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- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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FAUCET ASSEMBLY WITH RETRACTABLE FEATURES

INTRODUCTION

5 [0001] The information provided in this section is for the purpose of generally presenting the context of the disclosure. Work of the presently named inventors, to the extent it is described in this section, as well as aspects of the description that may not otherwise qualify as prior art at the time of filing, are neither expressly nor impliedly admitted as prior art against the present disclosure.

10 [0002] The present disclosure relates to a faucet assembly, and more particularly to a faucet assembly having retractable features.

15 [0003] Sinks are plumbing fixtures used for washing hands, dishwashing, and the like. Sinks typically include faucets, or taps, that supply water and drains that allow the water to exit the sink. Additionally, sinks for kitchens, bathrooms, and other facilities come in an array of designs and styles. Countertops and sinks are important architectural features of the facility.

SUMMARY

20 [0004] In an example, a faucet assembly is disclosed. The faucet assembly includes a retractable faucet configured to transition between a retracted position and an extended position and an actuator configured to cause the retractable faucet to transition between the retracted position and the extended position.

[0005] In other features, the retractable faucet includes a top portion that is substantially flush with a top surface of the faucet assembly when the retractable faucet is in the retracted position.

25 [0006] In other features, the faucet assembly includes at least another retractable feature including at least one of: a retractable hot water faucet, a retractable spray hose, or a retractable sponge holder.

[0007] In other features, the faucet assembly includes at least one sensor, and the one or more retractable features are configured to extend and retract based on a proximity signal generated by the at least one sensor.

30 [0008] In other features, the faucet assembly includes at least one sensor, and the one or more retractable features are configured to extend and retract based on at least one user command.

[0009] In other features, the one or more retractable features are configured to retract after a predetermined time.

[0010] In other features, the actuator comprises a linear actuator.

In other features, the faucet assembly includes a base and a sleeve disposed between the actuator and a surface of the base, and the retractable faucet is disposed within the sleeve when the retractable faucet is in the retracted position.

5 **[0011]** In other features, the actuator is disposed within the base.

[0012] In other features, the faucet assembly includes a controller that is configured to control the actuator based on an actuation signal.

[0013] In an example, a system is disclosed. The system includes a base, a retractable faucet disposed within the base and configured to transition between a retracted position and an extended position, and an actuator disposed within the base and configured to cause the retractable faucet to transition between the retracted position and the extended position.

10 **[0014]** In other features, the retractable faucet includes a top portion that is substantially flush with a top surface of the base when the retractable faucet is in the retracted position.

[0015] In other features, the system includes at least another retractable feature including at least one of: a retractable hot water faucet, a retractable spray hose, or a retractable sponge holder.

15 **[0016]** In other features, the system further includes at least one sensor, and the one or more retractable features are configured to extend and retract based on a proximity signal generated by the at least one sensor.

[0017] In other features, the system further includes at least one sensor disposed proximate to the base, and the one or more retractable features are configured to extend and retract based on at least one user command.

20 **[0018]** In other features, the one or more retractable features are configured to retract after a predetermined time.

In other features, the system includes a sleeve disposed between the actuator and a surface of the base, and the retractable faucet is disposed within the sleeve when the retractable faucet is in the retracted position.

25 **[0019]** In an example, a system is disclosed. The system includes a retractable faucet configured to transition between a retracted position and an extended position and a motor configured to cause the retractable faucet to transition between the retracted position and the extended position.

30 **[0020]** In other features, the system includes a threaded rod connected to the motor, and the threaded rod is configured to be driven by the motor. The system also includes

a follower connected to the threaded rod and connected to the retractable faucet, and the follower is configured to be linearly displaced with respect to the threaded rod when the threaded rod is driven by the motor.

5 **[0021]** In other features, the follower comprises a threaded portion that is configured to mate with the threaded rod.

[0022] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject
10 matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The detailed description is described with reference to the accompanying figures. The use of the same reference numbers in different instances in the description and the figures may indicate similar or identical items.

15 **[0024]** FIG. 1 is a cross-sectional view of a faucet assembly having retractable features in a retracted position in accordance with an example implementation of the present disclosure.

[0025] FIG. 2 is a cross-sectional view of the faucet assembly shown in FIG. 1 having retractable features in an extended position in accordance with an example
20 implementation of the present disclosure.

[0026] FIG. 3 is a cross-sectional view of an actuator in accordance with an example implementation of the present disclosure.

[0027] FIG. 4 is a cross-sectional view of a faucet assembly having retractable features in a retracted position in accordance with another example implementation of
25 the present disclosure.

[0028] FIG. 5 is a cross-sectional view of the faucet assembly shown in FIG. 4 having retractable features in an extended position in accordance with an example implementation of the present disclosure.

[0029] FIG. 6 is a cross-sectional view of an actuator in accordance with another
30 example implementation of the present disclosure.

[0030] FIG. 7 is a diagrammatic illustration of a control system for controlling the retractable features of the faucet assembly in accordance with an example implementation of the present disclosure.

[0031] FIG. 8 is a flow diagram illustrating an example method for controlling the retractable features of the faucet assembly in accordance with an example implementation of the present disclosure.

[0032] FIG. 9 is an isometric view of the faucet assembly in a retracted state in accordance with an example implementation of the present disclosure.

[0033] FIG. 10 is an isometric view of the faucet assembly in an extended state in accordance with an example implementation of the present disclosure.

[0034] FIG. 11 is a plan view of multiple faucet assemblies in accordance with an example implementation of the present disclosure.

[0035] In the drawings, reference numbers may be reused to identify similar and/or identical elements.

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DETAILED DESCRIPTION

[0036] The present disclosure is directed to a faucet assembly that includes one or more features that can transition between an extended position, or open position, and a retracted position, or closed position. As used herein, features may include a faucet, a soap dispenser, a sponge holder, a spray hose, or the like, that are used in conjunction with a faucet assembly. When in the retracted position, the features are substantially hidden such that only a top portion of the features are visible at the surface, as described in greater detail below.

[0037] FIGS. 1 through 11 illustrate various embodiments and a method for operating a retractable faucet assembly 100. The faucet assembly 100 can include multiple retractable features (e.g., devices). For example, the faucet assembly 100 can include a retractable faucet 102 configured to transition from a retracted position and an extended (non-retracted) position and an actuator that imparts linear motion (described in further detail below) configured to cause the retractable faucet 102 to transition between the retracted position and the non-retracted position upon an actuation event. The faucet assembly 100 may include other retractable features, such as a hot water dispenser 106, a sponge holder 108, and a spray hose 110 that are substantially

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hidden when in the retracted position. When in the retracted position, the top portions of the features may be flush or substantially flush with the sink base.

[0038] The faucet assembly 100 can be configured as an add-on assembly, or in some implementations, the faucet assembly 100 can form a portion of a sink (e.g., integrated within the sink base). For example, the faucet assembly 100 may comprise a half-circle or half-oval shaped assembly configured to be coupled to a back portion of a sink. The faucet assembly 100 can also include any other form factor (e.g., rectangular, trapezoidal, etc.), and in some embodiments, may be configured to be mounted within a counter top 114 (e.g., set below a counter top, above, or flush-mounted) behind the sink.

[0039] As described in greater detail herein, the faucet assembly 100 includes actuators 116-1 to 116-4 that impart linear motion on the retractable features. The actuators 116-1 to 116-4 are connected to the corresponding features so that each linear actuator 116-1 to 116-4 causes the corresponding feature to transition between the retracted position and the extended position, or vice versa, in response to the actuation event. It is understood that the faucet assembly 100 may include additional or fewer linear actuators according to the configuration of the faucet assembly 100.

[0040] In some implementations, the actuators 116-1 to 116-4 comprise any suitable actuator that imparts linear displacement on the retractable features. For example, the linear actuators 116-1 to 116-4 may comprise hydraulic actuators, pneumatic actuators, piezoelectric actuators, electro-mechanical actuators, or the like.

[0041] In an example implementation, as illustrated in FIGS. 1 and 2, the actuators 116-1 to 116-4 include a corresponding motor 115-1 to 115-4. In some implementations, the motors 115-1 to 115-4 may comprise servo motors, or the like.

