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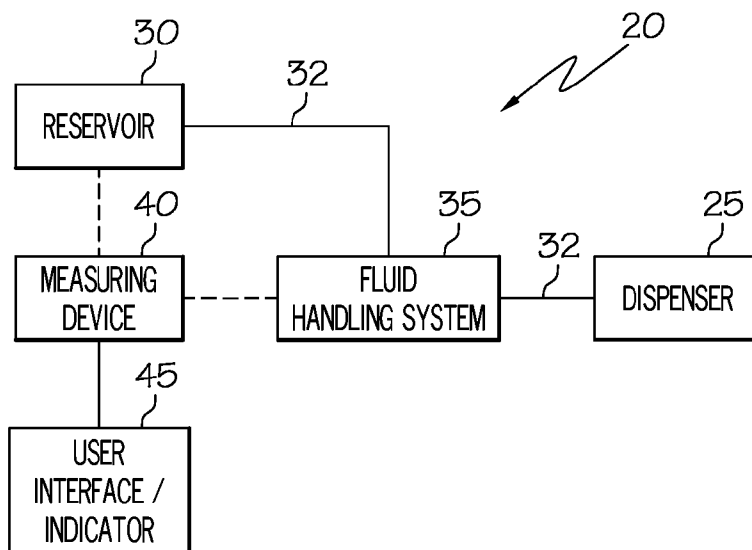
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- (74) Common Representative: **THE PROCTER & GAMBLE COMPANY**; c/o Eileen L. Hughett, The Procter & Gamble Company, Winton Hill Business Center, 6110 Center Hill Road, Cincinnati, Ohio 45224 (US).
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- (71) Applicant (for all designated States except US): **THE PROCTER & GAMBLE COMPANY** [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **FRANCE, Paul, Amaat Raymond Gerard** [BE/US]; 5240 Barkwood Drive, West Chester, OH 45069 (US). **SMITH, Christopher, Lawrence** [US/US]; 6221 Summerville Lane, Liberty Township, OH 45011 (US). **CLARK, Melissa,**
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(54) Title: FABRIC ARTICLE TREATING DEVICE AND SYSTEM WITH USER INTERFACE



(57) Abstract: A fabric article treating device (20) having a dispenser (25), reservoir (30), fluid handling system (35), measuring device (40) and user interface (45). The dispenser and reservoir are adapted for fluid communication with one another. The reservoir is configured to contain a benefit composition. The measuring device communicates with the reservoir and/or fluid handling system to determine the amount of benefit composition remaining in the reservoir and activate a user signal on the user interface to inform the consumer with information relating to the amount of benefit composition in the reservoir.

WO 2007/004162 A1



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FABRIC ARTICLE TREATING DEVICE AND SYSTEM
WITH USER INTERFACE

FIELD OF THE INVENTION

5 The present invention relates to a fabric article treating device for use with a fabric article drying appliance, and more specifically to a unique fabric article treating device and system for dispensing a benefit composition, employing a reservoir and a user interface to inform the user regarding a quantity of the benefit composition remaining in the reservoir.

BACKGROUND OF THE INVENTION

10 Fabric article treating methods and/or apparatuses have been evolving over the past twenty years. There exists an ongoing need to develop a fabric article treating method and/or apparatus especially an in-home fabric article treating method and/or apparatus that improves/enhances the deposition of fabric article actives or benefit agents on the fabric articles
15 being treated as compared to the currently existing deposition methods and/or apparatuses.

 One particular challenge presented in the delivery of fabric article actives in the fabric article drying environment is the effect of moisture and heat, both during handling of a product in the chain of commerce and as generated during the drying of the fabric articles. Particularly, storage containers or reservoirs are sealed to minimize the effects of such conditions, thereby
20 minimizing bacterial and fungal growth especially on head space surfaces such as lids or gaps, subject to repeated condensation and perspiration, and to avoid product loss or contamination.

