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(54) REFRIGERATION APPLIANCE HAVING ICE-MAKING ASSEMBLY, AND CLEANING METHOD

(57) A refrigerator appliance and methods of operating the same may include a cabinet, an ice making assembly, and a controller. The ice making assembly may be attached to the cabinet and include fluid path downstream of a water supply line, an icemaker along the fluid path, a fluid storage volume in fluid communication with the icemaker, a cleaning cartridge selectively provided along the fluid path between the icemaker the fluid storage volume, and a drain line between the fluid storage volume and the icemaker. The controller may be in operative communication with the ice making assembly and configured to initiate a cleaning operation that includes initiating a flow of water to the fluid storage volume from the water supply line, directing an overspill water flow to the icemaker, guiding water from the icemaker to the cleaning cartridge, motivating a cleaning solution to the icemaker, and opening the drain line.

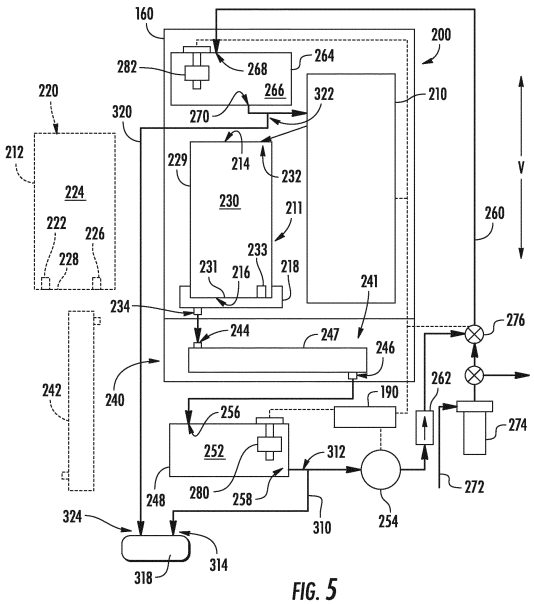

FIG. 5

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Description

FIELD OF THE INVENTION

[0001] The present subject matter relates generally to refrigerator appliances and ice making assemblies, and more particularly to features and methods for cleaning an ice making assembly (e.g., within a refrigerator appliance).

BACKGROUND OF THE INVENTION

[0002] Certain refrigerator appliances include an icemaker. In order to produce ice, liquid water is directed to the icemaker and frozen. A variety of ice types can be produced depending upon the particular icemaker used. For example, certain icemakers include a mold body for receiving liquid water. An auger within the mold body can rotate and scrape ice off an inner surface of the mold body to form ice nuggets. Such icemakers are generally referred to as nugget style icemakers. Certain consumers prefer nugget style icemakers and their associated ice nuggets.

[0003] Ice nuggets are generally stored at temperatures above the freezing temperature of liquid water to maintain a texture of the ice nuggets. When stored at such temperatures, at least a portion of the ice nuggets will melt to liquid water. Generally, liquid water can thus accumulate within an ice bucket of the ice making assembly. This may create a number of difficulties or undesirable conditions for the refrigerator appliance. For instance, some of liquid water every freeze, causing portions of the nugget ice to clump together such that dispensing ice nuggets is difficult. Moreover, liquid water may damage or negatively affect performance of electrical components, such as motors. Furthermore, the liquid water may be difficult to remove and, in some instances, drip or flow from an ice dispensing portion of the refrigerator appliance.

[0004] Although some existing systems have attempted to reuse melted water within an ice making assembly (e.g., in order to make new ice nuggets), difficulties with such systems still exist. For instance, it may be difficult to ensure that liquid water from melted ice nuggets does not carry or include undesirable elements, such as, for instance, sediments, dirt, bacteria, etc. Regular cleaning of the system may be useful to address such concerns. Nonetheless, cleaning the entire assembly can be difficult, especially when a user is not able to remove certain components from the assembly or refrigerator appliance for detailed cleaning.

[0005] Accordingly, it would be useful provide a refrigerator appliance or ice making assembly addressing one or more of the above identified issues. In particular, it would be advantageous to provide a refrigerator appliance or ice making assembly with features or methods for cleaning the ice making assembly.

BRIEF DESCRIPTION OF THE INVENTION

[0006] Aspects and advantages of the invention will be set forth in part in the following description, or may be obvious from the description, or may be learned through practice of the invention.

[0007] In one exemplary aspect of the present disclosure, a method of cleaning an ice making assembly is provided. The method may include providing a cleaning cartridge containing a cleaning agent along a fluid path between an icemaker and a fluid storage volume and initiating a flow of water to the fluid storage volume. The method may further include directing an overspill water flow to the icemaker and guiding water from the icemaker to the cleaning cartridge to generate a cleaning solution. The method may still further include motivating the cleaning solution to the icemaker through the fluid storage volume and opening a drain line downstream from the cleaning cartridge between the fluid storage volume and the icemaker to guide the cleaning solution from the fluid path.

[0008] In another exemplary aspect of the present disclosure, a refrigerator appliance is provided. The refrigerator appliance may include a cabinet, an ice making assembly, and a controller. The ice making assembly may be attached to the cabinet. The ice making assembly may include a fluid path downstream of a water supply line, an icemaker provided along the fluid path, a fluid storage volume provided along the fluid path in fluid communication with the icemaker, a cleaning cartridge containing a cleaning agent and selectively provided along the fluid path between the icemaker the fluid storage volume, and a drain line downstream from the cleaning cartridge between the fluid storage volume and the icemaker. The controller may be in operative communication with the ice making assembly. The controller may be configured to initiate a cleaning operation that includes initiating a flow of water to the fluid storage volume from the water supply line, directing an overspill water flow to the icemaker, guiding water along the fluid path from the icemaker to the cleaning cartridge to generate a cleaning solution, motivating the cleaning solution to the icemaker through the fluid storage volume, and opening the drain line to guide the cleaning solution from the fluid path.

[0009] These and other features, aspects and advantages of the present invention will become better understood with reference to the following description and appended claims. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] A full and enabling disclosure of the present invention, including the best mode thereof, directed to one of ordinary skill in the art, is set forth in the specification,

which makes reference to the appended figures.

FIG. 1 provides a perspective view of a refrigerator appliance according to exemplary embodiments of the present disclosure.

FIG. 2 provides a perspective view of a door of the example refrigerator appliance of FIG. 1.

FIG. 3 provides a schematic view of a sealed cooling system of the exemplary refrigerator appliance shown in FIG. 1.

FIG. 4 provides an elevation view of the door of the exemplary refrigerator appliance of FIG. 2 with an access door of the door shown in an open position and an ice storage bin mounted for an ice making operation.

FIG. 5 provides a schematic view of an ice making assembly according to exemplary embodiments of the present disclosure.

FIG. 6 provides a schematic elevation view of a portion of an ice making assembly according to exemplary embodiments of the present disclosure.

FIG. 7 provides a schematic elevation view of a portion of an ice making assembly according to exemplary embodiments of the present disclosure, wherein an ice bin has been removed for a cleaning operation.

FIG. 8 provides a schematic elevation view of a portion of the exemplary ice making assembly of FIG. 7, wherein the ice bin has been returned for an ice making operation.

FIG. 9 provides a schematic elevation view of a portion of an ice making assembly according to exemplary embodiments of the present disclosure.

FIG. 10 provides a flow chart illustrating a method of operating a refrigerator appliance according to exemplary embodiments of the present disclosure.

FIG. 11 provides a schematic view of an ice making assembly according to other exemplary embodiments of the present disclosure.

DETAILED DESCRIPTION

[0011] Reference now will be made in detail to embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, not limitation of the invention. In fact, it will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the scope of the invention. For instance, features illustrated or described as part of one embodiment can be used with another embodiment to yield a still further embodiment. Thus, it is intended that the present invention covers such modifications and variations as come within the scope of the appended claims and their equivalents.

[0012] As used herein, the term "or" is generally intended to be inclusive (i.e., "A or B" is intended to mean "A or B or both"). The terms "first," "second," and "third" may be used interchangeably to distinguish one component from another and are not intended to signify location or importance of the individual components. The terms "upstream" and "downstream" refer to the relative flow direction with respect to fluid flow in a fluid pathway. For example, "upstream" refers to the flow direction from which the fluid flows, and "downstream" refers to the flow direction to which the fluid flows.

[0013] Turning to the figures, FIG. 1 illustrates a perspective view of a refrigerator 100. Refrigerator appliance 100 includes a cabinet or housing 102 that extends between a top 104 and a bottom 106 along a vertical direction V, between a first side 108 and a second side 110 along a lateral direction L, and between a front side 112 and a rear side 114 along a transverse direction T. Each of the vertical direction V, lateral direction L, and transverse direction T are mutually perpendicular to one another.

[0014] Housing 102 defines chilled chambers for receipt of food items for storage. In particular, housing 102 defines fresh food chamber 122 positioned at or adjacent top 104 of housing 102 and a freezer chamber 124 arranged at or adjacent bottom 106 of housing 102. As such, refrigerator appliance 100 is generally referred to as a bottom mount refrigerator. It is recognized, however, that the benefits of the present disclosure apply to other types and styles of refrigerator appliances such as, for example, a top mount refrigerator appliance or a side-by-side style refrigerator appliance. Consequently, the description set forth herein is for illustrative purposes only and is not intended to be limiting in any aspect to any particular refrigerator chamber configuration.

[0015] Refrigerator doors 128 are rotatably hinged to an edge of housing 102 for selectively accessing fresh food chamber 122. In addition, a freezer door 130 is arranged below refrigerator doors 128 for selectively accessing freezer chamber 124. Freezer door 130 is coupled to a freezer drawer (not shown) slidably mounted within freezer chamber 124. Refrigerator doors 128 and freezer door 130 are shown in the closed position in FIG. 1.

[0016] Refrigerator appliance 100 also includes a delivery assembly 140 for delivering or dispensing liquid water or ice. Delivery assembly 140 includes a dispenser 142 positioned on or mounted to an exterior portion of refrigerator appliance 100 (e.g., on one of refrigerator doors 128). Dispenser 142 includes a discharging outlet 144 for accessing ice and liquid water. An actuating mechanism 146, shown as a paddle, is mounted below discharging outlet 144 for operating dispenser 142. In alternative exemplary embodiments, any suitable actuating mechanism may be used to operate dispenser 142. For example, dispenser 142 can include a sensor (such as an ultrasonic sensor) or a button rather than the paddle. A control panel 148 is provided for controlling the mode of operation. For example, control panel 148 includes a plurality of user inputs (not labeled), such as a water dispensing button and an ice-dispensing button,

for selecting a desired mode of operation such as crushed or non-crushed ice.

[0017] Discharging outlet 144 and actuating mechanism 146 are an external part of dispenser 142 and are mounted in a dispenser recess 150. Dispenser recess 150 is positioned at a predetermined elevation convenient for a user to access ice or water and enabling the user to access ice without the need to bend-over and without the need to open refrigerator doors 128. In the exemplary embodiment, dispenser recess 150 is positioned at a level that approximates the chest level of a user. As described in more detail below, the dispensing assembly 140 may receive ice from an icemaker disposed in a sub-compartment of the fresh food chamber 122.

[0018] FIG. 2 provides a perspective view of a door of refrigerator doors 128. As shown, optional embodiments of refrigerator appliance 100 includes a sub-compartment 160 defined on refrigerator door 128. Sub-compartment 160 is often referred to as an "icebox." Moreover, sub-compartment 160 extends into fresh food chamber 122 when refrigerator door 128 is in the closed position.

