



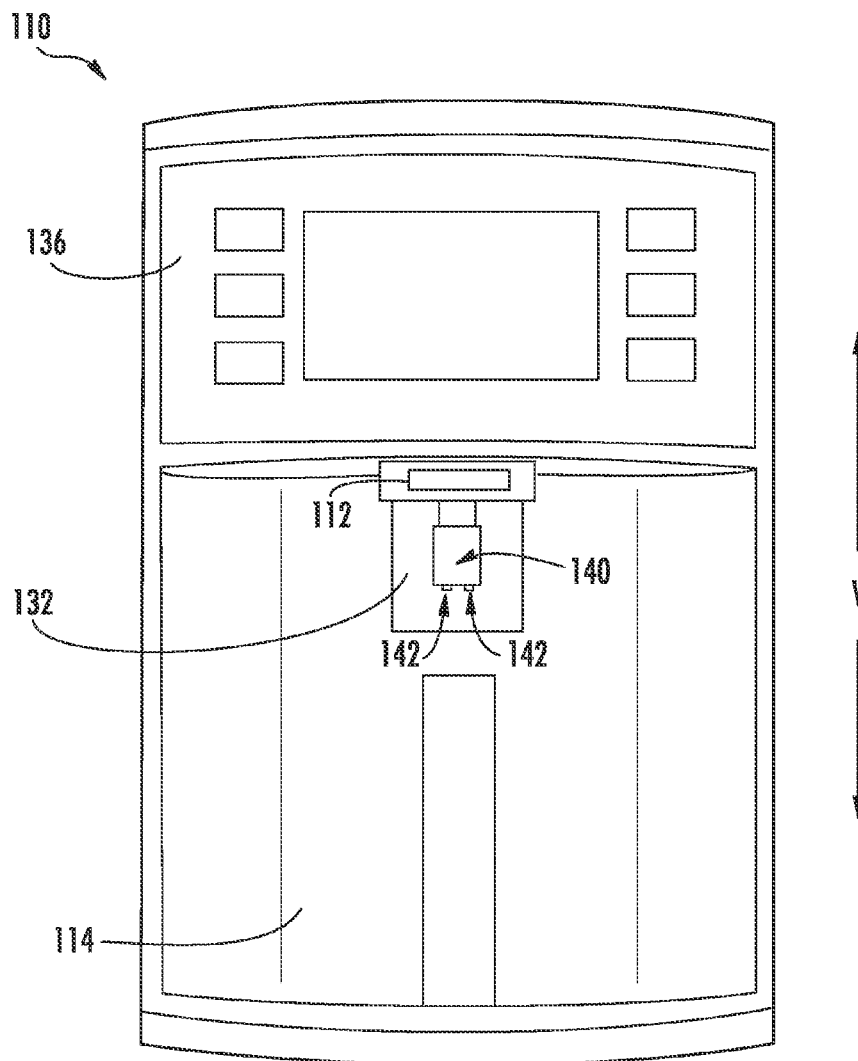
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(19) **United States**(12) **Patent Application Publication****Doering et al.**(10) **Pub. No.: US 2017/0010034 A1**(43) **Pub. Date:****Jan. 12, 2017**(54) **SYSTEMS AND METHODS OF DISPENSING WATER OR ICE**(52) **U.S. Cl.**CPC *F25C 5/005* (2013.01); *F25D 23/126* (2013.01); *F25D 23/028* (2013.01); *F25C 2400/10* (2013.01); *F25C 2600/04* (2013.01); *F25C 2700/02* (2013.01); *F25C 2700/04* (2013.01)(71) Applicant: **General Electric Company**,
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ABSTRACT

Systems and methods for dispensing water or ice are provided. In particular, a dispensing system can include a sensor configured to detect the presence of a container proximate the dispensing system. The sensor can be further configured to detect a top lip of the container and a level of contents in the container relative to the top lip. When a container is detected, the dispensing system can be configured to dispense water or ice, for instance, responsive to a user input. The dispensing system can be further configured to cease dispensing water or ice when the level of water or ice reaches a threshold level.



