United States Patent Application Publication	20250263288
Kind Code	A1
Publication Date	August 21, 2025
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AUTOFILL PITCHER WITH FILL SENSOR

Abstract

An autofill pitcher system includes a pitcher and a dispenser. The pitcher includes at least one pitcher wall and an internal volume defined within the at least one pitcher wall. The dispenser defines a cavity. The cavity is configured to receive the pitcher. The dispenser also includes a fill tube and a sensor. The fill tube is positioned and configured to direct a flow of water from a water supply into the internal volume of the pitcher when the pitcher is received within the cavity. The sensor is positioned above the cavity and is operable to detect a fill level within the internal volume of the pitcher.

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Family ID: **1000007697492**

Appl. No.: **18/582762**

Filed: **February 21, 2024**

Publication Classification

Int. Cl.: **B67D1/12** (20060101); **B67D1/00** (20060101); **B67D1/08** (20060101); **F25D23/12** (20060101)

U.S. Cl.:

CPC **B67D1/124** (20130101); **B67D1/0003** (20130101); **B67D1/0894** (20130101); **F25D23/126** (20130101); B67D2210/00036 (20130101); F25D2331/81 (20130101); F25D2700/06 (20130101)

Background/Summary

FIELD OF THE INVENTION

[0001] The present subject matter relates generally to refrigerator appliances, and more particularly to autofill water dispensing systems for refrigerator appliances.

BACKGROUND OF THE INVENTION

[0002] Some refrigerator appliances include autofill dispensing systems. Autofill dispensing systems typically include a dispensing housing and a pitcher. When the pitcher is positioned in a designated spot, e.g., beneath the autofill housing, water or another liquid is automatically dispensed into the pitcher. Some autofill dispensing systems include a pitcher present sensor in the dispensing housing and a trigger device in the pitcher to determine when the pitcher is in the correct position to accept the dispensed liquid. In addition to the pitcher present sensor, some autofill dispensing systems include a pitcher full sensor including a float mechanism positioned within a housing of the pitcher that moves upward with the rising liquid in the autofill pitcher. When the liquid within the autofill pitcher has reached a designated fill level, the float mechanism triggers the dispensing system to cease dispensing liquid. Such float sensors, however, are typically limited to detecting only the designated fill level and thus provide only limited information, e.g., are unable to distinguish a partial fill from a completely empty pitcher.

[0003] In some situations, float mechanisms may not operate as expected, e.g., may provide inaccurate level detection, such as due to deposits from the water or water additives introduced by users into the pitcher that build up and interfere with the proper operation of the float mechanism. In additional situations, the float mechanism may be stuck or jammed and thus provide inaccurate level detection. Overfill or underfill conditions may result, leading to consumer dissatisfaction.

[0004] Accordingly, an autofill dispensing system in a refrigerator that addresses one or more of the challenges noted above would be desirable.

BRIEF DESCRIPTION OF THE INVENTION

[0005] Aspects and advantages of the invention will be set forth in part in the following description, may be apparent from the description, or may be learned through practice of the invention.

[0006] In one exemplary aspect, a refrigerator appliance is provided. The refrigerator appliance includes a cabinet. The cabinet defines a fresh food chamber. The refrigerator appliance also includes an autofill pitcher system. The autofill pitcher system includes a pitcher and a dispenser. The pitcher includes at least one pitcher wall and an internal volume defined within the at least one pitcher wall. The dispenser defines a cavity. The cavity is configured to receive the pitcher. The dispenser also includes a fill tube and a sensor. The fill tube is positioned and configured to direct a flow of water from a water supply into the internal volume of the pitcher when the pitcher is received within the cavity. The sensor is positioned above the cavity and is operable to detect a fill level within the internal volume of the pitcher.

[0007] In another example aspect, an autofill pitcher system is provided. The autofill pitcher system includes a pitcher and a dispenser. The pitcher includes at least one pitcher wall and an internal volume defined within the at least one pitcher wall. The dispenser defines a cavity. The cavity is configured to receive the pitcher. The dispenser also includes a fill tube and a sensor. The fill tube is positioned and configured to direct a flow of water from a water supply into the internal volume of the pitcher when the pitcher is received within the cavity. The sensor is positioned above the cavity and is operable to detect a fill level within the internal volume of the pitcher.