[0019] FIG. 3 provides a schematic view of certain components of refrigerator appliance 100. As may be seen in FIG. 3, refrigerator appliance 100 includes a sealed cooling system 180 for executing a vapor compression cycle for cooling air within refrigerator appliance 100 (e.g., within fresh food chamber 122 and freezer chamber 124). Sealed cooling system 180 includes a compressor 182, a condenser 184, an expansion device 186, and an evaporator 188 connected in fluid series and charged with a refrigerant. As will be understood by those skilled in the art, sealed cooling system 180 may include additional components (e.g., at least one additional evaporator, compressor, expansion device, or condenser). As an example, sealed cooling system 180 may include two evaporators.

[0020] Within sealed cooling system 180, gaseous refrigerant flows into compressor 182, which operates to increase the pressure of the refrigerant. This compression of the refrigerant raises its temperature, which is lowered by passing the gaseous refrigerant through condenser 184. Within condenser 184, heat exchange with ambient air takes place so as to cool the refrigerant and cause the refrigerant to condense to a liquid state.

[0021] Expansion device 186 (e.g., a valve, capillary tube, or other restriction device) receives liquid refrigerant from condenser 184. From expansion device 186, the liquid refrigerant enters evaporator 188. Upon exiting expansion device 186 and entering evaporator 188, the liquid refrigerant drops in pressure and vaporizes. Due to the pressure drop and phase change of the refrigerant, evaporator 188 is cool relative to fresh food and freezer chambers 122 and 124 of refrigerator appliance 100. As such, cooled air is produced and refrigerates fresh food and freezer chambers 122 and 124 of refrigerator appliance 100. Thus, evaporator 188 is a heat exchanger which transfers heat from air passing over evaporator 188 to refrigerant flowing through evaporator 188.

[0022] Optionally, refrigerator appliance 100 further includes a valve 194 (e.g., in fluid communication with a water supply line 272) for regulating a flow of liquid water to a fluid flow path 260 or an icemaker 210 therealong. Valve 194 is selectively adjustable between an open configuration and a closed configuration. In the open configuration, valve 194 permits a flow of liquid water to icemaker 210. Conversely, in the closed configuration, valve 194 hinders the flow of liquid water to icemaker 210.

[0023] In some embodiments, refrigerator appliance 100 also includes an air handler 192. Air handler 192 may be operable to urge a flow of chilled air from an evaporator (FIG. 3) (e.g., within a freezer chamber 124) into icebox compartment 160 (e.g., via supply and return ducts or chilled air passages) and may be any suitable device for moving air. For example, air handler 192 can be an axial fan or a centrifugal fan.

[0024] Operation of the refrigerator appliance 100 can be regulated by a controller 190 that is operably coupled to (e.g., in electrical or wireless communication with) user interface panel 148, sealed cooling system 180, or various other components. User interface panel 148 provides selections for user manipulation of the operation of refrigerator appliance 100, such as dispensing ice, chilled water, or other various options. In response to user manipulation of user interface panel 148 or one or more sensor signals, controller 190 may operate various components of the refrigerator appliance 100. Controller 190 may include a memory and one or more microprocessors, CPUs or the like, such as general or special purpose microprocessors operable to execute programming instructions or micro-control code associated with operation of refrigerator appliance 100. The memory may represent random access memory such as DRAM, or read only memory such as ROM or FLASH. In one embodiment, the processor executes programming instructions stored in memory. The memory may be a separate component from the processor or may be included onboard within the processor. Alternatively, controller 190 may be constructed without using a microprocessor (e.g., using a combination of discrete analog or digital logic circuitry, such as switches, amplifiers, integrators, comparators, flip-flops, AND gates, and the like) to perform control functionality instead of relying upon software.

[0025] Controller 190 may be positioned in a variety of locations throughout refrigerator appliance 100. In the illustrated embodiment, controller 190 is located within the user interface panel 148. In other embodiments, controller 190 may be positioned at any suitable location within refrigerator appliance 100, such as for example within a fresh food chamber, a freezer door, etc. Input/output ("I/O") signals may be routed between controller 190 and various operational components of refrigerator appliance 100. For example, user interface panel 148 may be in communication with controller 190 via one or more signal lines or shared communication busses.

[0026] As illustrated, controller 190 may be in commu-

nication with the various components of refrigerator appliance 100 and may control operation of the various components. For example, the various valves, switches, etc. may be actuatable based on commands from controller 190. As discussed, interface panel 148 may additionally be in communication with controller 190. Thus, the various operations may occur based on user input or automatically through controller 190 instruction.

[0027] As may be seen in FIG. 4, certain embodiments include an ice making assembly 200, including an icemaker 210 and a selectively-removable ice storage bin 212 attached to cabinet 102 (FIG. 1) (e.g., indirectly via a door 128 or, alternatively, directly within a chilled chamber defined by cabinet 102). In optional embodiments, ice making assembly 200 is positioned or disposed within icebox compartment 160. Alternatively, ice making assembly 200 may be directly mounted within a chilled chamber (e.g., freezer chamber 124-FIG. 1) of refrigerator appliance 100, as would be understood.

[0028] In some embodiments, ice can be selectively supplied to dispenser 142 recess 150 (FIG. 1) from icemaker 210 or ice storage bin 212 in icebox compartment 160 on a back side of refrigerator door 128 (e.g., during or as part of an ice making operation). In additional or alternative embodiments, air from a sealed system 180 (FIG. 3) of refrigerator appliance 100 may be directed into icemaker 210 in order to cool icemaker 210. As an example, during ice making operations, chilled air from the sealed system 180 may cool components of icemaker 210, such as a casing or mold body of icemaker 210, to or below a freezing temperature of liquid water. Thus, icemaker 210 may be an air cooled icemaker 210. Chilled air from the sealed system 180 may also cool ice storage bin 212. In particular, air around ice storage bin 212 can be chilled to a temperature above the freezing temperature of liquid water (e.g., to about the temperature of fresh food chamber 122, such that ice nuggets in ice storage bin 212 melt over time due to being exposed to air having a temperature above the freezing temperature of liquid water).

[0029] In optional embodiments, an access door 166 is hinged to refrigerator door 128. Generally, access door 166 may permit selective access to icebox compartment 160. Any manner of suitable latch 168 is configured with icebox compartment 160 to maintain access door 166 in a closed position. As an example, latch 168 may be actuated by a consumer in order to open access door 166 for providing access into icebox compartment 160. Access door 166 can also assist with insulating icebox compartment 160.

[0030] It is noted that although ice making assembly 200 is illustrated as being at least partially enclosed within icebox compartment 160, alternative embodiments may be free of any separate access door 166 (e.g., such that ice making assembly 200 is generally in open fluid communication with at least one chilled chamber of refrigerator appliance 100).

[0031] Referring now generally to FIGS. 4 through 6, FIGS. 5 and 6 provide schematic views of an ice making assembly 200 (e.g., during a cleaning operation).

[0032] As shown, a filtration assembly 240 may be provided downstream from support tray 218 and tray outlet 234 to filter liquid water (e.g., before selectively returning liquid water to icemaker 210). Moreover, filtration assembly 240, support tray 218, and icemaker 210 may be provided along a fluid flow path 260. Although fluid flow path 260 may receive liquid (e.g., water from a water supply line 272), fluid flow path 260 may be defined as a closed loop having one or more drains or drain lines. Additionally or alternatively, fluid flow path 260 may be fluidly isolated from dispenser 142 such that liquid within or drained from fluid flow path 260 does not flow to or from dispenser 142.

[0033] Generally, a bin mounting region 211 is provided adjacent to icemaker 210 (e.g., to receive ice nuggets or fluids therefrom, depending on the initiated operation at a given moment). As shown, bin mounting region 211 extends along the vertical direction V between a top end 214 and a bottom end 216. Optionally, a support tray 218 may generally define, or extend below, the bottom end 216 to provide an area on which a bin maybe received. Moreover, support tray 218 may define a tray outlet 234 to permit the flow of liquid therethrough. Additionally or alternatively, support tray 218 may be mounted or formed on a portion of the door 128 to hold or otherwise engage a bin mounted within bin mounting region 211.

[0034] In some embodiments, an ice storage bin 212 is provided. Specifically, ice storage bin 212 may be selectively or removably received within the bin mounting region 211 (e.g., during ice making operations). For instance, ice storage bin 212 may be slidably mounted within the icebox compartment 160 on support tray 218. Generally, ice storage bin 212 defines an ice storage volume 224 for holding ice nuggets therein. As would be understood, a movable auger or paddle may be mounted within ice storage volume 224 to agitate or motivate ice therein. An ice inlet 220 may be defined (e.g., at an upper end) to permit ice from icemaker 210 to the ice storage volume 224 (e.g., during ice making operations when ice storage bin 212 is received within the bin mounting region 211). In some embodiments, an ice outlet 222 is defined (e.g., at a lower end) to selectively permit ice to pass from the ice storage volume 224 to the dispenser 142 (FIG. 1). Separate and apart from any ice outlet 222, ice storage bin 212 may define a bin outlet 226 through the lower end. As an example, a bottom wall 228 of ice storage bin 212 may define one or more apertures therethrough (e.g., above tray outlet 234). Generally, the apertures of the bin outlet 226 may be sufficiently sized (e.g., in diameter) to permit the flow of liquid water therethrough and to tray outlet 234. For instance, the apertures of bin outlet 226 may be defined as a series of unimpeded perforations. Additionally or alternatively, the bin outlet 226 may include a movable or resilient plug, which is configured to selectively engage support tray 218 and permit water through the bin outlet 226 to tray outlet 234 when ice storage bin 212 is fully received within the icebox com-

partment 160.

[0035] In additional or alternative embodiments, a cleaning bin 229 is provided. Specifically, cleaning bin 229 may be selectively or removably received within the bin mounting region 211 (e.g., during cleaning operations). Optionally, cleaning bin 229 may be mounted within bin mounting region 211 in place of ice storage bin 212 such that cleaning operations may be performed without flowing a cleaning solution through ice storage bin 212. Cleaning bin 229 may be slidably mounted within the icebox compartment 160 on support tray 218. Generally, cleaning bin 229 defines a container volume 230 for holding a liquid (e.g., water or cleaning solution) therein. The container volume 230 may generally be open and unobstructed by any internal (e.g., movable) members. A container inlet 232 may be defined (e.g., at an upper end) to permit liquid water or cleaning solution from icemaker 210 to the container volume 230 (e.g., during cleaning operations when cleaning bin 229 is received within the bin mounting region 211). In some embodiments, a container outlet 233 is defined at a lower end of cleaning bin 229. As an example, a bottom wall 231 of cleaning bin 229 may define one or more apertures therethrough. Generally, the apertures of the container outlet 233 may be sufficiently sized (e.g., in diameter) to permit the flow of liquid water therethrough. For instance, the apertures of container outlet 233 may be defined as a series of unimpeded perforations. Additionally or alternatively, the container outlet 233 may include a movable or resilient plug, which is configured to selectively engage support tray 218 and permit water through the container outlet 233 to tray outlet 234 when cleaning bin 229 is fully received within the icebox compartment 160.

