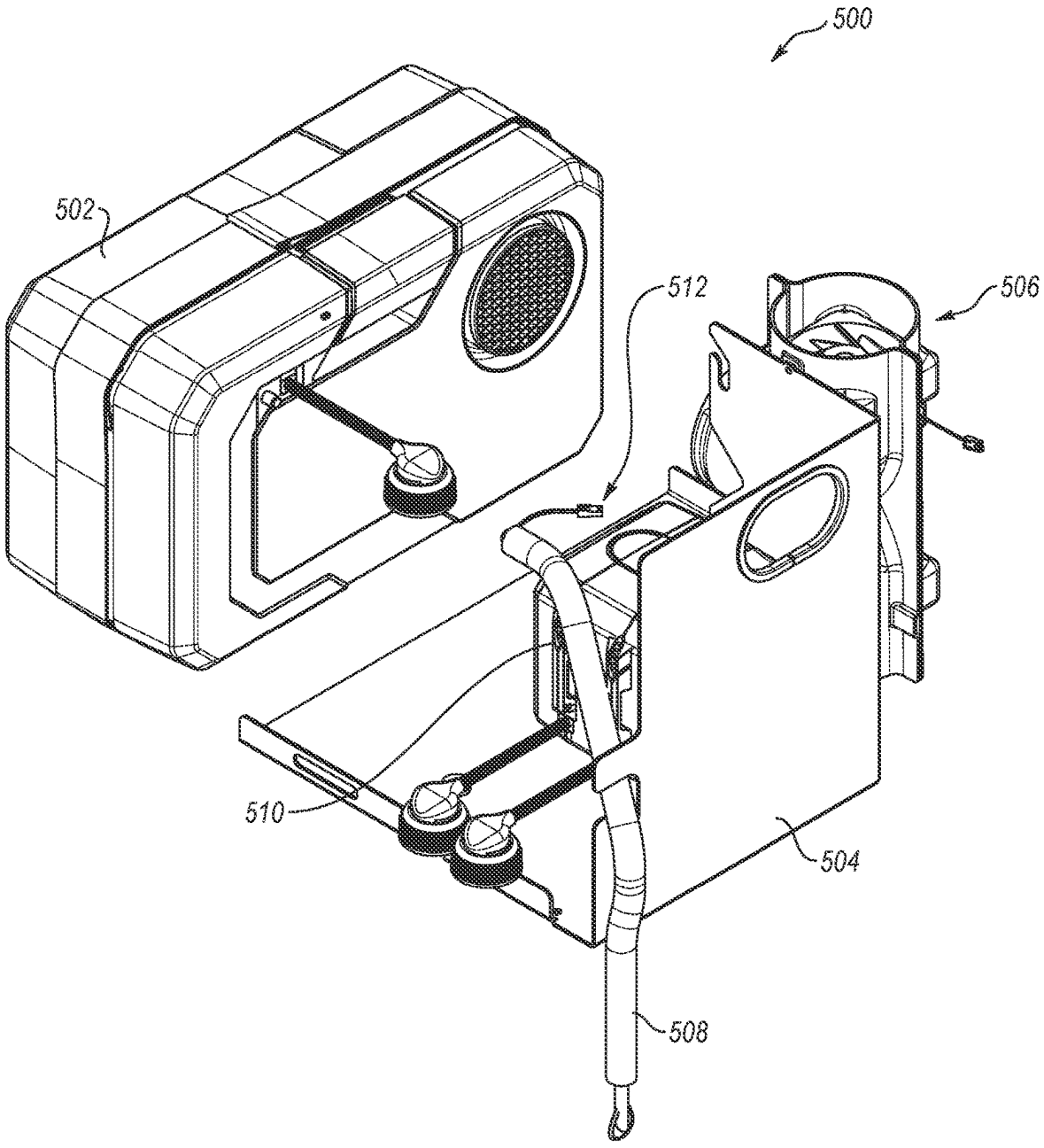


FIG. 5

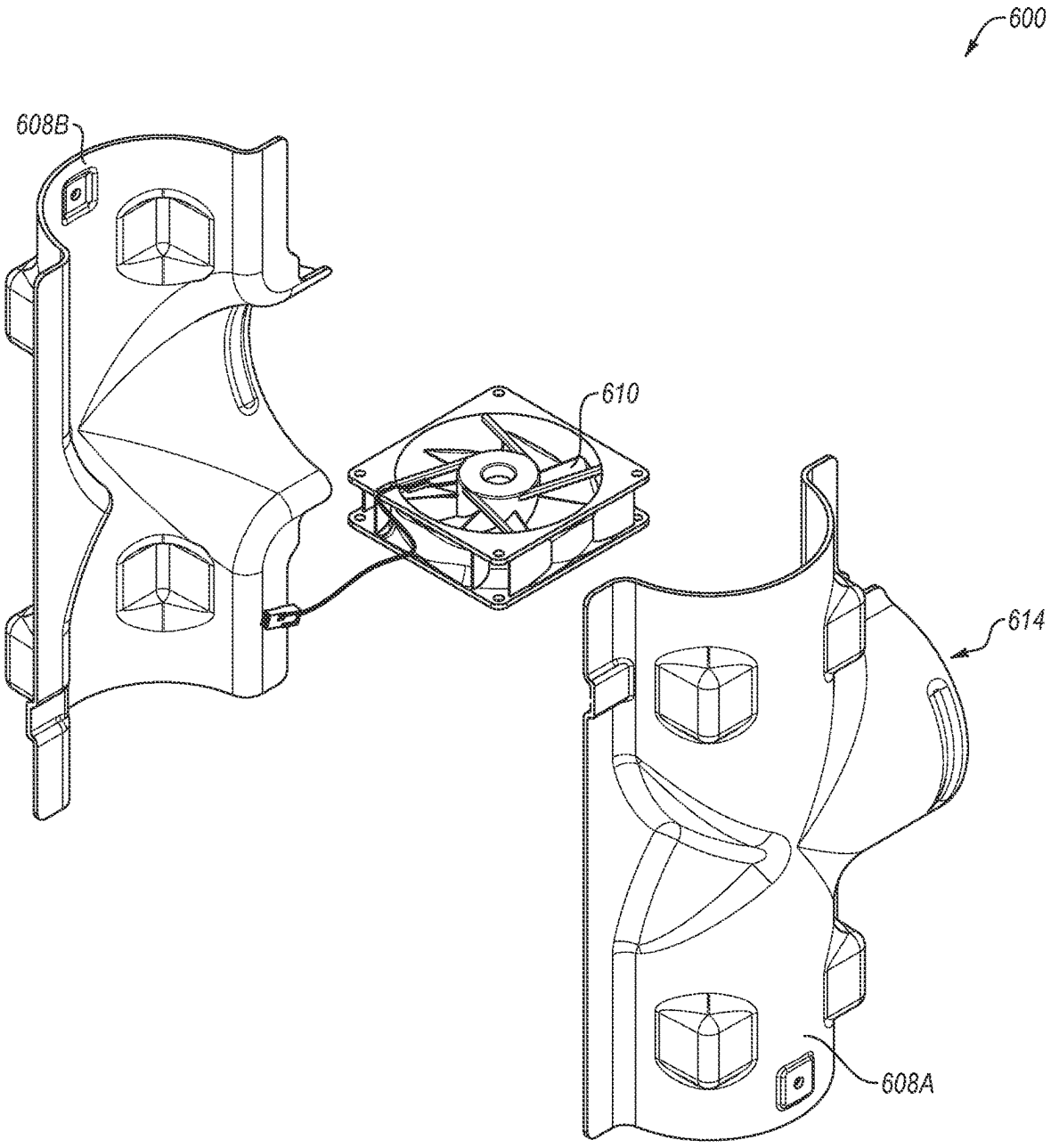


FIG. 6A

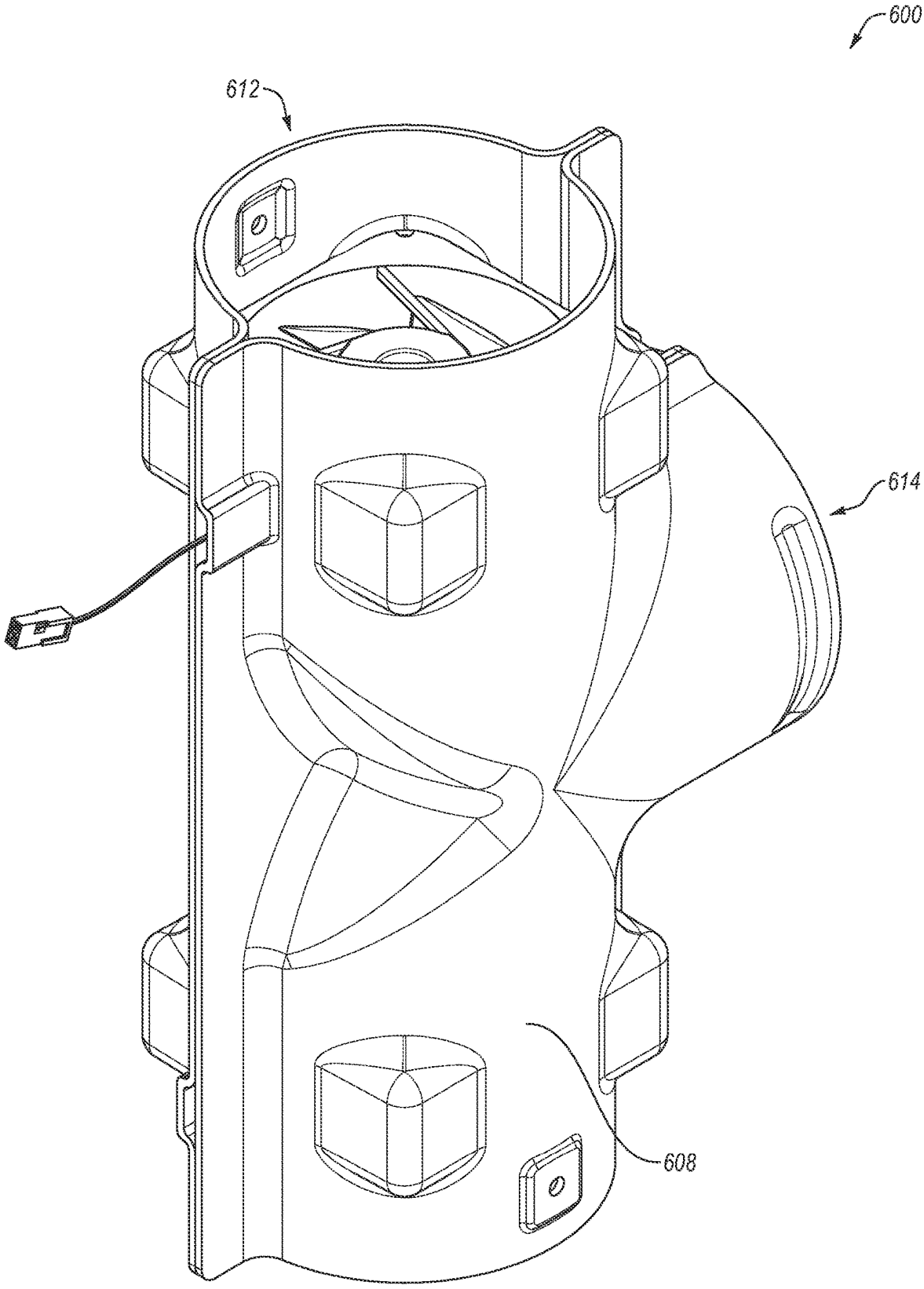


FIG. 6B

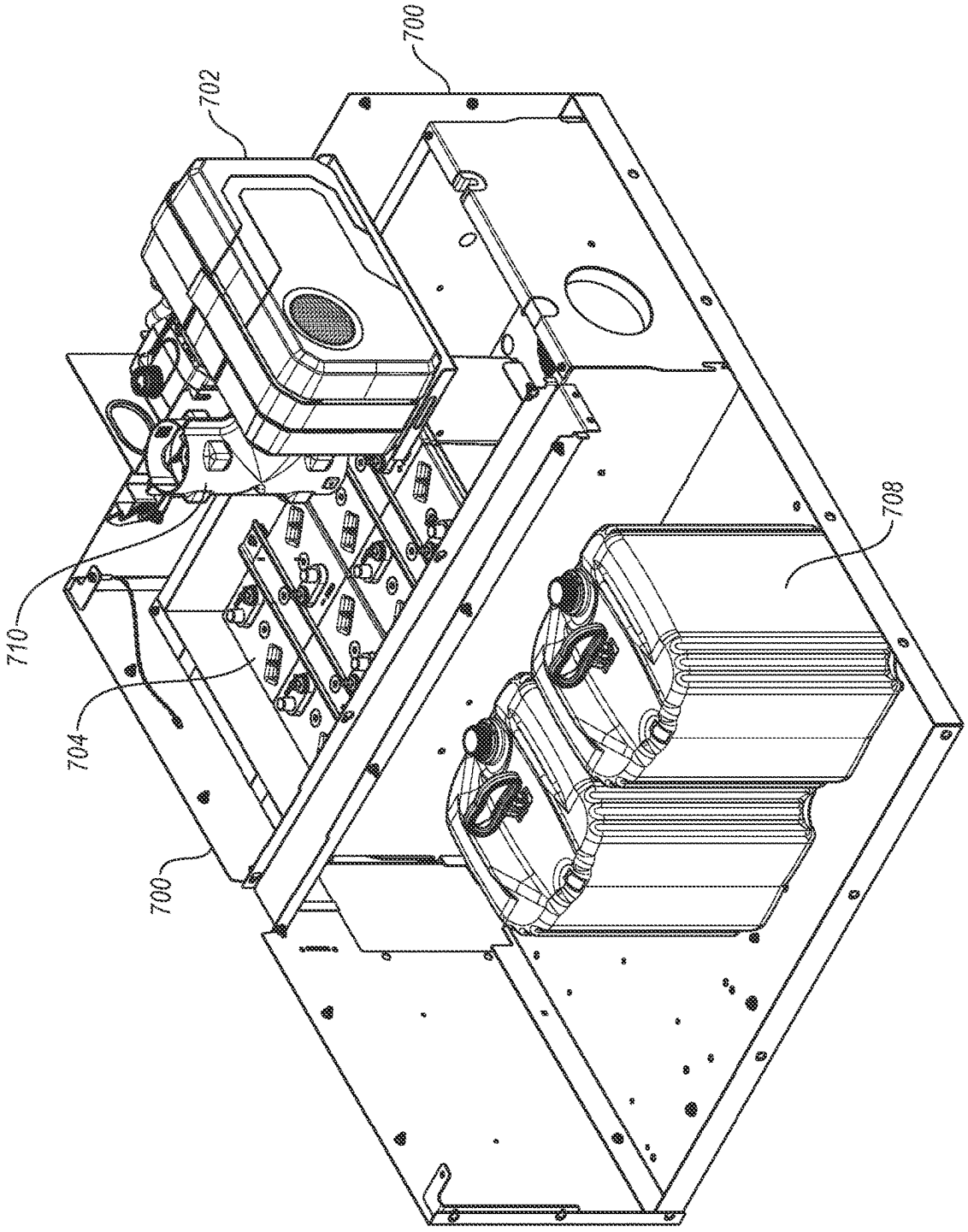


FIG. 7A

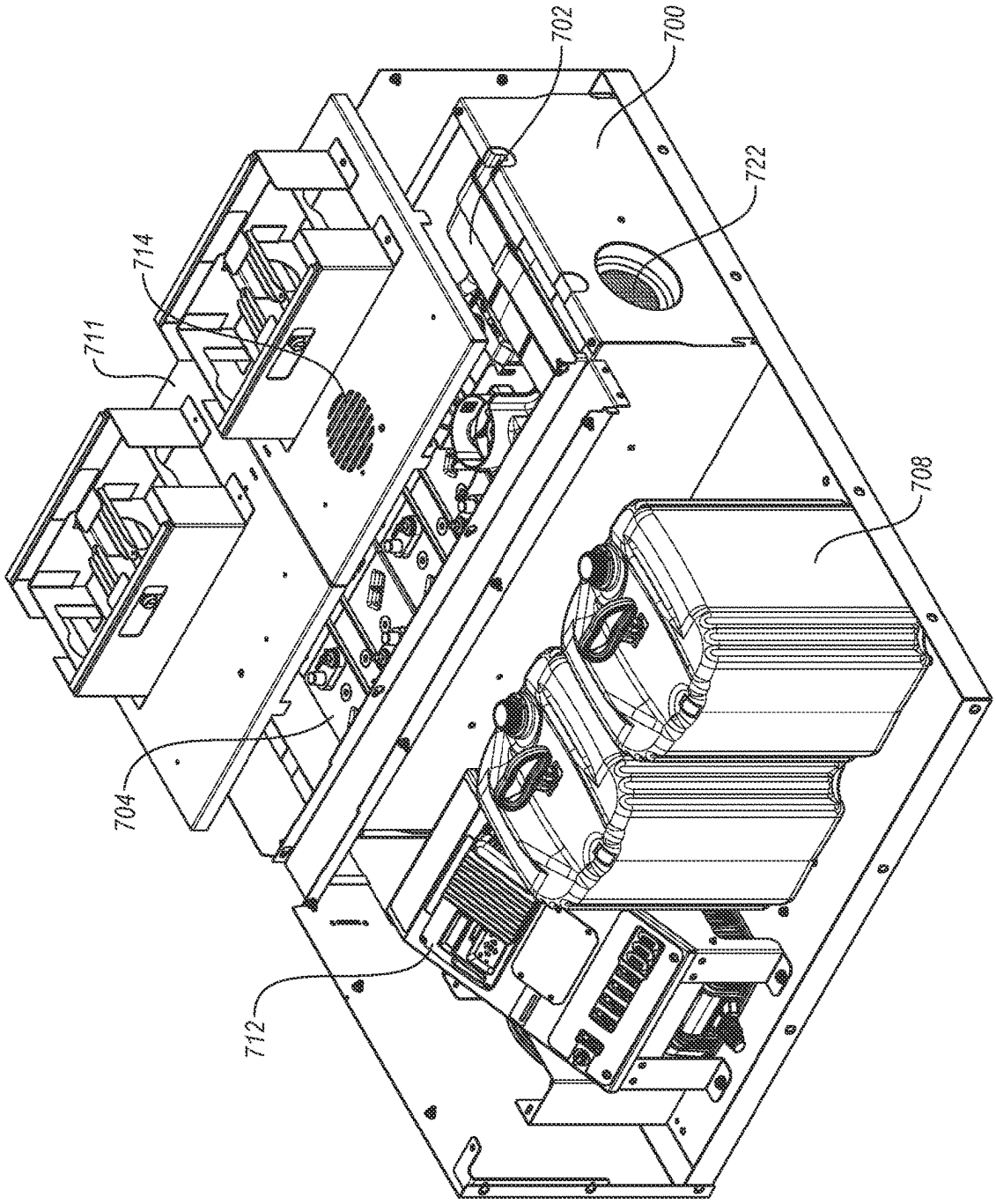


FIG. 7B

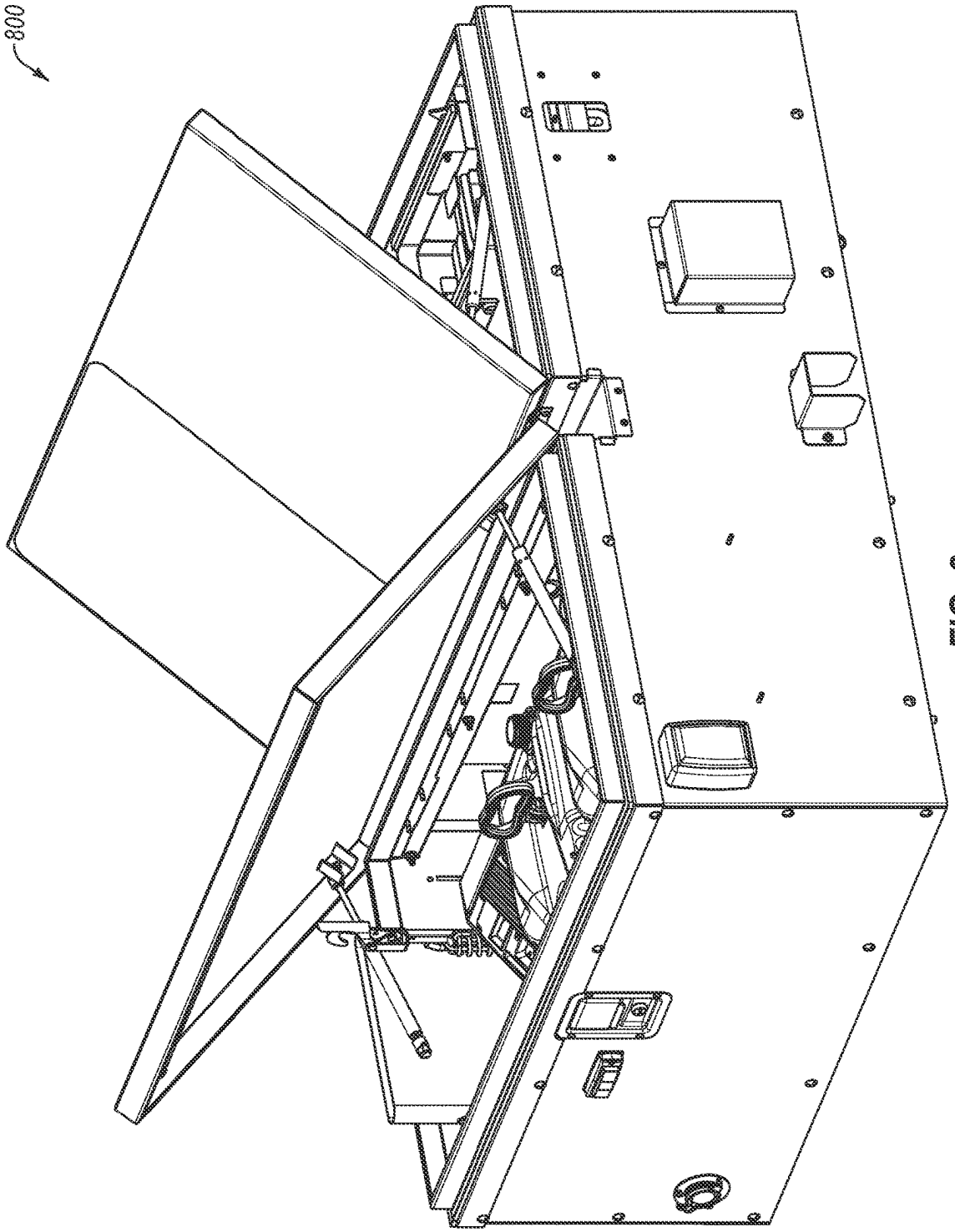


FIG. 8

