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Laundry treating appliance

Abstract

A laundry treating appliance includes a cabinet defining a cabinet interior, a drum, rotatable within the cabinet interior, at least partially defines a treating chamber for holding laundry items for treatment. A lid provides access to the cabinet interior. A user interface is carried by the cabinet and includes a console having a first input opening, a controller including a printed circuit board (PCB) located behind the console, and a rotary knob assembly and push button assembly located above the console and operably coupled to the PCB. A liquid seal is formed between the console and the rotary knob assembly and the console and the push button.

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Background/Summary

BACKGROUND

(1) Laundry treating appliances, such as washing machines, combination washer/dryers, condensing dryers, refreshers, and non-aqueous systems, can have a configuration based on a rotating laundry basket or drum that defines a drum opening and at least partially defines a treating chamber in which laundry items are placed for treating. The drum can be provided within an interior of a tub that defines a tub opening and further can at least partially define the treating chamber. The laundry treating appliance can have a controller that implements a number of user-

selectable, pre-programmed cycles of operation having one or more operating parameters. Hot water, cold water, or a mixture thereof, along with various treating chemistries, can be supplied to the treating chamber in accordance with the cycle of operation.

BRIEF SUMMARY

(2) A laundry treating appliance includes a cabinet defining a cabinet interior, a drum, rotatable within the cabinet interior, at least partially defines a treating chamber for holding laundry items for treatment. A lid provides access to the cabinet interior. A user interface is carried by the cabinet and includes a console having a first input opening, a controller including a printed circuit board (PCB) located behind the console, and a rotary knob and push button assembly located above the console and operably coupled to the PCB. A liquid seal is formed between the console and the rotary knob and the console and the push button.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) In the drawings:

(2) FIG. **1** illustrates a schematic view of a laundry treating appliance.

(3) FIG. **2** is a schematic perspective view of a top-loading, laundry treating appliance illustrating a user interface.

(4) FIG. **3** is an exploded view of the user interface of FIG. **2** including a console, input devices (knob assembly and a push button assembly), light guide, and printed circuit board (PCB).

(5) FIG. **4** is a perspective, cross-sectional view of an enlarged portion of the knob assembly taken along the line IV-IV of FIG. **3** illustrating a liquid seal with the knob, console and PCB.

(6) FIG. **5** is a perspective view of the push button assembly of FIG. **3**.

(7) FIG. **6** is a perspective, cross-sectional view taken along the line VI-VI of FIG. **2** and illustrating the push button assembly of FIG. **3** including a liquid seal and with the push button in a non-pressed state.

(8) FIG. **7** is a detailed cross-section view of the push button assembly of FIG. **6** including a liquid seal and with the push button in a pressed state.

DETAILED DESCRIPTION

(9) The description is directed to solving the problem of a liquid spill on the user interface of a home appliance console, such as a laundry treating appliance. Such liquid spills can be in the form of treating chemistries or water and can involve larger volumes of liquid, which might overflow or flood prior liquid spill solutions. The spilled liquid is prevented from reaching the electronic components in the user interface. The spilled liquid can be directed around or away from the electronic components and/or contained. The solution is specifically useful for user interfaces that are located on an upper, outer surface of a home appliance, such as a console located along a rear portion of the upper surface of the appliance cabinet. Such consoles typically have a more gently sloped face, as compared to a console on a vertical front surface of the appliance, which lets the spilled liquid dwell on the surface for a slightly longer time. While the solution is described in the environment of a laundry treating appliance, it has applicability to other household appliances.

(10) FIG. **1** schematically illustrates a laundry treating appliance **10** including a cabinet **20** in which a treating chamber **30** is located, along with a plurality of systems, with one or more of the systems controlled by a controller **130** to carry out a treating cycle of operation on laundry within the treating chamber **30**. Examples of such laundry treating appliances **10** include, without limitation, clothes washer (washer), clothes dryer (dryer), combination washer/dryer (combo), and/or refreshers. Different combinations of the systems can be used depending on the type of laundry treating appliance **10**.

