US Patent & Trademark Office
Patent Public Search | Text View

United States Patent Application Publication	20250262650
Kind Code	A1
Publication Date	August 21, 2025
Inventor(s)	Venkata; Srikanth Raavi et al.

DESCALE TANK FOR STAND-ALONE ICE MAKING APPLIANCE

Abstract

A cleaning vessel is configured to fluidly couple to a stand-alone ice making appliance. The cleaning vessel includes a casing and a user interface on the casing. The cleaning vessel also includes a pump and a plurality of tanks disposed within the casing. A fluid port is on the casing and is fluidly coupled to the plurality of tanks. A controller is also disposed within the casing. The controller is configured to operate the pump to drain a first fluid from the stand-alone ice making appliance into a first tank of the plurality of tanks of the cleaning vessel. The controller is also configured to operate the pump to pump a second fluid from a second tank of the plurality of tanks of the cleaning vessel into the stand-alone ice making appliance.

Inventors: **Venkata; Srikanth Raavi (Louisville, KY), Tarr; Ronald Scott (Louisville, KY), DuPlessis; Samuel Vincent (Louisville, KY)**

Applicant: **Haier US Appliance Solutions, Inc.** (Wilmington, DE)

Family ID: **1000007697066**

Appl. No.: **18/442697**

Filed: **February 15, 2024**

Publication Classification

Int. Cl.: **B08B9/08** (20060101); **F25C1/00** (20060101)

U.S. Cl.:

CPC **B08B9/08** (20130101); **F25C1/00** (20130101); B08B2209/08 (20130101); F25C2400/12 (20130101)

Background/Summary

FIELD OF THE INVENTION

[0001] The present subject matter relates generally to ice making appliances, and more particularly to systems and methods for descaling components of stand-alone ice making appliances.

BACKGROUND OF THE INVENTION

[0002] Ice makers generally produce ice for use by consumers, such as in beverages, for cooling food items, etc. Certain refrigerator appliances include ice makers for producing ice. The ice maker can be positioned within the appliance's freezer chamber and direct ice into an ice bucket where the ice is stored within the freezer chamber. Such refrigerator appliances can also include a dispensing system for assisting a user with accessing ice produced by the refrigerator appliance's ice maker. However, the incorporation of ice makers into refrigerator appliances can have drawbacks, such as limits on the amount of ice that can be produced and the reliance on the refrigeration system of the refrigerator appliance to form the ice.

[0003] Stand-alone ice makers are separate from refrigerator appliances and provide independent ice supplies. Generally, liquid water is added to the stand-alone ice makers, and the ice makers operate to freeze the liquid water and form ice. Users frequently add tap water to the stand-alone ice makers. Tap water may include various impurities that negatively affect the appearance and/or taste of ice cubes formed from the tap water. Further, tap water may, over time, lead to scale buildup within the ice maker.

[0004] Traditional methods of cleaning some ice makers may include moving the whole ice machine closer to a sink or use a big bucket to drain the water used to clean and rinse, which is manually intensive. Accordingly, a system for cleaning an ice maker that removes the manual intensity of traditional methods would be advantageous.

BRIEF DESCRIPTION OF THE INVENTION

[0005] 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.

[0006] In one example embodiment, a cleaning vessel is provided. The cleaning vessel is configured to fluidly couple to a stand-alone ice making appliance. The cleaning vessel includes a casing and a user interface on the casing. The cleaning vessel also includes a pump and a plurality of tanks disposed within the casing. A fluid port is on the casing and is fluidly coupled to the plurality of tanks. A controller is also disposed within the casing. The controller is configured to operate the pump to drain a first fluid from the stand-alone ice making appliance into a first tank of the plurality of tanks of the cleaning vessel. The controller is also configured to operate the pump to pump a second fluid from a second tank of the plurality of tanks of the cleaning vessel into the stand-alone ice making appliance.

[0007] In another example embodiment, a method for operating a cleaning vessel is provided. The cleaning vessel is configured to fluidly couple to a stand-alone ice making appliance. The cleaning vessel includes a casing, a user interface on the casing, and a pump disposed within the casing. The cleaning vessel also includes a plurality of tanks within the casing and a fluid port on the casing. The fluid port is fluidly coupled to the plurality of tanks. A controller is also included in the cleaning vessel, disposed within the casing. The method includes operating the pump to drain a first fluid from the stand-alone ice making appliance into a first tank of the plurality of tanks of the cleaning vessel. The method also includes operating the pump to pump a second fluid from a second tank of the plurality of tanks of the cleaning vessel into the stand-alone ice making appliance.