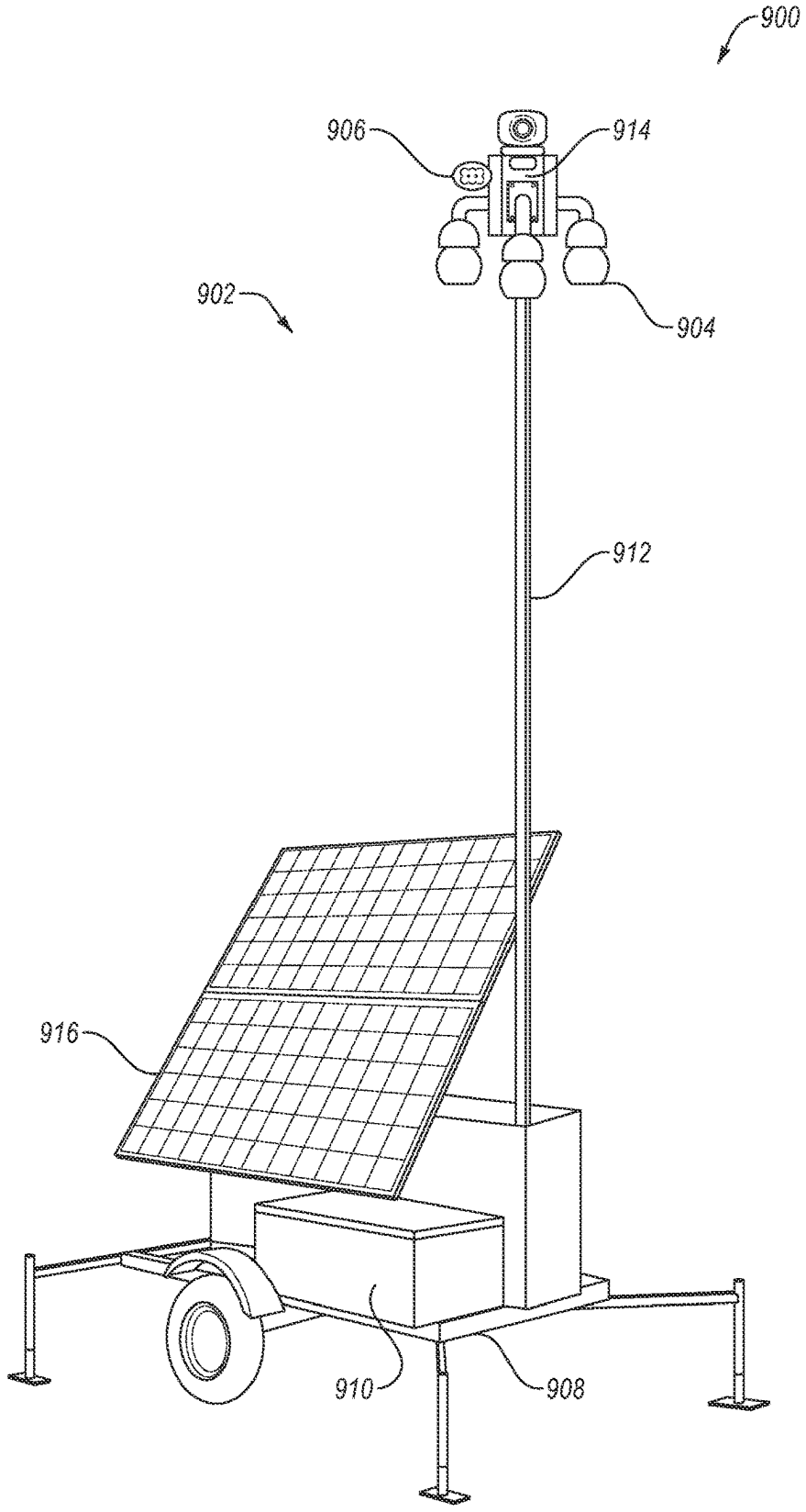


FIG. 9

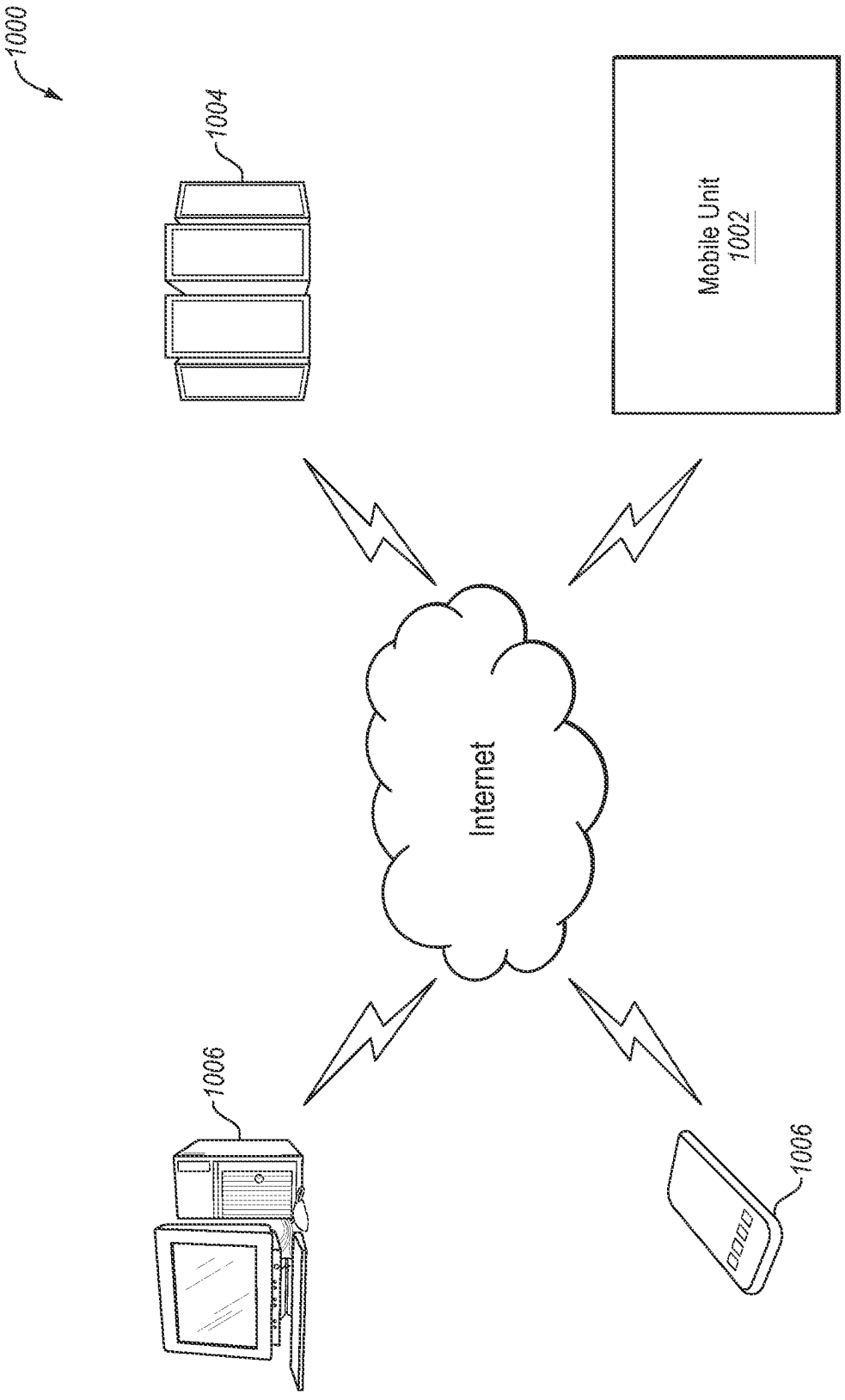


FIG. 10

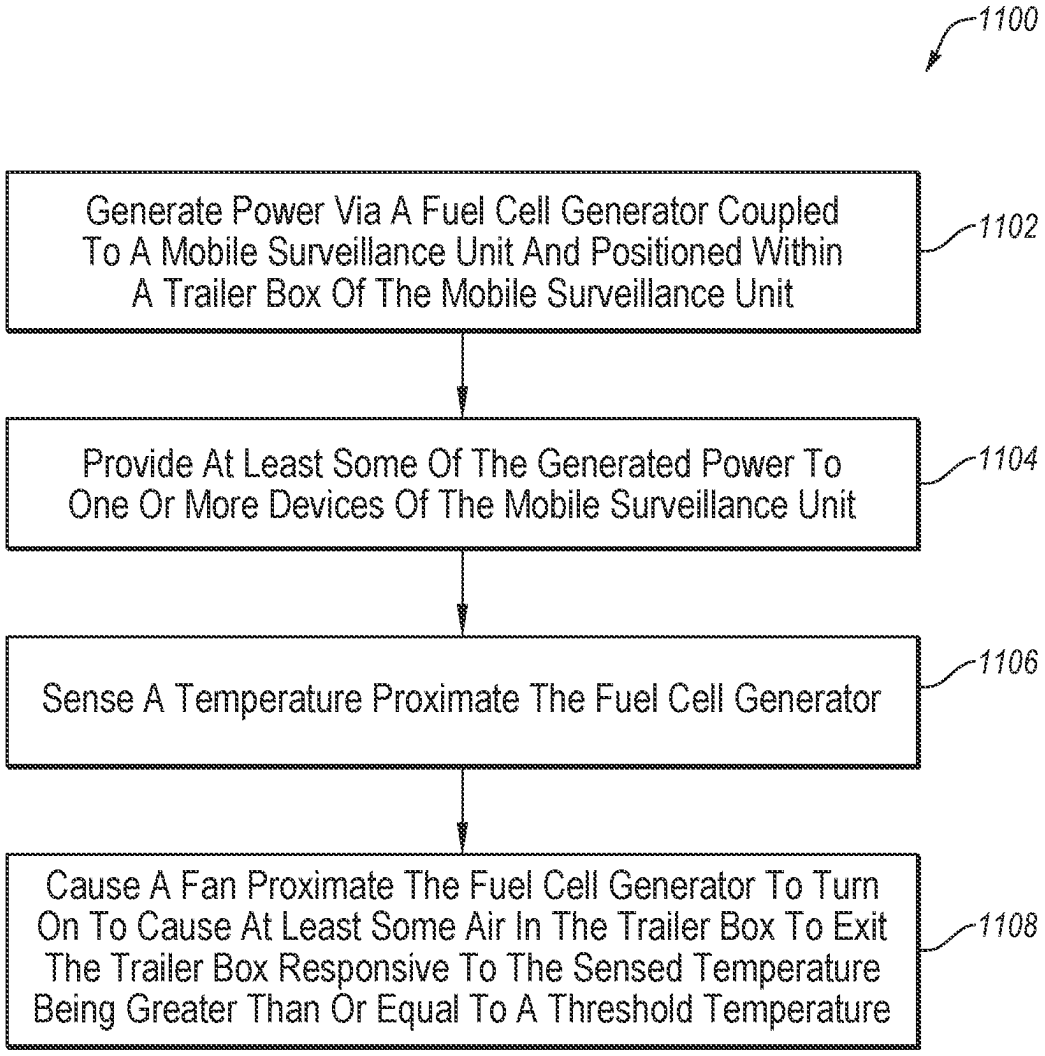

1100
Generate Power Via A Fuel Cell Generator Coupled To A Mobile Surveillance Unit And Positioned Within A Trailer Box Of The Mobile Surveillance Unit
1102
Provide At Least Some Of The Generated Power To One Or More Devices Of The Mobile Surveillance Unit
1104
Sense A Temperature Proximate The Fuel Cell Generator
1106
Cause A Fan Proximate The Fuel Cell Generator To Turn On To Cause At Least Some Air In The Trailer Box To Exit The Trailer Box Responsive To The Sensed Temperature Being Greater Than Or Equal To A Threshold Temperature
1108

FIG. 11

POWER GENERATOR TEMPERATURE REGULATION, AND ASSOCIATED SYSTEMS, DEVICES, MOBILE UNITS, AND METHODS

TECHNICAL FIELD

[0001] This disclosure relates generally to temperature regulation and, more specifically, to power generator temperature regulation, and to related devices, systems, mobile units, and methods.