[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** provides a front view of a refrigerator appliance according to one or more exemplary embodiments of the present disclosure.

[0011] FIG. **2** provides a front view of the refrigerator appliance of FIG. **1** with refrigerator doors shown in an open configuration.

[0012] FIG. **3** provides a perspective view of an exemplary door of a refrigerator appliance according to one or more exemplary embodiments of the present disclosure.

[0013] FIG. **4** provides an enlarged perspective view of a portion of the door of FIG. **3**.

[0014] FIG. **5** provides a perspective view of a pitcher in accordance with one or more exemplary embodiments of the present disclosure.

[0015] FIG. **6** provides an enlarged side sectional view of a pitcher and lid in accordance with one or more exemplary embodiments of the present disclosure.

[0016] FIG. **7** provides an illustrative view of a pitcher received in a dispenser cavity in accordance with one or more exemplary embodiments of the present disclosure.

DETAILED DESCRIPTION

[0017] 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.

[0018] As used herein, 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 “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”). In addition, here and throughout the specification and claims, range limitations may be combined and/or interchanged. Such ranges are identified and include all the sub-ranges contained therein unless context or language indicates otherwise. For example, all ranges disclosed herein are inclusive of the endpoints, and the endpoints are independently combinable with each other. The singular forms “a,” “an,” and “the” include plural references unless the context clearly dictates otherwise.

[0019] Approximating language, as used herein throughout the specification and claims, may be 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 “generally,” “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, or the precision of the methods or machines for constructing or manufacturing the components and/or systems. For example, the approximating language may refer to being within a 10 percent margin, i.e., including values within

ten percent greater or less than the stated value. In this regard, for example, when used in the context of an angle or direction, such terms include within ten degrees greater or less than the stated angle or direction, e.g., “generally vertical” includes forming an angle of up to ten degrees in any direction, e.g., clockwise or counterclockwise, with the vertical direction V.

[0020] The word “exemplary” is used herein to mean “serving as an example, instance, or illustration.” In addition, references to “an embodiment” or “one embodiment” does not necessarily refer to the same embodiment, although it may. Any implementation described herein as “exemplary” or “an embodiment” is not necessarily to be construed as preferred or advantageous over other implementations. Moreover, 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.

[0021] Turning to the figures, FIG. **1** provides a front view of an exemplary refrigerator appliance **100** according to one or more exemplary embodiments of the present disclosure. Refrigerator appliance **100** extends between a top **101** and a bottom **102** along a vertical direction V, between a left side **105** and a right side **106** along a lateral direction L, and extends between a front and a back along a transverse direction T (not shown), which is a direction orthogonal to the vertical direction V and the lateral direction L. Vertical direction V, lateral direction L, and transverse direction T are mutually perpendicular and form an orthogonal direction system.

[0022] Refrigerator appliance **100** includes a housing or cabinet **120** defining a chilled chamber, fresh food chamber **122**, and one or more freezer chambers, such as a first freezer chamber **124** and a second freezer chamber **125**, which may both be arranged below fresh food chamber **122** along the vertical direction V. In additional embodiments, the middle chamber may be a flexible chamber in place of first freezer chamber **124** and may be selectively operable at various temperatures for storing any desired food items, such as produce, wine, etc. As illustrated, fresh food chamber **122** is bounded by vertical walls at the left side **105** and at the right side **106**, such walls spaced apart in the lateral direction, a horizontal wall at the top **101** and at the bottom by a lower wall **132**. In this configuration, refrigerator appliance **100** may generally be referred to as a bottom mount, or bottom freezer, refrigerator. Cabinet **120** also defines a mechanical compartment (not shown) for receipt of a sealed cooling system (not shown).

[0023] Left and right refrigerator doors **126**, **128**, respectively, are rotatably hinged to an edge of cabinet **120** at left **105** and right **106** sides, respectively, for accessing fresh food chamber **122** (FIG. **2**) or sealing fresh food chamber **122** as illustrated in FIG. **1**. For example, upper and lower hinges may couple each door **126**, **128** to cabinet **120**. When left and right doors **126**, **128** are configured as illustrated in FIG. **1**, the door arrangement is sometimes referred to as a “French door” configuration. Freezer doors, such as a first freezer door **130** and a second freezer door **131**, may be arranged below refrigerator doors **126**, **128** for accessing one or more freezer chambers, such as first and second freezer chambers **124**, **125**, respectively. In the exemplary embodiment shown in FIG. **1**, freezer doors **130**, **131** are coupled to freezer drawers (not shown) slidably mounted within first and second freezer chambers **124**, **125**. Such drawers are thus generally “pull-out” drawers in that they can be manually moved into and out of freezer chambers **124**, **125** on suitable slide mechanisms. Each door **126**, **128**, **130**, **131** can include a handle for accessing one of the chambers **122**, **124**, **125** of refrigerator appliance **100**.