 Typically, when using a product which utilizes an expendable composition which needs to be replaced, the user desires the ability to determine how much of the composition is remaining. This allows the user to plan future purchases of the composition and to ensure that
25 enough of the composition is on hand for the planned activity. As such, it would be advantageous to provide a fabric article treating device in which a user can easily determine when additional composition is needed.

SUMMARY OF THE INVENTION

30 The present invention is directed to fabric article treating devices and fabric article treating systems. More particularly, the invention is directed to fabric article treating devices in which a user interface provides information related to the amount of benefit composition remaining in the reservoir.

One embodiment of the present invention is a fabric article treating device. The fabric article treating device comprises a dispenser and a reservoir, wherein the reservoir is configured to contain a benefit composition. A fluid handling system is configured to transport benefit composition from the reservoir to the dispenser. The dispenser is configured to deliver benefit composition to one or more fabric articles in a fabric article treating appliance. A measuring device is adapted to be in communication with the reservoir and/or the fluid handling system, and to determine an amount of benefit composition remaining in the reservoir. A user interface is in communication with the measuring device and comprises a user signal adapted to provide a user with information relating to the amount of benefit composition remaining in the reservoir.

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BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed the same will be better understood from the following description taken in conjunction with the accompanying drawings in which:

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Figure 1 is a schematic illustration of an exemplary fabric article treating device according to a first embodiment of the present invention;

Figure 2 is a schematic illustration of an exemplary fabric article treating device according to a second embodiment of the present invention;

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Figure 3 is a schematic illustration of an exemplary fabric article treating device according to a third embodiment of the present invention;

Figure 4 is a schematic illustration of an exemplary fabric article treating device according to a fourth embodiment of the present invention;

Figure 5 is a schematic illustration of an exemplary fabric article treating device according to a fifth embodiment of the present invention; and

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Figure 6 is a schematic illustration of an exemplary fabric article treating device according to a sixth embodiment of the present invention.

The embodiments set forth in the drawings are illustrative in nature and not intended to be limiting of the invention defined by the claims. Moreover, individual features of the drawings and the invention will be more fully apparent and understood in view of the detailed description.

30

DETAILED DESCRIPTION

Reference will now be made in detail to various embodiments of the invention, examples of which are illustrated in the accompanying drawings, wherein like numerals indicate similar elements throughout the views.

5

DEFINITIONS

All percentages, ratios and proportions herein are on a weight basis unless otherwise indicated. Except as otherwise noted, all amounts including quantities, percentages, portions, and proportions, are understood to be modified by the word "about", and amounts are not intended to indicate significant digits. Except as otherwise noted, the articles "a", "an", and "the" mean "one or more".

10

As used herein, "comprising" means that other steps and other ingredients which do not affect the end result can be added. This term encompasses the terms "consisting of" and "consisting essentially of". The compositions and methods/processes of the present invention can comprise, consist of, and consist essentially of the essential elements and limitations of the invention described herein, as well as any of the additional or optional ingredients, components, steps, or limitations described herein.

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The phrase "fabric article treating system" as used herein means a fabric article treating device which may be discrete in relation to the fabric article drying appliance and/or it may be integrated into the fabric article drying appliance. Furthermore, the fabric article treating device may be integrated into a readily replaceable portion of the fabric article drying appliance, a non-limiting example of which includes a closure structure of the drying appliance.

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"Fabric article" or "fabric" as used herein means any article that is customarily cleaned in a conventional laundry process or in a dry cleaning process. The term encompasses articles of fabric including, but not limited to, clothing, linen, drapery, clothing accessories, leather, floor coverings, sheets, towels, rags, canvas, polymer structures, and the like. The term also encompasses other items made in whole or in part of fabric material, such as tote bags, furniture covers, tarpons, shoes, and the like.