BACKGROUND

[0002] Mobile units, such as mobile surveillance units, which may include a number of sensors and/or a number of output devices, may be positioned in a remote environment for providing surveillance and/or security in and/or around the remote environment.

[0003] In some applications, a mobile unit may include one or more solar panels for providing power to one or more devices of the mobile unit. However, as will be appreciated, solar energy has various limitations due to the lack of sunlight as a result of, for example, storms and/or overcast skies, shorter daylight hours (e.g., during winter), and/or other obstacles that may prevent sunlight radiation from reaching a solar panel.

[0004] Other power generators, such as fuel cell power generators, may also be used with mobile units. However, due to extreme and ever-changing weather and temperature conditions in an environment wherein a mobile unit is positioned, regulating a power generator of a mobile unit for optimal performance has proven to be challenging.

BRIEF SUMMARY

[0005] At least one embodiment of the disclosure includes a system including a mobile surveillance unit. The system may include a mobile surveillance unit comprising at least one controller and a fuel cell generator coupled to the controller. The mobile surveillance unit may also include a temperature regulator proximate the power generator. The temperature regulator may include a temperature sensor coupled to the controller and configured for sensing a temperature near the power generator, and a fan system including a fan. The controller may be configured to receive a signal from the temperature sensor indicative of the sensed temperature and generate a control signal to turn the fan on based on the sensed temperature being greater than or equal to a threshold temperature.

[0006] Another embodiment includes a method of operating a mobile surveillance unit. The method may include generating power via a fuel cell generator coupled to a mobile surveillance unit and positioned within a trailer box of the mobile surveillance unit. The method may also include providing at least some of the generated power to one or more devices of the mobile surveillance unit. Further, the method may include sensing a temperature proximate the fuel cell generator. Also, the method may include causing a fan proximate the fuel cell generator to turn on to cause at least some air in the trailer box to exit the trailer box responsive to the sensed temperature being greater than or equal to a threshold temperature.

[0007] Other embodiments may include a mobile surveillance unit. The mobile surveillance unit may include a trailer, a storage box coupled to the trailer, a mast coupled to the trailer, and a head unit coupled to the mast. The head unit may include a controller, a number of sensors, and a number of output devices. The storage box may include at least one battery, a power generator, and a temperature regulator proximate the power generator. The temperature regulator may include a temperature sensor for sensing a temperature proximate the power generator, and a fan system including a fan. The controller may be configured to receive a signal from the temperature sensor indicative of the sensed temperature. The controller may also be configured to generate a control signal to control operation of the fan system based on the sensed temperature.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** depicts an example system including a mobile unit, in accordance with one or more embodiments of the disclosure.

[0009] FIGS. **2**A-**2**C illustrate examples of a mobile unit, in accordance with various embodiments of the disclosure.

[0010] FIG. **3** is a block diagram illustration of a system including a mobile unit, in accordance with various embodiments of the disclosure.

[0011] FIG. **4** depicts an example system including a power generator and fan within a housing, in accordance with various embodiments of the disclosure.

[0012] FIG. **5** depicts an example system including a power generator, a portion of an example housing, and an example fan system, according to various embodiments of the disclosure.

[0013] FIG. **6**A illustrates an example fan system including a fan, in accordance with various embodiments of the disclosure.

[0014] FIG. **6**B is another illustration of an example fan system including a fan, in accordance with various embodiments of the disclosure.

[0015] FIGS. **7**A and **7**B illustrate a portion of an example storage box including a power generator, fuel for the power generator, and a number of batteries, according to various embodiments of the disclosure.

[0016] FIG. **8** depicts an example storage box for holding a power generator, in accordance with various embodiments of the disclosure.

[0017] FIG. **9** depicts an example system including a mobile unit, in accordance with various embodiments of the disclosure.

[0018] FIG. **10** depicts an example system including a mobile unit, a server, and one or more devices, in accordance with various embodiments of the disclosure.

[0019] FIG. **11** is a flowchart illustrating an example method of operating a mobile unit, according to various embodiments of the disclosure.

DETAILED DESCRIPTION

[0020] Referring in general to the accompanying drawings, various embodiments of the present disclosure are illustrated to show example embodiments related to regulating temperature of and/or near a power generator. It should be understood that the drawings presented are not meant to be illustrative of actual views of any particular portion of an actual circuit, device, system, or structure, but are merely representations which are employed to more clearly depict various embodiments of the disclosure.

[0021] The following provides a more detailed description of the present disclosure and various representative embodiments thereof. In this description, functions may be shown in block diagram form in order not to obscure the present disclosure in unnecessary detail. Additionally, block definitions and partitioning of logic between various blocks is exemplary of a specific implementation. It will be readily apparent to one of ordinary skill in the art that the present disclosure may be practiced by numerous other partitioning solutions. For the most part, details concerning timing considerations and the like have been omitted where such details are not necessary to obtain a complete understanding of the present disclosure and are within the abilities of persons of ordinary skill in the relevant art.

[0022] As will be appreciated, some devices (e.g., electronic devices) may function properly in one temperature range but not in another temperature range. More specifically, for example, in some conventional systems, a power generator (e.g., a fuel cell generator) system may be configured to operate in one extreme temperature condition (i.e., either hot or cold temperatures), but not both. As will also be appreciated, it may be ideal for a device (e.g., a mobile unit including a power generator) to operate in a range of extreme temperature environments (e.g., hot conditions during summer months, cold/freezing conditions during winter months). Also, due to its mobile nature, a single mobile unit may be positioned in one location (e.g., southern Arizona) during one time period (e.g., summer) and another location (e.g., Minnesota) during another time period (e.g., winter). Various embodiments disclosed herein may enable a device (e.g., a mobile unit including a power generator) to function properly over a wide range of temperatures.

[0023] As will further be appreciated, various embodiments of the disclosure, as described more fully herein, provide a technical solution to one or more problems that arise from technology that could not reasonably be performed by a person, and various embodiments disclosed herein are rooted in computer technology in order to overcome the problems and/or challenges described below. Further, at least some embodiments disclosed herein may improve computer-related technology by allowing computer performance of a function not previously performable by a computer.

[0024] Embodiments of the disclosure will now be explained with reference to the accompanying drawings.

[0025] FIG. **1** illustrates an example system **100**, according to one or more embodiments of the disclosure. System **100**, which may include a security and/or surveillance system, includes a unit **102**, which may also be referred to herein as a "mobile unit," a "mobile security unit," a "mobile surveillance unit," a "physical unit," or some variation thereof. According to various embodiments, unit **102** may include one or more sensors (e.g., cameras, weather sensors, motion sensors, noise sensors, chemical sensors, without limitation) **104** and one or more output devices **106** (e.g., lights, speakers, electronic displays, without limitation). For example only, sensors **104** may include one or more cameras, such as thermal cameras, infrared cameras, optical cameras, PTZ cameras, bi-spectrum cameras, any other camera, or any combination thereof. Further, for example only, output devices **106** may include one or more lights (e.g., flood lights, strobe lights (e.g., LED strobe lights), and/or other lights), one or more speakers (e.g., two-way public address (PA) speaker systems), any other suitable output device (e.g., a digital display), or any combination thereof.

[0026] In some embodiments, unit **102** may also include one or more storage devices **108**. Storage device **108**, which may include any suitable storage device (e.g., a memory card, hard drive, a digital video recorder (DVR)/network video recorder (NVR), internal flash media, a network attached storage device, or any other suitable electronic storage device), may be configured for receiving and storing data (e.g., video, images, and/or i-frames) captured by sensors **104**. In some embodiments, during operation of unit **102**, storage device **108** may continuously record data (e.g., video, images, i-frames, and/or other data) captured by one or more sensors **104** (e.g., cameras, lidar, radar, environmental sensors, acoustic sensors, without limitation) of unit **102** (e.g., 24 hours a day, 7 days a week, or any other time scenario).