(11) The cabinet **20** can include a closure **22** that selectively provides access to the treating

chamber **30** through a cabinet access opening. The closure **22** can vary depending on the type and configuration of the laundry treating appliance **10**. For front-loading laundry treating appliances, the closure can be a door moveably mounted relative to a front of the cabinet **20**. For top-loading appliances, the closure can be a lid moveably mounted to a top of the cabinet **20**. In a drawer-type appliance, the closure is the cabinet that a drawer slides in and out of. In some configurations, the closure can extend over at least a portion of both the top and front of the cabinet **20**. The cabinet **20** can be implemented by a chassis or frame to which a variety of panels (front, back, left, right, and top) are mounted, with the panels forming the cabinet exterior.

(12) The treating chamber **30** can be a container **32** defining an access opening **34**, which is selectively closed by the closure **22**. The container **32** can be oriented in the cabinet **20** such that the access opening **34** faces one or more sides of the cabinet **20**. For front-loading appliances, the access opening **34** generally faces a front of the cabinet **20** and for top-loading appliances, the access opening **34** generally faces a top of the cabinet **20**. The container **32** can be stationary or it can move, such as by translating, rotating, or reciprocating, for example.

(13) The container **32** can be configured to hold liquid, such as in a dryer-only configuration or a low-pressure dryer. The container **32** can also be configured to let liquid pass through, such as by having a series of perforations, such as in a clothes washer or a combo washer/dryer. In a liquid pass through configuration, the container **32** can be located partially or completely within a liquid holding tub **38**, which catches the liquid after passing through the container **32**. In a vertical axis clothes washer, the container is often referred to as a basket, and in a horizontal axis clothes washer, the container is often referred to as a drum.

(14) The container **32**, alone, or in combination with the tub **38**, can be sealed, including the closure **22**, relative to atmosphere to provide a low-pressure chamber, i.e. lower than ambient pressure, suitable for a low-pressure drying cycle, where the pressure inside the treating chamber **30** is dropped, relative to the ambient pressure, a sufficient amount to effect a flash drying of the liquid. Such a sealing need not be a perfect seal as the low pressure need not be a vacuum to effect a flash drying.

(15) The different systems can include a water system **40**, which receives water from a household water supply line **42** and supplies the water to other systems and/or the treating chamber **30** along water supply lines **44**. The water system **40** can optionally include a water treater **46** and a water tank **48**. The water treater **46** can treat the water from the household water supply line **42** and then supply the treated water to the tank **48**, the systems, or the treating chamber **30**. The water treater **46** can be a water softener, an ionizer, etc. The tank **48** can be cither or both a supply tank or a reuse tank. As a supply tank, the tank **48** stores water from the household water supply and supplies it as demanded. For convenience, the tank **48** can be sized such that it holds a predetermined volume of water that corresponds to a volume contemplated for use in the laundry treating appliance **10**, which can be referred to as a “charge” of water. As a reuse tank, the tank **48** stores water that is used in a treating cycle of operation, which means the stored water may, but not necessarily, include chemicals, such as detergents, softeners, etc., and can be described as a wash liquid. The tank **48** can be located near or in abutting contact with the treating chamber **30** such that heat from the treating chamber **30** is transferred to the tank **48** and any contents within the tank **48**.

(16) A recirculation system **50** can recirculate liquid from the treating chamber **30** back to the treating chamber **30**. To accomplish the recirculation, the recirculation system **50** can include at least one pump **52**, which draws liquid from the treating chamber **30**, through a return line **54**, such as from the container **32** or tub **38**, and returns it, through a re-supply line **56**, to the treating chamber **30**, such as through a nozzle **58**. The nozzle **58** can be in the form of a plain tube and/or a spray head, which may have a predetermined spray pattern. The return line **54** and re-supply line **56** can be thought of as a liquid recirculation circuit for the treating chamber **30**. The return line **54** can originate from a sump fluidly connected to or formed as part of the tub **38**.

(17) Additional liquid lines can be provided to redirect the liquid as desired outside of the

recirculation system **50**. For example, a reuse line **57** can fluidly couple the output of the pump **52** to the tank **48**, where the liquid may be stored for reuse in the current cycle of operation or for a future cycle of operation. A drain line **59** can be coupled to the pump **52** such that the output of the pump **52** is supplied to a household drain. In some configurations, the pump **52** can include multiple pumps, such as a drain pump and a recirculation pump, with the drain pump typically being more robust to handle foreign objects and other items that are not recirculated, but are removed down the drain.