25

As used herein, the term "benefit composition" refers to a composition used to deliver a benefit to a fabric or article. Non-limiting examples of materials and mixtures thereof which can comprise the benefit composition include: water, softening agents, crispening agents, perfume, water/stain repellents, refreshing agents, antistatic agents, antimicrobial agents, durable press agents, wrinkle resistance agents, odor resistance agents, abrasion resistance agents, solvents and combinations thereof. The benefit composition may comprise a liquid, a powder, a suspension, or

30

a gas product, and/or a combination of such. In one embodiment, the benefit composition includes a preservative. Various preservatives which help maintain one or more properties of the benefit composition are generally known in the art and are suitable for use herein. One exemplary preservative is Dantoguard Plus™ (dimethylol-5,5-dimethylhydantoin) commercially available
5 from Lonza (Fairfield, New Jersey, USA).

Figure 1 illustrates an exemplary fabric article treating device 20 according to one embodiment of the present invention. The fabric article treating device 20 comprises a dispenser 25 in communication with a reservoir 30. The dispenser 25 and the reservoir 30 are adapted for fluid communication with each other, for example, via line 32. A fluid handling system 35 is
10 adapted to transport the benefit composition from the reservoir 30 to the dispenser 25 via the line 32. A measuring device 40 is adapted to be in communication with the reservoir, the fluid handling system, and/or the dispenser, wherein the measuring device is adapted to approximate and/or determine the amount of the benefit composition remaining in the reservoir 30. A user interface 45 is in communication with the measuring device 40. In one exemplary embodiment,
15 the user interface 45 comprises a user signal adapted to provide a user with information relating to the amount of benefit composition in the reservoir.

In one exemplary embodiment, the fluid connection between the dispenser 25 and the reservoir 30 comprises tubing configured to allow the benefit composition to be transported from the reservoir 30 to the dispenser 25. One exemplary tubing comprises a polymeric tubing with
20 one or more channels or conduits. In another exemplary embodiment, the tubing is configured to allow a closure structure on the fabric article drying appliance to be maintained in a closed position while still permitting dispensing of the benefit composition. The reservoir 30 contains a benefit composition that is configured in one exemplary embodiment with minimum head space or void volume designed to maintain an anaerobic environment within the reservoir during
25 dispensing of the benefit composition. In one exemplary embodiment, the reservoir 30 is removeable. In another exemplary embodiment, the reservoir 30 comprises a sealed pouch.

The reservoir 30 may be constructed of any material known in the art and in one exemplary embodiment will provide an anaerobic environment within the reservoir. Non-limiting examples of such materials include polymeric materials including but not limited to polyurethane,
30 polypropylene, polyethylene, polycarbonate, polyethylene terephthalate (PET), polyvinyl chloride (PVC), polystyrene, nylon, polyester and the like. Other exemplary materials of construction include aluminum foil, or other metal films. In one embodiment, the reservoir 30 comprises

multiple layers of one or more materials. In another embodiment, the reservoir 30 comprises a single or multiple layer barrier film.

The dispenser 25 may comprise at least one nozzle for the purpose of distributing the benefit composition into the fabric article drying appliance. Misting/atomizing of the benefit composition can be achieved using any suitable spraying device such as a hydraulic nozzle, sonic nebulizer, pressure swirl atomizers, high pressure fog nozzles or the like to deliver target particle size. Non-limiting examples of suitable nozzles include nozzles commercially available from Spray Systems, Inc. of Pomona, California under the Model Nos. 850, 1050, 1250, 1450 and 1650. Another suitable example of a nozzle is a pressure swirl atomizing nozzle made by Seaquist Perfect Dispensing of Cary, Illinois under Model No. DU-3813.

In one exemplary embodiment, as illustrative in Figure 2, the fluid handling system 35 comprises a pump 52, a power supply 50, and a controller 60. In one exemplary embodiment, the power supply 50 is configured to provide electrical power as needed by the fabric article treating device, such as the controller 60, the pump 52 and any electrical needs of the user interface 45 and/or measuring device 40. The controller 60 is configured to regulate the dispensing of the benefit composition. For example, the controller 60 may determine the optimum time to dispense the benefit composition, the quantity of the benefit composition to be dispensed, and the rate at which to dispense the benefit composition. In one embodiment, the controller 60 is an electrical communication with the measuring device 40. In this embodiment, if the measuring device 40 determines that there is no benefit composition in the reservoir 30, a signal is sent to the controller 60 not to activate the pump 52. By avoiding running the pump when there is no benefit composition, the lifetime of the pump can be extended and power consumption can be reduced .