[0027] Unit **102** may further include a computer **110**, which may include memory and/or any suitable processor, controller, logic, and/or other processor-based device known in the art. Moreover, although not shown in FIG. **1**, unit **102** may include one or more additional devices including, but not limited to, one or more microphones, one or more solar panels, one or more power generators (e.g., fuel cell generators), or any combination thereof. Unit **102** may also include a communication device (e.g., a modem (e.g., a cellular modem, a satellite modem, a Wi-Fi modem, etc.)) **112** that may comprise any suitable and known communication device, which may be coupled to sensors **104**, output devices **106**, storage device **108**, and/or computer **110** via wired connections, wireless connections, or a combination thereof. In some embodiments, communication device **112** may include one or more radios and/or one or more antennas.

[0028] System **100** may further include one or more electronic devices **113**, which may comprise, for example only, a mobile device (e.g., mobile phone, tablet, etc.), a desktop computer, or any other suitable electronic device including a display. Electronic device **113** may be accessible to one or more end-users. Additionally, system **100** may include a server **116** (e.g., a cloud server), which may be remote from unit **102**. Communication device **112**, electronic devices **113**, and server **116** may be coupled to one another via the Internet **114**.

[0029] According to various embodiments of the disclosure, unit **102** may be within a first location (a "remote location," "camera location" or a "unit location"), and server **116** may be within a second location, remote from the first location. In addition, each electronic device **113** may or may not be remote from unit **102** and/or server **116**. As will be appreciated by a person having ordinary skill in the art, system **100** may be modular, expandable, and/or scalable.

[0030] As noted above, in some embodiments, unit **102** may include a mobile unit (e.g., a mobile security/surveillance unit). In these and other embodiments, unit **102** may include a portable trailer (not shown in FIG. **1**), a storage box (e.g., including one or more batteries and/or a power generator) (not shown in FIG. **1**), and a mast (not shown in FIG. **1**) coupled to a head unit (e.g., including, for example, one or more cameras, one or more lights, one or more speakers, and/or one or more microphones) (not shown in FIG. **1**). According to various examples, in addition to sensors (e.g., sensors **104**) and output devices (e.g., output

devices **106**), a head unit of unit **102** may include and/or may be coupled to storage device **108**, computer **110**, and/or communication device **112**.

[0031] Non-limiting examples of unit **102** are shown in FIGS. **2**A-**2**C. More specifically, FIG. **2**A illustrates a mobile unit **202** including a trailer, a storage box, a mast, and a head unit; FIG. **2**B illustrates a head unit **210** (i.e., of a mobile unit) including a number of lights, a number of cameras, and a speaker; and FIG. **2**C is another depiction of a head unit **220** (i.e., of a mobile unit) including a number of lights, a number of cameras, and a speaker. As an example, a mobile unit may be configured to be positioned in an environment (e.g., a parking lot, a roadside location, a construction zone, a concert venue, a sporting venue, a school campus, without limitation).

[0032] According to various embodiments, a mobile unit (e.g., unit **102**) may include one or more power generators (e.g., one or more fuel cell generators, such as one or more EFOY® fuel cells made by SFC Energy AG of Brunnthal, Germany). In some examples, a power generator, such as a fuel cell generator, may be used to provide power to a mobile unit (e.g., in the event sufficient power is not generated via one or more solar panels).

[0033] FIG. **3** includes a block diagram of an example system **300**, in accordance with various embodiments of the disclosure. System **300** includes a controller **302**, a switch **304**, a modem **306**, and a reel **308**, which may include a power and/or Ethernet reel. For example, in some embodiments, controller **302**, switch **304**, and modem **306** may be positioned within a head unit (e.g., head unit **210** and/or head unit **220**) of a mobile unit, and reel **308**, which may be part of the mobile unit, may be configured to provide power and/or Ethernet to and/or from one or more components of the head unit. As will be appreciated, modem **306** may be configured to enable communication with a remote device and/or system (e.g., remote from a mobile unit), such as one or more servers **309** (e.g., server **116** of FIG. **1**) and/or devices **310** (e.g., electronic device **113** of FIG. **1**).

[0034] System **300** may further include a switch **312**, a converter (e.g., Ethernet to serial converter) **314**, a charge controller **316**, and an I/O device **318**. For example, switch **312**, charger controller **316**, and/or I/O device **318** may be positioned within a box (e.g., a storage box coupled to a base of the mobile unit) (e.g., a box **408** of FIG. **4**) of a mobile unit. In addition, system **300** may include one or more power generators **320** and a temperature regulator system **321**, which may include a heat trace **322**, a temperature sensor **323**, and a fan system **324**. For example, fan system **324** may include a fan and a housing. For example, power generator (s) **320** and temperature regulator system **321** may be positioned within a box of a mobile unit (e.g., a storage box coupled to a base of the mobile unit). In some embodiments, temperature sensor **323** may be within (e.g., part of) power generator **320**. In other embodiments, temperature sensor **323** may be a standalone temperature sensor.

[0035] According to various embodiments, temperature sensor **323** may be configured to sense a temperature (e.g., continuously, periodically, and/or in response to a trigger) in or near power generator **320**, and data indicative thereof may be received by controller **302**, which may compare the sensed temperature to one or more threshold temperatures. Further, based on the sensed temperature in or near power generator **320**, a signal may be conveyed (e.g., from controller **302**) to control a fan of fan system **324**. For example, if the sensed temperature is equal to or greater than a threshold temperature, a fan of fan system **324** may be turned on such that at least some air around power generator **320** is pulled (or pushed) out of an enclosure (e.g., a housing) including power generator **320** (i.e., and toward an exit vent). As another example, if the sensed temperature is less than the threshold temperature (or another temperature), a fan of fan system **324** may be turned off (or remain off) such that at least some air around power generator **320** remains in or near power generator **320**. As another example, rather than turning the fan off, a rotation of the fan may be such that air is blown away from an exit vent (e.g., recirculated within an enclosure including power generator **320**). Further, in some embodiments, based on the sensed temperature, a speed of the fan may be controlled (e.g., higher fan speed in response to a higher sensed temperature, a lower fan speed in response to a lower sensed temperature, etc.).

[0036] As noted above, a system (e.g., system **300**) may include a power generator (e.g., power generator **320**) and a fan system (e.g., fan system **324**) including a fan within a fan housing positioned proximate a power generator. For example, with reference to FIG. **4**, a system **400**, including a power generator **402** and a fan system including a fan **404** within a housing **406**, in accordance with various embodiments, is shown. According to various embodiments, power generator **402** and housing **406** may be positioned within a housing **407**, which may be positioned within a box **408** (also referred to herein as a "storage box," "enclosure," or a "container"). In some examples, box **408** may be coupled to a base (e.g., of trailer of a mobile unit). Box **408** may include additional space **410** for housing additional devices, such as one or more batteries, fuel (e.g., for a fuel cell), a controls enclosure, and/or other devices and/or equipment.

[0037] During a contemplated operation of system **400**, a sensor (not shown in FIG. **4**; e.g., temperature sensor **323** of FIG. **3**) may sense a temperature (e.g., continuously or periodically) in and/or near power generator **402**, and, in response to the sensed temperature being equal to or greater than a threshold temperature (e.g., 100 degrees Fahrenheit, 105 degrees Fahrenheit, 108 degrees Fahrenheit, or any other temperature), fan **404** may be turned on such that air in and/or near power generator **402** may be pulled away from power generator **402** along path **412** and out of box **408**, as indicated by arrow **414**. For example, blades of fan **404** may rotate in a direction such that air is moved away from power generator **402** along path **412** and out of box **408**, as indicated by arrow **414**. As will be appreciated, in this example, air (e.g., cooler air) may be moved into box **408** via opening **422**. Further, if fan **404** is on and the sensed temperature drops below a temperature (e.g., the threshold temperature or another temperature), fan **404** may be turned off (e.g., such that at least some of the air remains in box **408**). In other embodiments, if the sensed temperature drops below a temperature (e.g., the threshold temperature or another temperature), fan **404** may be turned on (or remain on) and the blades of fan **404** may rotate in a direction such that air flows along path **416**/**418** into space **410** and/or back toward generator **402** via path **416**/**420**. Causing air (e.g., warm air) to remain in box may be beneficial (e.g., in cold temperatures), such as providing heat around one or more batteries and/or other components.

[0038] FIG. **5** depicts an example system **500**, according to various embodiments. System **500** includes a fuel cell

generator **502**, a housing **504** (i.e., for coupling to fuel cell generator **502**), and a fan system **506**. FIG. **5** further depicts an exhaust drain tube **508**, a fuel manager **510**, and a heat trace **512**.