[0008] 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.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] 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.

[0010] FIG. **1** is a perspective view of an appliance according to an example embodiment of the present disclosure.

[0011] FIG. **2** is a perspective section view of the example appliance of FIG. **1**.

[0012] FIG. **3** is a rear perspective view of the example appliance of FIG. **1** with a casing of the example appliance removed to show interior components of the example appliance.

[0013] FIG. **4** is a perspective view of the example auxiliary reservoir in FIG. **1**.

[0014] FIG. **5** is a perspective view of an example cleaning vessel according to aspects of the present disclosure.

[0015] FIG. **6** is a side, schematic view of the example cleaning vessel of FIG. **5**.

[0016] FIG. **7** provides a flowchart of an example method of operating a cleaning vessel according to aspects of the present disclosure.

[0017] Repeat use of reference characters in the present specification and drawings is intended to represent the same or analogous features or elements of the present invention.

DETAILED DESCRIPTION

[0018] 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 or spirit 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.

[0019] As used herein, the terms “includes” and “including” are intended to be inclusive in a manner similar to the term “comprising.” Similarly, the term “or” is generally intended to be inclusive (i.e., “A or B” is intended to mean “A or B or both”). Approximating language, as used herein throughout the specification and claims, is applied to modify any quantitative representation that could permissibly vary without resulting in a change in the basic function to which it is related. Accordingly, a value modified by a term or terms, such as “about,” “approximately,” and “substantially,” are not to be limited to the precise value specified. In at least some instances, the approximating language may correspond to the precision of an instrument for measuring the value. For example, the approximating language may refer to being within a ten percent (10%) margin.

[0020] Referring now to FIGS. **1** through **3**, one embodiment of an appliance **10** in accordance with the present disclosure is illustrated. As shown, appliance **10** is provided as a stand-alone ice making appliance embodiment. Appliance **10** includes an outer casing **12** which defines a primary opening **11** (e.g., first primary opening) and an internal cavity or volume **13**. Internal volume **13** generally at least partially houses various other components of the appliance therein **10**. Primary opening **11** defined in outer casing **12** may extend internal volume **13** to an ambient environment. Through primary opening **11**, access (e.g., by a user) to the internal volume **13** may be permitted. Outer casing **12** further defines a vertical direction V, a lateral direction L, and a transverse direction T. The vertical direction V, lateral direction L, and transverse direction T are mutually perpendicular

and form an orthogonal direction system.

[0021] A container **14** of appliance **10** is also illustrated. Container **14** defines a first storage volume **16** for the receipt and storage of ice **18** therein. A user of the appliance **10** may access ice **18** within the container **14** for consumption or other uses, as described in detail below. Container **14** may include multiple walls, including one or more sidewalls **20** and a base wall **22**, which may together define the first storage volume **16**. In example embodiments, at least one sidewall **20** may be formed in part from a clear, see-through (i.e., transparent, or translucent) material, such as a clear glass or plastic, such that a user can see into the first storage volume **16** and thus view ice **18** therein. For instance, at least one sidewall **20** may include a separate external panel and internal panel formed from a clear, see-through (i.e., transparent, or translucent) material, such as a clear glass or plastic. In some example embodiments, container **14** may include a handle **17**. In general, handle **17** may advantageously improve accessibility to ice **18** within container **14**. Further, in example embodiments, container **14** may be removable, such as from the outer casing **12**, by a user. This facilitates advantageous easy access by the user to ice within the container **14**, as discussed below. In general, a user interface **15** may be positioned on casing **12** above container **14**. The user interface **15** may generally include input selectors to be selected (e.g., by a user) for controlling the appliance **10**.

[0022] Appliances **10** in accordance with the present disclosure are advantageously stand-alone appliances, and thus are not connected to refrigerators or other appliances. Additionally, in example embodiments, such appliances are not connected to plumbing or another water source that is external to the appliance **10**, such as a refrigerator water source. Rather, in example embodiments, water is initially supplied to the appliance **10** manually by a user, such as by pouring water into water tank **24** and/or an auxiliary reservoir **100**. Optionally, in example embodiments, water tank **24** may be removable, such as from the outer casing **12**, by a user. This facilitates advantageous easy access by the user to water tank **24** (e.g., in order to easily fill water tank **24**), as discussed below.