[0036] In certain embodiments, cleaning bin 229 is supplied as a part of an assembly kit with ice storage bin 212 and appliance 100 such that a user can selectively swap or exchange ice storage bin 212 with cleaning bin 229 (e.g., to permit appliance 100 to perform cleaning operations), and similarly swap or exchange cleaning bin 229 with ice storage bin 212 (e.g., to permit appliance 100 to perform ice making operations).

[0037] Turning briefly to FIGS. 7 through 9, although a separate ice storage bin 212 and cleaning bin 229 are illustrated with respect to FIGS. 5 and 6, alternative embodiments may include only a single bin (e.g., ice storage bin 212), which may receive ice without receiving a liquid (e.g., water or cleaning solution) directly from icemaker 210. For instance, a catch cup 284 may positioned below the icemaker 210. In particular, catch cup 284 may be positioned horizontally between ice storage bin 212 and icemaker 210 (e.g., when ice storage bin 212 is mounted in bin mounting region 211 or received on support tray 218). Additionally or alternatively, at least a portion of catch cup 284 may be positioned above ice storage bin 212.

[0038] As shown, catch cup 284 defines at least one fluid outlet (e.g., apex outlet 286) along fluid flow path 260 between icemaker 210 and the filtration assembly 240 (e.g., at a cartridge mounting region 241). Thus, apex outlet 286 may be downstream from icemaker 210 while being upstream from a cartridge mounting region 241 of filtration assembly 240 (FIG. 5).

[0039] Referring especially to FIG. 6, catch cup 284 may be fixedly mounted (e.g., within icebox 160). In some such embodiments, catch cup 284 includes a lower funnel base 288 attached to an upper guide plate 289. Upper guide plate 289 may be tilted or sloped along a decline from icemaker 210 toward bin mounting region 211. Additionally or alternatively, upper guide plate 289 may define one or more plate apertures 290 extending therethrough (e.g., along the vertical direction V) to lower funnel base 288. Generally, the plate apertures 290 may each define a diameter that is smaller than the predetermined size of ice nuggets formed within icemaker 210. As ice is dispensed from icemaker 210, guide plate 289 may direct ice nuggets to ice storage bin 212 (e.g., ice storage volume 224). By contrast, liquids (e.g., water or cleaning solutions) may pass through guide plate 289 to lower funnel base 288. Apex outlet 286 may be defined through lower funnel base 288 (e.g., at a lowermost point thereof), such that water or cleaning solution is permitted to flow from lower funnel base 288 to filtration assembly 240.

[0040] Referring especially to FIGS. 8 and 9, catch cup 284 may be movably (e.g., pivotably) mounted (e.g., within icebox 160). In some such embodiments, catch cup 284 includes a funnel wall 292 positioned proximal to bin mounting region 211. A secondary wall 294 may be positioned proximal to icemaker 210. When assembled, funnel wall 292 and secondary wall 294 may extend in opposite directions to an apex point. Optionally, funnel wall 292 and secondary wall 294 may be joined together as an continuous or integral funnel. As shown, catch cup 284 may be pivotably mounted to rotate about a predetermined pivot axis A (e.g., defined above ice storage bin 212). In some such embodiments, the pivot axis A is positioned closer to the bin mounting region 211 (e.g., along a horizontal direction, such as the lateral direction L) than the apex outlet 286. When assembled, catch cup 284 may selectively move between a storage position (e.g., FIG. 8) and a cleaning position (e.g., FIG. 9). In the storage position, ice storage bin 212 may be fully received within icebox 160 (e.g., on support tray 218 or otherwise between the icemaker 210 and the cartridge mounting region 241) proximal to funnel wall 292. Moreover, funnel wall 292 may be pivoted downward toward the ice bin. As ice is dispensed from icemaker 210, funnel wall 292 may thus direct ice nuggets to ice storage bin 212 (e.g., ice storage volume 224). By contrast, in the cleaning position, ice storage bin 212 may be removed from icebox compartment 160 or otherwise moved apart from catch cup 284. Moreover, the funnel wall 292 may be pivoted upward. In turn, liquid flowing from the icemaker 210 may be directed along funnel wall 292 to the apex outlet 286 (e.g., such that water is permitted to flow from lower funnel base 288 to filtration assembly 240).

[0041] Returning generally to FIG. 5, in exemplary embodiments, the filtration assembly 240 includes a selectively removable fluid filter 242 having one or more filtration media for treating water therein. In some embodiments, or during certain operations (e.g., during icemaking operations), fluid filter 242 is disposed along a fluid flow path 260 between icemaker 210 and one or more fluid storage volumes. For instance, a cartridge mounting region 241 may be defined below support tray 218 (e.g., along the vertical direction V) to receive fluid filter 242. Optionally, the cartridge mounting region 241 may be directly beneath support tray 218 or, alternatively, laterally offset therefrom. Generally, cartridge mounting region 241 includes a cartridge inlet 244 and a cartridge outlet 246 that is located at a position below (e.g., lower than) the cartridge inlet 244 along the vertical direction V. When assembled, the cartridge inlet 244 is positioned downstream from the tray outlet 234 such that water flowing from the tray outlet 234 (e.g., as motivated by gravity) may enter fluid filter 242 through the cartridge inlet 244. Moreover, the cartridge outlet 246 is positioned downstream from the cartridge inlet 244.

[0042] Fluid filter 242 may include any suitable filtration media. In optional embodiments, filtration media includes a mixed resin media, such as a mixed-bed media of commingled anion and cation resin. As is understood, the mixed-bed media may be configured to remove dissolved solids, such as inorganic salts of sodium and chlorine ions. Additional or alternative embodiments may include another suitable media configured to filter liquid water, such as a paper filter cartridge, activated carbon, etc.

[0043] Separately from fluid filter 242, filtration assembly 240 may include a selectively removable cleaning cartridge 247 containing one more cleaning agents for generating a cleaning solution (e.g., when mixed with or dissolved in water). Generally, the cleaning agent(s) may be any suitable cleaner for descaling or sanitizing (e.g., eliminating pathogens) within an icemaker, such as citric or nitric acid. In some embodiments, or during certain operations (e.g., during cleaning operations), cleaning cartridge 247 is disposed along the fluid flow path 260 at the cartridge mounting region 241 (e.g., in the place of fluid filter 242). Thus, when mounted within cartridge mounting region 241, cleaning cartridge 247 may be held or otherwise positioned between cartridge inlet 244 and cartridge outlet 246 such that water flowing along flow path 260 is generally forced through cleaning cartridge 247 (e.g., to mix or dissolve with a cleaning agent therein).

[0044] In some embodiments, a filtered storage tank 248 defining a storage volume (e.g., first storage volume 252) is provided downstream from cartridge mounting region 241 (i.e., downstream from the cartridge outlet 246) to receive a liquid therefrom (e.g., liquid water or a cleaning solution based on whether fluid filter 242 or cleaning cartridge 247 is mounted within cartridge mounting region 241). Specifically, filtered storage tank 248 may define a tank inlet 256 through which liquid may be received. As an example, liquid water may be received after such water is filtered within fluid filter 242 and passes through the cartridge outlet 246 (e.g., during ice making operations in which fluid filter 242 is mounted within cartridge mounting region 241). As an additional or alternative example, the liquid cleaning solution may be received after the liquid cleaning solution is generated within cartridge mounting region 241 and passes through the cartridge outlet 246 (e.g., during cleaning operations in which cleaning cartridge 247 is mounted within cartridge mounting region 241).

[0045] In some embodiments, filtered storage tank 248 is positioned below cartridge mounting region 241 (e.g., along the vertical direction V). Advantageously, liquid water may flow (e.g., as motivated by gravity) from cartridge mounting region 241 to filtered storage tank 248 without requiring any intermediate pump, valve, or other mechanically driven fluid motivating device.

[0046] Turning briefly to FIG. 11, as shown, filtered storage tank 248 may be optionally disposed upstream from filtration mounting assembly 240. Thus, the cartridge (e.g., fluid filter cartridge 242 or cleaning cartridge 247) within cartridge mounting region 241 may be in fluid communication between filtered storage tank 248 and icemaker 210 or an upper reservoir 264. During use, liquid water may be drawn through cartridge mounting 241 from filtered storage tank 248 via, for instance, a fluid pump 254 downstream from filtered storage tank 248 or cartridge mounting region 241.

[0047] Returning primarily to FIG. 5, in certain embodiments, a fluid pump 254 may be positioned in fluid communication between filtered storage tank 248 and icemaker 210. Fluid pump 254 may be configured to selectively direct or motivate liquid water or cleaning solution from the first storage volume 252 (e.g., after passing through a tank outlet 258) and through a fluid flow path 260 between fluid pump 254 and icemaker 210. In some embodiments, icemaker 210 is positioned above filtered storage tank 248 such that fluid pump 254 is forced to motivate a liquid (e.g., water or cleaning solution), at least in part, along the vertical direction V. In some such embodiments, a check valve 262 is positioned along the fluid flow path 260 (e.g., in fluid communication therewith) downstream from fluid pump 254.

[0048] In exemplary embodiments, a drain line (e.g., first drain line 310) is provided between the first storage volume 252 and the fluid pump 254 or icemaker 210, generally. For instance, first drain line 310 may extend between a first drain end 312 and a second drain end 314. As shown, first drain end 312 may join to fluid flow path 260 downstream from tank outlet 258 (or first storage volume 252, generally), while second drain end 314 is spaced apart from fluid flow path 260 downstream from first drain end 312. A suitable drain plug or valve 318 may be positioned on first drain line 310 to selectively open or close second drain line 320 (e.g., as manually motivated by a user or, alternatively, as directed by controller 190 operably coupled to drain valve 318). Although not

pictured, it is understood that drain valve 318 may be further mounted in fluid communication with a separate refrigerator drain (e.g., to guide water out from refrigerator appliance 100, such as to a municipal drain or ambient environment).

[0049] During ice making operations, liquid water may flow from first storage volume 252 and to the fluid pump 254 before reaching icemaker 210. If present, first drain line 310 may be closed during such operations. As an additional or alternative example, during certain portions or phases of a cleaning operation, the generated liquid cleaning solution may flow from first storage volume 252 and to the fluid pump 254 before reaching icemaker 210. If present, first drain line 310 may be closed. Optionally, during other portions or phases of a cleaning operation (e.g., following generation and circulation of the cleaning solution through fluid flow path 260), first drain line 310 may be opened to guide the cleaning solution from the fluid flow path 260.

[0050] In additional or alternative embodiments, an upper reservoir 264 defining a storage volume (e.g., second storage volume 266) is positioned upstream from icemaker 210. For instance, the upper reservoir 264 may be positioned at a location that is above cartridge mounting region 241 or support tray 218. In certain embodiments, the upper reservoir 264 is positioned, at least in part, above icemaker 210. For instance, the upper reservoir 264 may be positioned directly above icemaker 210 to selectively flow liquid thereto. In further embodiments, the upper reservoir 264 is positioned downstream from fluid pump 254. A reservoir inlet 268 defined by the upper reservoir 264 may be disposed upstream from the second storage volume 266 to selectively receive liquid water flowed from fluid pump 254 through the fluid flow path 260. A reservoir outlet 270 may further be defined by the upper reservoir 264 downstream from the second storage volume 266 and upstream from icemaker 210.