In one embodiment, the pump 52 comprises a piezo-electric pump. In another embodiment, the pump 52 may comprise a diaphragm pump. As one skilled in the art will appreciate, any pump known to one skilled in the art may be utilized to transport the benefit composition from the reservoir 30 to the dispenser 25. Other exemplary pumps include piston pumps, peristaltic pumps, gear pumps and bellows-type pumps.

As noted above, one type of pump 52 that can be used in the present invention is a piezo-electric pump. While a piezo-electric pump has certain membranes or laminations which may vibrate in the reciprocating-type fashion, the piezo-electric pumps generally do not have major moving parts, such as rotating shaft and bearings used with a rotator member to displace a fluid or gaseous fluid, that experience wear over time. One commercially available suitable piezo-electric pump usable in the present invention is manufactured by PAR Technologies, LLC, located in

Hampton, Virginia, and marketed as the “LPD-Series” laminated piezo-electric fluid pumps. Pumps which draw a relatively low current are particularly suitable in certain embodiments.

In another exemplary embodiment illustrated in Figure 3, the measuring device 40 further comprises a current sensor 41 and a logic control system 42. The logic control system 42 is adapted to activate the user signal of the user interface 45 when the current sensor 41 detects a current less than a predetermined current level. The current sensor 41 is in electrical communication with the pump 52 and/or power supply 50. While not being limited by a theory, it is believed that the current draw on the pump 52 will decrease when there is no benefit composition to be transported from the reservoir to the dispenser by the fluid handling system. For example, as long as the current draw by the pump is greater than the threshold current, the pumping continues without activating the user signal. When the measured current indicates that the current is equal or below the threshold, the logic control system sends a trigger signal to the user interface to activate the user signal. One exemplary current sensor amplifier is commercially available from Maxim Integrated Products Inc. of Sunnyvale, California under the model name MAX4071AUA.

In one exemplary embodiment as illustrated in Figure 4, the user interface 45 comprises one or more user signals 82. The user signals 82 are adapted to provide the user with useful information regarding the fabric article treating device 20. For example, one user signal may indicate whether the device is currently in use. Another user signal may indicate a low battery condition. One exemplary user signal is adapted to inform the user information regarding the amount of benefit composition remaining in the reservoir. Exemplary user signals comprise a sound or buzzer, LEDs, graphic display panel and the like. As one skilled in the art will appreciate, any user signal known to one skilled in the art could be utilized in the present invention. In another exemplary embodiment, the user signal may comprise the ability to send the user an email or text message via the internet or cell phone networks. One exemplary user signal comprises an LED commercially available from Lumex Inc. of Palatine, Illinois under the model name SML-LX1206GC-TR. An exemplary user signal comprises an audio indicator available from Projects Unlimited of Dayton, Ohio under the model name AT-08.

In another exemplary embodiment, the measuring device comprises a weight sensor adapted to weigh the amount of benefit composition in the reservoir. When the weight sensor detects a weight below a predetermined threshold level, the measuring device is adapted to activate the user signal of the user interface. The weight exerts a pressure that can be converted to some intermediate form, such as displacement. The weight sensor then converts this displacement

into an electrical output such as voltage or current. The three most universal types of pressure transducers of this form are the strain gage, variable capacitance, and piezoelectric. In another exemplary embodiment, the user signal may comprise several signals to the user, such as varying levels of benefit composition remaining, as well as an indication that there is no benefit composition remaining in the reservoir.