[0023] Notably, appliances **10** as discussed herein include various features which allow the appliances **10** to be affordable and desirable to typical consumers. For example, the stand-alone feature reduces the cost associated with the appliance **10** and allows the consumer to position the appliance **10** at any suitable desired location, with the only requirement in some embodiments being access to an electrical source. In example embodiments, such as those shown in FIGS. **1** through **3**, the removable container **14** allows easy access to ice **18** within first storage volume **16** and allows the container **14** to be moved to a different position from the remainder of the appliance **10** for ice usage purposes.

[0024] As discussed herein, appliance **10** is configured to make nugget ice, which is becoming increasingly popular with consumers. Ice **18** may be nugget ice. Generally, nugget ice is ice that that is maintained or stored (i.e., in first storage volume **16** of container **14**) at a temperature greater than the melting point of water or greater than about thirty-two degrees Fahrenheit. Accordingly, the ambient temperature of the environment surrounding the container **14** may be at a temperature greater than the melting point of water or greater than about thirty-two degrees Fahrenheit. In some embodiments, such temperature may be greater than forty degrees Fahrenheit, greater than fifty degrees Fahrenheit, or greater than sixty degrees Fahrenheit.

[0025] Still referring to FIGS. **1** through **3**, various components of appliance **10** in accordance with the present disclosure are illustrated. For example, as mentioned, appliance **10** includes a water tank **24**. The water tank **24** defines a second storage volume **26** for the receipt and holding of water. Water tank **24** may include multiple walls, including one or more sidewalls **28** and a base wall **30**, which may together define the second storage volume **26**. In example embodiments, the water tank **24** may be disposed below the container **14** along the vertical direction V defined for the appliance **10**, as shown.

[0026] As discussed, in example embodiments, water is provided to the water tank **24** for use in

forming ice. Accordingly, appliance **10** may further include a pump **32**. Pump **32** may be in fluid communication with the second storage volume **26**. For example, water may be flowable from the second storage volume **26** through a fluid outlet **31** defined in the water tank **24**, such as in a sidewall **28** thereof, and may flow through a conduit to and through pump **32**. Pump **32** may, when activated, be operable to actively flow water from the second storage volume **26** therethrough and from the pump **32**.

[0027] Water actively flowed from the pump **32** may be flowed (e.g., through a suitable conduit) to a reservoir **34**. For example, reservoir **34** may define a third storage volume **36**. In some embodiments, third storage volume **36** is defined by one or more sidewalls **38** and a base wall **40**. Third storage volume **36** may, for example, be in fluid communication with the pump **32** and may thus receive water that is actively flowed from the water tank **24**, such as through the pump **32**. During operation, water may be flowed into the third storage volume **36** through an opening **44** defined in the reservoir **34**.

[0028] Referring still to FIGS. **1** through **3**, reservoir **34** and third storage volume **36** thereof may receive and contain water to be provided to an ice maker **50** for the production of ice. Accordingly, third storage volume **36** may be in fluid communication with ice maker **50**. For example, water may be flowed, such as through an opening **42** and through suitable conduits, from third storage volume **36** to ice maker **50**.

[0029] Ice maker **50** generally receives water, such as from reservoir **34**, and freezes the water to form ice **18**. In example embodiments, ice maker **50** is a nugget ice maker, and in particular is an auger-style ice maker, although other suitable styles of ice makers and/or appliances are within the scope and spirit of the present disclosure. As shown, ice maker **50** may include a casing **52** into which water from third storage volume **36** is flowed. Casing **52** is thus in fluid communication with third storage volume **36**. For example, casing **52** may include one or more sidewalls **54** which may define an interior volume **56**, and an opening may be defined in a sidewall **54**. Water may be flowed from third storage volume **36** through the opening (such as via a suitable conduit) into the interior volume **56**.

[0030] As illustrated, an auger **60** may be disposed at least partially within the casing **52**. During operation, the auger **60** may rotate. Water within the casing **52** may at least partially freeze due to heat exchange, such as with a refrigeration system as discussed herein. The at least partially frozen water may be lifted by the auger **60** from casing **52**. Further, in example embodiments, the at least partially frozen water may be directed by auger **60** to and through an extruder **62**. The extruder **62** may extrude the at least partially frozen water to form ice, such as nuggets of ice **18**.