[0051] In exemplary embodiments, a drain line (e.g., second drain line 320) is provided between the second storage volume 266 and the icemaker 210. For instance, second drain line 320 may extend between a first drain end 322 and a second drain end 324. As shown, first drain end 322 may join to fluid flow path 260 downstream from reservoir outlet 270 (or second storage volume 266, generally), while second drain end 324 is spaced apart from fluid flow path 260 downstream from first drain end 322. A suitable drain plug or valve may be positioned on second drain line 320 to selectively open or close second drain line 320 (e.g., as manually motivated by a user or, alternatively, as directed by controller 190 operably coupled to drain valve 318).

[0052] As shown, second drain line 320 may be joined to the same drain valve 318 as first drain line 310. Nonetheless, it is understood that alternative embodiments may include discrete drain plugs or valves corresponding to first drain line 310 and second drain line 320, respectively.

[0053] During operations, liquid may flow from fluid pump 254 and to the second storage volume 266 before reaching icemaker 210. As an example, during ice making operations, liquid water may flow from fluid pump 254 and to the second storage volume 266 before reaching icemaker 210. If present, second drain line 320 may be closed during such operations. As an additional or alternative example, during certain portions or phases of a cleaning operation, the generated liquid cleaning solution may flow from fluid pump 254 and to the second storage volume 266 before reaching icemaker 210. If present, second drain line 320 may be closed. Optionally, during portions or phases of a cleaning operation (e.g., prior to generation of the liquid cleaning solution), liquid water may be supplied to second storage volume 266 (e.g., from a water supply line 272) before such water is supplied to the icemaker 210 and, subsequently, to the cleaning cartridge 247 mounted within the cartridge mounting region 241. Additionally or alternatively, during other portions or phases of a cleaning operation (e.g., following generation and circulation of the cleaning solution through fluid flow path 260), second drain line 320 may be opened to guide the cleaning solution from the fluid flow path 260.

[0054] In some embodiments, a water supply line 272 is provided in selective fluid communication with the ice making assembly 200. As would be understood, water supply line 272 may be in downstream fluid communication to receive a flow or volume of water from a suitable water source (e.g., a municipal water supply, residential well, etc.). Optionally, water supply line 272 may further be in upstream fluid communication with fluid flow path 260 (e.g., to supply liquid water thereto). For instance, water supply line 272 may connect to fluid flow path 260 at a location between fluid pump 254 (e.g., or check valve 262) and second storage volume 266.

[0055] In some embodiments, a prefilter cartridge 274 and supply valve 276 are positioned upstream from ice making assembly 200 (e.g., fluid flow path 260). Water received in fluid flow path 260 from water supply line 272 may thus be forced through prefilter cartridge 274 before being directed to ice making assembly 200. Prefilter cartridge 274 may generally include any suitable filtration body or media. Optionally, prefilter cartridge 274 may be an activated carbon filter configured to remove sediment or organic material from water supplied thereto.

[0056] In some embodiments, supply valve 276 is positioned in fluid communication between the second storage volume 266 and water supply line 272 (e.g., with or as part of valve 194-FIG. 3). For instance, supply valve 276 may be located along the fluid flow path 260 at a location downstream from fluid pump 254 or check valve 262. Supply valve 276 may be provided as any suitable valve for selectively permitting or restricting water from water supply line 272 to enter the fluid flow path 260 (e.g., independently or separately from fluid pump 254). Liquid water may thus be selectively and alternately flowed to the second storage volume 266 from the first storage volume 252 and water supply line 272.

[0057] In certain embodiments, one or more level sensors (e.g., 280, 282) are provided. As an example, a first level sensor 280 may be mounted to filtered storage tank 248 in fluid communication with the first storage volume 252 to detect an amount or volume of water therein. As an additional or alternative example, a second level sensor 282 may be mounted to the upper reservoir 264 in fluid communication with the second storage volume 266 and an amount volume or volume of water therein. One or both of the level sensors 280, 282 may be operably coupled to (i.e., in operative communication with) controller 190. Moreover, as would be understood, the level sensors 280, 282 may be provided as any suitable liquid detecting sensor (e.g., a float-reed sensor, ultrasonic sensor, conductivity sensor, etc.). During use, controller 190 may thus generally determined if and when water within the first storage volume 252 or the second storage volume 266 has reached one or more corresponding predetermined levels.

[0058] In optional embodiments, controller 190 is configured to control or direct the flow of liquid (e.g., water or cleaning solution) to the second storage volume 266 alternately from the first storage volume 252 and water supply line 272. For instance, controller 190 may be configured to initiate a cleaning operation.

[0059] Turning now to FIG. 10, a flow chart is provided of a method (e.g., 300) of operating a refrigerator appliance 100 (FIG. 1), as described above. One or more portions of the method 400 can be performed, for instance, by the controller 150 (FIG. 3). For example, controller 150 may, as discussed, be in communication with control panel 148, air handler 192, compressor 182, icemaker 210, fluid pump 254, supply valve 276, or one or more sensors 280, 282. During operations, controller 150 may send signals to and receive signals from panel 148, air handler 192, compressor 182, icemaker 210, fluid pump 254, supply valve 276, or one or more sensors 280, 282. Controller 150 may further be in communication with other suitable components of the appliance 100 to facilitate operation of the appliance 100 generally.

[0060] Advantageously, the disclosed methods may advantageously provide for cleaning of an ice making assembly without removing various portions of the assembly, such as the icemaker. Additionally or alternatively, the disclosed methods may easily, efficiently, and effectively clean portions of the assembly, such as without requiring significant user intervention or care.

[0061] FIG. 10 depicts steps performed in a particular order for purpose of illustration and discussion. Those of ordinary skill in the art, using the disclosures provided herein, will understand that the steps of any of the methods disclosed herein can be modified, adapted, rearranged, omitted, or expanded in various ways without deviating from the scope of the present disclosure (except as otherwise described).

[0062] At 410, the method 400 includes providing a cleaning cartridge containing a cleaning agent along a fluid flow path between an icemaker, such as a nugget icemaker, and a fluid storage volume (e.g., first storage volume or second storage volume, as discussed above). In some embodiments, the cleaning cartridge is provided in a cartridge mounting region. Optionally, the cleaning cartridge may be provided as a replacement for a recirculation filter (e.g., provided as a kit). Thus, 410 may include replacing the recirculation filter within the cartridge mounting region. The replaced recirculation filter may be maintained apart from the cabinet or remainder of the appliance (e.g., for the duration of method 400). Such a replacement may be performed by a user (e.g., manually) and may include any steps required to typically replace a recirculation filter (e.g., following the expiration of the recirculation filter's usable lifespan).

[0063] In optional embodiments, the method 400 may require removing an ice bin (e.g., ice storage bin) from a position between the icemaker and the cleaning cartridge. For instance, the ice bin may be separated from an icebox or bin mounting region in which the ice bin is provided to receive ice during ice making operations, as described above. The removed ice bin may be maintained apart from the cabinet or remainder of the appliance (e.g., for the duration of method 400). Such a removal may be performed by a user (e.g., manually) and may include any steps required to typically replace an ice bin (e.g., to completely empty or remove a large portion of ice held within the ice bin). Moreover, the removal of the ice bin may be required prior to any subsequent steps (e.g., 420 through 460), such as those described below. Optionally, the ice bin may be replaced by a cleaning bin (e.g., within the icebox or bin mounting region), as described above.

[0064] At 420, the method 400 includes initiating a flow of water to the fluid storage volume. Specifically, 420 may follow (e.g., occur subsequent to) 410. The initiated water flow may, for instance, be provided from a water supply conduit. Thus, 420 may include opening a supply valve (e.g., moving the supply to the open configuration, as described above). Optionally, the fluid pump may be held in an inactive state for the duration of 420.

[0065] At 430, the method 400 includes directing an overspill water flow to the icemaker. For instance, the initiated water flow of 420 may be continued such that a predetermined overspill volume is supplied to the fluid storage volume. Determination that the overspill volume may be made, for instance, in response to a fill signal received from a level sensor (e.g., second level sensor) within the fluid storage volume or expiration of a predetermined fill time following opening of the water supply valve. Optionally, the supply valve may be maintained in an open position, then subsequently closed or restricted (e.g., moving the supply valve to the closed configuration) upon determination that the predetermined overspill volume had been supplied the fluid storage volume. From the fluid storage volume, the overspill volume may be guided or released to the icemaker as the overspill water flow. In some such embodiments, the overspill water flow provides a volume of water in excess of the capacity of

the icemaker such that at least a portion of the water (e.g., excess portion) pours out from the icemaker.

[0066] At 440, the method 400 includes guiding water (e.g., the excess portion) from the icemaker to the cleaning cartridge to generate a cleaning solution. As described above, the icemaker may be upstream from the cleaning cartridge along the flow path. Thus, water may be directed through the assembled flow path before reaching the filter cartridge. In some such embodiments, this includes directing the excess portion of water through the cleaning bin or along a path that bypasses the ice bin, as described above.

[0067] In optional embodiments, 440 include directing water through the catch cup positioned below the icemaker. Moreover, as further described above, the catch cup may be pivotably mounted to move between a storage position and a cleaning position. Thus, 440 may include providing the catch cup in the cleaning position such that water is funneled from the icemaker to an outlet (e.g., apex outlet) of the catch cup.

[0068] Once generated, the cleaning solution may be motivated or circulated (e.g., repeatedly) from the cleaning cartridge along the assembled flow path, such as in a loop.

[0069] At 450, the method 400 includes motivating the cleaning solution to the icemaker through the fluid storage volume. Optionally, from the cleaning cartridge, the cleaning solution may collect (e.g., as motivated, at least in part, by gravity) in the first storage volume defined by the storage tank positioned below the cleaning cartridge. Additionally or alternatively, the cleaning solution may be pumped (e.g., by the fluid pump) to the second storage volume defined by the upper reservoir. For instance, the fluid pump may pump the cleaning solution along the fluid path from the first storage volume and upward to the second storage volume.

[0070] At 460, the method 400 includes opening a drain line downstream from the cleaning cartridge between the fluid storage volume and the icemaker to guide the cleaning solution from the fluid flow path. For instance, the second drain line may be opened downstream from the second storage volume, as described above. Additionally or alternatively, the first drain line may be opened downstream from the cleaning cartridge or first storage volume, as also described above.

[0071] Optionally, 460 may be initiated by a determined expiration of the cleaning operation. For instance, the cleaning operation may have a predetermined time period (e.g., in seconds or minutes) in which the fluid (e.g., water or the cleaning solution) is to be motivated through the ice making assembly. In response to a determination that the cleaning solution has expired (e.g., following 420), 460 may be initiated. Additionally or alternatively, 460 may be initiated at a user-selected moment, such as in response to a user input to drain the cleaning solution.

[0072] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they include structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

Claims

1. A method of cleaning an ice making assembly, the method comprising:

providing a cleaning cartridge containing a cleaning agent along a fluid path between an icemaker and a fluid storage volume;
initiating a flow of water to the fluid storage volume;
directing an overspill water flow to the icemaker;
guiding water from the icemaker to the cleaning cartridge to generate a cleaning solution;
motivating the cleaning solution to the icemaker through the fluid storage volume; and
opening a drain line downstream from the cleaning cartridge between the fluid storage volume and the icemaker to guide the cleaning solution from the fluid path.

2. The method of claim 1, further comprising removing an ice bin from between the icemaker and the cleaning cartridge prior to guiding water from the icemaker to the cleaning cartridge.

3. The method of claim 2, wherein guiding water from the icemaker to the cleaning cartridge comprises directing water through a catch cup positioned below the icemaker.