[0042] The faucet assembly 100 includes sleeves 122-1 to 122-4. The sleeves can be attached to a base 119 of the faucet assembly 100. The sleeves 122-1 to 122-4 retain the corresponding retractable feature (e.g., faucet, sponge holder, hand spray dispenser, etc.) while the retractable feature is in the retracted position and may be comprised of any suitable material, such as polyvinyl chloride (PVC), metal, or the like.

[0043] Each of the actuators 116-1 to 116-4 is connected to a power supply 124. The power supply 124 may generate one or more voltages of power for distribution. For example, the power supply 124 may include one or more voltage regulators and one or more DC-DC conversion circuits, such as a boost circuit, a buck circuit, or a boost/buck

circuit. For example, the motors 115-1 to 115-4 may be powered by the power supply 124.

[0044] The faucet assembly 100 can include a controller 142 that can send control signals to the motors 115-1 to 115-4. For example, the controller 142 can receive one or more signals indicating an actuation event. For example, one or more sensors 138 may be deployed about the faucet assembly 100 to detect an actuation event (e.g., proximity signal, actuation command, etc.). In an implementation, the sensors 138 may be positioned proximate to a corresponding feature. The faucet assembly 100 may also include one or more actuation sensors 140 for indicating a position of an actuator (see FIGS. 4 and 5).

[0045] As illustrated in FIGS. 1 and 2, the motors 115-1 to 115-4 impart linear displacement to the corresponding features in response to receiving a control signal from the controller 142. In an example implementation, the motors 115-1, 115-3, and 115-4 are connected to a corresponding threaded rod 117-1 (see FIG. 3), 117-2, 117-3. The threaded rods 117-1 (see FIG. 3), 117-3 are connected to a corresponding follower 121-1, 121-2, and the threaded rod 117-2 is connected to a base 123. When the threaded rods 117-1, 117-3 are rotated, the followers 121-1, 121-2 remain stationary with respect to the corresponding threaded rods 117-1, 117-3, which imparts linear displacement to the follower 121-1, 121-2. In an example implementation, the followers 121-1, 121-2 may include a threaded portion that mates with the threaded rods 117-1, 117-3. In another implementation, the followers 121-1, 121-2 may include ball bearings.

[0046] The follower 121-1 is connected to the retractable faucet 102, and the follower 121-2 is connected to the spray hose 110. The base 123 is stationary with respect to the threaded rod 117-2 so that the threaded rod 117-2 imparts linear displacement on the base 123 when rotated by the motor 115-3. The sponge holder 108 can be positioned over the base 123. The motor 115-2 may include one or more gear mechanisms 125 that interface with the hot water dispenser 106. For example, during operation, the motor 115-2 rotates the gear mechanisms 125, which impart linear displacement on the hot water dispenser 106.

[0047] The sleeves 122-1, 122-4 may define slots (not shown) that allow a connection between the follower 121-1, 121-2 and the retractable faucet 102 and the spray hose 110, respectively. As shown in FIGS. 1 and 2, the sleeve 122-1 may further define a

guiding member slot 127 that can receive a guiding member 129. The guiding member 129 can be connected to the retractable faucet 102 and stabilizes the retractable faucet 102 during linear displacement.

[0048] As shown in FIG. 3, the retractable faucet 102 is disposed on a base 202. The base 202 is connected to the follower 121-1 and is connected to the guiding member 129. In one or more implementations, the sleeve 122-1 may comprise cylindrical tubing positioned between the motor 115-1 and the countertop 114.

[0049] When in the extended position, the base 202 may be flush with the top surface 203 of the countertop 114. When in the retracted position, a top portion 206 of the retractable faucet 102 is received by an opening 208 defined by the countertop 114.

[0050] While not illustrated in FIGS. 1 and 2, the faucet 102, hot water dispenser 106, and the spray hose 110 are connected to one or more tubes 132 (see FIGS 4 and 5). It is understood that the embodiment illustrated in FIGS. 1 and 2 can be connected in a similar configuration as shown in FIGS. 4 and 5. The tubes 132 can be connected to a water supply control module 134 and supply a dedicated water supply to the connected features. The water supply control module 134 controls the supply of water to the various retractable features via the tubes 132. The faucet assembly 100 may include one or more connectors 136 to allow for interconnections between the various tubes 132.

[0051] FIGS. 3 and 4 illustrate another embodiment of the present disclosure. In this embodiment, the actuators 116-1 to 116-4 include a corresponding housing 318-1 to 318-4 that attach to the base 119 of the faucet assembly 100. Each housing 318-1 to 318-4 can be retained by a corresponding mounting bracket 320-1 to 320-4, and the mounting bracket 320-1 to 320-4 can be attached to the base 119 using fasteners, such as screws.

[0052] Similar to the embodiments described above, the faucet assembly 100 includes sleeves 122-1 to 122-4. The sleeves 122-1 to 122-4 are positioned between the corresponding actuator 116-1 to 116-4 and the countertop 114. The sleeves 122-1 to 122-4 retain the corresponding retractable feature (e.g., faucet, sponge holder, hand spray dispenser, etc.) while the retractable feature is in the retracted position. The sleeves 122-1 to 122-4 may be comprised of any suitable material, such as polyvinyl chloride (PVC), metal, or the like.

[0053] FIG. 6 illustrates an example actuator 116 that displaces the retractable faucet 102. As shown, the retractable faucet 102 is disposed on a base 202. The base 202 is connected to one end of a piston 204 of the actuator 116. In one or more implementations, the sleeve 122 may comprise cylindrical tubing positioned between the actuator and the countertop 114.

[0054] When in the extended position, the base 202 may be flush with the top surface 205 of the countertop 114. When in the retracted position, a top portion 206 of the retractable faucet 102 is received by an opening 208 defined by the countertop 114. When in the retracted position, the base 202 can rest on a flange 210. The flange 210 may be connected to one end of the actuator 116. In some embodiments, the flange 210 can include a connector 212 that connects with one end of the tube 132. In these embodiments, a flexible tube 214 may be connected to the other end of the connector 212 and the faucet 102. The flexible tube 214 may comprise a suitable material and have a length to allow the flexible tube 214 to transition with the faucet 102.

[0055] FIG. 7 illustrates an example control system 700 for controlling the faucet assembly 100. The control system 700 includes the controller 142 and sensors 138-1 through 138-M, where M is an integer greater than or equal to one. The sensors 138-1 to 138-M may include any suitable sensor for detecting the presence or the absence of a user at the faucet assembly 100 and/or an actuation command, such as a voice command or an actuation gesture performed by the user. For example, the sensors 138-1 to 138-M may be a proximity sensor, such as an optical sensor, a sonar sensor, or the like, a microphone, a receiver, or an actuation sensor, such as a button, a switch, or the like. The sensors 138-1 to 138-M can be deployed about the faucet assembly 100 and provide an actuation signal to the controller 142. In response, the controller 142 sends a control signal to one or more actuators 116-1 to 116-M to extend or retract the corresponding feature.

[0056] In some embodiments, one feature (or a subset of the features) can be extended/retracted based a first proximity sensor, while another feature (or subset of features) is extended/retracted based on a second (different) proximity sensor. For example, the main faucet may be extended to the operational (open) position when the individual reaches towards the main faucet, while the hot water faucet remains in the retracted (closed) position until and unless the individual reaches towards the hot water faucet. Alternatively, the features can be extended or retracted based on a user

command (e.g., user pushing a button or flipping a switch, a voice command, or the like).

[0057] In some embodiments, the features may be configured to retract after predetermined (e.g., programmed) time after the feature is no longer being operated and/or the proximity sensor indicates that the user is no longer present. For example, an individual feature, subset of the features, or all the features may be retracted to the closed position several minutes after the feature(s) are no longer being used or after the respective proximity sensor(s) indicate lack of user presence at the sink or at the particular feature or subset of features.

[0058] In some instances, the actuators 116-1 to 116-M may include a corresponding sensor 140-1 to 140-M. The sensors 140-1 to 140-M can provide actuator position signals that indicate whether the corresponding actuator 116-1 to 116-M is in an extended position or a retracted position.

[0059] As shown in FIG. 7, an electronic device 702 can also send one or more actuation signals that are received by the control system 700. The controller 142 can control linear displacement of the retractable features based on the electronic device 702. In some embodiments, a user can send actuation signals to the control system 700 using the electronic device 702, such as a smart phone, a tablet, or the like. The actuation signals may control linear displacement of a subset of the retractable features (i.e., individually) or control linear displacement for all of the retractable features.