[0039] FIGS. **6**A and **6**B illustrate a fan system **600**, according to various embodiments of the disclosure. More specifically, FIG. **6**A depicts fan system **600** in a disassembled state, showing housing portions **608**A and **608**B and a fan **610**. FIG. **6**B depicts fan system **600** in an assembled state. As shown in each of FIGS. **6**A and **6**B, housing **608** includes an opening **612** (e.g., for enabling air to flow out of, for example, box **408**, as indicated by arrow **414** shown in FIG. **4**). Housing **608** further includes an opening **614** to enable air in and/or near power generator **402** to flow away from power generator **402** along path **412** and/or path **416**, as shown in FIG. **4**.

[0040] FIG. **7**A depicts a portion of an example housing **700**, a fuel cell generator **702**, batteries **704**, fuel cell cartridges **708**, and a fan housing **710** posited proximate fuel cell generator **702**. FIG. **7**B is another illustration of an example housing **700**, fuel cell generator **702**, batteries **704**, fuel cell cartridges **708**, and a portion of a cover **711**, which may include any suitable material (e.g., foam). Cover **711** may include a vent **714**, which may enable air to flow out of housing **700** (e.g., as indicated by arrow **414** shown in FIG. **4**). Also, housing **700** may include a vent **722**, which may enable air to flow into housing **700** (e.g., via opening **422** of FIG. **4**). Other devices (e.g., control enclosure **712**) are also shown in FIG. **7**B.

[0041] FIG. **8** depicts an example box **800**, according to various embodiments of the disclosure. For example, box **800** may be sized and configured to receive at least one power generator (e.g., power generator **320** of FIG. **3**) and a temperature regulator (e.g., temperature regulator system **321** of FIG. **3**), which may include a temperature sensor and a fan system (e.g., fan system **324** of FIG. **3** and/or fan system **600** of FIGS. **6**A and **6**B). Further, in some examples, box **800** may be part of a mobile unit (e.g., unit **102** of FIG. **1**, unit **202** of FIG. **2**A, a unit **902** of FIG. **9**, and/or a mobile unit **1002** of FIG. **10**). As a more specific example, box **800** may be coupled to a trailer (e.g., a trailer **908** of FIG. **9**) of a mobile surveillance unit.

[0042] FIG. **9** depicts another example system **900** including a unit **902**, in accordance with various embodiments of the disclosure. Unit **902**, which may also be referred to herein as a "mobile unit," a "mobile security unit," a "live unit," or a "physical unit," may be configured to be positioned in an environment (e.g., a parking lot, a roadside location, a construction zone, a concert venue, a sporting venue, a school campus, without limitation). In some embodiments, unit **902** may include one or more sensors **904** (e.g., cameras, weather sensors, motion sensors, noise sensors, without limitation) and one or more output devices **906** (e.g., lights, speakers, electronic displays, without limitation). Unit **902** may also include at least one storage device (e.g., internal flash media, a network attached storage device, or any other suitable electronic storage device), which may be configured for receiving and storing data (e.g., video, images, audio, without limitation) captured by one or more sensors of unit **902**. According to some embodiments, unit **902** may include or may be part of at least a portion of system **100** of FIG. **1**, system **300** of FIG. **3**, system **400** of FIG. **4**, system **500** of FIG. **5**, system **600** of FIGS. **6**A and **6**B, housing **700** of FIG. **7**, and/or box **800** of FIG. **8**.

[0043] In some embodiments, unit **902** may include a mobile security unit. In these and other embodiments, unit **902** may include a portable trailer **908**, a storage box **910** (e.g., box **800** of FIG. **8**), and a mast **912** coupled to a head unit **914**, which may include, for example, one or more batteries, one or more cameras, one or more lights, one or more speakers, and/or one or more microphones. According to some embodiments, a first end of mast **912** may be proximate storage box **910** and a second, opposite end of mast **912** may be proximate, and possibly adjacent, head unit **914**. More specifically, in some embodiments, head unit **914** may be coupled to mast **912** at an end opposite an end of mast **912** proximate storage box **910**.

[0044] In some examples, unit **902** may include one or more primary batteries (e.g., within storage box **910**) and one or more secondary batteries (e.g., within head unit **914**). In these embodiments, a primary battery positioned in storage box **910** may be coupled to one or more loads and/or a secondary battery positioned within head unit **914** via, for example, a cord reel (e.g., reel **308** of FIG. **3** (e.g., configured for Ethernet and/or power)).

[0045] In some embodiments, unit **902** may also include one or more solar panels **916**, which may provide power to one or more batteries of unit **902**. More specifically, according to some embodiments, one or more solar panels **916** may provide power to a primary battery within storage box **910**. As noted herein, unit **902** may also include one or more additional power sources, such as one or more generators (e.g., fuel cell generators), which may be positioned within storage box **910**.

[0046] FIG. **10** depicts a system **1000**, in accordance with various embodiments of the disclosure. System **1000** includes a mobile unit **1002**, a server **1004**, and one or more devices **1006**. In one non-limiting example, mobile unit **1002** includes mobile unit **902** (see FIG. **9**), server **1004** may include a cloud server or any other server, and device(s) **1006** may include an electronic device, such as a user device (e.g., mobile phone, tablet, etc.), a desktop computer, or any other suitable electronic device (e.g., including a display). According to various embodiments, each of server **1004** and device(s) **1006** may be remote from mobile unit **1002**.

[0047] According to various embodiments of the present disclosure, mobile unit **1002**, which includes a modem (e.g., communication device **112** of FIG. **1**), may be within a first location (a "camera location" or a "remote location"), and server **1004** may be within a second location, remote from the camera location. In addition, in at least some examples, electronic device **1006** may be remote from the camera location and/or server **1004**. As will be appreciated by a person having ordinary skill in the art, system **1000** is modular, expandable, and scalable.

[0048] FIG. **11** is a flowchart of an example method **1100** of operating a mobile surveillance unit, according to various embodiments of the disclosure. More specifically, for example, method **1100** may be related to regulating temperature proximate at least one power generator of a mobile surveillance unit. Method **1100** may be arranged in accordance with at least one embodiment described in the disclosure. Method **1100** may be performed, in some embodiments, by a device or system, such as system **100** of FIG. **1**, system **300** of FIG. **3**, system **400** of FIG. **4**, system **500** of FIG. **5**, system **600** of FIG. **6**A and FIG. **6**B, system **900** of FIG. **9**, and/or system **1000** of FIG. **10**, or another device or system. Although illustrated as discrete blocks, various

blocks may be divided into additional blocks, combined into fewer blocks, or eliminated, depending on the desired implementation.

[0049] Method **1100** may begin at block **1102**, wherein power is generated via a fuel cell generator positioned within a trailer box of a mobile surveillance unit, and method **1100** may proceed to block **1104**. For example, power generator **320** (see FIG. **3**), which may include a fuel cell generator, may be positioned within box **800** (see FIG. **8**) of the mobile surveillance unit (e.g., mobile unit **1002** of FIG. **10**) and may be configured to generate power.

[0050] At block **1104**, at least some of the generated power may be provided to one or more devices of the mobile surveillance unit, and method **1100** may proceed to block **1106**. For example, at least some of the generated power may be provided to one or more batteries (e.g., batteries **704** of FIGS. **7**A and **7**B), a controller (e.g., controller **302** of FIG. **3**), an output device (e.g., lights, speakers, etc.), a sensor (e.g., a camera, microphone, weather sensor, etc.), another device, and/or any combination thereof.

[0051] At block **1106**, a temperature proximate the fuel cell generator may be sensed, and method **1100** may proceed to block **1108**. For example, a temperature sensor (e.g., temperature sensor **323** of FIG. **3**) may sense the temperature near, around, and/or within the fuel cell generator. Further, for example, a signal indicative of the sensed temperature may be sent from the temperature sensor to a controller (e.g., controller **302** of FIG. **3**). Further, for example, the controller may compare the sensed temperature to at least one predetermined threshold temperature (e.g., approximately 105 degrees Fahrenheit or any other temperature) or threshold temperature range (e.g., a range of approximately 102 degrees Fahrenheit to approximately 108 degrees Fahrenheit, or any other temperature range).

[0052] At block **1108**, responsive to the sensed temperature being greater than or equal to a threshold temperature, a fan proximate the fuel cell generator may turn on to cause at least some air in the trailer box to exit the trailer box. For example, responsive to the sensed temperature being greater than or equal to a temperature of approximately 105 degrees Fahrenheit, the fan (e.g., fan **404** of FIG. **4** and/or fan **610** of FIGS. **6**A and **6**B) may be turned on. In some examples, a controller (e.g., controller **302** of FIG. **3**) may convey one or more signals to a fan system (e.g., fan system **324** of FIG. **3**) to cause an associated fan (e.g., fan **404** of FIG. **4** and/or fan **610** of FIGS. **6**A and **6**B) to turn on.