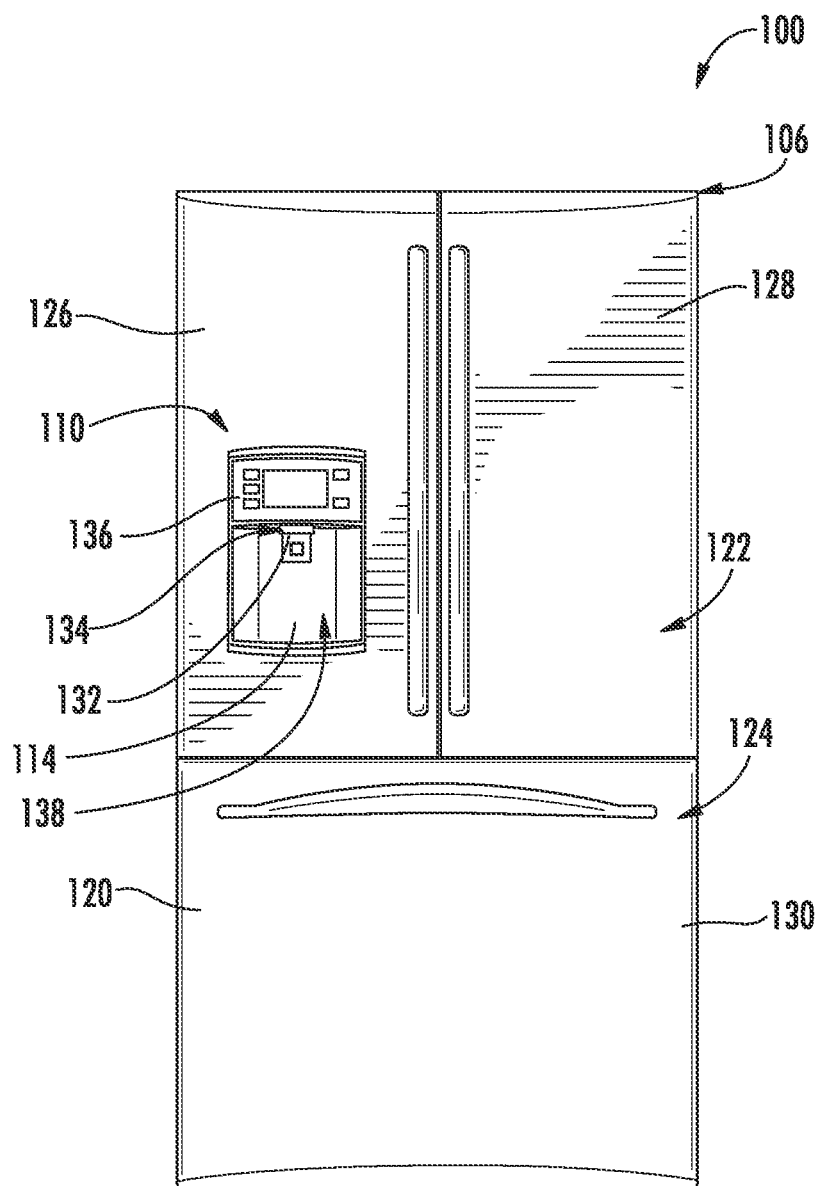


FIG. 1

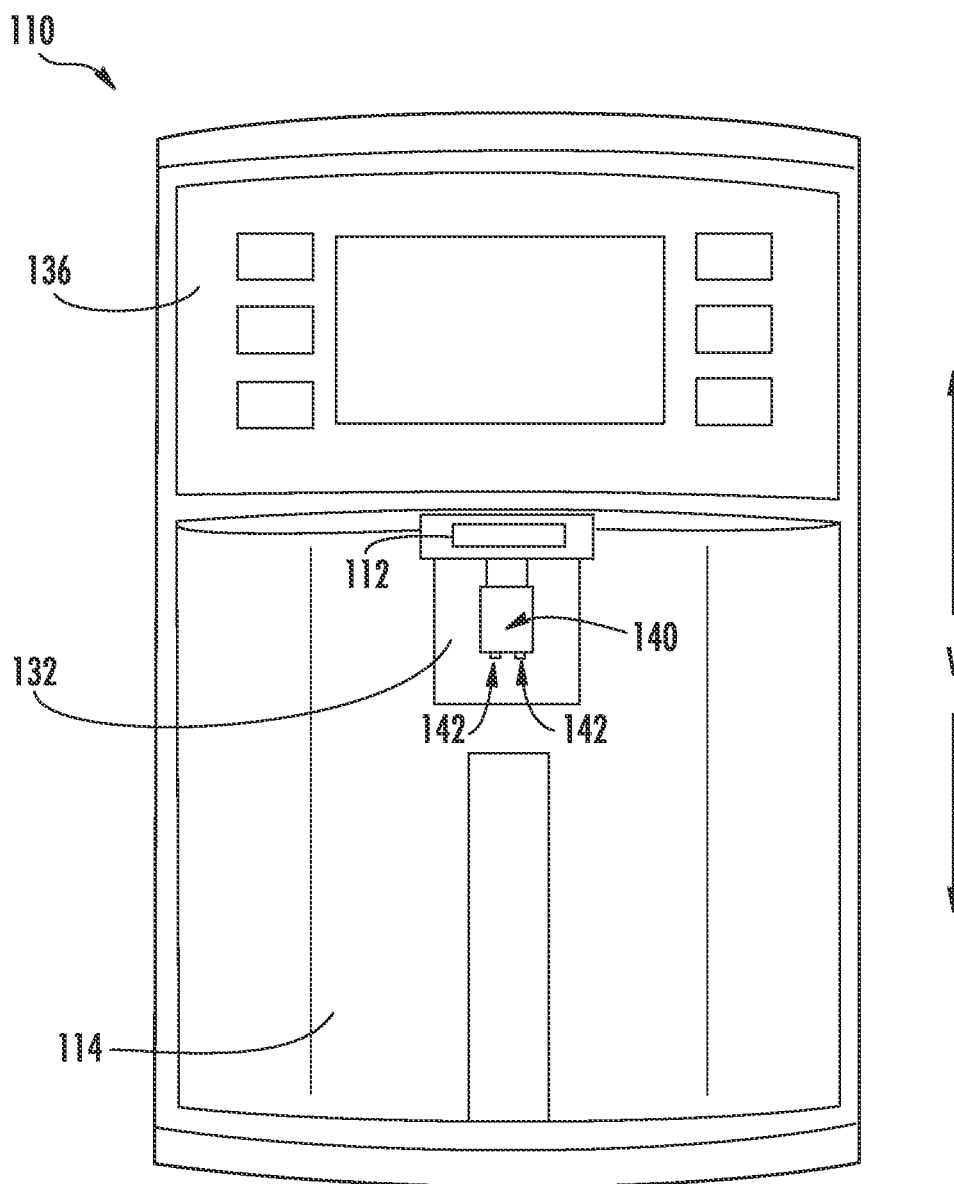


FIG. 2