(18) A dispensing system **60** dispenses treating chemistry, directly or indirectly, into the treating chamber **30**. The dispensing system includes a dispenser **62** that is connected to the treating chamber **30** by a conduit **64**, such that chemistry dispensed from the dispenser **62** travels through the conduit **64** to the treating chamber **30**. The dispenser **62** can have one or more sources **66** of treating chemistry, which can be either or both single-use or bulk sources of treating chemistry. Single-use sources will typically contain a single "charge" of treating chemistry that is fully dispensed over a cycle of operation, whereas bulk sources contain multiple charges of treating chemistry. In a single-use configuration, the source **66** can be a cup or other container that is manually filled or a cartridge that is replaced by the user. In a bulk-use configuration, the source **66** can be a container that is re-filled by the user or a container that is replaced after multiple cycles. Typically, the types of chemistries that might be dispensed include: detergent, fabric softener, bleach, and enzymes.

(19) One configuration for the dispenser **62** is a drawer **68** within which are located one or more cups **70** having a fluid outlet, like a siphon **72**. A housing **74** underlies the siphon **72** and is fluidly coupled to the treating chamber **30** by the conduit **64**. The water system **40** and/or the recirculation system **50** supplies water to the cup **70**, which floods the cup **70**, causing the chemistry in the cup **70** to mix with the water and flow out the siphon **72**. Alternatively, a pump **76** can fluidly couple the cup **70** directly to the conduit **64** and/or the treating chamber **30**.

(20) An air system **80** supplies air to the treating chamber **30**. The supply of air can be one or both of a pass-through air supply circuit **82** or a recirculating air supply circuit **84**. The air system **80** can include an air flower **86**, such as a fan or blower, to flow air through the pass-through air supply circuit **82** or the recirculating air supply circuit **84**.

(21) A heating system **90** can be used to heat fluid, liquid, or air, used in the treating chamber **30**. The heating system **90** can include one or more heaters **92**, including a resistive heater, immersible or non-immersible, a heat pump, or a gas heater, for example. The heater **92** can be located in the tub **38**, such as an immersion heater in a sump formed by the tub **38**, or located in one of the pass-through or recirculating air supply circuits **82**, **84**. In some implementations, both an immersible heater can be used in the sump and a resistive or gas heater used inline in one or both of the air supply circuits **82**, **84**.

(22) A moisture removing system **100** removes moisture from the treating chamber **30** and/or laundry located within the treating chamber **30**. The moisture removing system **100** can combine the air system **80** and the heating system **90** to supply heated air to the treating chamber **30**. The moisture removing system **100** can just supply heat to the treating chamber **30**, without the supplying of air, and rely on natural convection air flow for moisture removal. The moisture removing system **100** can also just supply air, without the addition of heat, to the treating chamber **30**. An optional condenser **102** can be provided to receive the naturally flowing air or the forced air from the air system **80** and condense moisture from the air passing through the condenser **102**. The condenser **102** can be fluidly coupled to at least one of the water system **40** or the recirculation system **50** such that the condensate can be stored for reuse in the tank **48** or drained.

(23) A movement system **110** is provided for imparting motion or mechanical energy to laundry within the treating chamber **30** or to the treating chamber **30**. The motion can be rotational or linear in one or more axes. For example, in horizontal axis appliances, the container **32** can be rotated about a rotational axis to effect a lifting/dropping or tumbling of the laundry and thereby impart

mechanical energy to the laundry, and, or in addition, the container **32** can be reciprocated in one or more of the three primary axes to also impart mechanical energy to the laundry. In vertical axis appliances, a clothes mover can reside within the treating chamber and impart mechanical energy to the laundry. The clothes mover can be one or more, alone or in combination, of an agitator, auger, impeller, wash plate, nutator, pulsator, just to name a few. These clothes movers can rotate, either clockwise (CW) or counterclockwise (CCW), or reciprocally rotate between the CW and CCW directions. The agitators can also reciprocate about an axis, which can be a rotational axis, where the clothes mover both rotates and reciprocates, or at least has one portion that rotates and another portion the reciprocates, as in a combination agitator with a pulsator.