4. The method of claim 3, wherein the catch cup is pivotably mounted to move between a storage position and a cleaning position, wherein the storage position comprises a funnel wall pivoted downward toward the ice bin between the icemaker and the cleaning cartridge, and wherein the cleaning position comprises the funnel wall pivoted upward to funnel liquid to an apex outlet of the catch cup.

5. The method of claim 1, wherein the storage volume is a second storage volume defined by an upper reservoir positioned above the cleaning cartridge, and wherein motivating the cleaning solution to the icemaker comprises

collecting the cleaning solution in a first storage

volume defined by a storage tank positioned below the cleaning cartridge, and
pumping the cleaning solution from the first storage volume to the second storage volume through a fluid pump.

6. The method of claim 5, wherein the drain line is a second drain line, and wherein the method further comprises:
opening a first drain line downstream from the cleaning cartridge between the first fluid storage volume and the fluid pump to guide the cleaning solution from the fluid path.

7. The method of claim 1, wherein providing a cleaning cartridge comprises replacing a recirculation filter along the fluid path between the icemaker and the fluid storage volume.

8. The method of claim 1, wherein the ice making assembly is mounted within a refrigerator appliance, and wherein the fluid path is fluidly isolated from a water dispenser of the refrigerator appliance.

9. The method of claim 8, wherein the ice making assembly is mounted within a rotating door of the refrigerator appliance.

10. A refrigerator appliance defining a vertical direction, a lateral direction, and a transverse direction, the refrigerator appliance comprising:

a cabinet;
an ice making assembly attached to the cabinet, the ice making assembly comprising

a fluid path downstream of a water supply line,
an icemaker provided along the fluid path,
a fluid storage volume provided along the fluid path in fluid communication with the icemaker,
a cleaning cartridge containing a cleaning agent and selectively provided along the fluid path between the icemaker the fluid storage volume, and
a drain line downstream from the cleaning cartridge between the fluid storage volume and the icemaker; and

a controller in operative communication with the ice making assembly, the controller being configured to initiate a cleaning operation comprising

initiating a flow of water to the fluid storage volume from the water supply line,
directing an overspill water flow to the icemaker,
guiding water along the fluid path from the icemaker to the cleaning cartridge to generate a cleaning solution,
motivating the cleaning solution to the icemaker through the fluid storage volume, and opening the drain line to guide the cleaning solution from the fluid path.

11. The refrigerator appliance of claim 10, further comprising removing an ice bin removably mounted between the icemaker and the cleaning cartridge.

12. The refrigerator appliance of claim 10, further comprising a catch cup mounted below the icemaker, the catch cup defining an apex outlet upstream from the cleaning cartridge, wherein guiding water from the icemaker to the cleaning cartridge comprises directing water through the catch cup.

13. The refrigerator appliance of claim 12, wherein the catch cup is pivotably mounted to move between a storage position and a cleaning position, wherein the storage position comprises a funnel wall pivoted downward toward the ice bin between the icemaker and the cleaning cartridge, and wherein the cleaning position comprises the funnel wall pivoted upward to funnel liquid to the apex outlet of the catch cup.

14. The refrigerator appliance of claim 10, wherein the storage volume is a second storage volume defined by an upper reservoir positioned above the cleaning cartridge, wherein the ice making assembly further comprises first storage volume and a fluid pump, wherein the first storage volume is mounted below the cleaning cartridge in downstream fluid communication therewith, wherein the fluid pump is in fluid communication between the first storage volume and the second storage volume, and wherein motivating the cleaning solution to the icemaker comprises

collecting the cleaning solution in a first storage volume defined by a storage tank positioned below the cleaning cartridge, and
pumping the cleaning solution from the first storage volume to the second storage volume through the fluid pump.

15. The refrigerator appliance of claim 14, wherein the drain line is a second drain line, wherein the ice making assembly further comprises first drain line downstream from the cleaning cartridge between the first fluid storage volume and the fluid pump, and wherein the cleaning operation further comprises opening the first drain line to guide the cleaning solution from the fluid path.

16. The refrigerator appliance of claim 10, wherein providing a cleaning cartridge comprises replacing a recirculation filter along the fluid path between the icemaker and the fluid storage volume.

17. The refrigerator appliance of claim 10, further comprising a door rotatably mounted on the cabinet, wherein the door comprises a water dispenser, and wherein the fluid path is fluidly isolated from the water dispenser.

18. The refrigerator appliance of claim 17, wherein the ice making assembly is mounted within the door.

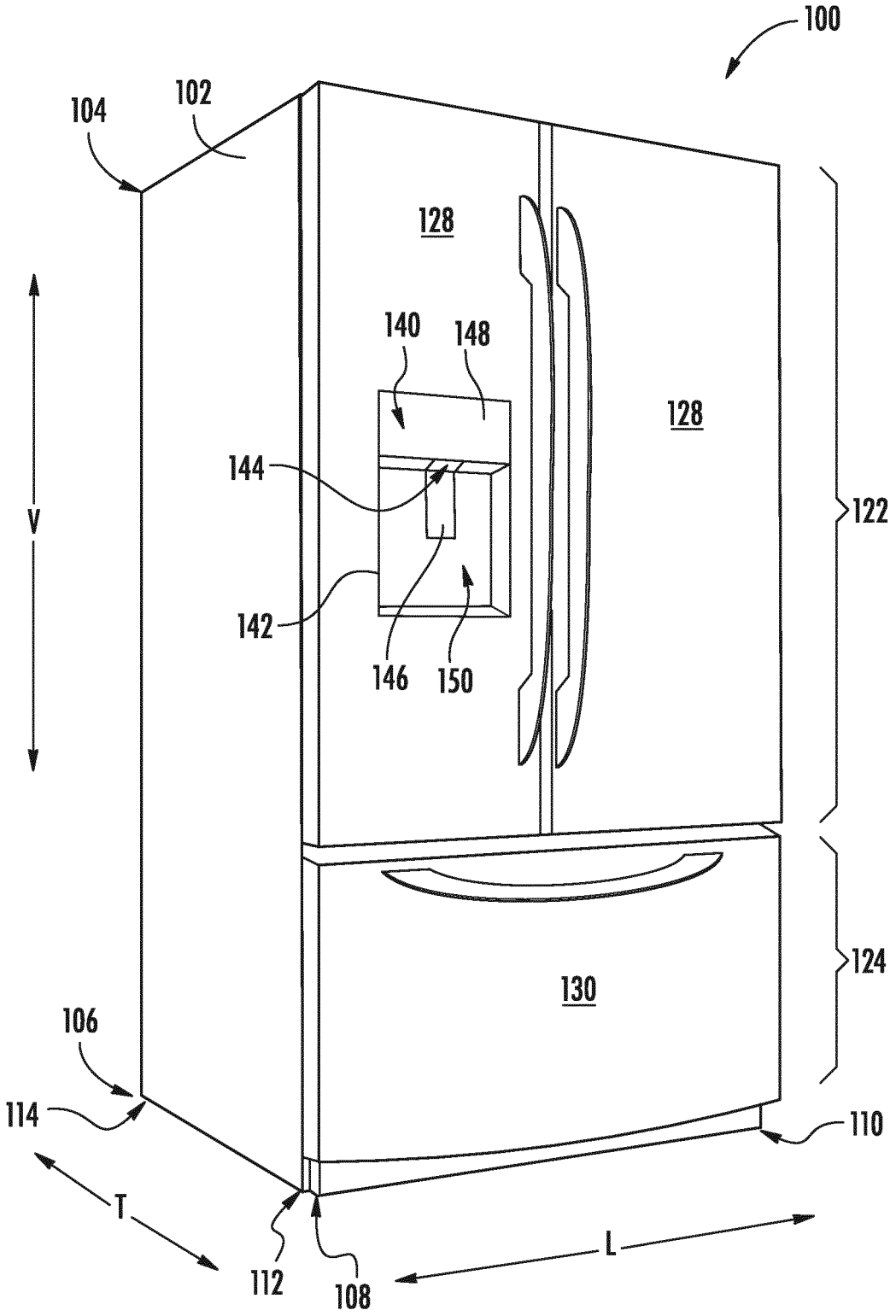
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FIG. 1