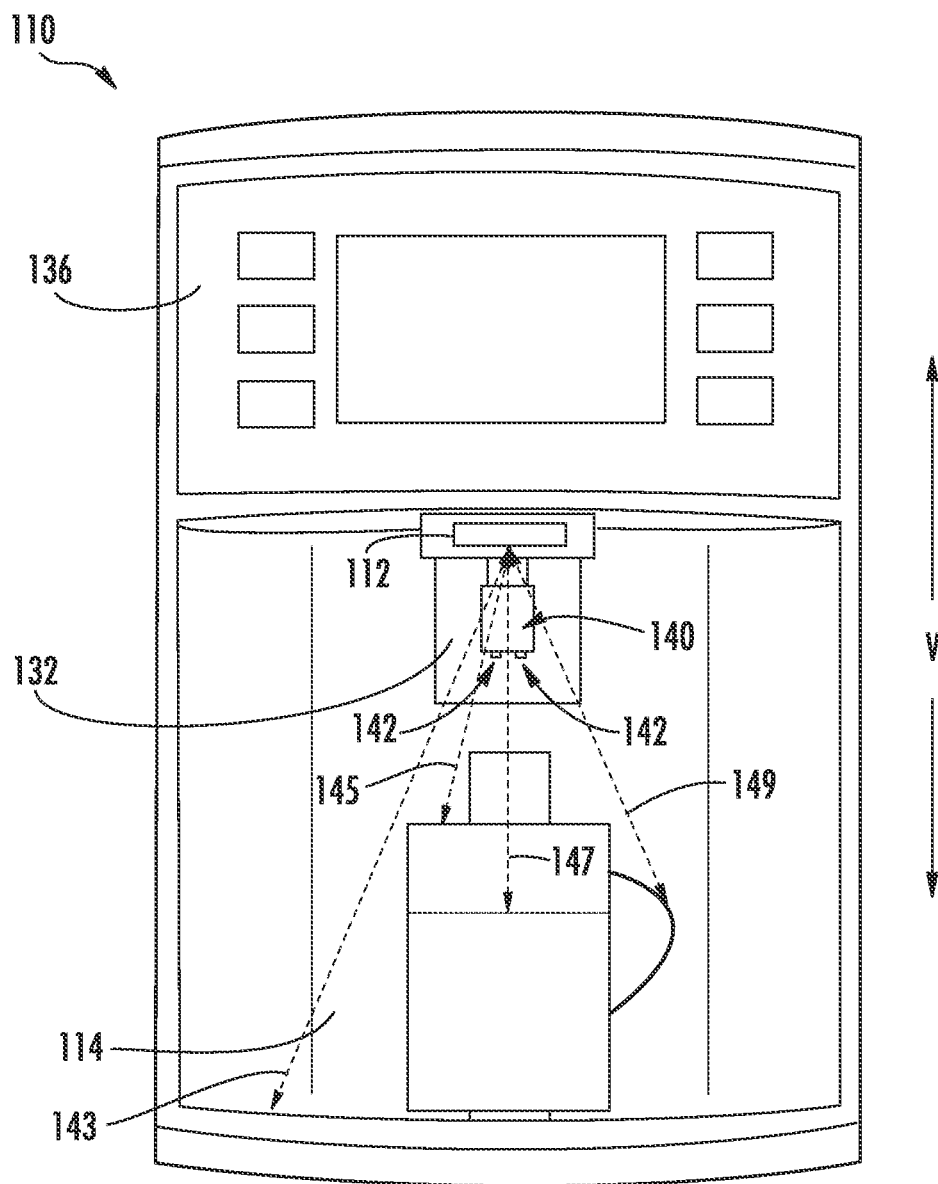
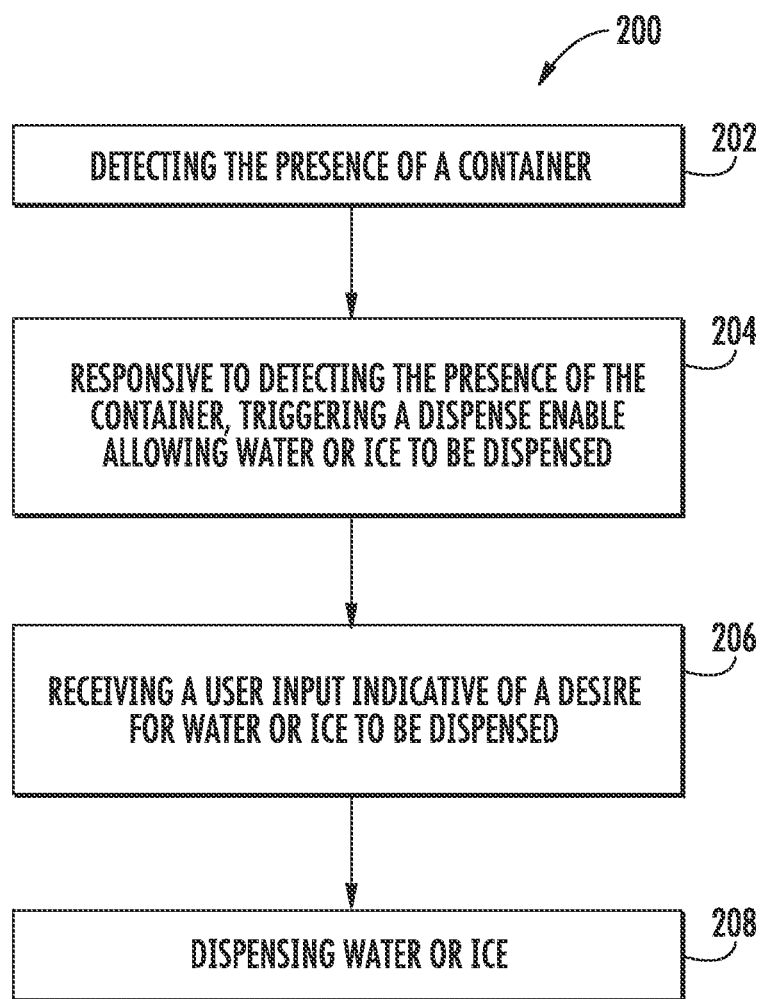
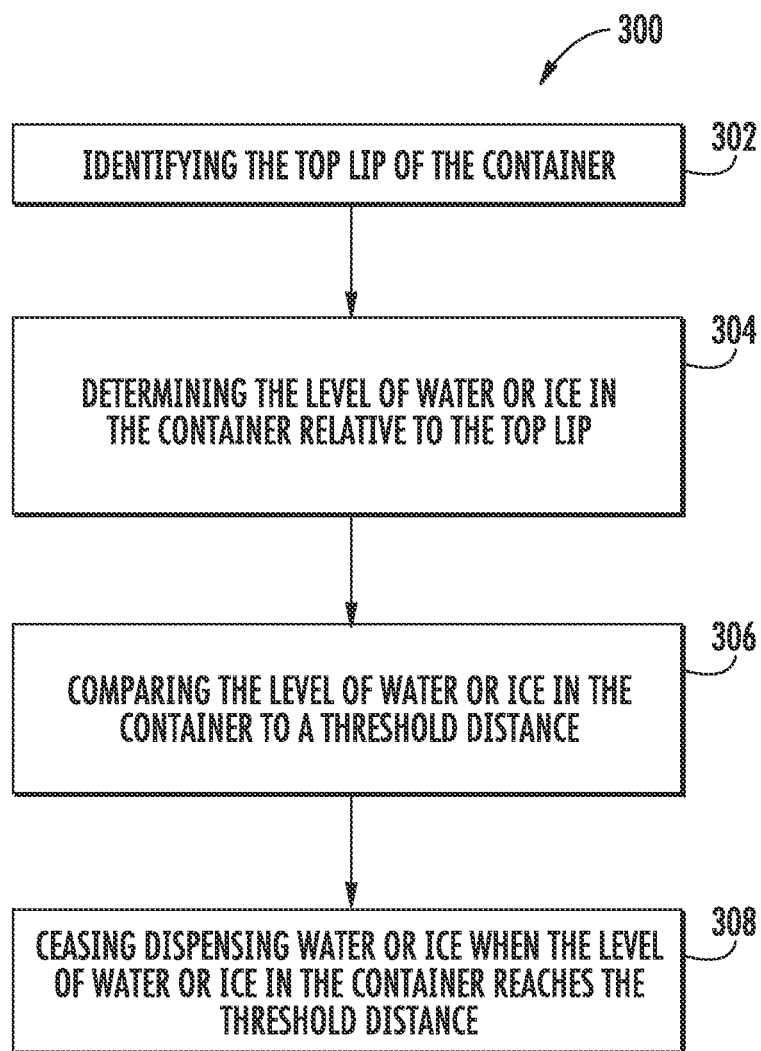