(24) The movement system **110** can be implemented with an electric motor **112** that is directly or indirectly coupled to the container **32** or clothes mover to drive the movement of the container **32** or clothes mover. In some implementations, the electric motor **112** can be directly mounted to the tub **38** and connected to the container **32** or clothes mover via a drive shaft.

(25) For purposes of this description, the terms horizontal axis and vertical axis are used to represent the general orientation of the axis of rotation and is not meant to be limited to a perfectly horizontal or perfectly vertical axis of rotation. The terms horizontal axis of rotation or vertical axis of rotation, when used to identify the type of laundry treating appliance, are more accurately used to describe the primary mechanism by which mechanical energy is imparted to the laundry. The horizontal axis washing machine imparts mechanical energy primarily by tumbling the laundry within the drum (container). That is, rotation of the drum lifts and then drops the laundry. This lifting/dropping imparts mechanical energy to the laundry. The vertical axis washing machine imparts mechanical energy via a clothes mover located in the basket (container), such as an agitator, impeller, pulsator, auger, etc., which is rotated within the basket to effect movement of liquid in the basket or directly impact the laundry. While a laundry container is normally referred to as a drum for a horizontal axis machine and a basket for a vertical axis machine, for this disclosure, unless otherwise stated, drum and basket are interchangeable. Additionally, while most horizontal axis clothes washers are front loading and most vertical axis clothes washers are top loading, that need not be the case. Horizontal axis clothes washers can be top loaders, and typically have a door in the side of the drum. Vertical axis clothes washers can have a lid that extends into the front of the cabinet.

(26) A suspension system **120** can be used to support one or more of the components of the movement system **110** or other system components, which are moved by the movement system **110**. For example, one or more suspension components can support the tub **38** and/or container **32** relative to the cabinet **20**. The suspension components can include one or more springs **122** and/or dampeners **124** coupling the tub **38** or container **32** to the cabinet **20**. The spring **122**/dampener **124** can be combined into a single device like a shock absorber. One implementation is for springs **122** to suspend an upper portion of the tub **38** from the cabinet **20** or a frame within the cabinet **20** in combination with a dampener **124** coupling a lower portion of the tub **38** to a floor of the cabinet **20**.

(27) A controller **130** is operably coupled to the various systems and their components to control the operation of the laundry treating appliance **10** and its various working systems to control the operation of the working systems and to implement one or more treating cycles of operation. A user interface **132** is operably coupled with the controller **130**. The user interface **132** can provide an input and output function for the controller **130**. The user interface **132** can be provided or integrated with the closure **22** or can be provided on the cabinet **20**.

(28) The user interface **132** can include one or more knobs, dials, switches, displays, touch screens and the like for communicating with the user, such as to receive input and provide output. For example, the displays can include any suitable communication technology including that of a liquid crystal display (LCD), a light-emitting diode (LED) array, or any suitable display that can convey a message to the user. The user can enter different types of information including, without limitation,

cycle selection and cycle parameters, such as cycle options. Other communications paths and methods can also be included in the laundry treating appliance **10** and can allow the controller **130** to communicate with the user in a variety of ways. For example, the controller **130** can be configured to send a text message to the user, send an electronic mail to the user, or provide audio information to the user either through the laundry treating appliance **10** or utilizing another device such as a mobile phone.

(29) The controller **130** can include the machine controller and any additional controllers provided for controlling any of the systems of the laundry treating appliance **10**. For example, the controller **130** can include the machine controller and a motor controller. Many known types of controllers can be used for the controller **130**. It is contemplated that the controller is a microprocessor-based controller that implements control software and sends/receives one or more electrical signals to/from each of the various working systems to effect the control software. As an example, proportional control (P), proportional integral control (PI), and proportional derivative control (PD), or a combination thereof, a proportional integral derivative control (PID control), can be used to control the various systems.