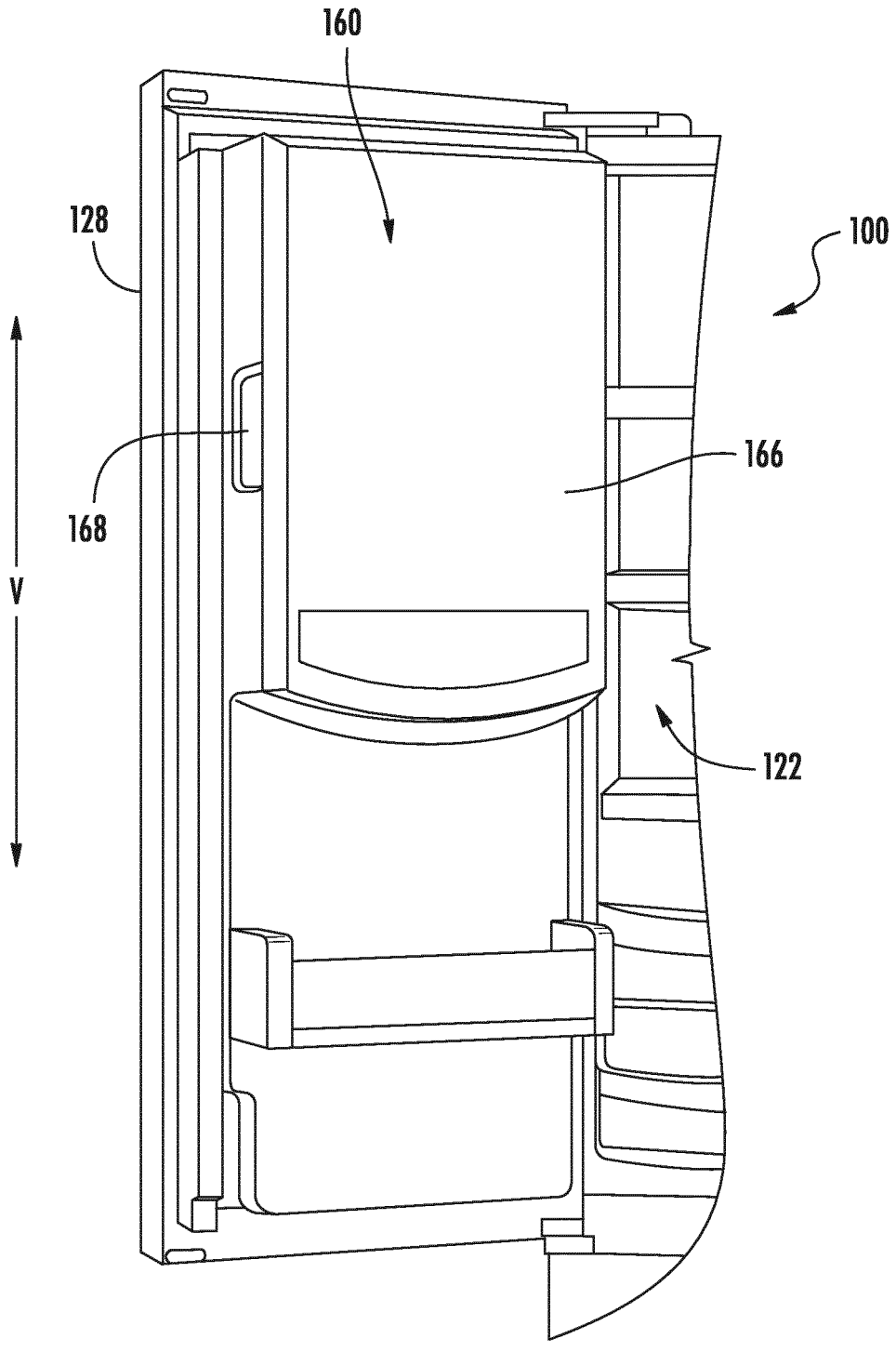
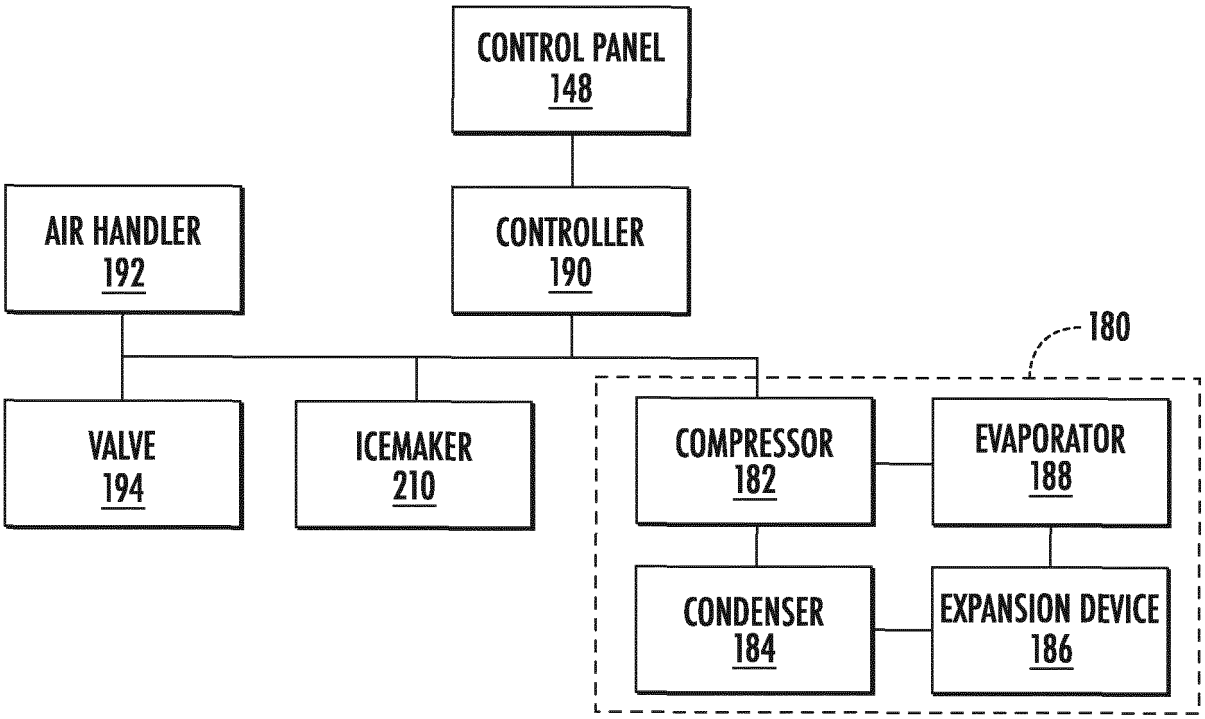


FIG. 2


CONTROL PANEL
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AIR HANDLER
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CONTROLLER
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VALVE
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ICEMAKER
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COMPRESSOR
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EVAPORATOR
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CONDENSER
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EXPANSION DEVICE
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FIG. 3

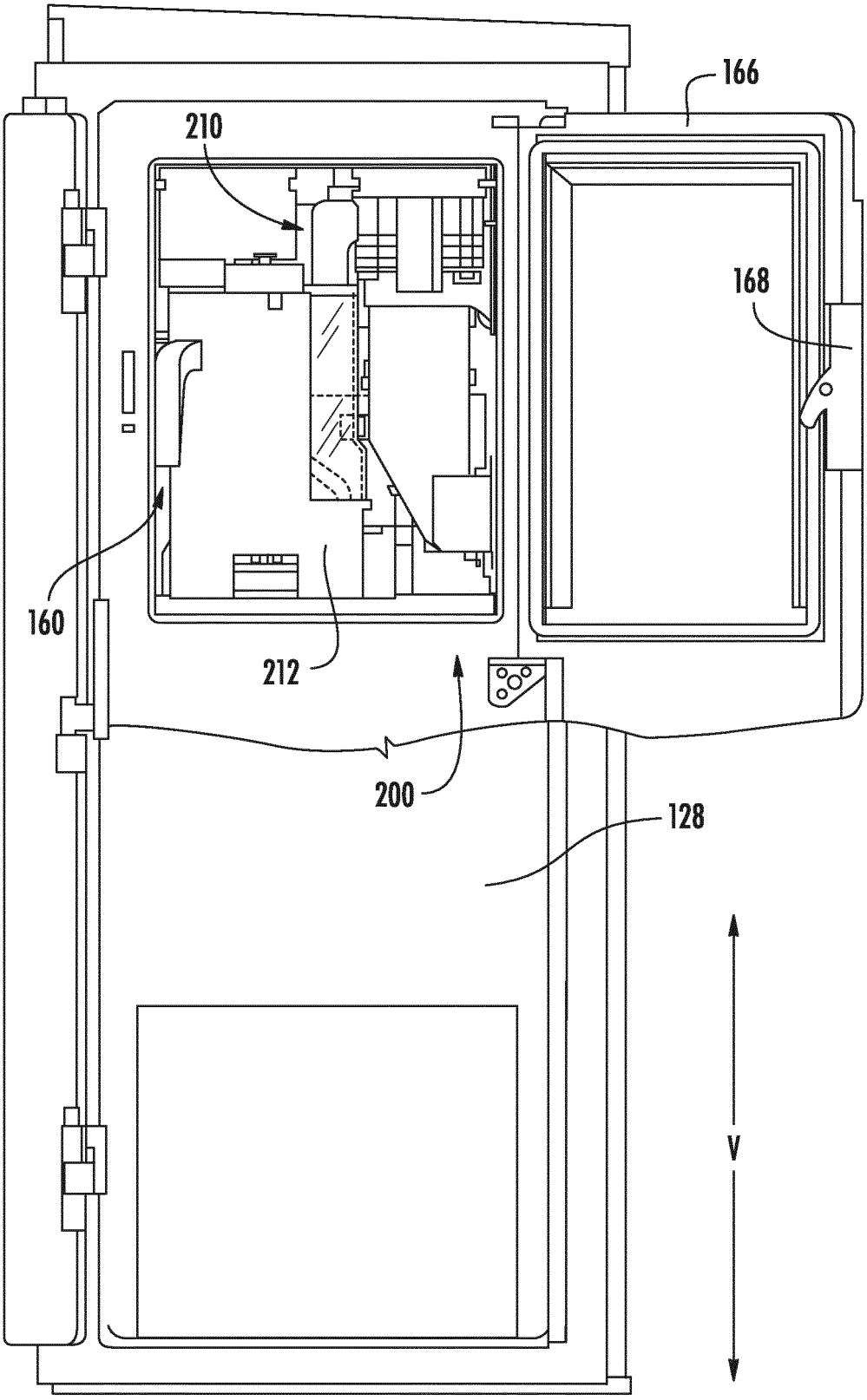

FIG. 4

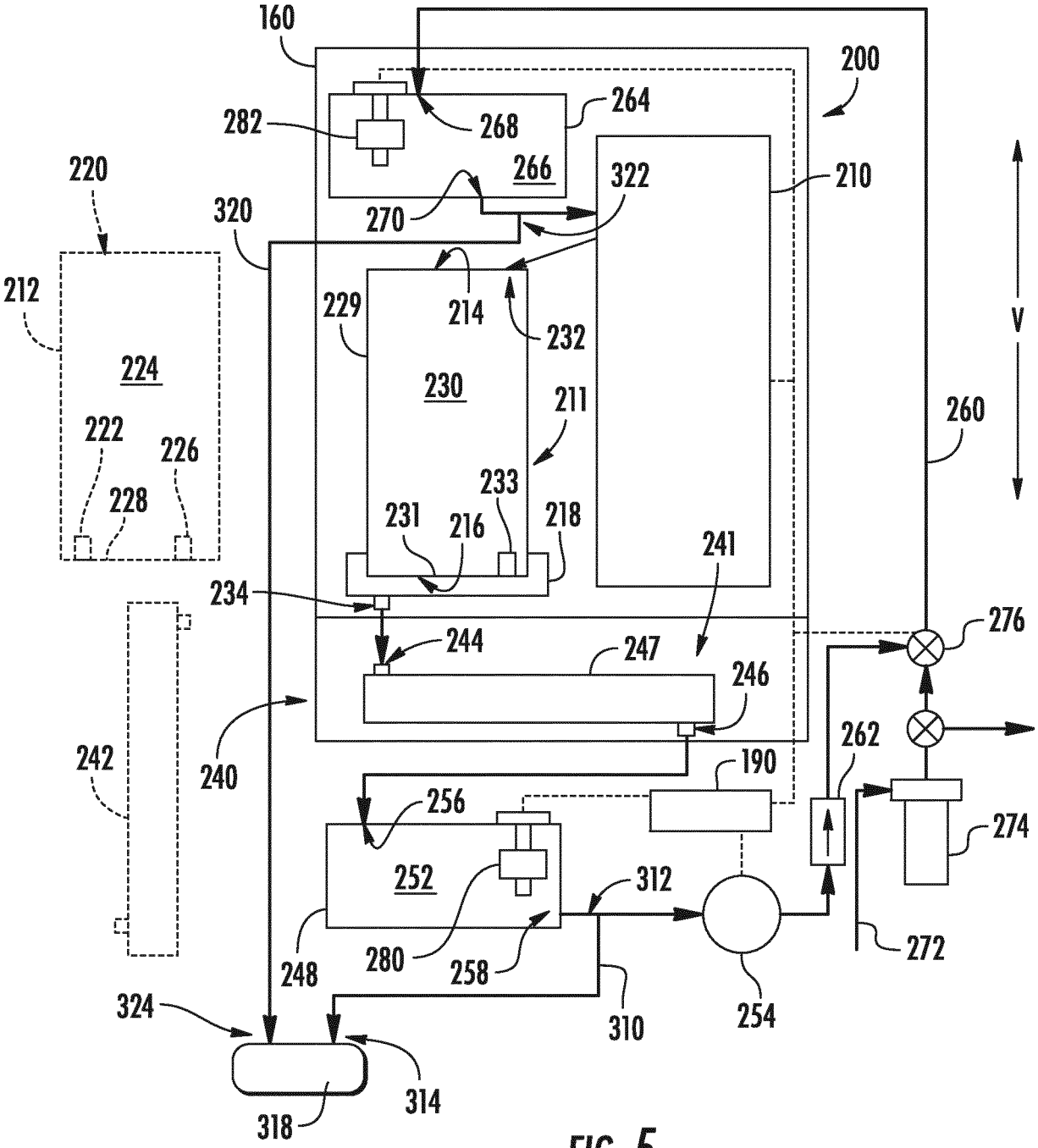
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FIG. 5