[0031] Formed ice **18** may be provided by the ice maker **50** to container **14**, and may be received in the first storage volume **16** thereof. For example, ice **18** formed by auger **60** and/or extruder **62** may be provided to the container **14**. In example embodiments, appliance **10** may include a chute **70** for directing ice **18** produced by the ice maker **50** towards the first storage volume **16**. For example, as shown, chute **70** is generally positioned above container **14** along the vertical direction V. Thus, ice can slide off of chute **70** and drop into storage volume **16** of container **14**. Chute **70** may, as shown, extend between ice maker **50** and container **14**, and may include a body **72**, which defines a passage **74** therethrough. Ice **18** may be directed from the ice maker **50** (such as from the auger **60** and/or extruder **62**) through the passage **74** to the container **14**. In some embodiments, for example, a sweep **64**, which may be connected to and rotate with the auger, may contact the ice emerging through the extruder **62** from the auger **60** and direct the ice **18** through the passage **74** to the container **14**.

[0032] As discussed, water within the casing **52** may at least partially freeze due to heat exchange, such as with a refrigeration system. In example embodiments, ice maker **50** may include a sealed refrigeration system **80**. The sealed refrigeration system **80** may be in thermal communication with the casing **52** to remove heat from the casing **52** and interior volume **56** thereof, thus facilitating freezing of water therein to form ice. Sealed refrigeration system **80** may, for example, include a

compressor **82**, a condenser **84**, a throttling device **86**, and an evaporator **88**. Evaporator **88** may, for example, be in thermal communication with the casing **52** in order to remove heat from the interior volume **56** and water therein during operation of sealed system **80**. For example, evaporator **88** may at least partially surround the casing **52**. In particular, evaporator **88** may be a conduit coiled around and in contact with casing **52**, such as the sidewall(s) **54** thereof.

[0033] It should additionally be noted that, in example embodiments, a controller **200** may be in operative communication with the sealed system **80**, such as with the compressor **82** thereof, and may activate the sealed system **80** as desired or required for ice making purposes.

[0034] In example embodiments, controller **200** is in operative communication with the pump **32**. Such operative communication may be via a wired or wireless connection, and may facilitate the transmittal and/or receipt of signals by the controller **200** and pump **32**. Controller **200** may be configured to activate the pump **32** to actively flow water. For example, controller **200** may activate the pump **32** to actively flow water therethrough when, for example, reservoir **34** requires water. A suitable sensor(s), for example, may be provided in the third storage volume **36**. The sensor(s) may be in operative communication with the controller **200** and may be configured to transmit signals to the controller **200**, which indicate whether or not additional water is desired in the reservoir **34**. When controller **200** receives a signal that water is desired, controller **200** may send a signal to pump **32** to activate pump **32**.

[0035] As shown in FIG. **1**, appliance **10** may also include an auxiliary water reservoir **100**. FIG. **4** also illustrates auxiliary water reservoir **100** according to another example embodiment. Auxiliary water reservoir **100** is described in greater detail below with reference to FIGS. **1** and **4**. As may be seen in FIG. **1**, a height HWR of auxiliary water reservoir **100** may be about equal to a height HC of casing **12**. Thus, the appearance of auxiliary water reservoir **100** may complement casing **12**.

[0036] Auxiliary water reservoir **100** may be disposed outside of casing **12**. For example, auxiliary water reservoir **100** may be mounted at the side of casing **12**. Thus, while most components of appliance **10** are housed within casing **12**, auxiliary water reservoir **100** is positioned outside of casing **12**. In certain example embodiments, auxiliary water reservoir **100** may include a base **110** and a container **120**. Base **110** may be attached to casing **12**, e.g., at the side of casing **12** adjacent to the bottom of casing **12**. For instance, base **110** may be clipped, fastened, etc. to casing **12**. As may be seen in FIG. **4**, container **120** is removably mounted to base **110**. For example, a cap **130** positioned at a bottom portion **122** of container **120** may be received within base **110** to mount container **120** on base **110**. A user may lift upwardly on container **120** to remove container **120** from base **110**, and the user may insert cap **130** of container **120** into base **110** to mount container **120** on base **110**. As an example, the user may remove container **120** from base **110** in order to conveniently fill container **120** with water at a faucet.

[0037] Auxiliary water reservoir **100** may be in fluid communication with a water tank within casing **12** such that water within auxiliary water reservoir **100** is flowable to the water tank. For example, a flexible tubing conduit, or a supply line **102**, may extend from auxiliary water reservoir **100** to water tank **24**, and water from within auxiliary water reservoir **100** may flow from auxiliary water reservoir **100** into second storage volume **26** via supply line **102**. It will be understood that appliance **10** may be plumbed in any other suitable manner to deliver water from auxiliary water reservoir **100** into casing **12** for use with ice maker **50** in alternative example embodiments.