[0024] Referring still to FIG. **1**, a schematic diagram of an external communication system **110** will be described according to an exemplary embodiment of the present subject matter. In general, external communication system **110** is configured for permitting interaction, data transfer, and other communications between appliance **100** and one or more external devices. For example, this

communication may be used to provide and receive operating parameters, user instructions or notifications, performance characteristics, user preferences, or any other suitable information for improved performance of appliance **100**. In addition, it should be appreciated that external communication system **110** may be used to transfer data or other information to improve performance of one or more external devices or appliances and/or improve user interaction with such devices.

[0025] For example, external communication system **110** permits controller **200** of appliance **100** to communicate with a separate device external to appliance **100**, referred to generally herein as an external device **112**. As described in more detail below, these communications may be facilitated using a wired or wireless connection, such as via a network **114**. In general, external device **112** may be any suitable device separate from appliance **100** that is configured to receive communications, information, or data from the controller **200** regarding the operation of refrigerator appliance **100**, or provide commands from a user to the controller **200** of the refrigerator appliance **100**. In this regard, external device **112** may be, for example, a personal phone, a smartphone, a tablet, a laptop or personal computer, a wearable device, a smart home system, or another mobile or remote device. Controller **200** is in operative communication with external device **112** through network **114** of external communication system **110**.

[0026] In addition, a remote server **116** may be in communication with appliance **100** and/or external device **112** through network **114**. In this regard, for example, remote server **116** may be a cloud-based server **116**, and is thus located at a distant location, such as in a separate state, country, etc., from the appliance **100**. In additional embodiments, the remote server **116** may be in the fog or the edge instead of the cloud. According to an exemplary embodiment, external device **112** may communicate with a remote server **116** over network **114**, such as the Internet, to transmit/receive data or information, provide user inputs, receive user notifications or instructions, interact with or control appliance **100**, etc. In addition, external device **112** and remote server **116** may communicate with appliance **100** to communicate similar information.

[0027] In general, communication between appliance **100**, external device **112**, remote server **116**, and/or other user devices or appliances may be carried using any type of wired or wireless connection and using any suitable type of communication network, non-limiting examples of which are provided below. For example, external device **112** may be in direct or indirect communication with appliance **100** through any suitable wired or wireless communication connections or interfaces, such as network **114**. For example, network **114** may include one or more of a local area network (LAN), a wide area network (WAN), a personal area network (PAN), the Internet, a cellular network, any other suitable short- or long-range wireless networks, etc. In addition, communications may be transmitted using any suitable communications devices or protocols, such as via Wi-Fi®, Bluetooth®, Zigbee®, wireless radio, laser, infrared, Ethernet type devices and interfaces, etc. In addition, such communication may use a variety of communication protocols (e.g., TCP/IP, HTTP, SMTP, FTP), encodings or formats (e.g., HTML, XML), and/or protection schemes (e.g., VPN, secure HTTP, SSL).

[0028] External communication system **110** is described herein according to an exemplary embodiment of the present subject matter. However, it should be appreciated that the exemplary functions and configurations of external communication system **110** provided herein are used only as examples to facilitate description of aspects of the present subject matter. System configurations may vary, other communication devices may be used to communicate directly or indirectly with one or more associated appliances, other communication protocols and steps may be implemented, etc. These variations and modifications are contemplated as within the scope of the present subject matter.