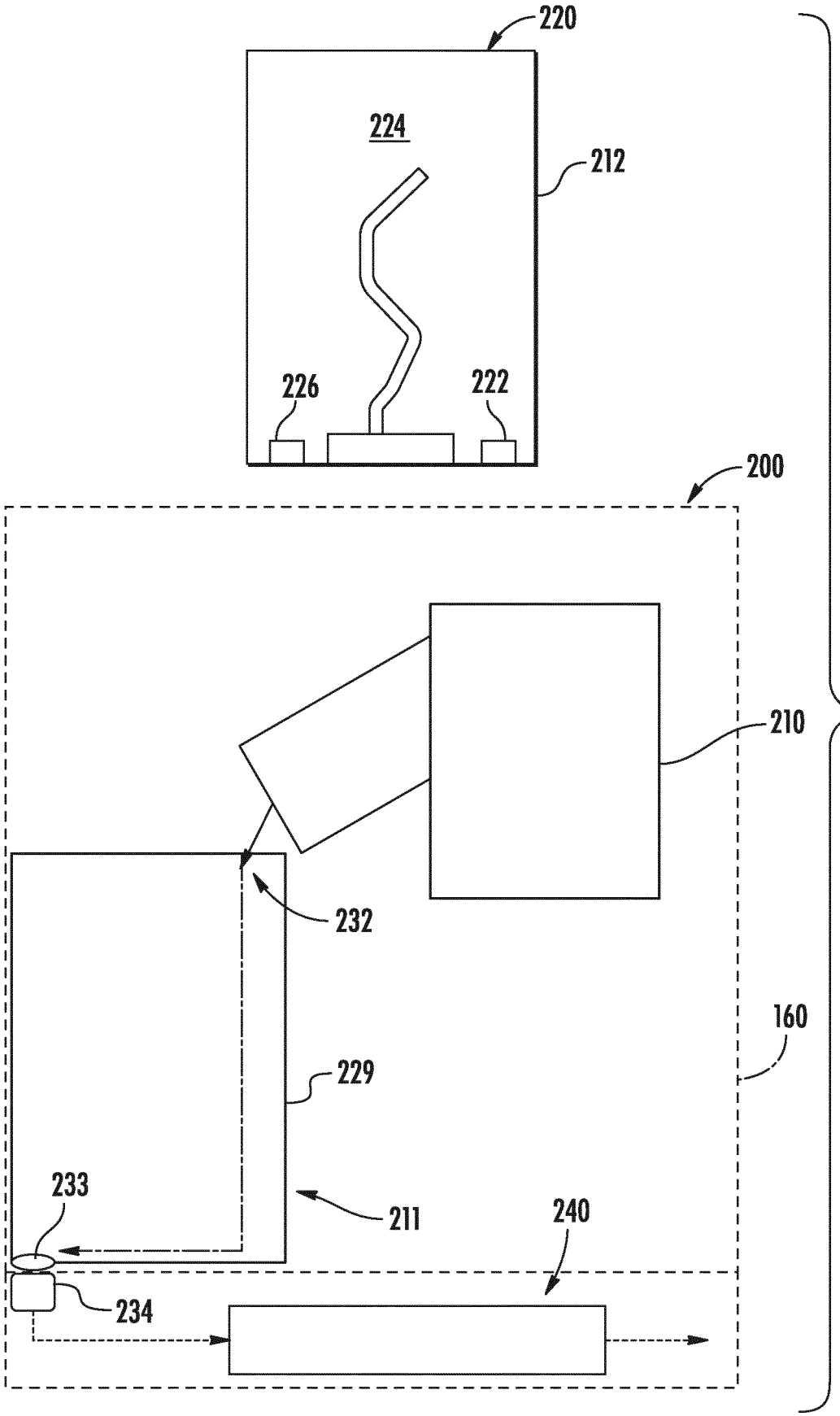

FIG. 6

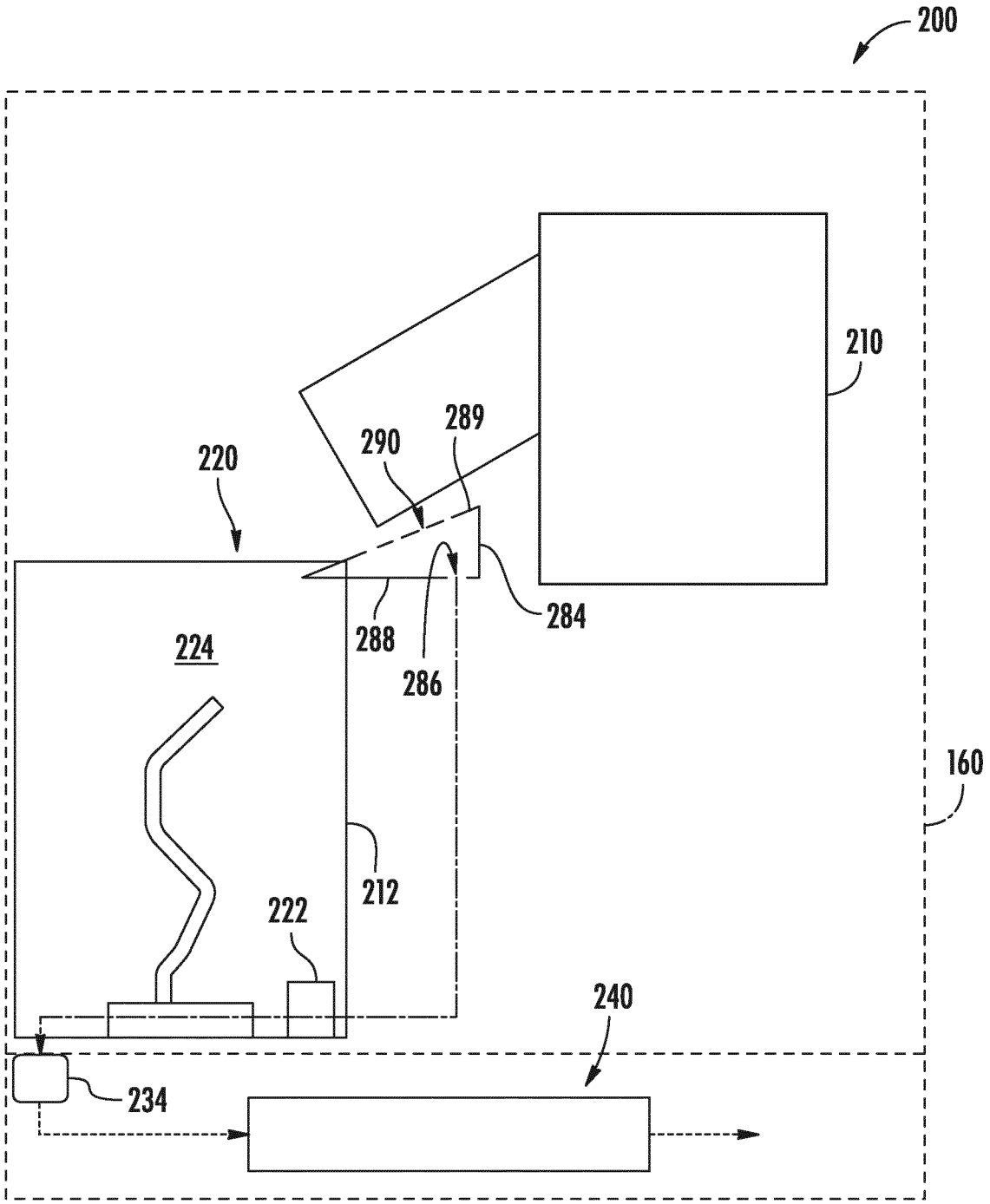

FIG. 7

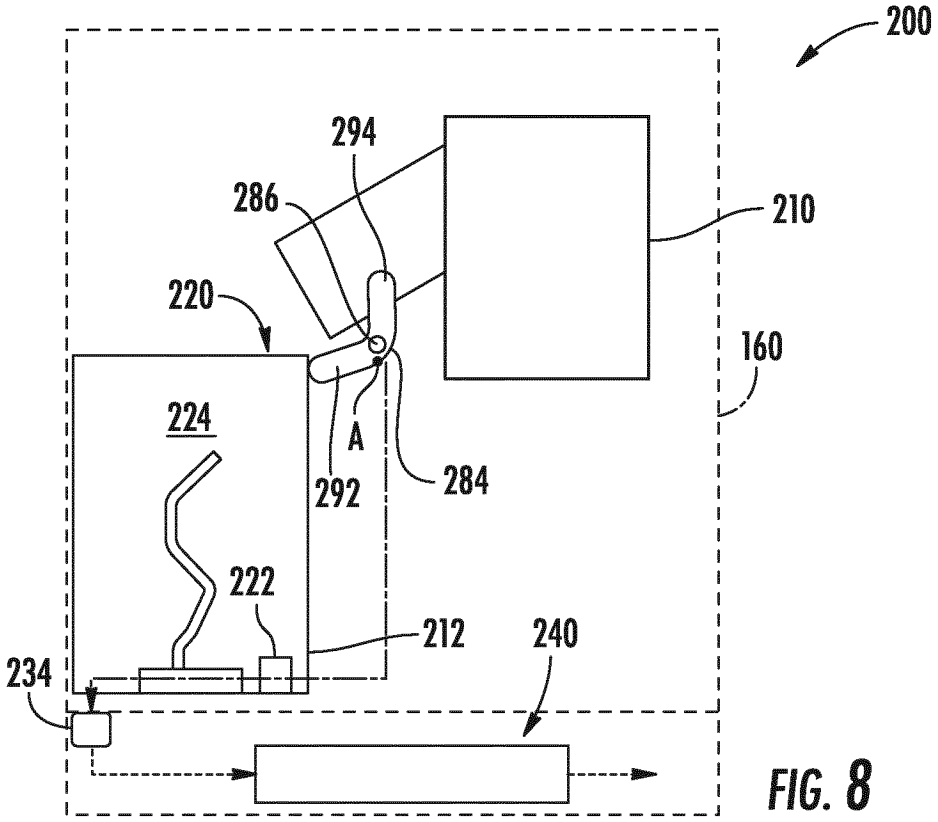
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FIG. 8