FIG. 3

**FIG. 4**

**FIG. 5**

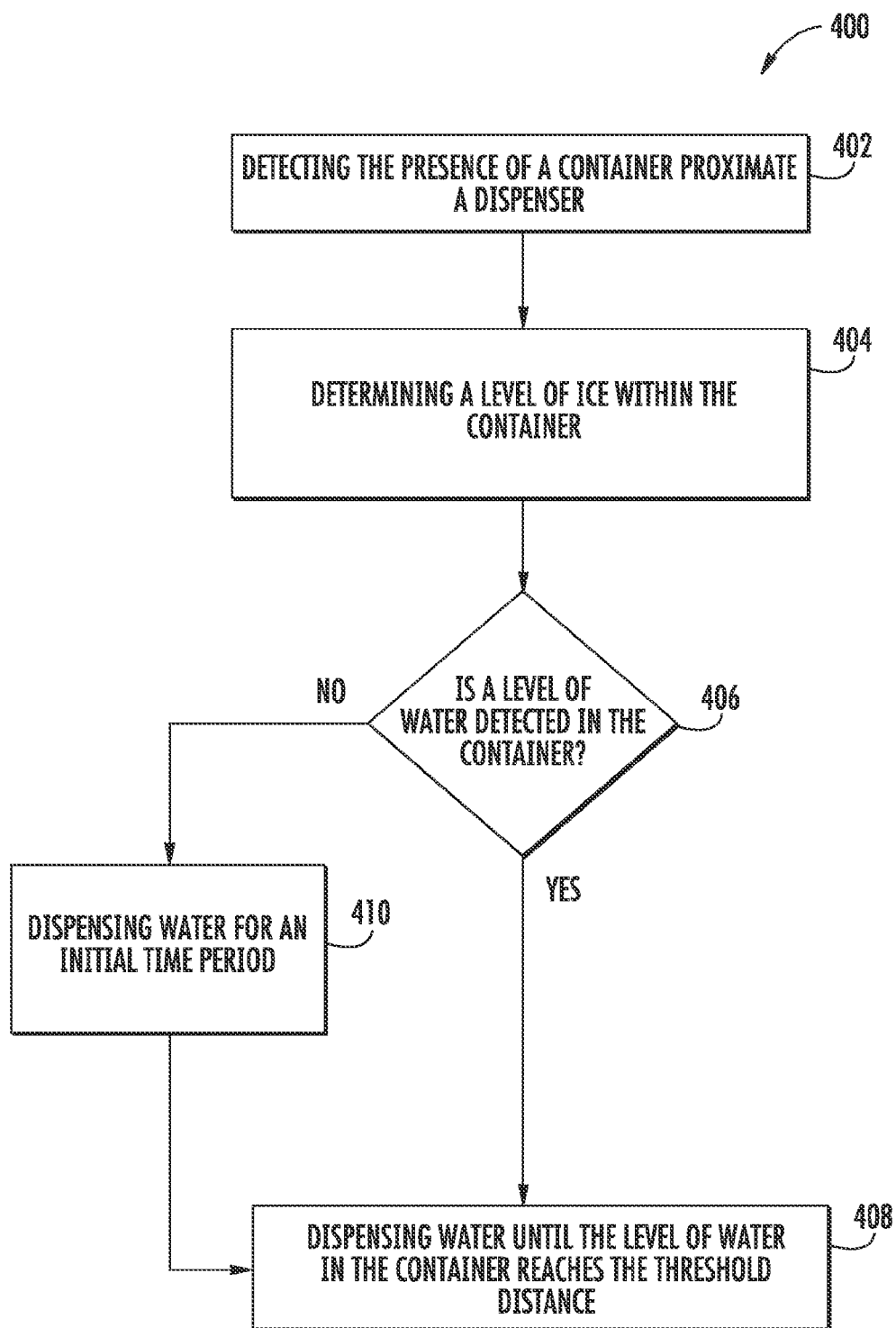


FIG. 6

SYSTEMS AND METHODS OF DISPENSING WATER OR ICE

FIELD OF THE INVENTION

[0001] The present disclosure relates generally to dispensing water or ice from an appliance, and more particularly to automatically dispensing water or ice using a single sensor configuration.

BACKGROUND OF THE INVENTION

[0002] Refrigerator appliances generally include one or more cabinets defining chambers for the receipt of food items for storage. Refrigerator appliances may also include features for dispensing ice and/or water. To provide ice and/or water, a dispenser is typically positioned on a door of the appliance. The user positions a container proximate the dispenser and ice, water, or both are deposited into the container depending upon the user's selection. A paddle or other type switch can be provided whereby the user can make a selection. Typically, the water is chilled by routing through one of the refrigerated chambers.

[0003] The water dispenser may have an associated sensor arrangement configured to detect the height and/or presence of a container positioned proximate the dispenser. For instance, conventional dispenser systems may implement a horizontal sensor to detect a position of the container, and a vertical sensor to detect a top lip of the container and/or a liquid level within the container.

[0004] Such conventional sensor arrangements can be costly and inefficient. Thus, there is a need for a water dispensing system having a simplified sensor system.

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] One example aspect of the present disclosure is directed to a dispensing system for dispensing liquid or ice. The system includes a dispenser defining a dispensing recess. The dispenser comprises a nozzle for dispensing liquid or ice. The system further includes a sensor disposed within the dispensing recess. The sensor is configured to receive one or more signals indicative of a presence of a container proximate the dispensing recess and a level of contents in the container. The system further includes one or more control devices configured to control the operation of the dispenser. The one or more control devices are configured to receive one or more signals from the sensor. The one or more control devices are further configured to detect a level of ice within the container based at least in part on the one or more signals from the sensor. The one or more control devices are further configured to, responsive to detecting the level of ice, determine whether a level of liquid is detected within the container based at least in part on the one or more signals from the sensor. Wherein, when a level of liquid is not detected within the container, liquid is dispensed into the container for an initial time period. When liquid is detected, liquid is dispensed into the container until the level of liquid rises to a threshold level.