[0038] Auxiliary water reservoir **100** may include a check valve **140**, such as a normally closed check valve. Check valve **140** may be mounted to container **120**, e.g., positioned in cap **130** at bottom portion **122** of container **120**. Check valve **140** may be configured such that check valve **140** is open when container **120** is mounted to base **110**. In addition, check valve **140** may be configured such that check valve **140** is closed when container **120** is removed from base **110**. When check valve **140** is open, check valve **140** may allow water within container **120** to flow into base **110**. Within base **110**, the water may flow to outlet **106** and thus supply line **102**, as described above.

[0039] Referring now to FIGS. **5** and **6**, provided is a perspective view of a cleaning vessel **300** (FIG. **5**) and a side, schematic view of cleaning vessel **300** (FIG. **6**) fluidly coupled with appliance **10**. The cleaning vessel **300** may generally include a casing **301** defined between a front side **303**, a rear side **305**, and a pair of sidewalls **307**. A lid (not shown) may enclose a top side **309** of casing **301**. A user interface **302** may be positioned on casing **301**. User interface **302** may generally be configured to receive user inputs to selectively control cleaning vessel **300**, as will be explained further hereinbelow. A pump **306** may be disposed within casing **301**. Pump **306** may generally be fluidly coupled to a plurality of tanks **304** within casing **301**. For example, pump **306** of cleaning vessel **300** may be a dual-direction pump generally configured for operating/pumping fluid in two directions of flow. In the present example embodiment, the plurality of tanks **304** may generally include no less than three tanks within casing **301**, as will be further described hereinbelow. A fluid port **310** may be positioned on casing **301** and may generally be fluidly coupled to the plurality of tanks **304**.

[0040] Moreover, cleaning vessel **300** may include a controller **308** disposed within casing **301**. For example, controller **308** may be generally configured to facilitate operation of cleaning vessel **300**. In this regard, user interface **302** may be in communication with controller **308** such that controller **308** may receive control inputs from user interface **302** and may otherwise regulate operation of cleaning vessel **300**. For example, signals generated by controller **308** may operate cleaning vessel **300**, including any or all system components, subsystems, or interconnected devices, in response to the position of user interface **302** and other control commands. Specifically, draining and/or pumping fluid to/from cleaning vessel **300** may occur in response to a user input on user interface **302**. For example, the user interface **302** may receive the user input, e.g., a button press, a touch on a touchscreen interface, etc., and the user interface **302** may generate a corresponding signal in response to the user input and such signal may be transmitted to the controller **308**. Other components of cleaning vessel **300** may be in communication with controller **308** via, for example, one or more signal lines or shared communication busses. In this manner, Input/Output ("I/O") signals may be routed between controller **308** and various operational components of cleaning vessel **300**.

[0041] As used herein, the terms "processing device," "computing device," "controller," or the like may generally refer to any suitable processing device, such as a general or special purpose microprocessor, a microcontroller, an integrated circuit, an application specific integrated circuit (ASIC), a digital signal processor (DSP), a field-programmable gate array (FPGA), a logic device, one or more central processing units (CPUs), a graphics processing units (GPUs), processing units performing other specialized calculations, semiconductor devices, etc. In addition, these "controllers" are not necessarily restricted to a single element but may include any suitable number, type, and configuration of processing devices integrated in any suitable manner to facilitate appliance operation. Alternatively, controller **308** may be constructed without using a microprocessor, e.g., using a combination of discrete analog and/or digital logic circuitry (such as switches, amplifiers, integrators, comparators, flip-flops, AND/OR gates, and the like) to perform control functionality instead of relying upon software.

[0042] Controller **308** may include, or be associated with, one or more memory elements or non-transitory computer-readable storage mediums, such as RAM, ROM, EEPROM, EPROM, flash memory devices, magnetic disks, or other suitable memory devices (including combinations thereof). These memory devices may be a separate component from the processor or may be included onboard within the processor. In addition, these memory devices can store information and/or data accessible by the one or more processors, including instructions that can be executed by the one or more processors. It should be appreciated that the instructions can be software written in any suitable programming language or can be implemented in hardware. Additionally, or alternatively, the instructions can be executed logically and/or virtually using separate threads on one or more processors.