[0029] FIG. **2** provides a front perspective view of refrigerator appliance **100** showing refrigerator doors **126**, **128** in an open position to reveal the interior of fresh food chamber **122**. Additionally, freezer doors **130**, **131** are shown in partially open positions to reveal a portion of the interior of

freezer chambers **124**, **125**, respectively.
[0030] Left door **126** of refrigerator appliance **100** includes an inner surface **134** and an outer surface **136**. Inner surface **134** generally defines a portion of the interior of fresh food chamber **122** when door **126** is in a closed position as shown in FIG. **1**. Outer surface **136** is generally opposite inner surface **134** and defines a portion of the exterior of refrigerator appliance **100** when door **126** is in the closed position.
[0031] The same construction may result in a similarly formed right door **128** as left door **126**, with inner surface **134** and outer surface **136**. Moreover, it will further be appreciated that freezer doors **130**, **131** can likewise include inner and outer surfaces.
[0032] Doors **126**, **128** may include storage bins or shelves **138** movably or fixedly attached to the inner surface **134** of the doors **126**, **128**. In the embodiment illustrated in FIG. **2**, left door **126** includes an autofill pitcher system **140** in accordance with this disclosure. The autofill pitcher system **140** is illustrated on the left door **126** for convenience. In other embodiments, the autofill pitcher system **140** may be in a different position on the left door **126**, or on the right door **128**, or elsewhere within the fresh food chamber **122**. The autofill pitcher system **140** comprises a removable pitcher **142**, a dispenser **180**, and controller **200**.
[0033] FIG. **3** provides a perspective view of exemplary door **126** of refrigerator appliance **100** according to one or more exemplary embodiments of the present disclosure, and FIG. **4** provides an enlarged view of a lower portion of the exemplary door **126** of FIG. **3**. In the illustrated exemplary embodiments, the autofill pitcher system **140** is provided on the left door **126**. As noted above, such is by way of example only and the autofill pitcher system **140** may be provided on right door **128** or elsewhere within the fresh food chamber **122** in various embodiments. As may be seen in FIGS. **3** and **4**, the pitcher **142** of the autofill pitcher system **140** may be accessible when the door, e.g., left door **126**, is in an open position. The autofill pitcher system **140** comprises a removable pitcher **142**, a dispenser **180**, and controller **200** (FIGS. **1** and **2**). The pitcher **142** may be supported within a cavity **181** (FIG. **7**) below a portion of the dispenser **180** and on top of a support shelf **108**.
[0034] It will be appreciated that the present subject matter can be used with other types of refrigerator appliances as well, such as e.g., top mount, or top freezer, refrigerator appliances or single door refrigerators. Consequently, the description set forth herein is not intended to limit the present subject matter in any aspect.
[0035] Further details of exemplary pitcher **142** may be seen with reference to FIGS. **5**, **6**, and **7**. FIG. **5** is a perspective view of a representative pitcher **142** comprising a pitcher wall **144** connected to, or formed with, pitcher bottom **146**. In the illustrated exemplary embodiment, the pitcher wall **144** is a single continuous side wall which extends completely around the outermost perimeter of the pitcher bottom **146** and extends upward from the pitcher bottom **146** generally along the vertical direction V. It should be understood that references herein throughout to the orthogonal direction system including vertical direction V, lateral direction L, and transverse direction T in the context of the pitcher **142** are with reference to when the pitcher **142** is docked in the cavity **181** and, in embodiments where the autofill pitcher system **140** is provided on a door of the refrigerator appliance, the door is in the closed position.
[0036] A top edge **150** is formed by the pitcher wall **144** at the pitcher end opposite pitcher bottom **146**. The pitcher wall **144** and pitcher bottom **146** define an internal volume of the pitcher **142**, i.e., a pitcher volume **148**, accessible through opening **151** defined by the top edge **150**. In additional embodiments, the pitcher **142** may include a plurality of side walls which collectively extend completely around the outermost perimeter of the pitcher bottom **146** and thereby define the internal volume of the pitcher **142**, e.g., pitcher volume **148** may be enclosed on four side (such as front, back, left, and right) by one or more side walls and on a fifth side (e.g., bottom) by the pitcher bottom **146**, and the pitcher volume **148** may be open on the sixth side, e.g., at the top.
[0037] For convenience, top edge **150** may also define a spout **152** at a first end (e.g., front end) of the pitcher **142** to facilitate directing liquid into, or out of, the pitcher **142**. At a second end of the

pitcher, opposite the spout **152**, a handle **153** may be included to provide a gripping area to aid in manipulating the pitcher **142**.