(30) The controller **130** can be provided with a memory **134** and a central processing unit (CPU) **136**. The memory **134** can be used for storing the control software that is executed by the CPU **136** in completing a cycle of operation using the laundry treating appliance **10** and any additional software. For example, the memory **134** can store a set of executable instructions including at least one user-selectable cycle of operation. Examples, without limitation, of cycles of operation include: wash, heavy duty wash, delicate wash, quick wash, pre-wash, refresh, rinse only, timed wash, dry, heavy duty dry, delicate dry, quick dry, or automatic dry, which can be selected at the user interface **132**. The memory **134** can also be used to store information, such as a database or table, and to store data received from one or more systems of the laundry treating appliance **10** that can be communicably coupled with the controller **130**. The database or table can be used to store the various operating parameters for the one or more cycles of operation, including factory default values for the operating parameters and any adjustments to them by the control assembly or by user input.

(31) The controller **130** can be operably coupled with one or more systems of the laundry treating appliance **10** for communicating with and controlling the operation of the systems to complete a cycle of operation. For example, the controller **130** can be operably coupled with the water system **40** for controlling the temperature and flow rate of treating liquid into the treating chamber **30**, the motor **112** for controlling the direction and speed of rotation of the container **32**, the pump **52** for controlling the amount of treating liquid in the treating chamber **30** or sump, the dispenser **62** for controlling the flow of treating chemistries into the treating chamber **30**, the user interface **132** for receiving user selected inputs and communicating information to the user, and the heater **92**, the moisture removing system **100**, including the air flower **86** and the heating system **90**, to control the operation of these and other systems to implement one or more of the cycles of operation.

(32) The controller **130** can also be coupled with one or more sensors **138** provided in one or more of the assemblies of the laundry treating appliance **10** to receive input from the sensors **138**, which are known in the art and not shown for simplicity. Non-limiting examples of sensors **138** that can be communicably coupled with the controller **130** include: a treating chamber temperature sensor, such as a thermistor, which can detect the temperature of the treating liquid in the treating chamber **30** and/or the temperature of the treating liquid being supplied to the treating chamber **30**, a moisture sensor, a weight sensor, a chemical sensor, a position sensor, an imbalance sensor, a load size sensor, and a motor torque sensor, which can be used to determine a variety of assembly and laundry characteristics, such as laundry load inertia or mass.

(33) Referring to FIG. **2**, a top-loading clothes washer **200** is illustrated, which has many parts and features similar to the laundry treating appliance **10**, and therefore like parts and features will be identified with like numerals increased by 200. The clothes washer **200** can include a cabinet **220**

forming an interior **222**. The interior **222** is covered by a horizontal top wall **224** in which a selectively openable lid **226** covers an access opening **234** for access to the interior **222**. A user interface **232** is located along a rear of the top wall **224** and is oriented at an acute angle relative to the top wall **224** to provide a convenient viewing angle for the user.

(34) Referring to FIG. **3**, the user interface **232** includes a console **240** overlying a light guide assembly **300**, which overlies a printed circuit board (PCB) **402**, which is supported by a back panel **500**. User input devices, illustrated as, but not limited to, a knob assembly **600** and push button assembly **700**, enable the user to input selections to the PCB **402**. The PCB **402** includes various switches **404** and light emitting diodes (LED) **406**, some of which correspond to the switches **404** to indicate the status of the switches **404**. The light guide assembly **300** is separate from the push button assembly **700**, however, it is contemplated they could be integrated.

(35) The console **240** further includes a first input opening **244**, through which the knob assembly **600** can couple to the PCB **402**, a second input opening **250**, through which the push button assembly **700** is accessible, and a plurality of third console light openings **252**, through which light from the PCB **402** can be projected for viewing by the user. A catch **248** (FIG. **4**) circumscribes the first input opening **244** and helps hold the knob assembly **600** to the console **240** and retards its withdrawal.

(36) Light guide assembly **300** includes a first plate **301** and a second plate **306** which together transfers light emitted from the PCB **402** to the console **240**. The first plate **301** includes a plurality of light pipes **302** and a plurality of push button guide collars **304**. The light pipe **302** transmits light from a light source, which may be the LEDs **406**, on the PCB **402** out through the console light openings **252**. The push button guide collar **304** provides a hub through which a portion of the push button assembly **700** is slidably received.