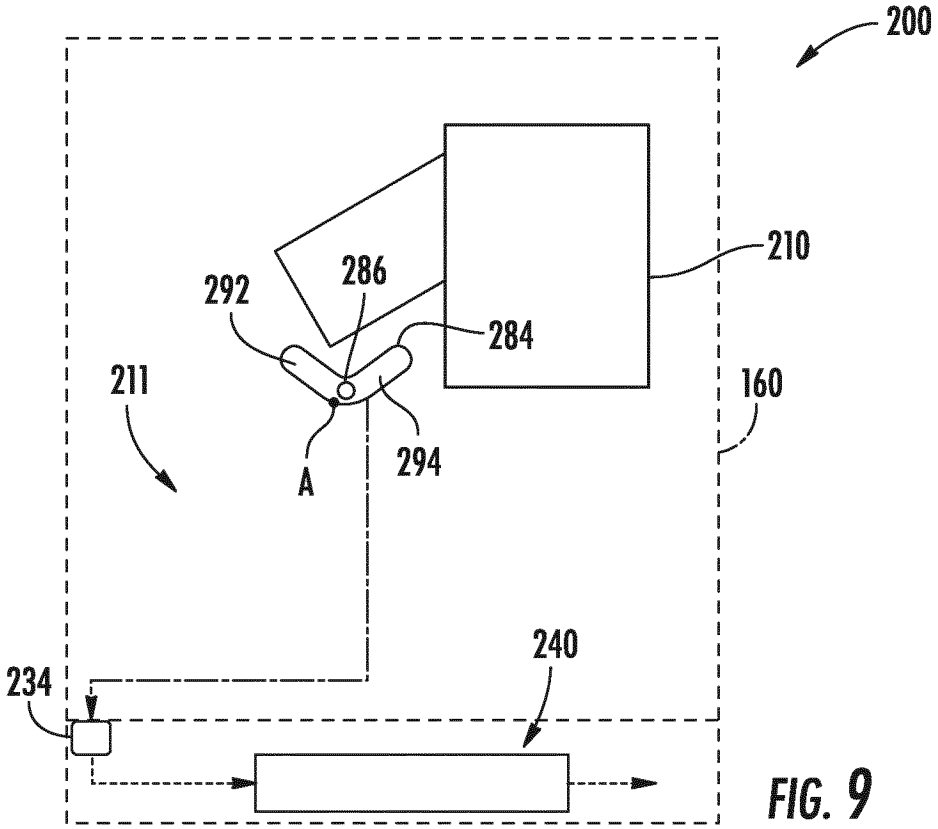
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FIG. 9

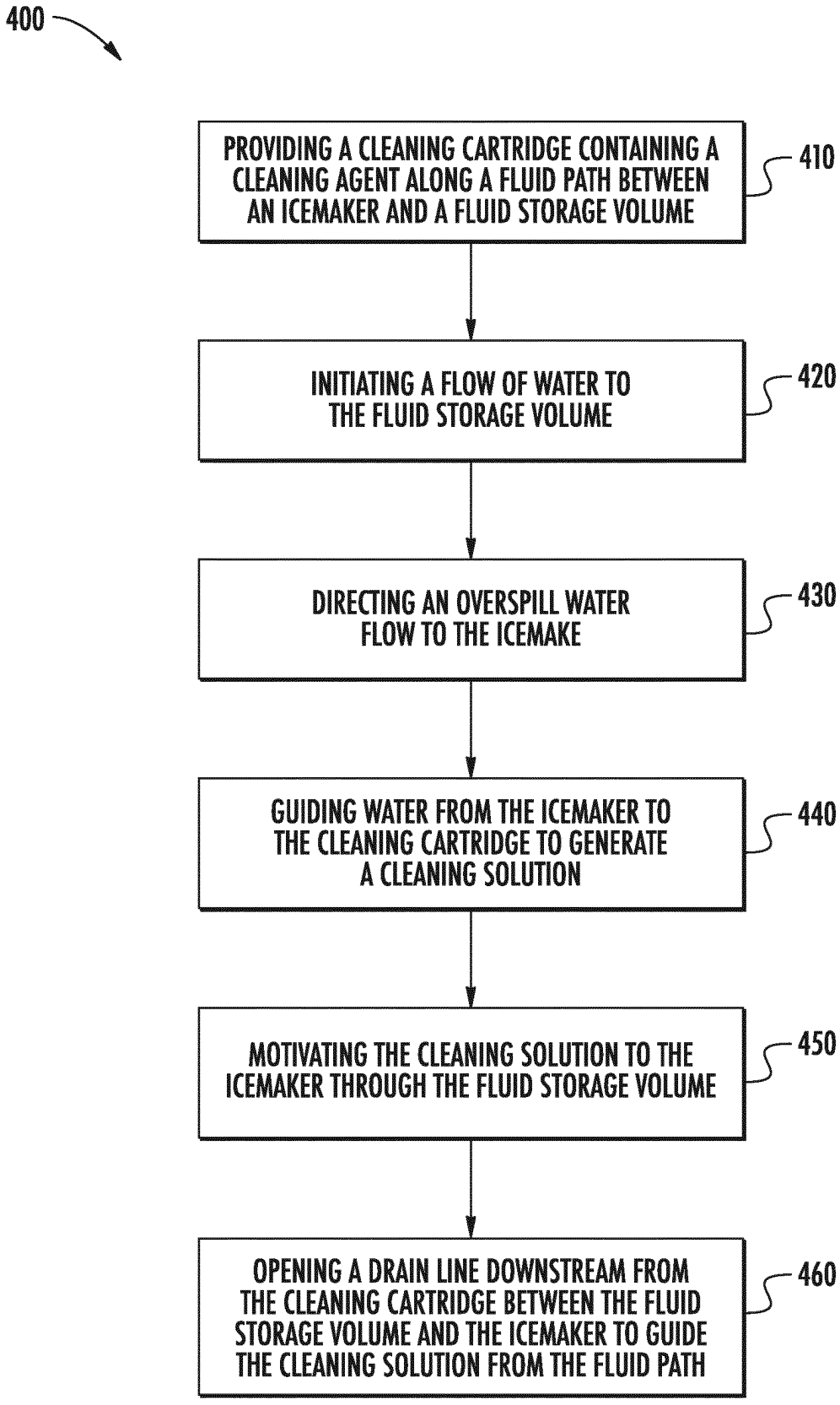
400
PROVIDING A CLEANING CARTRIDGE CONTAINING A CLEANING AGENT ALONG A FLUID PATH BETWEEN AN ICEMAKER AND A FLUID STORAGE VOLUME
410
INITIATING A FLOW OF WATER TO THE FLUID STORAGE VOLUME
420
DIRECTING AN OVERSPILL WATER FLOW TO THE ICEMAKE
430
GUIDING WATER FROM THE ICEMAKER TO THE CLEANING CARTRIDGE TO GENERATE A CLEANING SOLUTION
440
MOTIVATING THE CLEANING SOLUTION TO THE ICEMAKER THROUGH THE FLUID STORAGE VOLUME
450
OPENING A DRAIN LINE DOWNSTREAM FROM THE CLEANING CARTRIDGE BETWEEN THE FLUID STORAGE VOLUME AND THE ICEMAKER TO GUIDE THE CLEANING SOLUTION FROM THE FLUID PATH
460

FIG. 10

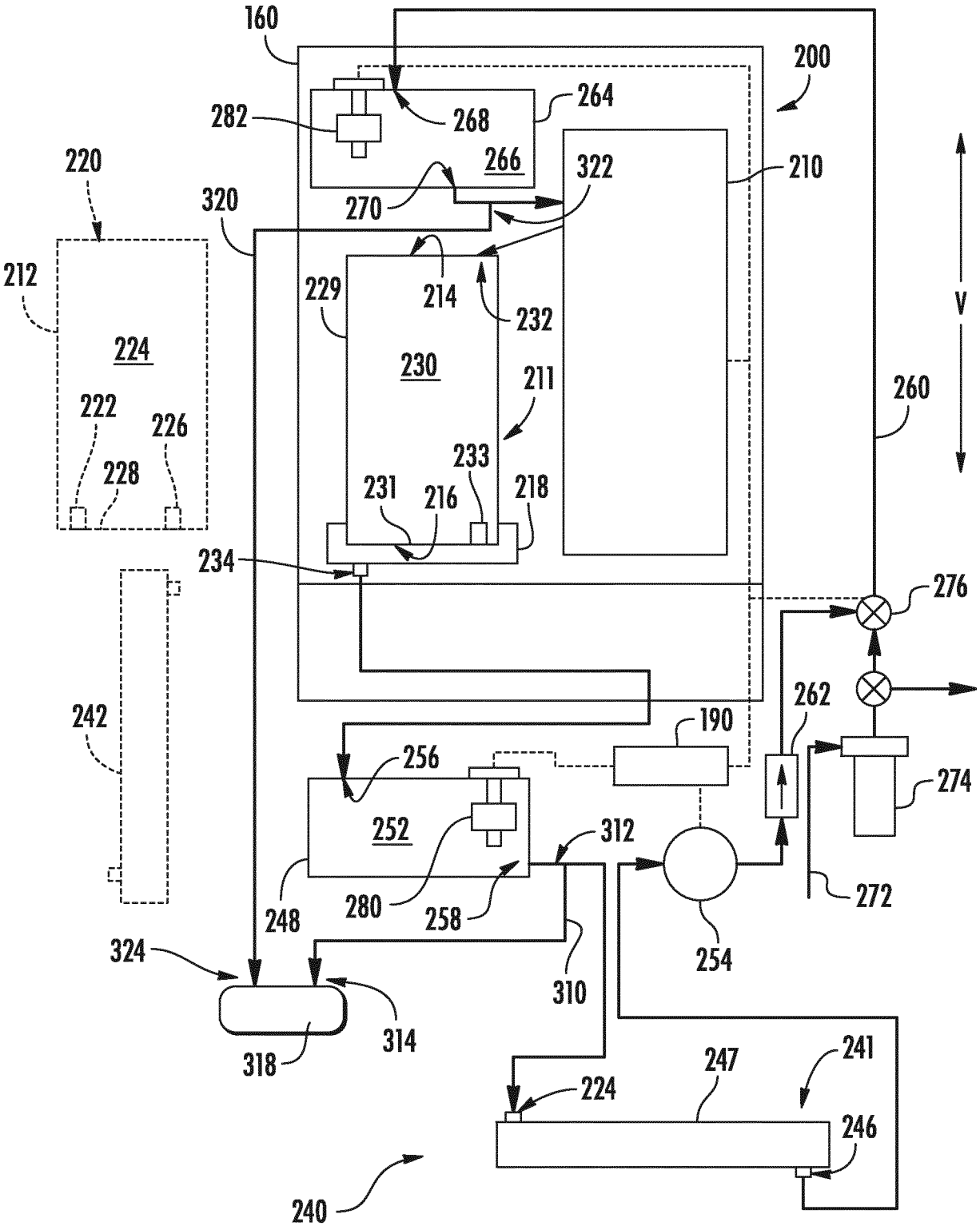
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FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/105018

A. CLASSIFICATION OF SUBJECT MATTER

F25C 5/02(2006.01)i; F25C 1/00(2006.01)i; F25D 11/02(2006.01)i

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)

F25C; F25D

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

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

CNTXT, CNABS, CNKI, SIPOABS, DWPI: 制冰, 冰, 融化, 水, 清洁, 过滤, 滤水, 滤芯, 净化, 净水, 消毒, 杀菌, 循环, 储, ice, maker, melt, water, clean, filter, purifi+, sterilization

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012118001 A1 (MITCHELL ALAN JOSEPH et al.) 17 May 2012 (2012-05-17) description, paragraphs [0015]-[0035], and figures 1-5	1, 7-11, 14-18
X	US 2015108886 A1 (GENERAL ELECTRIC COMPANY) 23 April 2015 (2015-04-23) description, paragraphs [0025]-[0066], and figures 12-13	1, 7-11
X	US 2003010054 A1 (COKE COCA-COLA CO., et al.) 16 January 2003 (2003-01-16) description, paragraphs [0017]-[0045], and figures 1-4	1, 7
X	CN 111207544 A (LU'AN SOYEA ELECTRIC APPLIANCE MANUFACTURING CO., LTD.) 29 May 2020 (2020-05-29) description, paragraphs [0021]-[0038], and figure 1	1, 7
A	CN 104075533 A (HEFEI KINGHOME ELECTRICAL CO., LTD.) 01 October 2014 (2014-10-01) entire document	1-18

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 September 2021	**12 October 2021**
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