[0038] Exemplary pitcher **142** is illustrated as a generally hollow rectangular cuboid for ease of illustration only. Other embodiments may have other shapes, for example a hollow cylinder, or may be non-prismatic, among other possible examples, and may or may not have features such as a spout or a handle.

[0039] As illustrated in FIG. **6**, embodiments of pitcher **142** may include a lid **154** removably received in, and fitted to, the opening **151** at the top edge **150**. The lid **154** may include a peripheral skirt **156** configured to be removably received in the opening **151** of pitcher **142**. Some embodiments of the skirt **156** may include features (not shown) that engage an inner portion of pitcher wall **144** at the top edge **150** to secure the lid against accidental separation from the pitcher **142**.

[0040] Lid **154** may include a top wall **158** joined to, or formed with, the skirt **156**. As illustrated in FIG. **6**, in some embodiments of the present disclosure, at least a portion of the top wall **158** may be movable, e.g., slidable, relative to the pitcher **142** and the remainder of the lid **154**. For example, the lid **154** may include a retractable portion **162**. For example, the lid **154** may include the retractable portion **162** and a stationary portion **164**, where the retractable portion **162** may be movable relative to the pitcher **142** and the remainder of the lid **154** (i.e., the stationary portion **164** of the lid **154**) when the lid **154** is received in the pitcher **142**. For example, the retractable portion **162** may be a portion of the top wall **158** of the lid **154**, and may be configured to provide an aperture **168** (FIG. **7**) when the retractable portion **162** is in the retracted position. In such embodiments, the retractable portion **162** may be movable along a direction generally perpendicular to the vertical direction V between a retracted, open position (FIG. **7**) and an extended, closed position (FIG. **6**). Also as may be seen in FIGS. **6** and **7**, a biasing element **166** may be coupled between the retractable portion **162** and the stationary portion **164**. The biasing element **166** may be a spring, such as a coil spring or other linear spring which is configured to provide a biasing force along a linear direction. The biasing element **166** may be configured to urge the retractable portion **162** to or towards the extended position. For example, as may be seen in FIGS. **6** and **7**, the biasing element **166** may be uncompressed or relaxed when the retractable portion **162** is in the extended (closed) position (FIG. **6**) and the biasing element **166** may be compressed when the retractable portion **162** is in the retracted (open) position (FIG. **7**), e.g., the biasing element **166** may be compressed in the retracted position, thereby storing energy in the biasing element **166** to urge the retractable portion **162** back to the extended position when the pitcher **142** is removed from the cavity **181**.

[0041] As illustrated for example in FIG. **7**, dispenser **180** defines a cavity **181** to receive the pitcher **142**. In the illustrative embodiment shown in the figures, the dispenser **180** is positioned on the inner surface **134** of left door **126** of the refrigerator appliance **100**. Other embodiments may have the dispenser on other doors or elsewhere in the fresh food chamber **122**. As illustrated, the cavity **181** comprises a support or shelf **108** (FIGS. **3** and **4**) to support the pitcher **142** in the vertical direction V and a sensor board **188** adjacent to the lid **154** of the pitcher **142**. As illustrated, the shelf **108** is dedicated to support the pitcher **142** on the left door **126**. In other embodiments, the shelf **108** may not be a dedicated shelf for the pitcher **142**. The shelf **108** may have other or additional uses, for example storage of other food products on the door. In other embodiments, the shelf **108** may be within the cabinet **120**. Other features (not shown) may be provided to secure the pitcher **142** in the cavity **181** during filling and as the door **126** is opened and closed to provide access to the fresh food chamber **122**.

[0042] The dispenser **180** may include a fill tube **184** adapted to direct water from a water supply **178** to the pitcher **142**. The water supply **178** may be, for example, a water utility supply or a private source water supply, such as a private well. A valve **186** may be provided in line with the fill tube **184** between the water supply **178** and the pitcher **142** to selectively allow the flow of