[0007] Another example aspect of the present disclosure is directed to a refrigerator appliance. The refrigerator appliance includes a cabinet defining a chilled chamber for

receipt of food articles. The refrigerator appliance further includes a door mounted to the cabinet configured for permitting selective access to the chilled chamber of the cabinet. The refrigerator appliance further includes a dispenser mounted to the door defining a dispensing recess and including a nozzle for dispensing liquid or ice. The refrigerator appliance further includes a sensor positioned within the dispensing recess configured to detect the presence of a container proximate the dispenser and a level of contents within the container. The refrigerator appliance further includes one or more control devices configured to control the operation of the dispenser. The one or more control devices are configured to receive one or more signals from the sensor. At least one of the one or more signals is indicative of a level of ice within the container. The one or more control devices are further configured to, responsive to receiving the at least one signal indicative of the level of ice, control the operation of the dispenser such that when a level of liquid is not detected in the container, liquid is dispensed for an initial time period. When a level of liquid is detected in the container, liquid is dispensed until the level of liquid in the container reaches a threshold level.

[0008] Another example aspect of the present disclosure is directed to a method of dispensing liquid or ice into a container. The method includes receiving one or more signals from a sensor. The sensor is configured to detect data indicative of one or more surfaces associated with a container positioned proximate a dispenser. The dispenser is configured to dispense liquid or ice into the container. The method further includes detecting a presence of the container based at least in part on the one or more received signals. The method further includes determining a level of ice within the container based at least in part on the one or more received signals. The method further includes, responsive to determining the level of ice, dispensing liquid into the container based at least in part on a user input. When a level of liquid is not detected in the container, liquid is dispensed for an initial time period. When a level of liquid is detected in the container, liquid is dispensed until the level of liquid in the container reaches a threshold level.

[0009] Variations and modifications can be made to these example embodiments of the present disclosure.

[0010] 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

[0011] 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, in which:

[0012] FIG. 1 depicts an example refrigerator appliance according to example embodiments of the present disclosure;

[0013] FIG. 2 depicts an example dispensing assembly according to example embodiments of the present disclosure;

[0014] FIG. 3 depicts an example dispensing assembly having a sensor for detecting the presence of a container and

a level of contents within the container according to example embodiments of the present disclosure;

[0015] FIG. 4 depicts a flow diagram of an example method of dispensing water or ice into a container according to example embodiments of the present disclosure;

[0016] FIG. 5 depicts a flow diagram of an example method of ceasing dispensing water or ice according to example embodiments of the present disclosure; and

[0017] FIG. 6 depicts a flow diagram of an example method of dispensing water into a container already holding ice according to example embodiments of the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

[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] Example aspects of the present disclosure are directed to systems and methods for dispensing water or ice. More particularly, a sensor associated with a dispensing system can be configured to detect a presence of a container positioned proximate the dispensing system. The sensor can be further configured to determine a height of the container and/or a level of contents within the container. In example embodiments, the sensor may be an ultrasonic sensor positioned on an upper portion of the dispensing system, such that the sensor transmits signals parallel to the water stream dispensed by the dispenser. When a container is positioned proximate the dispensing system, the sensor can detect the container, and subsequently send a signal indicative of the detected container to a control system associated with the dispenser. The control system can then enable the dispenser to dispense water or ice, for instance, responsive to a user input. It will be appreciated by those skilled in the art that the dispenser can be configured to dispense various other suitable forms of liquid instead of or in addition to water without deviating from the scope of the present disclosure.

[0020] Once the container has been detected, a height of the container can be determined. In particular, the sensor can be further configured to detect a top lip of the container. The sensor can send a signal indicative of the lip to the control system, and the control system can determine a height of the container based at least in part on the signal.

[0021] As the container fills with water or ice, a level of the water or ice within the container can be determined. For instance, the sensor can detect the water or ice, and can send a signal indicative of the water or ice to the control system, which can determine the level of the water or ice from the signal. When the difference between the height of the container and the level of the water or ice falls below a threshold, the dispenser can cease dispensing water or ice. In example embodiments, the threshold can be in the range of about 1/2 inch to about 3 inches. As used herein, the term

“about,” when used in reference to a numerical value, is intended to refer to within 20% of the numerical value. It will be appreciated that various other suitable thresholds may be used. In example embodiments, the level of the water or ice relative to the height of the lip of the container can be determined at least in part from the amount of time between detecting the top lip and detecting the water or ice.

[0022] Referring now to the figures, FIG. 1 depicts a front view of an example embodiment of a refrigerator appliance 100. Refrigerator appliance 100 includes a cabinet or housing 120 defining an upper fresh food chamber 122 and a lower freezer chamber 124 arranged below the fresh food chamber 122. As such, refrigerator appliance 100 is generally referred to as a bottom mount refrigerator. In the exemplary embodiment, housing 120 also defines a mechanical compartment (not shown) for receipt of a sealed cooling system. Using the teachings disclosed herein, one of skill in the art will understand that the present invention can be used with other types of refrigerators (e.g., side-by-sides). Consequently, the description set forth herein is for illustrative purposes only and is not intended to limit the invention in any aspect.

[0023] Refrigerator doors 126, 128 are rotatably hinged to an edge of housing 120 for accessing fresh food compartment 122. A freezer door 130 is arranged below refrigerator doors 126, 128 for accessing freezer chamber 124. In the exemplary embodiment, freezer door 130 is coupled to a freezer drawer (not shown) slidably mounted within freezer chamber 124.

[0024] Refrigerator appliance 100 includes a dispensing assembly 110 for dispensing water and ice. Dispensing assembly 110 includes a dispenser 114 positioned on an exterior portion of refrigerator appliance 100. Dispenser 114 includes a discharging outlet 134 for accessing ice and water. Dispensing assembly 110 further includes a sensor 112 positioned on discharging outlet 134. As will be described in more detail below, sensor 112 can be configured to detect a presence of a container positioned within dispensing assembly 110, and to detect the top lip of the container. A user interface panel 136 is provided for controlling the mode of operation. For example, user interface panel 136 includes a water dispensing button (not labeled) and an ice-dispensing button (not labeled) for selecting a desired mode of operation such as crushed, non-crushed ice, or water, etc.

[0025] Discharging outlet 134 is an external part of dispenser 114, and is mounted in a dispensing recess or recessed portion 138 defined in an outside surface of refrigerator door 126. Recessed portion 138 is positioned at a predetermined elevation convenient for a user to access ice or water and enabling the user to access ice or water without the need to bend-over and without the need to access freezer chamber 124. In the exemplary embodiment, recessed portion 138 is positioned at a level that approximates the chest level of a user.