[0053] Modifications, additions, or omissions may be made to method **1100** without departing from the scope of the present disclosure. For example, the operations of method **1100** may be implemented in differing order. Furthermore, the outlined operations and actions are only provided as examples, and some of the operations and actions may be optional, combined into fewer operations and actions, or expanded into additional operations and actions without detracting from the essence of the disclosed embodiment. For example, responsive to a sensed temperature being less than a temperature (e.g., the threshold temperature), the fan may be turned off (or a fan direction may be changed) (e.g., via one or more controls signals generated via a controller, such as controller **302** of FIG. **3**).

[0054] As will be appreciated by persons having ordinary skill in the art, in contrast to conventional systems, which are configured to operate in only one temperature condition (i.e., either hot or cold), various embodiments may enable a device (e.g., a mobile unit), and more specifically, a power generator or a device, to operate in a range of extreme environments (e.g., hot conditions during summer months and cold/freezing conditions during winter months).

[0055] In accordance with common practice, the various features illustrated in the drawings may not be drawn to scale. The illustrations presented in the disclosure are not meant to be actual views of any particular apparatus (e.g., device, system, etc.) or method, but are merely idealized representations that are employed to describe various embodiments of the disclosure. Accordingly, the dimensions of the various features may be arbitrarily expanded or reduced for clarity. In addition, some of the drawings may be simplified for clarity. Thus, the drawings may not depict all of the components of a given apparatus (e.g., circuit, device, or system) or all operations of a particular method.

[0056] Terms used herein and especially in the appended claims (e.g., bodies of the appended claims) are generally intended as "open" terms (e.g., the term "including" should be interpreted as "including, but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes, but is not limited to," etc.).

[0057] Additionally, if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (e.g., "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. As used herein, "and/or" includes any and all combinations of one or more of the associated listed items.

[0058] In addition, even if a specific number of an introduced claim recitation is explicitly recited, it is understood that such recitation should be interpreted to mean at least the recited number (e.g., the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." or "one or more of A, B, and C, etc." is used, in general such a construction is intended to include A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B, and C together, etc. For example, the use of the term "and/or" is intended to be construed in this manner.

[0059] Further, any disjunctive word or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" should be understood to include the possibilities of "A" or "B" or "A and B."

[0060] As used herein, the term "approximately" or the term "substantially" in reference to a given parameter,

property, or condition means and includes to a degree that one of ordinary skill in the art would understand that the given parameter, property, or condition is met with a degree of variance, such as within acceptable tolerances. By way of example, depending on the particular parameter, property, or condition that is substantially met, the parameter, property, or condition may be at least 90.0 percent met, at least 95.0 percent met, at least 99.0 percent met, at least 99.9 percent met, or even 100.0 percent met.

[0061] As used herein, the term "approximately" or the term "about," when used in reference to a numerical value for a particular parameter, is inclusive of the numerical value and a degree of variance from the numerical value that one of ordinary skill in the art would understand is within acceptable tolerances for the particular parameter. For example, "about," in reference to a numerical value, may include additional numerical values within a range of from 90.0 percent to 110.0 percent of the numerical value, such as within a range of from 95.0 percent to 105.0 percent of the numerical value, within a range of from 97.5 percent to 102.5 percent of the numerical value, within a range of from 99.0 percent to 101.0 percent of the numerical value, within a range of from 99.5 percent to 100.5 percent of the numerical value, or within a range of from 99.9 percent to 100.1 percent of the numerical value.

[0062] Additionally, the use of the terms "first," "second," "third," etc., are not necessarily used herein to connote a specific order or number of elements. Generally, the terms "first," "second," "third," etc., are used to distinguish between different elements as generic identifiers. Absence a showing that the terms "first," "second," "third," etc., connote a specific order, these terms should not be understood to connote a specific order. Furthermore, absence a showing that the terms "first," "second," "third," etc., connote a specific number of elements, these terms should not be understood to connote a specific number of elements.

[0063] The embodiments of the disclosure described above and illustrated in the accompanying drawings do not limit the scope of the disclosure, which is encompassed by the scope of the appended claims and their legal equivalents. Any equivalent embodiments are within the scope of this disclosure. Indeed, various modifications of the disclosure, in addition to those shown and described herein, such as alternative useful combinations of the elements described, will become apparent to those skilled in the art from the description. Such modifications and embodiments also fall within the scope of the appended claims and equivalents.

What is claimed:

1. A system including a mobile surveillance unit, the system comprising:

the mobile surveillance unit including:

at least one controller;

a fuel cell generator coupled to the controller;

a temperature sensor coupled to the at least one controller and configured for sensing a temperature adjacent the fuel cell generator; and

a fan system coupled to the at least one controller and including a fan positioned adjacent the fuel cell generator;

wherein the at least one controller is configured to:

receive a signal from the temperature sensor indicative of the sensed temperature; and

generate a control signal to turn the fan on based on the sensed temperature being greater than or equal to a threshold temperature.

2. The system of claim **1**, wherein the fuel cell generator includes the temperature sensor.

3. The system of claim **1**, wherein the threshold temperature comprises a temperature of approximately 105 degrees Fahrenheit.

4. The system of claim **1**, wherein the threshold temperature comprises a temperature in the range of approximately 102 degrees Fahrenheit to approximately 108 degrees Fahrenheit.

5. The system of claim **1**, wherein the mobile surveillance unit further comprises:

a box including the fuel cell generator and at least one battery; and

a head unit including the at least one controller, at least one sensor, and at least one output device.

6. The system of claim **1**, wherein the mobile surveillance unit further comprises a box including the fuel cell generator, the temperature sensor, and at least one battery, wherein responsive to the fan being turned on, at least some air within the box is forced out of the box.

7. The system of claim **1**, wherein the at least one controller is further configured to generate another, different control signal to turn the fan off based on the sensed temperature being less than the threshold temperature.

8. The system of claim **7**, wherein the mobile surveillance unit further comprises a box including the fuel cell generator, the temperature regulator, and at least one battery, wherein responsive to the fan being turned off, at least some air within the box remains in the box.

9. The system of claim **1**, wherein the mobile surveillance unit further comprises a housing including the fuel cell generator and the temperature regulator.

10. The system of claim **9**, wherein the mobile surveillance unit further comprises a trailer and a box coupled to the trailer, the box comprising the housing, one or more batteries, and fuel for the fuel cell generator.

11. A method of operating a mobile surveillance unit, the method comprising:

generating power via a fuel cell generator coupled to a mobile surveillance unit and positioned with a trailer box of the mobile surveillance unit;

providing at least some of the generated power to one or more devices of the mobile surveillance unit;

sensing a temperature proximate the fuel cell generator; and

causing a fan proximate the fuel cell generator to turn on to cause at least some air in the trailer box to exit the trailer box responsive to the sensed temperature being greater than or equal to a threshold temperature.

12. The method of claim **11**, wherein causing the fan to turn on comprises causing the fan to turn on responsive to the sensed temperature being greater than or equal to approximately 105 degrees Fahrenheit.

13. The method of claim **11**, further comprising responsive to the sensed temperature being less than the threshold temperature, causing the fan to turn off such that at least some air within the trailer box remains in the trailer box.

14. The method of claim **11**, wherein causing the fan to turn off comprises causing the fan to turn off responsive to the sensed temperature being less than approximately 105 degrees Fahrenheit.

15. The method of claim **11**, further comprising comparing the sensed temperature to the threshold temperature.

16. A mobile surveillance unit, comprising:

a trailer;

a mast coupled to the trailer;

a head unit coupled to the mast and including a controller, a number of sensors, and a number of output devices; and

a storage box coupled to the trailer and including:

at least one battery;

a fuel cell generator;

a temperature regulator adjacent the fuel cell generator and including:

a temperature sensor coupled to the controller and configured for sensing a temperature proximate the fuel cell generator; and

a fan system including a fan;

wherein the controller is configured to:

receive a signal from the temperature sensor indicative of the sensed temperature; and

generate a control signal to control operation of the fan system based on the sensed temperature being greater than or equal to a threshold temperature.

17. The mobile surveillance unit of claim **16**, further comprising a temperature regulator positioned adjacent the fuel cell generator and including the temperature sensor and the fan system.

18. The mobile surveillance unit of claim **16**, wherein the fan system includes a housing at least partially around the fan, the housing positioned adjacent to the fuel cell generator.

19. The mobile surveillance unit of claim **16**, wherein the fuel cell generator includes the temperature sensor.

20. The mobile surveillance unit of claim **16**, wherein the controller is configured to:

compare the sensed temperature to the threshold temperature; and

convey the control signal to the fan system to turn the fan on responsive to the sensed temperature being greater than or equal to a threshold temperature.

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