[0043] For example, controller **308** may be operable to execute programming instructions or micro-control code associated with an operating cycle of cleaning vessel **300**. In this regard, the instructions may be software or any set of instructions that when executed by the processing device, cause the processing device to perform operations, such as running one or more software applications, displaying a user interface, receiving user input, processing user input, etc. Moreover, it should be noted that controller **308** as disclosed herein is capable of and may be operable to perform any methods, method steps, or portions of methods as disclosed herein. For example, in some embodiments, methods disclosed herein may be embodied in programming instructions stored in the memory and executed by controller **308**.

[0044] The memory devices may also store data that can be retrieved, manipulated, created, or stored by the one or more processors or portions of controller **308**. The data can include, for instance, data to facilitate performance of methods described herein. The data can be stored locally (e.g., on controller **308**) in one or more databases and/or may be split up so that the data is stored in multiple locations. In addition, or alternatively, the one or more database(s) can be connected to controller **308** through any suitable network(s), such as through a high bandwidth local area network (LAN) or wide area network (WAN). In this regard, for example, controller **308** may further include a communication module or interface that may be used to communicate with one or more other component(s) of cleaning vessel **300**, controller **308**, an external appliance controller, or any other suitable device, e.g., via any suitable communication lines or network(s) and using any suitable communication protocol. The communication interface can include any suitable components for interfacing with one or more network(s), including for example, transmitters, receivers, ports, controllers, antennas, or other suitable components.

[0045] Referring still to FIG. **6**, cleaning vessel **300** may be generally configured to fluidly couple the fluid port **310** of cleaning vessel **300** to a fluid port **330** of the appliance **10** prior to draining and/or pumping fluid to and/or from cleaning vessel **300**. For example, hosing **312** may extend between fluid port **310** and fluid port **330**. In general, hosing **312** may extend between each tank of the plurality of tanks **304**. Additionally, each tank of the plurality of tanks **304** of cleaning vessel **300** may be coupled to a respective valve **314**, e.g., a first valve **352** coupled to the first tank **342**, a second valve **354** coupled to the second tank **344**, a third valve **356** coupled to the third tank **346**, etc. Controller **308** may be generally configured to open the respective valve **314** prior to draining and/or pumping fluid to and/or from each tank of the plurality of tanks **304**.

[0046] As stated above, the plurality of tanks **304** may generally include no less than three tanks within casing **301**, e.g., a drain tank (first tank **342**), a descale tank (second tank **344**), and at least one rinse tank (third tank **346**). In an initial state, e.g., prior to use, the drain tank **342** may be empty. In general, the drain tank, of cleaning vessel **300** may define an internal volume **313** between one tenth of a gallon and one and a half gallons, such as between one third of a gallon and one and a quarter gallons, such as between one half of a gallon and a gallon. The drain tank **342** with internal volume **313** may be initially empty, such that the tank **342** may be filled with the drained fluid from appliance **10** while controller **308** operates pump **306** to drain fluid from appliance **10**. In general, the other tanks of the plurality of tanks **344**, **346** of cleaning vessel **300** may each define an internal volume **315** between one tenth of a gallon and one and a half gallons, such as between two-fifths of a gallon and a gallon, such as between one quarter of a gallon and three-quarters of a gallon of fluid. For example, as seen in FIG. **6**, both of the other tanks of the plurality of tanks **304** define internal volume **315**. Furthermore, one of the other tanks of the plurality of tanks **304**, e.g., descaling tank **344**, may be filled with descaling solution, thereby aiding descaling appliance **10** when pumped into it, and the other tank may be a rinse tank, e.g., filled with water or other suitable rinsing fluid. Some example embodiments may include more than one rinse tank, such as two or more rinse tanks **304** in addition to the drain tank **342** (internal volume **313**) and descale tank **344** (one of the tanks with internal volume **315**).

[0047] In other words, the drain tank **342** may define first internal volume **313** which is larger than

the internal volume of at least one other tank, such as 250% larger, such as 200% larger, such as 150% larger than the at least one other tank. For example, in some embodiments, the drain tank **342** may define a first internal volume **313** and one or more other tanks, such as every other tank of the plurality of tanks **304**, may define second internal volume **315** less than first internal volume **313**. In various embodiments, the smaller of the tanks **344**, **346** may all have the same internal volume, or, alternatively, the internal volumes of the other tanks of the plurality of tanks **304** may vary.