[0026] Operation of the refrigerator appliance 100 is regulated by a controller (not shown) that is operatively coupled to user interface panel 136 and/or sensor 112. Panel 136 provides selections for user manipulation of the operation of refrigerator appliance 100 such as e.g., selections between whole or crushed ice, chilled water, and/or other options. In response to user manipulation of the user interface panel 136, the controller operates various components of the refrigerator appliance 100. The controller may be positioned

in a variety of locations throughout refrigerator appliance 100. In the illustrated embodiment shown in FIG. 1, controller is located within beneath the user interface panel 136 on door 126. In such an embodiment, input/output (“I/O”) signals may be routed between controller and various operational components of refrigerator appliance 100. In one exemplary embodiment, the user interface panel 136 may represent a general purpose I/O (“GPIO”) device or functional block. In another exemplary embodiment, the user interface 136 may include input components, such as one or more of a variety of electrical, mechanical or electro-mechanical input devices including rotary dials, push buttons, and touch pads. The user interface 136 may be in communication with the controller via one or more signal lines or shared communication busses.

[0027] FIG. 2 provides a close-up front view of the dispenser 114 of dispensing assembly 110. An exemplary nozzle 140 of the present invention is positioned adjacent to an activation member 132. Nozzle 140 includes a plurality of fluid outlets 142 through which water may flow into a container placed into the recess 138 of dispensing assembly 110 by a user of appliance 100. Dispensing assembly 110 can further include a sensor, such as sensor 112. Sensor 112 can be positioned parallel to the water stream dispensed by dispenser 114. In particular, sensor 112 can be positioned within an upper portion of dispenser 114 such that one or more signals generated by sensor 112 are transmitted parallel to the water stream. In this manner, sensor 112 may be positioned vertically with respect to a container placed in dispenser 114.

[0028] In example embodiments, sensor 112 may be an ultrasonic transducer configured to periodically transmit and receive high frequency sound waves, and to convert the received sound waves into electrical data. In particular, sensor 112 may be configured to generate and transmit a sound wave, and to receive one or more echoed sound waves. Sensor 112 can further be configured to determine a time interval between transmitting the sound wave and receiving the one or more echoes. It will be appreciated that various other sensors and/or sensor configurations may be used, such as for instance, a sensor configuration including a separate and distinct transmitter and receiver.

[0029] FIG. 3 provides a close-up front view of the dispenser 114 of dispensing assembly 110. In example embodiments, sensor 112 can be configured to detect a presence of a container 111 positioned proximate dispenser 114. For instance, sensor 112 can transmit one or more signals (e.g. sound waves), and receive one or more signals (e.g. reflected sound waves) indicative of container 111. In particular, the presence of a container can be detected at least in part by a comparison of a received signal with a baseline signal. The baseline signal can be a signal received by sensor 112 that is not reflected by a container. For instance, the baseline signal can be a signal transmitted by sensor 112 that is reflected, for instance, by a bottom surface of dispenser 114. Such signal can have an associated time interval corresponding to a particular known time interval (or range of time) for a signal transmitted by sensor 112 to return to sensor 112 in the absence of a container. When container 111 is positioned proximate dispenser 114, a different signal can be received corresponding at least in part to the signal reflected by container 111. Such signal can have a different corresponding time interval (or range of time), which can be indicative of the presence of container 111.

[0030] The detection of the presence of container 111 can trigger a dispense enable, such that water or ice can be allowed to dispense from dispenser 114. In example embodiments, when the dispense enable is triggered, water or ice can be dispensed from dispenser 114 responsive to, for instance, a user interaction with user interface panel 136 indicative of a request for water or ice. In this manner, the presence of a container must be detected before dispenser 114 will dispense water or ice. For instance, if a user provides an input to user interface panel 136 indicative of a request to dispense water, water will not be dispensed unless a container is detected proximate dispenser 114 in conjunction with the user input.

[0031] Sensor 112 can be further configured to detect a level of water or ice in container 111 relative to a top lip of container 111. In example embodiments, sensor 112 can be configured to detect the level of the water or ice once the presence of a container has been detected. For instance, when a container is positioned proximate dispenser 114, various signals can be received by sensor 112 indicative of the various surfaces by which the signals are reflected. For instance, a signal can be received indicative of a bottom surface of dispenser 114 (e.g. signal 143). Such signal can correspond to the baseline signal described above. Further, a signal can be received indicative of the top lip of container 111 (e.g. signal 145), and a signal can be received indicative of the water or ice level within container 111 (e.g. signal 147). One or more signals may further be received indicative of the various geometries of container 111 (e.g. signal 149). For instance, container 111 includes a handle 113 extending horizontally from container 111. As shown, signal 149 is indicative of handle 113. As another example, if a container has a geometry wherein a middle portion of the container has a larger radius than the top lip of the container, a signal may be received indicative of the middle portion, and a different signal may be received indicative of the top lip.

[0032] In example embodiments, the top lip can be identified based at least in part on the first received signal by sensor 112, such that the first received signal corresponds to the surface closest to the sensor (e.g. the top lip). In this manner, the signal indicative of the top lip of container 111 can be distinguished from a signal indicative of, for instance, a middle portion of container 111 (e.g. handle 113), or from a signal indicative of water or ice in container 111. As described above, such signals can have an associated time intervals corresponding to the time it takes for the signal to travel from sensor 112, reflect off of a surface, and be received by sensor 112. The signal indicative of the top lip can have the shortest associated time interval.

[0033] Once the top lip is identified, a water or ice level within container 111 can also be identified. In particular, as dispenser 114 dispenses water or ice, the water or ice level within container 111 will rise. As the level rises, the time interval corresponding to the signal that reflects off of the water or ice will decrease. The signal indicative of the water or ice level may be identified due at least in part to the change in the level of the water or ice. In this manner, the signal indicative of the water level can be distinguished, for instance, from a signal indicative of a protruding middle portion of container 111. For instance, a signal indicative of the level of water in container 111 (e.g. signal 147), and a signal indicative of a middle portion of container 111 (e.g. signal 149) can each have time intervals that are less than the time interval associated with signal 143 (e.g. the baseline

signal) but greater than the time interval associated with signal 145. In example embodiments, the signal indicative of the level of water can be distinguished from the signal indicative of the middle portion due to the changing characteristics of the signal indicative of the water level.

[0034] Once the signals indicative of the top lip and the water or ice level have been identified, the water or ice level can be measured relative to the top lip. For instance, as the water or ice level rises, the distance between the water or ice level and the top lip will decrease. When the distance between the top lip and the water or ice level falls below a threshold distance, dispenser 114 can be configured to cease dispensing water or ice. The threshold distance can be, for instance, between about 3 centimeters and 15 centimeters. In example embodiments, the distance between the top lip and the water or ice level can be determined based on the difference between the time intervals of the respective signals. Dispenser 114 can be configured to cease dispensing water or ice when the difference between the time intervals corresponds to the threshold distance.