(37) The PCB **402** is mounted to the back panel **500**. The PCB **402** further comprises a plurality of depressible switches **404**, some of which may be depressible switches, and a series of LEDs **406**, as well as other commonly known components such as a rotary knob input to an encoder, potentiometer or rheostat. The depressible switches **404** and the LEDs **406** are aligned with the corresponding first and second openings **250**, **252** on the console **240** when the console **240** is assembled.

(38) The back panel **500** is mounted over the PCB **402** and secures the PCB **402** to the console **240**.

(39) Referring to FIG. **4**, a rotary knob assembly **600** includes the knob **602** fixed to an input shaft **608** and covered with a dome **606** on one end of the input shaft **608**. A first collar **604** circumscribes the input shaft **608** and extends from a hub **605** of the knob **602**. The dome **606** terminates in an annular edge **609** spaced above the console **240** and forms a hollow interior **607**. The input shaft **608** further comprises a pin **610** on which an annular detent **612** is formed in a ring-shaped fashion which is caught by the console catch **248** to retard removal of the rotary knob assembly **600** from the console **240**. A liquid flow path is formed by a gap between the annular edge **609** and the console **240**. Liquid flowing into the gap is received within a recess in the console **240** below the dome **606** and is drained via a drain hole **611**. In the case of a liquid spill, where larger amounts of liquid flood the console **240** and cannot be timely drained through the drain hole **611**, a liquid seal **621** prevents the flooding liquid from reaching the PCB **402**.

(40) The liquid seal **621** is formed between the knob assembly **600** and the console **240**. The liquid seal **621** comprises a second collar **251** on the console **240** and a rimmed bushing **614**. The second collar **251** circumscribes the first input opening **244** and terminates in an upper edge **622**. The rimmed bushing **614** has an annular disk **618** from which extends a first ring **616** and a second ring **620**. The annular disk **618** abuts the upper edge **622** to form a first seal interface **623** for the liquid seal **621**. The second ring **620** sits within, and is adjacent to, the second collar **251** to form a second seal interface **624**. The close fit between the second ring **620** and the second collar **251** forms the second seal interface **624**. Collectively, if both the first seal interface **623** and second seal interface **624** are used, they form a labyrinth seal. A third seal interface **626** can be formed by the first ring

616 of the rimmed busing **614** sitting within the first collar **604**.
(41) The spatial relationship between the first collar **604**, rimmed bushing **614**, second collar **251**, a detent **612** on the knob assembly **600**, and catch **248**, create a tolerance such that the annular disk **618** is biased against the upper edge **622** of the second collar **251**, yet the knob **602** is still free to rotate. The spatial relation can be such that there is a slight compression of the annular disk **618** against the upper edge **622** of the second collar **251**. The compressive force should not be so great that it prevents rotation of the knob.
(42) Referring to FIG. **5**, the push button assembly **700** includes a support structure **702** and a button arm **704**. The button arm **704** is flexibly mounted to the support structure **702** so that the button arm **704** can deflect when under pressure. The button arm **704** further includes a user-engageable button **706**. A button pin **708** extends orthogonally from the button arm **704** and is aligned with a corresponding depressible switch **404** located on the PCB **402**. A centerline A-A drawn through the centers of the buttons **706** is offset from centerline B-B drawn through the centerline of the button pins **708** indicating that the buttons **706** are offset from the button pins **708**.
(43) Referring to FIG. **6** which illustrates a sectional view taken along line VI-VI of FIG. **2**, when the user interface **232** is assembled, the button pins **708** extend through the push button collars **304** of the light guide assembly **300** and are aligned with the switches **404** on the PCB **402**. The light pipes **302** are aligned with an LED **406** on the PCB **402**. The light pipes **302** extend into the light openings **252** on the console **240**.
(44) A deflectable seal **710** further comprises a hollow annular body **712** terminating in a deflectable flange **714**. The annular body **712** circumscribes the push button guide collar **304** on the light guide assembly **300**. The deflectable flange **714** overlies an upper end of the push button guide collar **304** and directly contacts the push button pin **708**. The deflectable flange **714**, in cross-section, tapers in a direction from the annular body **712** toward the button pin **708**.
(45) To assemble, the deflectable seal **710** is placed over the button guide collar **304** through an interference fit. The light guide assembly **300** is then assembled to the console **240** whereby the push button pin **708** enters an interference fit with the tapered deflectable flange **714** creating a liquid seal between the push button pin **708** and the light guide assembly **300**. FIG. **6** illustrates the condition where the button **706** is in the off or extended state and the tapered deflectable flange **714** is not under pressure. Referring to FIG. **7**, the same components of FIG. **6** are illustrated but with the button **706** in the on or depressed state with the tapered deflectable flange **714** in the compressed condition.
(46) To the extent not already described, the different features and structures of the various aspects can be used in combination with each other as desired. That one feature is not illustrated in all of the aspects is not meant to be construed that it cannot be, but is done for brevity of description. Thus, the various features of the different aspects can be mixed and matched as desired to form new aspects, whether or not the new aspects are expressly described.
(47) This written description uses examples to disclose aspects of the disclosure, including the best mode, and also to enable any person skilled in the art to practice aspects of the disclosure, including making and using any devices or systems and performing any incorporated methods. While aspects of the disclosure have been specifically described in connection with certain specific details thereof, it is to be understood that this is by way of illustration and not of limitation. Reasonable variation and modification are possible within the scope of the forgoing disclosure and drawings without departing from the spirit of the disclosure, which is defined in the appended claims.