[0048] Turning to FIG. **7**, a flowchart of an example method (e.g., method **400**) of operating cleaning vessel **300** will be described. Although the discussion below refers to the example method **400** of operating cleaning vessel **300**, one skilled in the art will appreciate that the example method **400** is applicable to the operation of a variety of other appliances, such as other possible variations of the cleaning vessel. In example embodiments, the various method steps as disclosed herein may be performed (e.g., in whole or part) by controller **308**, or another, separate, dedicated controller.

[0049] FIG. **7** depicts steps performed in a particular order for the purpose of illustration and discussion. Those of ordinary skill in the art, using the disclosures provided herein, will understand that (except as otherwise indicated) various example methods as may be disclosed herein are not mutually exclusive with each other, e.g., aspects of any one example method may be combined with aspects of any other example method, such that features illustrated or described as part of one embodiment can be used with another embodiment to yield a still further embodiment. Moreover, the steps of method **400** may be modified, adapted, rearranged, omitted, interchanged, or expanded in various ways without deviating from the scope of the present disclosure.

[0050] Referring now to FIG. **7**, at (**410**), method **400** may generally include operating pump **306** to drain a first fluid **316** from appliance **10** into a first tank **342** of the plurality of tanks **304** of cleaning vessel **300**. Accordingly, step **410** of method **400** may include a plurality of sub-steps. For example, before draining appliance **10**, controller **308** may open the first valve **352**, e.g., the valve coupled to the first (drain) tank **342**. Controller **308** may then activate pump **306** to drain first fluid **316** from appliance **10** into the first tank **342** of the plurality of tanks **304** of cleaning vessel **300**. When appliance **10** is drained, pump **306** may be deactivated and the first valve **352** may be closed.

[0051] At (**420**), method **400** may generally include operating pump **306** to pump a second fluid **318** from a second tank **344** of the plurality of tanks **304** of cleaning vessel **300** into appliance **10**. Moreover, step **420** of method **400** may include a plurality of sub-steps. For example, controller **308** may open the second valve **354**, e.g., the valve coupled to the second (descale) tank **344**. Controller **308** may then activate pump **306** to pump second fluid **318** from the second tank **344** of the plurality of tanks **304** of cleaning vessel **300** into appliance **10**. In the present example embodiment, second fluid **318** may be any suitable descaling solution, such as vinegar. When appliance **10** is full of second fluid **318**, pump **306** may be deactivated and the second valve **354** may be closed. In some example embodiments, a user input on user interface **15** of appliance **10** may be received to begin a cleaning cycle with the second fluid **318**. After the cleaning cycle of appliance **10** concludes, second valve **354** may open and pump **306** may be activated to pump second fluid **318** back into the second (descale) tank **344**, whereby when appliance **10** is drained of second fluid **318**, the second valve **354** may be closed and pump **306** deactivated.

[0052] The method may then further include repeating the cleaning operations with the rinse tank **346**, or in some example embodiments, repeating the cleaning operations multiple times with a plurality of rinse tanks. For example, the third valve **356**, e.g., the valve coupled to the third (rinse) tank **346** may be opened and pump **306** activated to pump a third fluid **320**, e.g., the rinse fluid or water, into appliance **10**. At this point, after the third fluid **320** is pumped into appliance **10**, a user input on user interface **15** of appliance **10** may be received to begin a cleaning cycle with the third fluid **320**. After the cleaning cycle of appliance **10** concludes, third valve **356** may open and pump **306** may be activated to pump third fluid **320** back into the third (rinse) tank **346**, whereby when appliance **10** is drained of third fluid **320**, the third valve **356** may be closed and pump **306** deactivated. Accordingly, the process may be repeated in example embodiments with a fourth tank