[0035] In example embodiments, a signal indicative of ice in container 111 can be distinguished from a signal indicative of water in container 111. For instance, a container may first contain an amount of ice when a user requests for water to be dispensed, such that the rising water level may not initially be detected by sensor 112 due at least in part to the presence of the ice. In such embodiments, when ice can be detected but not water, dispenser 114 may be configured to blindly dispense water for an initial time period although the water level cannot initially be detected. For instance, the initial time period may be a predetermined time period, or may be determined at least in part from the determined height of container 111.

[0036] In alternative embodiments, dispenser 114 may be configured to blindly dispense water until a water level within container 111 can be detected. For instance, the initial time period can correspond to the amount of time until a level of water in container 111 is detected. In this manner, once sensor 112 is able to detect the water level, dispenser 114 can be configured to dispense water in accordance with example embodiments of the present disclosure. For instance, dispenser 114 can be configured to dispense water until the distance between the water level and the top lip falls below the threshold distance.

[0037] In such embodiments, water may still be dispensed even if the distance between the ice level and the top lip of container 111 is less than the threshold distance. For instance, if a level of ice is detected 0.5 inches from the top lip of container 111, water may still be dispensed. As the water is dispensed into container 111, the overall level of contents in container 111 will not initially rise. In particular, the ice level and the water level will converge as the ice settles and the water level rises. Accordingly, in such embodiments, water may be dispensed by dispenser 114 until the distance between the combined water and ice level and the top lip is less than the threshold distance.

[0038] FIG. 4 depicts a flow diagram of an example method (200) of dispensing water according to example embodiments of the present disclosure. The method (200) can be implemented by one or more computing devices. In addition, FIG. 4 depicts steps performed in a particular order for purposes 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, expanded, omitted, and/or rearranged in various ways without deviating from the scope of the present disclosure.

[0039] At (202), method (200) can include detecting the presence of a container proximate a dispenser. As described above, the dispenser can be configured to dispense water or ice into the container. The container can be detected based at least in part on one or more signals received from a sensor. In example embodiments, the sensor can be an ultrasonic transducer configured to transmit one or more high frequency sound waves, and to receive one or more reflected high frequency sound waves. The sound waves received by the sensor can have associated time intervals corresponding to an amount of time between the transmission of the sound wave and reception of the corresponding reflected sound wave. The presence of the container can be detected at least in part on a comparison between the time interval of a received sound wave and a baseline time interval associated with a baseline signal. The baseline time interval can correspond to the amount of time between transmission of a sound wave by the sensor and reception of the sound wave when no container is present proximate the dispenser.

[0040] At (204), method (200) can include, responsive to detecting the presence of the container, triggering a dispense enable. The triggering of the dispense enable can allow water or ice to be dispensed by the dispenser. In example embodiments, water or ice may be dispensed only when the dispense enable is triggered.

[0041] At (206), method (200) can include receiving a user input indicative of a request for water or ice to be dispensed. The user input can include an interaction with a user interface, an actuation of a paddle, or various other suitable user inputs. At (208), method (200) can include dispensing water or ice. In example embodiments, water or ice may be dispensed only responsive to the user input while the dispense enable is triggered (e.g. while the container is detected proximate the dispenser). In alternative embodiments, water or ice may automatically be dispensed responsive to the triggering of the dispense enable (e.g. without requiring a user input).

[0042] As water or ice is being dispensed into the container, the level of water or ice will rise. In example embodiments, the dispenser can automatically cease dispensing water or ice when the level of water or ice reaches a certain point. For instance, FIG. 5 depicts a flow diagram of an example method (300) of dispensing water or ice into a container according to example embodiments of the present disclosure. At (302), method (300) can include identifying a signal indicative of a top lip of the container. The top lip of the container can correspond to the highest point of the container. For instance, the top lip can be a rim of the container. The top lip of the container can be identified at least in part from the one or more signals received from the sensor. In particular, as described above, the top lip can correspond to signal having the shortest associated time interval.

[0043] At (304), method (300) can include determining the level of water or ice within the container. The level of water or ice can be determined at least in part from the one or more signals received from the sensor. In example embodiments, water or ice in the container can be identified based at least in part on a change in signals received from the sensor. In particular, as the water or ice level rises (e.g. as water or ice is being dispensed into the container), the time

interval associated with the sound waves reflected by the water or ice will shorten. The water or ice level can be determined based on the changing time interval of such signals.

[0044] In example embodiments, the container may have a geometry wherein one or more lower portions of the container extend outwardly beyond the top lip. For instance, the container may have a handle, such as depicted in FIG. 3. In such embodiments, the sensor may receive sound waves reflected by the top lip and sound waves reflected from the lower portion. Signals received from the sensor indicative of the top lip of the container can be distinguished from signals indicative of the lower portion based at least in part on the time intervals associated with the signals. Further, signals indicative of the water or ice level may be distinguished from signals indicative of the lower portion. In this manner, water or ice in the container may not be confused with the lower portion of the container.

[0045] At (306), method (300) can include comparing the level of water or ice within the container to a threshold distance. The threshold distance can correspond to a desired amount of water or ice in the container, such that the container does not overflow. In example embodiments, the threshold distance can be a distance measured relative to the bottom of the container (and/or the bottom surface of the dispensing assembly on which the container sits). For instance, the threshold distance can be a distance of six inches from the bottom of the container. In such embodiments, the threshold distance may be determined based at least in part on a determined height of the container. In further example embodiments, the threshold distance can be a distance measured relative to the top lip of the container. For instance, the threshold distance can be a distance of one inch from the top lip.

[0046] At (308), method (300) can include ceasing dispensing water or ice when the level of water or ice in the container reaches the threshold distance. In this manner, once the water or ice reaches an appropriate level, no more water or ice will be dispensed into the container.

[0047] In alternative embodiments, the dispenser can be configured to dispense water for a period of time (e.g. a dispensing period). In such embodiments, the dispensing period may be a predetermined time period, or the dispensing period may be determined based at least in part on the determined height of the container and a determined width and/or radius of the container. For instance, if the height of the container is determined to be eight inches, and the radius is determined to be two inches, a dispensing period can be determined such that an appropriate amount of water or ice is dispensed into the container during the dispensing period.

[0048] As described above, if an amount of ice is already present in the container proximate the dispenser, a level of water may not initially be detectable. For instance, the ice in the container may block the sound waves transmitted by the sensor from reaching the water. In such embodiments, water may be dispensed blindly for an initial period of time. For instance, FIG. 6 depicts a flow diagram of an example method (400) of dispensing water into a container according to example embodiments of the present disclosure.