[0060] FIG. 8 illustrates an example method 800 for causing the faucet assembly 100 to transition between a retracted position and an extended position. The method 800 begins at 802. At 804, the controller 142 determines whether a proximity signal indicating a presence of an object has been received from the sensors 138-1 to 138-M or an actuation command. In some instances, the actuation command may be based on detection of an audible sound or receiving an electromagnetic signal. If no signal has been received and no actuation command has been received, the method 800 returns to 804.

[0061] If the proximity signal or the actuation command has been received, the controller 142 sends the actuation signal to one or more actuators 116-1 to 116-M to transition a feature from a retracted position to an extended position at 806. As described above, each of the features or a subset of features may be actuated based

on the proximity signal. For example, each of the features can be individually actuated or simultaneously actuated.

[0062] At 808, the controller 142 determines whether a proximity signal has been received within a predetermined time period or another actuation command has been received. If a proximity signal has been received within the predetermined time period and no actuation command has been received, the method 800 returns to 808. If the proximity signal has not been received within the predetermined time period or the actuation command has been received, the controller 142 sends another actuation signal to retract the features at 810. The method 800 ends at 812.

[0063] FIG. 9 illustrates the faucet assembly 100 in the retracted position, and FIG. 10 illustrates the faucet assembly 100 in the extended position. FIG. 11 illustrates examples of various form factors for the faucet assembly 100. These are shown by way of example only, and it is contemplated that other form factors can be implemented depending on the design requirements of an installation environment.

[0064] The foregoing description is merely illustrative in nature and is in no way intended to limit the disclosure, its application, or uses. The broad teachings of the disclosure can be implemented in a variety of forms. Therefore, while this disclosure includes particular examples, the true scope of the disclosure should not be so limited since other modifications will become apparent upon a study of the drawings, the specification, and the following claims. It should be understood that one or more steps within a method may be executed in different order (or concurrently) without altering the principles of the present disclosure. Further, although each of the embodiments is described above as having certain features, any one or more of those features described with respect to any embodiment of the disclosure can be implemented in and/or combined with features of any of the other embodiments, even if that combination is not explicitly described. In other words, the described embodiments are not mutually exclusive, and permutations of one or more embodiments with one another remain within the scope of this disclosure.

[0065] Spatial and functional relationships between elements (for example, between modules, circuit elements, semiconductor layers, etc.) are described using various terms, including “connected,” “engaged,” “coupled,” “adjacent,” “next to,” “on top of,” “above,” “below,” and “disposed.” Unless explicitly described as being “direct,” when a relationship between first and second elements is described in the above disclosure, that relationship can be a direct relationship where no other intervening elements are

present between the first and second elements, but can also be an indirect relationship where one or more intervening elements are present (either spatially or functionally) between the first and second elements. As used herein, the phrase at least one of A, B, and C should be construed to mean a logical (A OR B OR C), using a non-exclusive logical OR, and should not be construed to mean “at least one of A, at least one of B, and at least one of C.”

[0066] In the figures, the direction of an arrow, as indicated by the arrowhead, generally demonstrates the flow of information (such as data or instructions) that is of interest to the illustration. For example, when element A and element B exchange a variety of information but information transmitted from element A to element B is relevant to the illustration, the arrow may point from element A to element B. This unidirectional arrow does not imply that no other information is transmitted from element B to element A. Further, for information sent from element A to element B, element B may send requests for, or receipt acknowledgements of, the information to element A.

[0067] In this application, including the definitions below, the term “module” or the term “controller” may be replaced with the term “circuit.” The term “module” may refer to, be part of, or include: an Application Specific Integrated Circuit (ASIC); a digital, analog, or mixed analog/digital discrete circuit; a digital, analog, or mixed analog/digital integrated circuit; a combinational logic circuit; a field programmable gate array (FPGA); a processor circuit (shared, dedicated, or group) that executes code; a memory circuit (shared, dedicated, or group) that stores code executed by the processor circuit; other suitable hardware components that provide the described functionality; or a combination of some or all of the above, such as in a system-on-chip.

[0068] The module may include one or more interface circuits. In some examples, the interface circuits may include wired or wireless interfaces that are connected to a local area network (LAN), the Internet, a wide area network (WAN), or combinations thereof. The functionality of any given module of the present disclosure may be distributed among multiple modules that are connected via interface circuits. For example, multiple modules may allow load balancing. In a further example, a server (also known as remote, or cloud) module may accomplish some functionality on behalf of a client module.

[0069] The term code, as used above, may include software, firmware, and/or microcode, and may refer to programs, routines, functions, classes, data structures, and/or objects. The term shared processor circuit encompasses a single processor circuit that executes some or all code from multiple modules. The term group processor

circuit encompasses a processor circuit that, in combination with additional processor circuits, executes some or all code from one or more modules. References to multiple processor circuits encompass multiple processor circuits on discrete dies, multiple processor circuits on a single die, multiple cores of a single processor circuit, multiple threads of a single processor circuit, or a combination of the above. The term shared memory circuit encompasses a single memory circuit that stores some or all code from multiple modules. The term group memory circuit encompasses a memory circuit that, in combination with additional memories, stores some or all code from one or more modules.

10 **[0070]** The term memory circuit is a subset of the term computer-readable medium. The term computer-readable medium, as used herein, does not encompass transitory electrical or electromagnetic signals propagating through a medium (such as on a carrier wave); the term computer-readable medium may therefore be considered tangible and non-transitory. Non-limiting examples of a non-transitory, tangible
15 computer-readable medium are nonvolatile memory circuits (such as a flash memory circuit, an erasable programmable read-only memory circuit, or a mask read-only memory circuit), volatile memory circuits (such as a static random access memory circuit or a dynamic random access memory circuit), magnetic storage media (such as an analog or digital magnetic tape or a hard disk drive), and optical storage media
20 (such as a CD, a DVD, or a Blu-ray Disc).

[0071] The apparatuses and methods described in this application may be partially or fully implemented by a special purpose computer created by configuring a general purpose computer to execute one or more particular functions embodied in computer programs. The functional blocks, flowchart components, and other elements described
25 above serve as software specifications, which can be translated into the computer programs by the routine work of a skilled technician or programmer.

[0072] The computer programs include processor-executable instructions that are stored on at least one non-transitory, tangible computer-readable medium. The computer programs may also include or rely on stored data. The computer programs
30 may encompass a basic input/output system (BIOS) that interacts with hardware of the special purpose computer, device drivers that interact with particular devices of the special purpose computer, one or more operating systems, user applications, background services, background applications, etc.

[0073] The computer programs may include: (i) descriptive text to be parsed, such as
35 HTML (hypertext markup language), XML (extensible markup language), or JSON

(JavaScript Object Notation) (ii) assembly code, (iii) object code generated from source code by a compiler, (iv) source code for execution by an interpreter, (v) source code for compilation and execution by a just-in-time compiler, etc. As examples only, source code may be written using syntax from languages including C, C++, C#, Objective-C, 5 Swift, Haskell, Go, SQL, R, Lisp, Java®, Fortran, Perl, Pascal, Curl, OCaml, Javascript®, HTML5 (Hypertext Markup Language 5th revision), Ada, ASP (Active Server Pages), PHP (PHP: Hypertext Preprocessor), Scala, Eiffel, Smalltalk, Erlang, Ruby, Flash®, Visual Basic®, Lua, MATLAB, SIMULINK, and Python®.

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CLAIMS

What is claimed is:

1. A faucet assembly, comprising:
5 a retractable faucet configured to transition between a retracted position and an extended position; and
an actuator configured to cause the retractable faucet to transition between the retracted position and the extended position.
2. The faucet assembly of claim 1, wherein the retractable faucet includes a top
10 portion that is substantially flush with a top surface of the faucet assembly when the retractable faucet is in the retracted position.
3. The faucet assembly of claim 1, further including at least another retractable feature comprising at least one of: a retractable hot water faucet, a retractable spray hose, and a retractable sponge holder.
- 15 4. The faucet assembly of claim 3, further comprising at least one sensor, wherein the one or more retractable features are configured to extend and retract based on a proximity signal generated by the at least one sensor.
5. The faucet assembly of claim 3, further comprising at least one sensor, wherein the one or more retractable features are configured to extend and retract based on at
20 least one user command.
6. The faucet assembly of claim 3, wherein the one or more retractable features are configured to retract after a predetermined time.
7. The faucet assembly of claim 1, wherein the actuator comprises a linear actuator.
- 25 8. The faucet assembly of claim 1, further comprising:
a base; and
a sleeve disposed between the actuator and a surface of the base,
wherein the retractable faucet is disposed within the sleeve when the retractable faucet is in the retracted position.