water to the pitcher **142**. The valve is operatively coupled to the controller **200**.
[0043] Controller **200** controls the operation of the autofill pitcher system in that it interprets signals received from various sensors of the dispenser **180** and determines if the autofill operation should initiate and when it should stop. Controller **200** may include control circuits, a memory, clock(s), an input/output device such as user interface **118** (FIG. **1**), and a microprocessor, such as a general purpose or special purpose microprocessor operable to execute programming instructions or micro-control code associated with the operation of the autofill pitcher system **140** and/or other components of the refrigerator appliance **100**. Alternatively, controller **200** may be constructed without using a microprocessor, e.g., using a combination of discrete analog or digital logic circuitry to perform control functionality instead of relying on software.
[0044] In embodiments, the controller **200** is in operative communication with a sensor **190** (described below), and the valve **186**. The controller may also be in operative communication with auditory or visual signaling devices provided in or on the refrigerator cabinet **120**, left and right doors **126**, **128**, first and second freezer drawers **130**, **131**, or user interface **118**.
[0045] In the exemplary embodiment illustrated in FIG. **7**, the fill tube **184** is positioned directly above the spout **152** of the pitcher **142**. In other embodiments, the fill tube **184** may be in other locations suitable to allow the flow of fluid (e.g., water) into the pitcher volume **148**. Fluid flow to the pitcher continues until a stop flow event occurs and the controller **200** receives a signal contraindicating the flow of liquid into the pitcher **142**. A stop flow event may occur when the sensor **190** detects a fill level at a predetermined limit. In response to a signal to the controller **200** from the fill sensor **190**, controller **200** may then signal the valve **186** to its normally closed position, stopping the flow of water to the pitcher **142**. A stop flow event may occur when the liquid level **171** rises to a predetermined vertical level, indicating a predetermined volume of liquid is present in the pitcher volume **148**.
[0046] In some embodiments, the sensor **190** may be positioned on the sensor board **188** and may be located above the pitcher **142** when the pitcher **142** is docked in the cavity **181**. Thus, for example, the sensor **190** may be oriented downwards towards the cavity **181** and, when the pitcher **142** is docked, the pitcher **142** therein. In various embodiments, the sensor **190** may be a non-contact sensor, such as a time-of-flight sensor or an ultrasonic sensor. Thus, for example, the sensor **190** may be configured to emit a wave **191**, e.g., a light wave or a sound wave, into the pitcher **142** to or towards the internal volume **148** and water which may be present therein. As those of ordinary skill in the art will recognize, the wave **191** may reflect off of the upper surface of the water (and/or other liquid) within the internal volume **148**, and, given the known speed of the wave **191**, e.g., the speed of sound, the distance from the sensor **190** to the liquid level **171** may be determined by the time elapsed between the wave **191** being emitted by the sensor **190** and the reflection being received by the sensor **190**.
[0047] Still referring to FIG. **7**, the sensor **190** may be positioned and oriented to emit the wave **191** directly into the internal volume **148** of the pitcher **142** without any obstructions or intervening elements, such as through an opening or aperture **168** in the lid **154**. For example, the aperture **168** may be formed between the retractable portion **162** and the stationary portion **164** when the retractable portion **162** is in the retracted, open position. In such embodiments, the autofill pitcher system **140** may include a ledge **210** in the cavity **181**. The ledge **210** may be configured to engage the lid **154** when the pitcher **142** is received in the cavity **181**, whereby the ledge **210** urges the retractable portion **162** of the lid **154** to the retracted position when the pitcher **142** is received in the cavity **181**. For example, the lid **154** may include a tab **212** formed on the lid **154**, such as a raised portion of the top wall **158** of the lid **154**. As illustrated, the tab **212** may be formed on the retractable portion **162** of the top wall **158** of the lid **154**. In such embodiments, the ledge **210** in the cavity **181** may be configured to engage the tab **212** on the lid **154**, such as a front wall **214** of the tab **212**. For example, the front wall **214** of the tab **212** may extend generally along the vertical direction V at a frontmost portion of the tab **212** (e.g., closest to the spout **152** of the pitcher **142**)

and the ledge **210** may be generally parallel to the front wall **214** of the tab **212**, whereby the ledge **210** engages, e.g., pushes on, the front wall **214** of the tab **212** to urge the tab **212** (along with the remainder of the retractable portion **162**) backwards from the extended position as the pitcher **142** is placed in the cavity **181**, thereby separating the retractable portion **162** from the stationary portion **164** of the lid **154** to form the aperture **168**. Thus, the retractable portion **162** and the aperture **168** provide unobstructed access for the sensor **190** to detect the fill level, e.g., fill level **171**, within the internal volume **148** of the pitcher **142** when the pitcher **142** is received in the cavity **181**, e.g., the sensor **190** may be positioned above the cavity **181** and may be operable to detect the fill level **171** within the internal volume **148** of the pitcher **142**, such as the sensor **190** may be positioned to measure the fill level **171** through the aperture **168** in the lid **154**, e.g., by emitting one or more wave(s) **191** through the aperture **168** into the internal volume **148** of the pitcher **142** and receiving one or more corresponding reflections from the internal volume **148** through the aperture **168**.