[0049] At (402), method (400) can include detecting the presence of a container proximate the dispenser. At (404), method (400) can include determining a level of ice within the container. In particular, ice within the container can be

distinguished from water within the container based at least in part on the one or more signals received from the sensor. The level of the ice can further be determined based at least in part on the received signals.

[0050] At (406), method (400) can include determining whether a level of water can be detected in the container. If water can be detected in the container, method (400) can include dispensing water until the water level reaches the threshold distance (408). For instance, the threshold distance can be a distance as described above with regard to method (300).

[0051] If a level of water is not detected within the container, method (400) can include dispensing water for an initial time period (410). The initial time period can correspond to a period of time wherein water cannot be detected in the container. In example embodiments, the initial time period can be determined at least in part from a determined height and width of the container. As another example, the initial time period can be the period of time until water can be detected in the container. For instance, the initial time period can end when water is detected. As yet another example, the initial time period can be a predetermined time period.

[0052] Once the initial time period ends, method (400) can proceed to (408). In alternative embodiments, if the water level reaches the threshold distance before the initial time period ends, the dispenser can be configured to cease dispensing water.

[0053] As indicated above, although the present disclosure generally contemplates a dispenser configured to dispense water or ice, the dispenser can be further configured to dispense various other suitable forms of liquid and/or ice. Such other forms of liquid and/or ice can be dispensed according to example embodiments of the present disclosure.

[0054] 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.

What is claimed is:

1. A dispensing system for dispensing liquid or ice, the system comprising:

- a dispenser defining a dispensing recess, the dispenser comprising a nozzle for dispensing liquid or ice;
- a sensor disposed within the dispensing recess, the sensor configured to receive one or more signals indicative of a presence of a container proximate the dispensing recess and a level of contents in the container; and
- one or more control devices configured to control the operation of the dispenser, the one or more control devices configured to:
 - receive one or more signals from the sensor;
 - detect a level of ice within the container based at least in part on the one or more signals from the sensor; and

responsive to detecting the level of ice, determine whether a level of liquid is detected within the container based at least in part on the one or more signals from the sensor;

wherein, when a level of liquid is not detected within the container, liquid is dispensed into the container for an initial time period, and wherein, when a level of liquid is detected, liquid is dispensed into the container until the level of liquid rises to a threshold level.

2. The dispensing system of claim 1, wherein the one or more control devices are further configured to control the operation of the dispenser such that the dispenser only dispenses liquid or ice when the presence of the container is detected proximate the dispensing recess.

3. The dispensing system of claim 2, wherein liquid or ice is only dispensed by the dispenser responsive to a user request for liquid or ice.

4. The dispensing system of claim 1, wherein the sensor is an ultrasonic transducer configured to periodically transmit one or more sound waves, and receive one or more reflected sound waves.

5. The dispensing system of claim 4, wherein the one or more reflected sound waves are indicative of at least one surface of the container.

6. The dispensing system of claim 1, wherein the sensor is configured to detect one or more surfaces of the container, and wherein the one or more control devices are configured to distinguish a signal indicative of a top lip of the container from a signal indicative of a lower portion of the container.

7. The dispensing system of claim 5, wherein the one or more control devices are further configured to distinguish a signal indicative of the level of contents in the container from the signal indicative of the lower portion and the signal indicative of the top lip.

8. The dispensing system of claim 1, wherein the one or more control devices are further configured to determine a height of the container based at least in part on the one or more signals from the sensor.

9. The dispensing system of claim 1, wherein the threshold level is between about 3 centimeters and about 7 centimeters beneath the top lip of the container.

10. The dispensing system of claim 1, wherein the sensor is positioned in the dispensing recess such that one or more sound waves transmitted by the sensor are transmitted parallel to a stream of liquid or ice being dispensed by the dispenser.

11. The dispensing system of claim 1, wherein the initial time period corresponds to an amount of time until liquid is detected in the container.

12. A refrigerator appliance, comprising:

a cabinet defining a chilled chamber for receipt of food articles;

a door mounted to the cabinet, the door configured for permitting selective access to the chilled chamber of the cabinet;

a dispenser mounted to the door, the dispenser defining a dispensing recess and including a nozzle for dispensing liquid or ice;

a sensor positioned within the dispensing recess configured to detect the presence of a container proximate the dispenser and a level of contents within the container; and

one or more control devices configured to control the operation of the dispenser, the one or more control devices configured to:

receive one or more signals from the sensor, wherein at least one of the one or more signals is indicative of a level of ice within the container; and

responsive to receiving the at least one signal indicative of the level of ice, control the operation of the dispenser such that when a level of liquid is not detected in the container, liquid is dispensed for an initial time period, and when a level of liquid is detected in the container, liquid is dispensed until the level of liquid in the container reaches a threshold level.

13. The refrigerator appliance of claim 12, wherein the sensor is an ultrasonic sensor configured to emit sound waves and receive reflected sound waves.

14. The refrigerator appliance of claim 13, wherein the reflected sound waves comprise sound waves reflected off of one or more surfaces of a container proximate the dispenser.

15. The refrigerator appliance of claim 12, wherein the container has a geometry comprising a top lip and a lower portion below the top lip extending outwardly beyond the top lip.

16. The refrigerator appliance of claim 15, wherein the one or more control devices are configured to distinguish a signal indicative of the top lip from a signal indicative of the lower portion.

17. The refrigerator appliance of claim 12, wherein the one or more control devices are configured to control the operation of the dispenser such that liquid or ice is dispensed only in response to a request from a user while the presence of a container is detected proximate the dispenser.

18. A method of dispensing liquid or ice into a container, the method comprising:

receiving one or more signals from a sensor, the sensor configured to detect data indicative of one or more surfaces associated with a container positioned proximate a dispenser, the dispenser configured to dispense liquid or ice into the container;

detecting a presence of the container based at least in part on the one or more received signals;

determining a level of ice within the container based at least in part on the one or more received signals; and

responsive to determining the level of ice, dispensing liquid into the container based at least in part on a user input, wherein, when a level of liquid is not detected in the container, liquid is dispensed for an initial time period, and when a level of liquid is detected in the container, liquid is dispensed until the level of liquid in the container reaches a threshold level.

19. The method of claim 18, wherein the container has a geometry including a top lip and a lower portion below the top lip extending outwardly beyond the top lip.

20. The method of claim 19, further comprising distinguishing at least one signal indicative of the lower portion from at least one signal indicative of the level of liquid within the container.

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