9. The faucet assembly of claim 8, wherein the actuator is disposed within the base.
10. The faucet assembly of claim 1, further comprising a controller that is configured to control the actuator based on an actuation signal.
- 5 11. A system, comprising:
a base;
a retractable faucet disposed within the base and configured to transition between a retracted position and an extended position; and
an actuator disposed within the base and configured to cause the retractable
10 faucet to transition between the retracted position and the extended position.
12. The system of claim 11, wherein the retractable faucet includes a top portion that is substantially flush with a top surface of the base when the retractable faucet is in the retracted position.
13. The system of claim 11, further including at least another retractable feature
15 comprising at least one of: a retractable hot water faucet, a retractable spray hose, and a retractable sponge holder.
14. The system of claim 13, further comprising at least one sensor, wherein the one or more retractable features are configured to extend and retract based on a proximity signal generated by the at least one sensor.
- 20 15. The system of claim 13, further comprising at least one sensor disposed proximate to the base, wherein the one or more retractable features are configured to extend and retract based on at least one user command.
16. The system of claim 13, wherein the one or more retractable features are configured to retract after a predetermined time.
- 25 17. The system of claim 11, further comprising:
a sleeve disposed between the actuator and a surface of the base,
wherein the retractable faucet is disposed within the sleeve when the retractable faucet is in the retracted position.

18. A system including:

a retractable faucet configured to transition between a retracted position and an extended position; and

5 a motor configured to cause the retractable faucet to transition between the retracted position and the extended position.

19. The system as recited in claim 18, further comprising:

a threaded rod connected to the motor, wherein the threaded rod is configured to be driven by the motor; and

10 a follower connected to the threaded rod and connected to the retractable faucet, wherein the follower is configured to be linearly displaced with respect to the threaded rod when the threaded rod is driven by the motor.

20. The system as recited in claim 19, wherein the follower comprises a threaded portion that is configured to mate with the threaded rod.