and fourth valve, fifth tank and fifth valve, sixth tank and sixth valve, etc.
[0053] After the rinsing process is complete, a user may detach the hosing **312** from fluid port **330**, and dispose of the liquid in each of the plurality of tanks **304** in any suitable water receptacle, such as a kitchen sink, utility sink/tub, or waste water drain. Accordingly, first tank **342** may be empty and ready to repeat method **400** when desired. Additionally, when the user is ready to repeat the descaling process, the other tanks **344**, **346** of the plurality of tanks **304** may be re-filled with fresh respective fluids, e.g., new (unused) descale solution in the second tank **344** and new (unused) rinse water in the third tank **346**.
[0054] As may be seen from the above, an accessory cleaning appliance may be configured to fluidly couple to a stand-alone ice making appliance in order to descale hard mineral deposits. The accessory may include three tanks equipped with valves and may be generally connected to the ice making appliance. The first tank may be configured to drain existing water from the ice making appliance before initiating the descaling process. The second tank may be filled with water mixed with any descaling solution (e.g., vinegar), while the other, third tank may be filled with fresh water for rinsing. During the descaling process, the descaling solution mixed with water (from the second tank) may be circulated inside the ice making appliance to flush out the mineral deposits. The accessory may include a dual-direction positive displacement pump in order to move the fluids from the tanks into the ice making appliance and vice versa. Advantageously, the accessory may be disconnected and drained independently from the ice making appliance after completion of the descaling and rinse cycle(s). As described above, the cleaning appliance may advantageously remove some manual intensity traditionally included in methods of descaling ice making appliances.
[0055] 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 cleaning vessel configured to fluidly couple to a stand-alone ice making appliance, the cleaning vessel comprising: a casing; a user interface on the casing; a pump disposed within the casing; a plurality of tanks within the casing; a fluid port on the casing, the fluid port fluidly coupled to the plurality of tanks; and a controller disposed within the casing, the controller configured to: operate the pump to drain a first fluid from the stand-alone ice making appliance into a first tank of the plurality of tanks of the cleaning vessel; and operate the pump to pump a second fluid from a second tank of the plurality of tanks of the cleaning vessel into the stand-alone ice making appliance.
2. The cleaning vessel of claim 1, wherein the controller is configured to operate the pump to drain fluid and/or pump fluid in response to a signal from the user interface.
3. The cleaning vessel of claim 1, wherein the fluid port of the cleaning vessel fluidly couples to a fluid port of the stand-alone ice making appliance.
4. The cleaning vessel of claim 1, wherein one tank of the plurality of tanks is filled with descaling solution, thereby aiding descaling the stand-alone ice making appliance when pumped into it.
5. The cleaning vessel of claim 1, wherein one tank of the plurality of tanks is initially empty, such that when fluid drains from the stand-alone ice making appliance, the empty tank may fill with the drained fluid.

6. The cleaning vessel of claim 1, wherein the pump of the cleaning vessel is a dual-direction pump, configured for operating in two directions of flow.
7. The cleaning vessel of claim 1, wherein each tank of the plurality of tanks of the cleaning vessel is coupled to a respective valve, wherein the controller is configured to operate the respective valve when draining and/or pumping fluid to and/or from each tank.
8. The cleaning vessel of claim 1, wherein one tank of the plurality of tanks of the cleaning vessel defines an internal volume between one half of a gallon and a gallon of fluid.
9. The cleaning vessel of claim 8, wherein other tanks of the plurality of tanks of the cleaning vessel each define an internal volume between one quarter of a gallon and three-quarters of a gallon of fluid.
10. A method for operating a cleaning vessel configured to fluidly couple to a stand-alone ice making appliance, the cleaning vessel comprising a casing, a user interface on the casing, a pump disposed within the casing, a plurality of tanks within the casing, a fluid port on the casing, the fluid port fluidly coupled to the plurality of tanks, and a controller disposed within the casing, the method comprising: operating the pump to drain a first fluid from the stand-alone ice making appliance into a first tank of the plurality of tanks of the cleaning vessel; and operating the pump to pump a second fluid from a second tank of the plurality of tanks of the cleaning vessel into the stand-alone ice making appliance.
11. The method of claim 10, wherein draining and/or pumping fluid is in response to a user input on the user interface.
12. The method of claim 10, further comprising fluidly coupling the fluid port of the cleaning vessel to a fluid port of the stand-alone ice making appliance prior to draining and/or pumping fluid to and/or from the cleaning vessel.
13. The method of claim 10, wherein one tank of the plurality of tanks is filled with descaling solution, thereby aiding descaling the stand-alone ice making appliance when pumped into it.
14. The method of claim 10, wherein one tank of the plurality of tanks is initially empty, further comprising filling the one tank with the drained fluid while operating the pump to drain fluid from the stand-alone ice making appliance.
15. The method of claim 10, wherein the pump of the cleaning vessel is a dual-direction pump, configured for operating in two directions of flow.
16. The method of claim 10, wherein each tank of the plurality of tanks of the cleaning vessel is coupled to a respective valve, further comprising opening the respective valve prior to draining and/or pumping fluid to and/or from each tank of the plurality of tanks.
17. The method of claim 10, wherein one tank of the plurality of tanks of the cleaning vessel holds between half of a gallon and a gallon of fluid.
18. The method of claim 17, wherein other tanks of the plurality of tanks of the cleaning vessel each hold between quarter of a gallon and three-quarters of a gallon of fluid.