[0048] 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 language of the claims.

Claims

1. A refrigerator appliance comprising: a cabinet defining a fresh food chamber; an autofill pitcher system comprising: a pitcher comprising at least one pitcher wall and an internal volume defined within the at least one pitcher wall; and a dispenser defining a cavity, the cavity configured to receive the pitcher, the dispenser comprising a fill tube and a sensor, the fill tube positioned and configured to direct a flow of water from a water supply into the internal volume of the pitcher when the pitcher is received within the cavity, the sensor positioned above the cavity and operable to detect a fill level within the internal volume of the pitcher.

2. The refrigerator appliance of claim 1, wherein the sensor is a non-contact sensor.

3. The refrigerator appliance of claim 1, wherein the sensor is an ultrasonic sensor.

4. The refrigerator appliance of claim 1, wherein the autofill pitcher system further comprises a lid, the lid removably coupled to the pitcher above the internal volume of the pitcher, wherein the sensor is operable to detect the fill level within the internal volume of the pitcher when the lid is coupled to the pitcher and the pitcher is received in the cavity below the sensor.

5. The refrigerator appliance of claim 4, wherein the lid comprises a retractable portion, the retractable portion movable along a direction generally perpendicular to a vertical direction between a retracted position and an extended position.

6. The refrigerator appliance of claim 5, wherein, when the retractable portion is in the retracted position, an aperture is formed in the lid, the sensor positioned to measure the fill level through the aperture in the lid.

7. The refrigerator appliance of claim 5, further comprising a ledge in the cavity, the ledge configured to engage the lid when the pitcher is received in the cavity, whereby the ledge urges the retractable portion of the lid to the retracted position when the pitcher is received in the cavity.

8. The refrigerator appliance of claim 7, further comprising a tab on the lid, wherein the ledge in the cavity is configured to engage the tab on the lid.

9. The refrigerator appliance of claim 5, wherein the lid further comprises a biasing element, wherein the biasing element urges the retractable portion of the lid to the extended position when the pitcher is removed from the cavity.

10. An autofill pitcher system comprising: a pitcher comprising at least one pitcher wall and an internal volume defined within the at least one pitcher wall; and a dispenser defining a cavity, the cavity configured to receive the pitcher, the dispenser comprising a fill tube and a sensor, the fill tube positioned and configured to direct a flow of water from a water supply into the internal volume of the pitcher when the pitcher is received within the cavity, the sensor positioned above the cavity and operable to detect a fill level within the internal volume of the pitcher.
11. The autofill pitcher system of claim 10, wherein the sensor is a non-contact sensor.
12. The autofill pitcher system of claim 10, wherein the sensor is an ultrasonic sensor.
13. The autofill pitcher system of claim 10, further comprising a lid, the lid removably coupled to the pitcher above the internal volume of the pitcher, wherein the sensor is operable to detect the fill level within the internal volume of the pitcher when the lid is coupled to the pitcher and the pitcher is received in the cavity below the sensor.
14. The autofill pitcher system of claim 13, wherein the lid comprises a retractable portion, the retractable portion movable along a direction perpendicular to a vertical direction between a retracted position and an extended position.
15. The autofill pitcher system of claim 14, wherein, when the retractable portion is in the retracted position, an aperture is formed in the lid, the sensor positioned to measure the fill level through the aperture in the lid.
16. The autofill pitcher system of claim 14, further comprising a ledge in the cavity, the ledge configured to engage the lid when the pitcher is received in the cavity, whereby the ledge urges the retractable portion of the lid to the retracted position when the pitcher is received in the cavity.
17. The autofill pitcher system of claim 16, further comprising a tab on the lid, wherein the ledge in the cavity is configured to engage the tab on the lid.
18. The autofill pitcher system of claim 14, wherein the lid further comprises a biasing element, wherein the biasing element urges the retractable portion of the lid to the extended position when the pitcher is removed from the cavity.