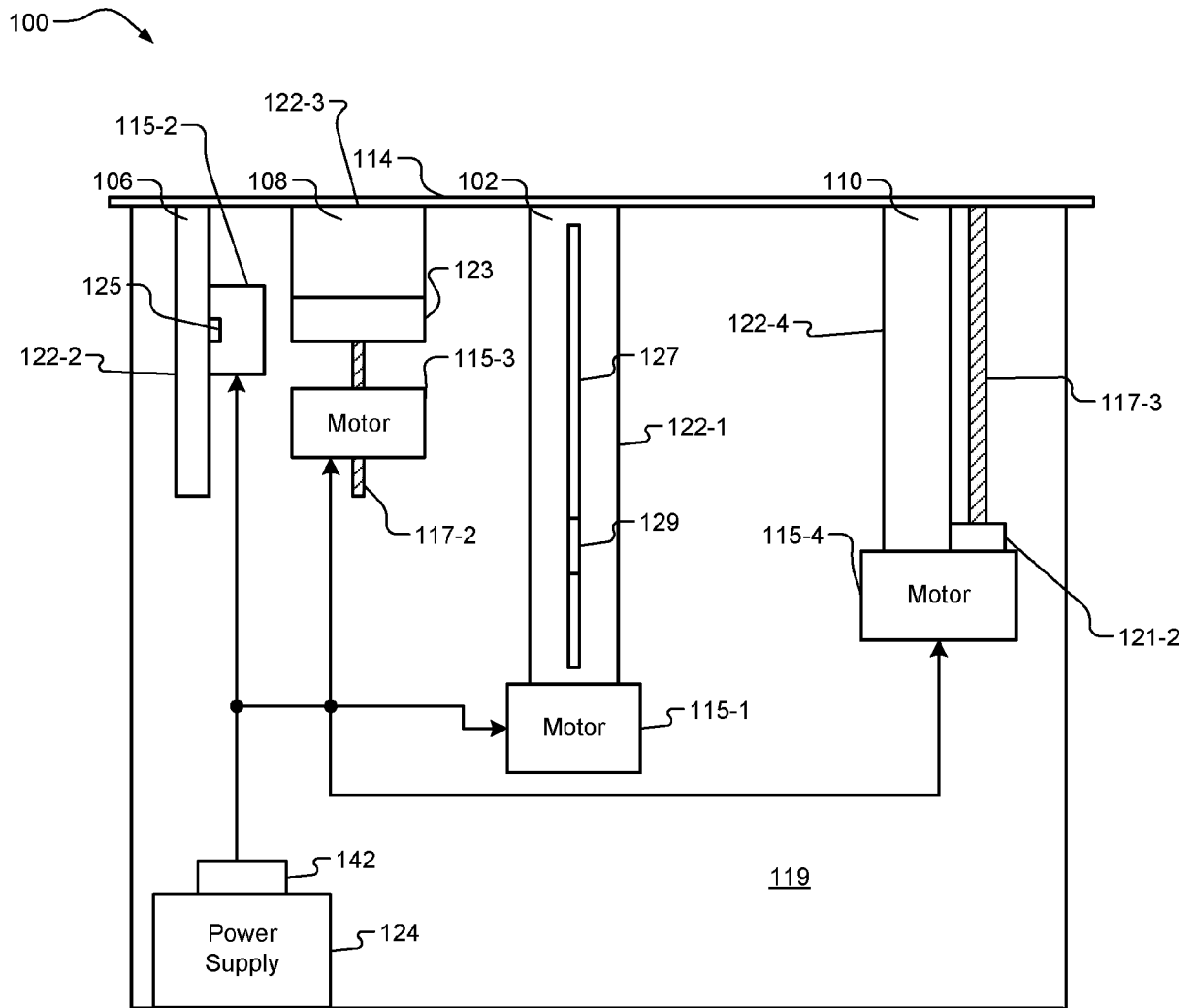


FIG. 1

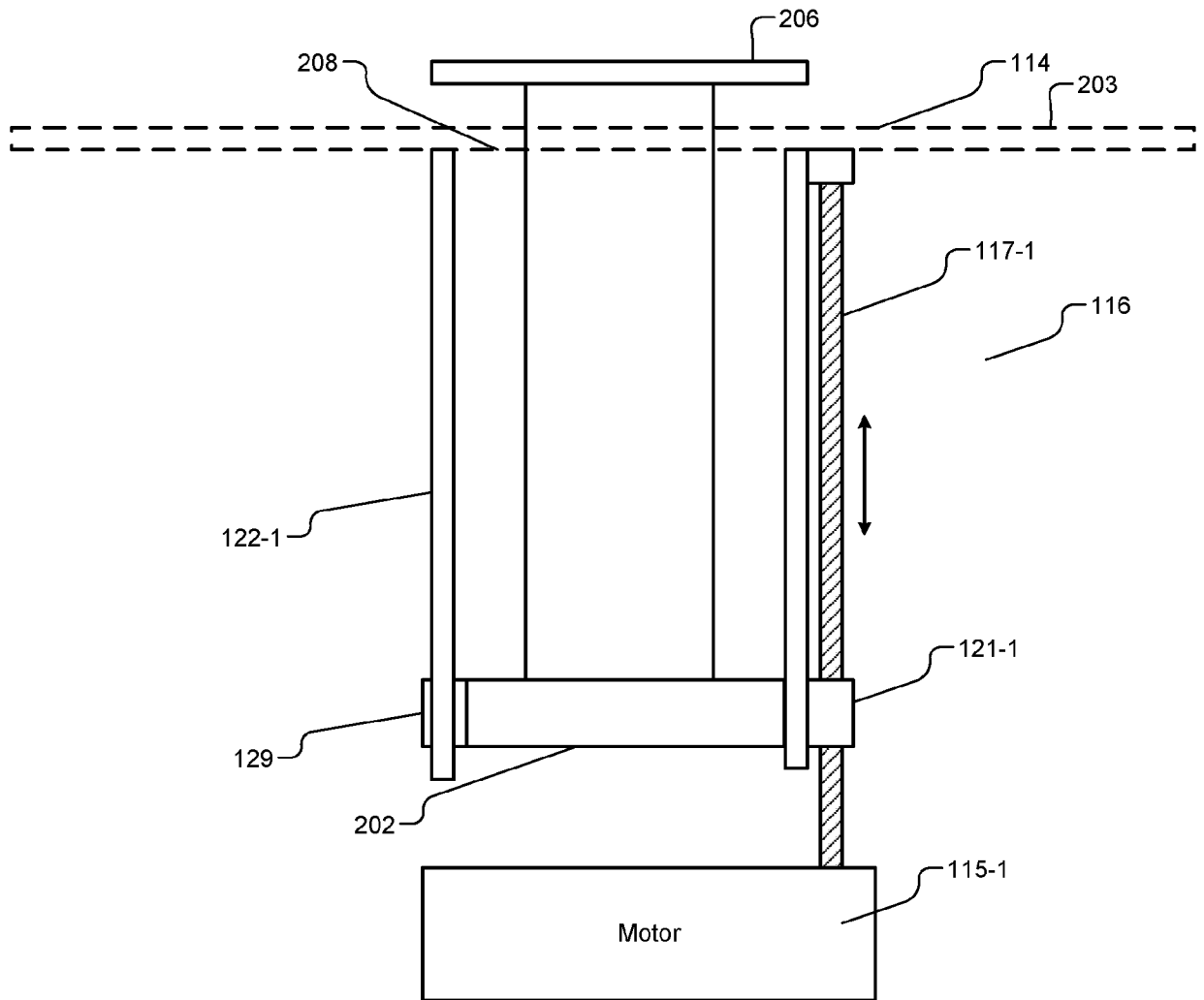


FIG. 3

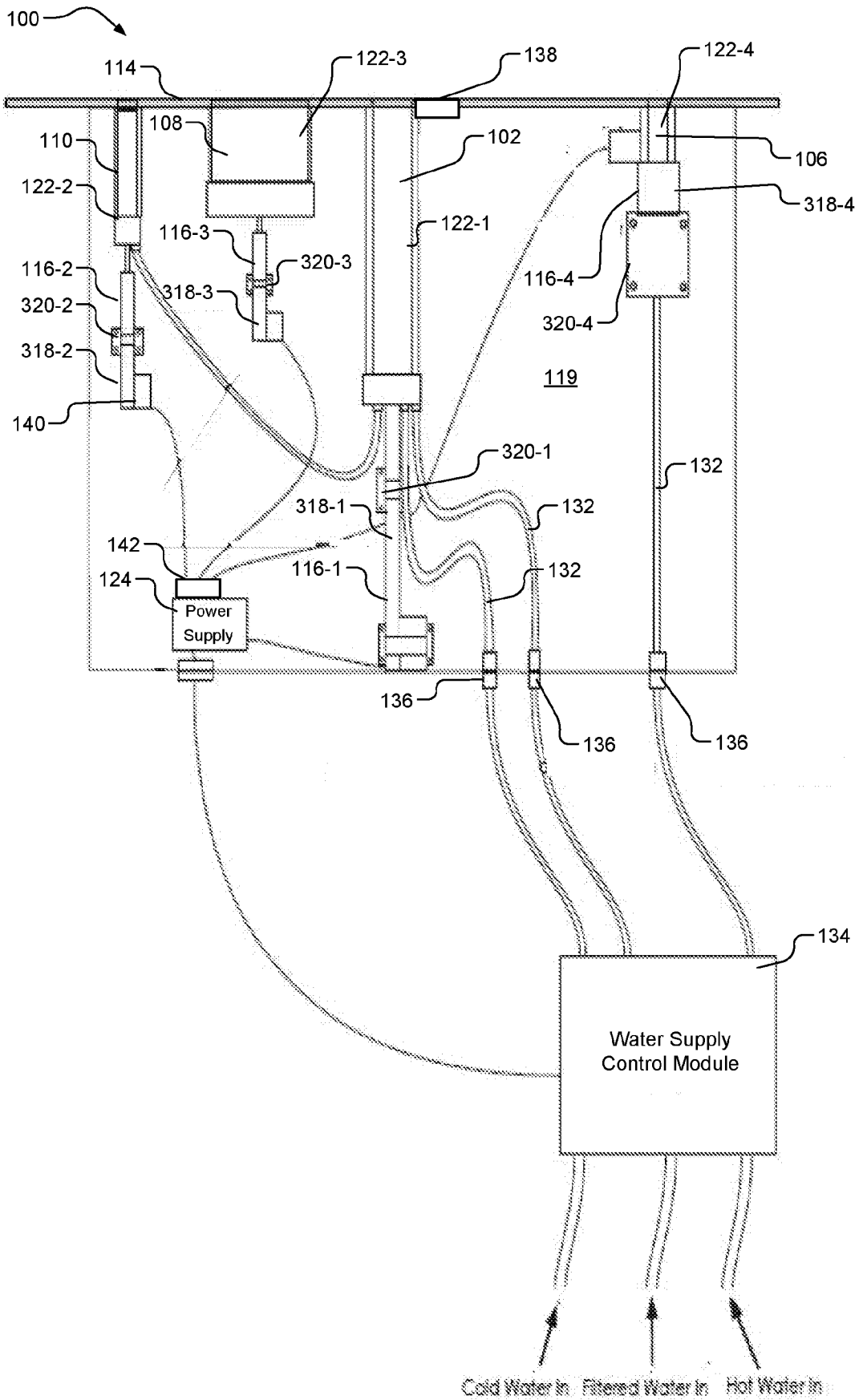


FIG. 4

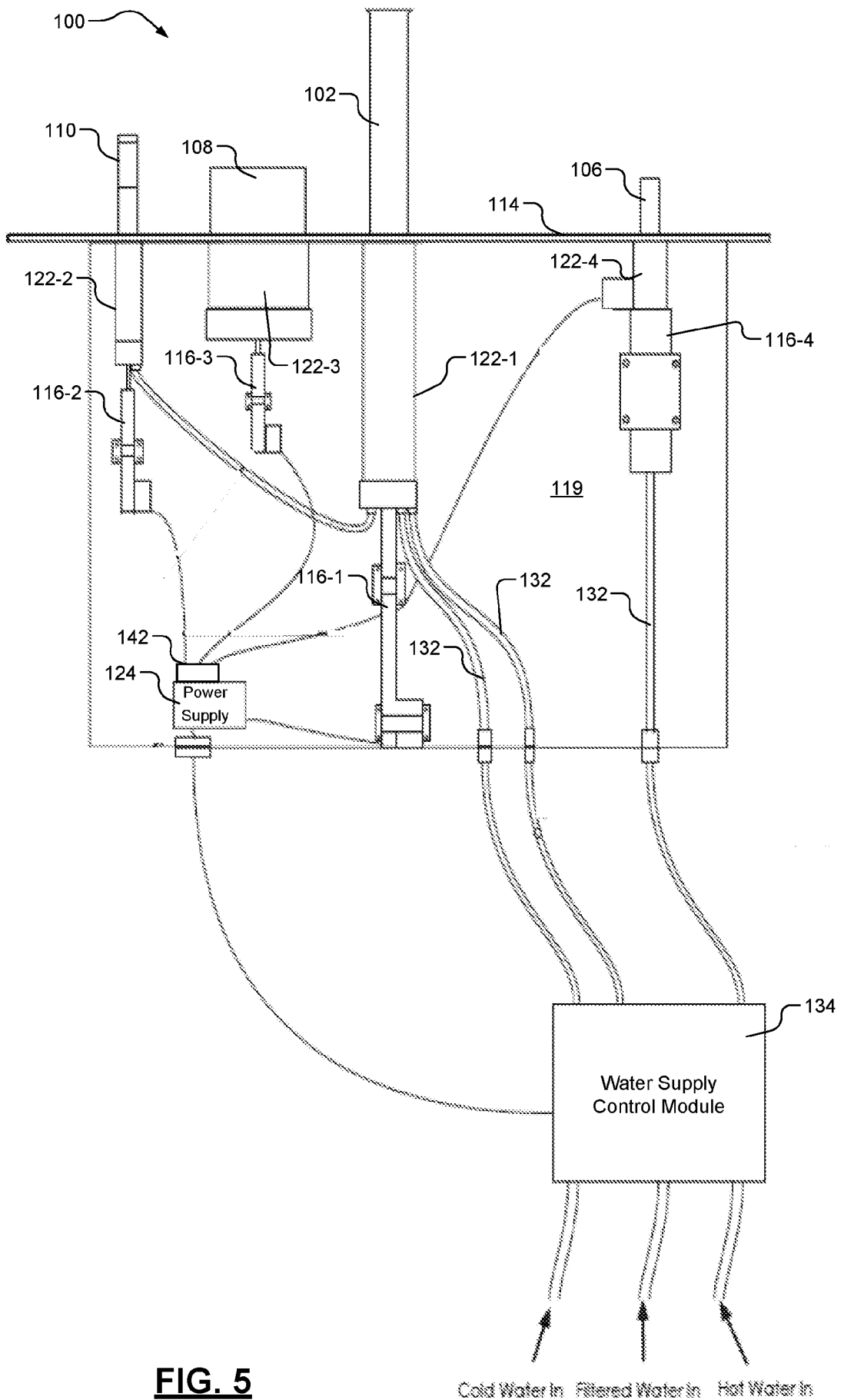


FIG. 5

Cold Water In Filtered Water In Hot Water In

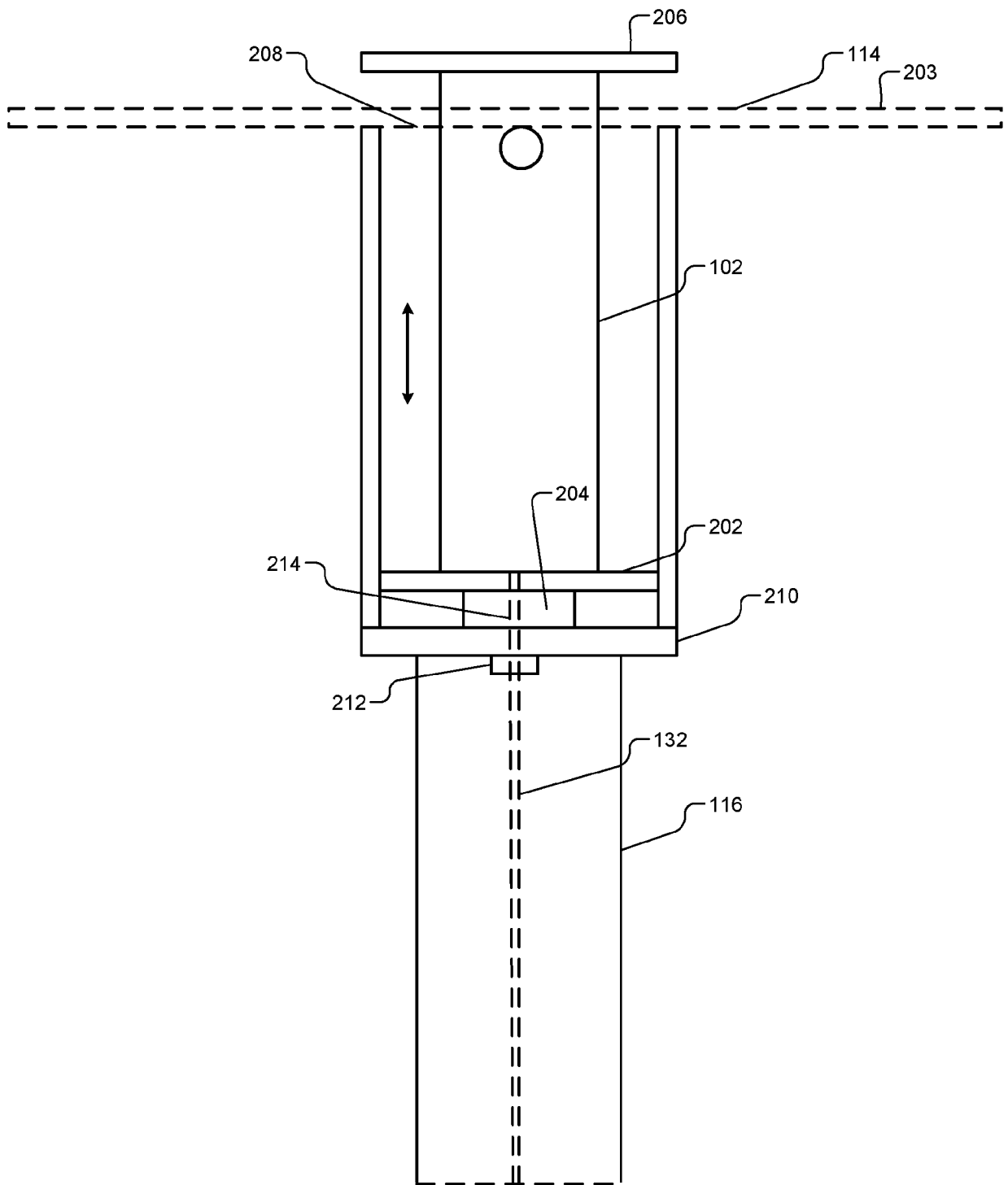


FIG. 6

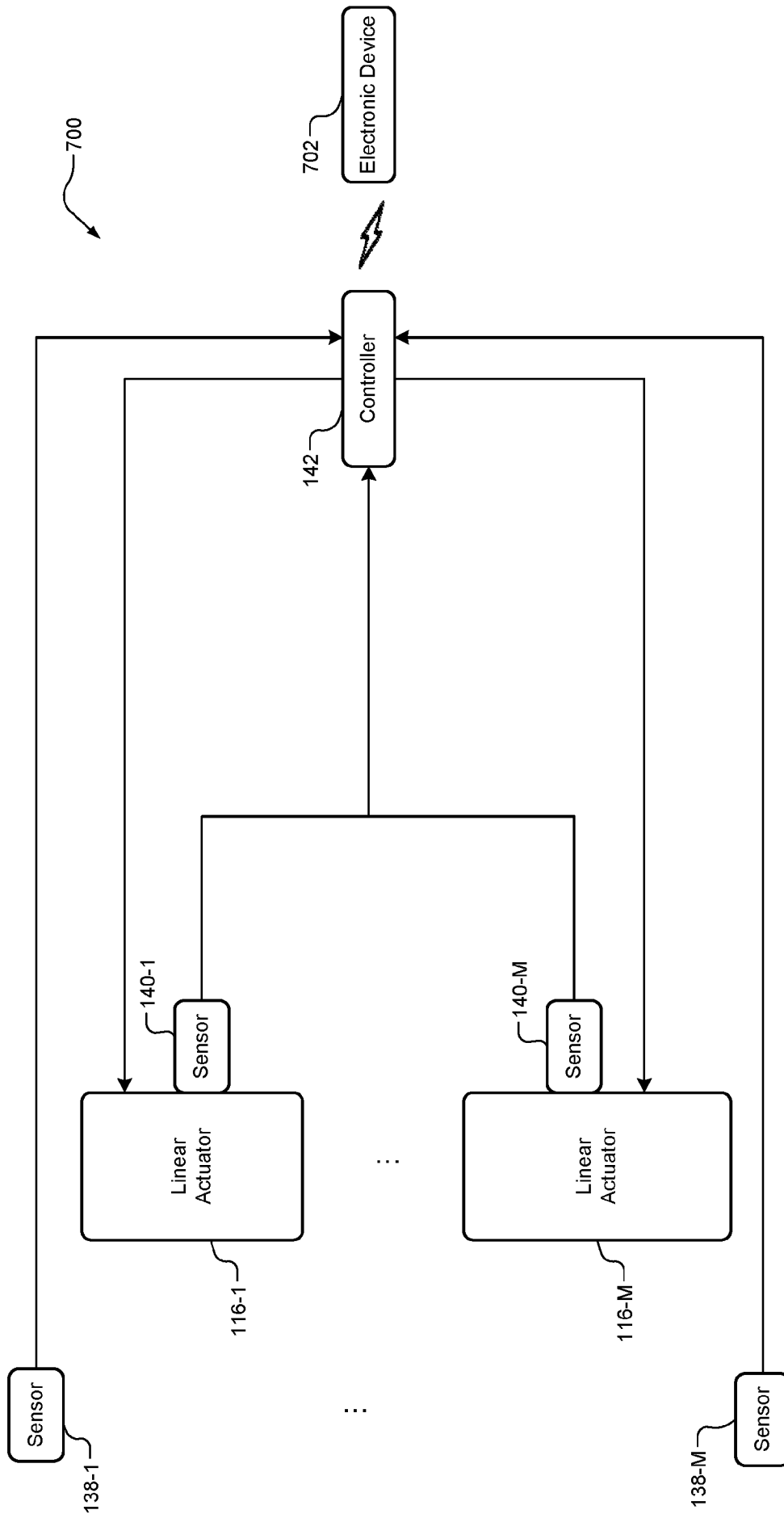


FIG. 7

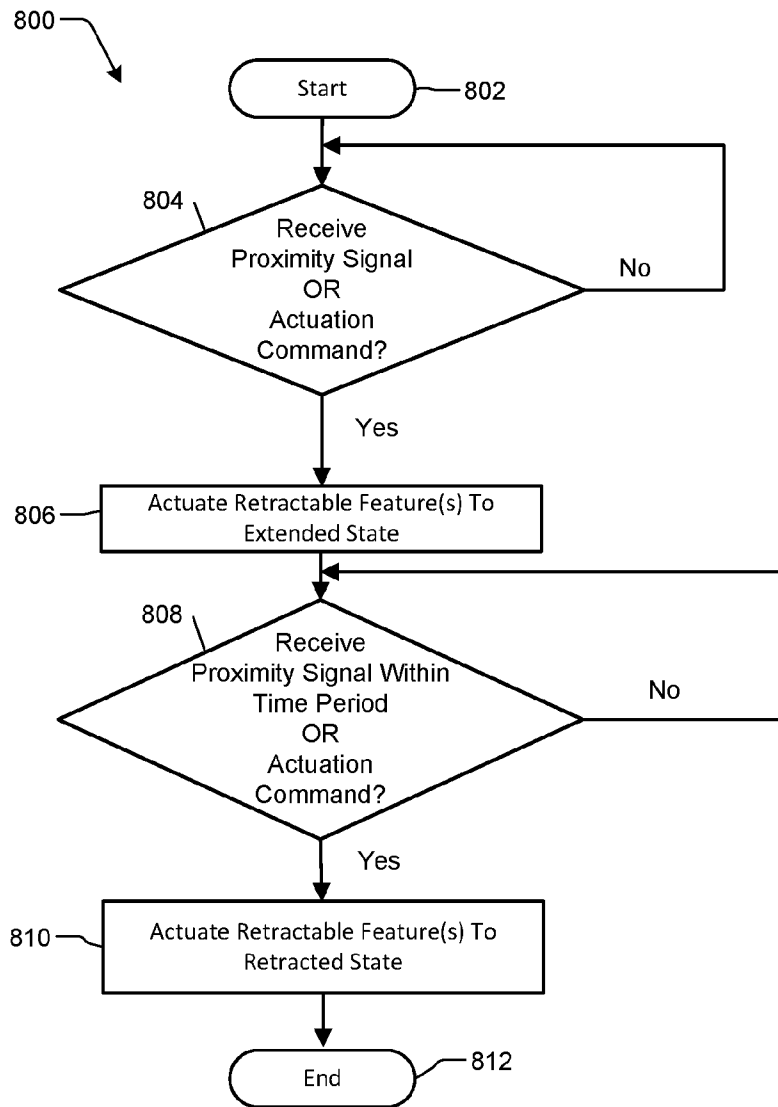


FIG. 8

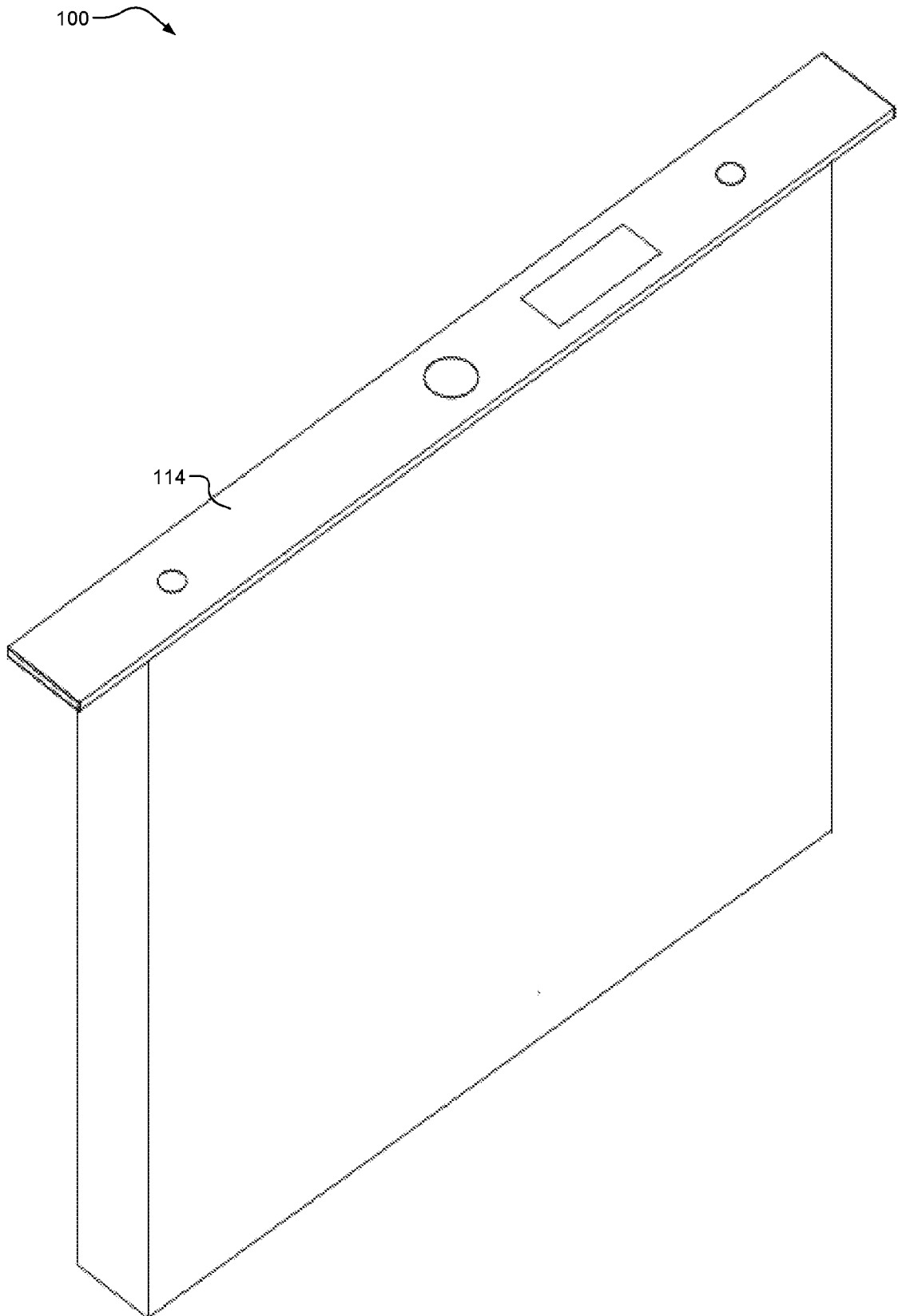