Claims

1. A laundry treating appliance comprising: a cabinet defining a cabinet interior and a top wall with a cabinet access opening providing access to the cabinet interior; and a user interface carried by the

cabinet and comprising: a console having a first input opening; a printed circuit board (PCB) located behind the console; a rotary knob assembly comprising a knob, located above the console, and an input shaft extending from the knob through the first input opening and operably coupled to the PCB; and a liquid seal between the console and the knob, said liquid seal comprising a first collar extending rearwardly from the knob, a second collar extending away from the console and circumscribing the first input opening, and a rimmed bushing having an annular disk from which extends a first ring, which abuts with the first collar, and a second ring, which sits within the second collar, wherein the input shaft passes through the annular disk, and the annular disk abuts the second collar to form a first seal interface.

2. The laundry treating appliance of claim 1 wherein the second ring is adjacent the second collar to form a second seal.

3. The laundry treating appliance of claim 2 wherein the first seal and the second seal form a labyrinth seal.

4. The laundry treating appliance of claim 3 wherein the knob comprises a dome having a hollow interior overlying the console.

5. The laundry treating appliance of claim 4 wherein the knob further comprises a hub located within the hollow interior, with the input shaft coupled to the hub.

6. The laundry treating appliance of claim 5 wherein the console comprises a catch and the input shaft comprises a pin which is caught by the catch to retard removal of the knob from the console.

7. The laundry treating appliance of claim 6 wherein the dome terminates in an annular edge spaced above the console.

8. The laundry treating appliance of claim 1 wherein the user interface is located along a rear of the top wall.

9. The laundry treating appliance of claim 8 wherein the top wall is horizontal and the user interface is oriented at an acute angle to the top wall.

10. The laundry treating appliance of claim 9 further comprising a lid mounted to the cabinet and selectively closing the cabinet access opening.

11. The laundry treating appliance of claim 1 wherein the PCB comprises a depressible switch, and the user interface further comprises a second input opening, with a push button assembly having a button, located in the second input opening, and a button pin aligned with the depressible switch, a light guide having a guide collar circumscribing the button pin, and a deflectable seal provided between the button pin and the guide collar.

12. The laundry treating appliance of claim 11 wherein the deflectable seal comprises an annular body, which circumscribes the guide collar.

13. The laundry treating appliance of claim 12 wherein the deflectable seal further comprises a deflectable flange extending from the annular body and circumscribing the button pin.

14. The laundry treating appliance of claim 13 wherein the push button assembly further comprises an arm connecting the button and the button pin, wherein the button pin is offset from the button, and the deflectable flange is located between the arm and the guide collar.