FIG. 9

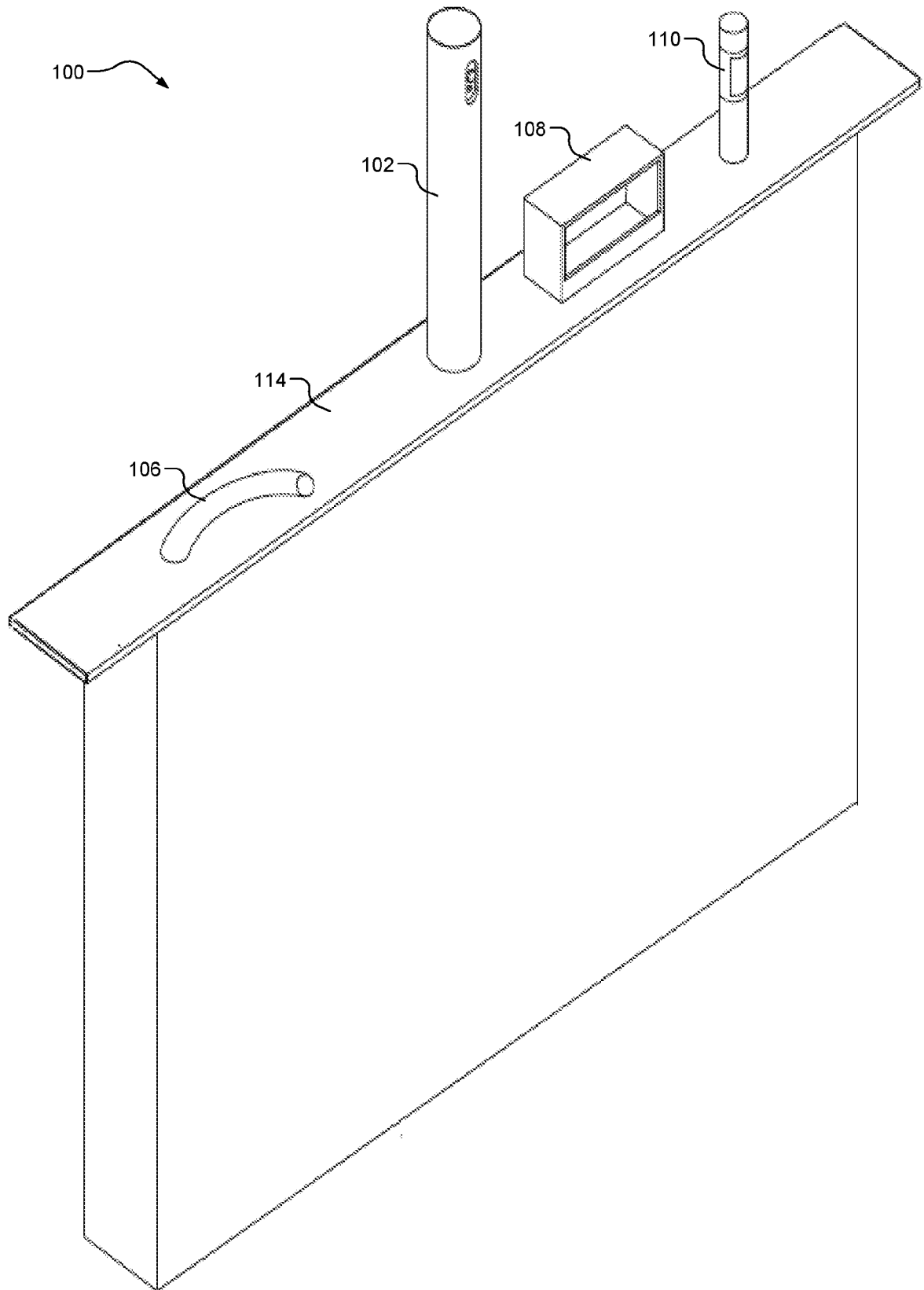


FIG. 10

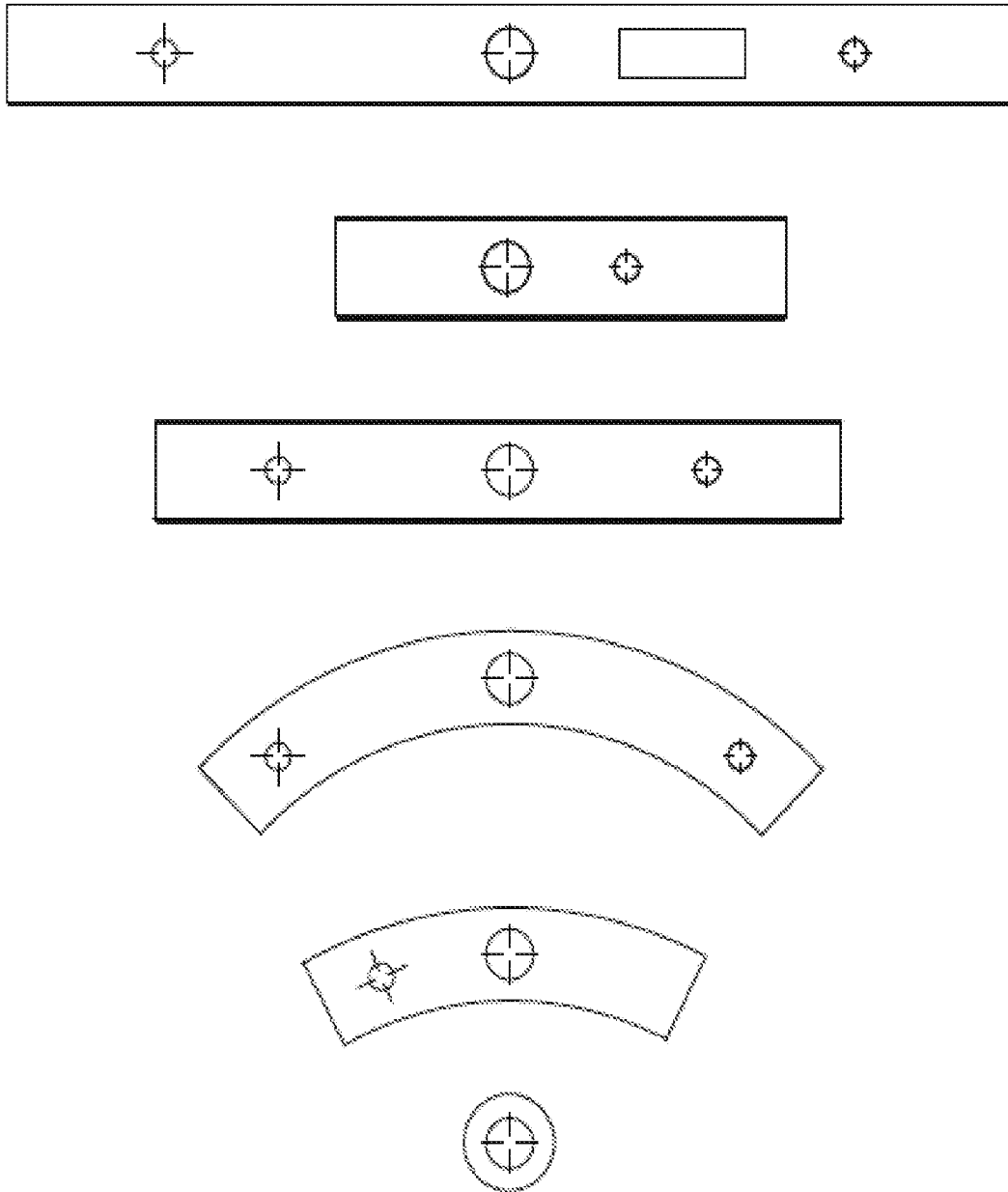


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2018/067973

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - E03C 1/02; A47B 77/06; E03C 1/01; E03C 1/04 (2019.01)

CPC - E03C 1/02; A47B 77/06; A47B 2220/0013; E03C 1/01; E03C 1/04; E03C 2001/0415; E03C 2001/0417 (2019.02)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 4/619; 4/630; 4/631; 4/638; 4/654; 4/661; 4/675; 4/678; 137/801 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	✓ CN 107201770 A (ZHANG) 26 September 2017 (26.09.2017) machine translation	1, 7, 10, 11, 18-20
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Y		2-6, 8, 9, 12-17
Y	✓ ES 1 086 255 U (TEKA INDUSTRIAL, S.A.) 30 July 2013 (30.07.2013) machine translation	2, 6, 12, 16
Y	WO 2017/148926 A1 (JET AVIATION AG) 08 September 2017 (08.09.2017) entire document	3-6, 13-16
Y	US 6,161,228 A (WIETECH) 19 December 2000 (19.12.2000) entire document	8, 9, 17

 Further documents are listed in the continuation of Box C. See patent family annex.

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

21 February 2019

Date of mailing of the international search report

15 MAR 2019

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