5 In yet another exemplary embodiment, the measuring device comprises a flow sensor in communication with the fluid handling system. The flow sensor is adapted to detect the flow rate of the benefit composition being transported from the reservoir to the dispenser. In one embodiment, the measuring device is adapted to activate a user signal of the user interface when the flow sensor detects a flow rate below a predetermined
10 threshold. One exemplary flow sensor comprises an inline type low flow switch commercially available from Fluid Components International of San Marcos, California under the model name FR78B Basic.

In another exemplary embodiment, the measuring device comprises a timer in communication with the fluid handling system, wherein the timer is adapted to measure the
15 amount of time the fluid handling system is transporting the benefit composition from the reservoir to the dispenser. When the timer reaches a predetermined threshold level, the measuring device is adapted to activate the user signal on the user interface. In this embodiment, the measuring device estimates the remaining amount of benefit composition remaining in the reservoir by calculating the amount of time the benefit composition is being dispensed. This
20 calculation estimates the amount of benefit composition dispensed based on an average flow rate rating of a fluid handling system.

In another exemplary embodiment of the present invention, the measuring device comprises an opacity sensor in visual communication with the reservoir. In this embodiment, the reservoir is transparent or translucent, such that wherein the opacity sensor is adapted to detect the
25 amount of benefit composition remaining in the reservoir. The measuring device is adapted to activate the user signal of the user interface when the opacity sensor detects a predetermined level of opacity of the reservoir. Exemplary photodiodes and phototransistors are commercially available from Lumex Inc. of Palatine, Illinois.

In one exemplary embodiment as illustrated in Figure 6, the measuring device comprises
30 an electrical sensor 41 and one or more electrodes 92 adapted to be in electrical communication with the benefit when the reservoir contains a predetermined amount of benefit composition. A small current is applied to the electrodes 92 and the electrical sensor monitors the current and/or resistance of the electrode circuit. While not being limited by a theory, it is believed that the

benefit composition will conduct electricity and as such by placement of one or more electrodes at strategic locations in the reservoir in electrical communication with the benefit composition, the electrical sensor will be able to determine if the benefit composition is completing the circuit between the electrodes. In addition, it is believed that the benefit composition may act as a resistor in the electrical circuit. Depending on location of the electrodes and specific components of the benefit composition, the value of resistance measured by the electrical sensor may decrease as the amount of benefit composition in the reservoir decreases. This data could then be utilized by the controller to approximate the amount of benefit composition remaining in the reservoir.

In another exemplary embodiment, the reservoir is removable and furthermore the reservoir comprises an RFID tag (Radio Frequency Identification) or similar such device. The RFID tag can contain various information regarding the fabric article treating device. For example, the RFID tag could contain a unique serial number that can then be utilized by the controller to determine optimal dispensing condition, track the amount of benefit composition dispensed, and track multiple removable reservoirs of benefit composition. This ability would be useful for a user who switches between different benefit compositions. In this embodiment, the measuring device would comprise an RFID tag reader, which is adapted to activate the RFID tag on the reservoir, receive the stored information from the RFID tag and send the information to the controller for further processing. The measuring device may also contain additional sensors such as timers or flow rate sensors to provide additional information related to the amount of benefit composition remaining in the removable reservoir.

In another exemplary embodiment, the reservoir is removable and furthermore the reservoir comprises an barcode or similar product identifier. The barcode can contain various information regarding the fabric article treating device. For example, the barcode could contain a unique serial number that can then be utilized by the controller to determine optimal dispensing condition, track the amount of benefit composition dispensed, and track multiple removable reservoirs of benefit composition. This ability would be useful for a user who switches between different benefit compositions. In this embodiment, the measuring device would comprise a barcode reader, which is adapted to read the barcode on the reservoir and send the information to the controller for further processing. The measuring device may also contain additional sensors such as timers or flow rate sensors to provide additional information related to the amount of benefit composition remaining in the removable reservoir.

In yet another exemplary embodiment, the measuring device comprises a thickness sensor. The thickness sensor is adapted to measure the thickness of the reservoir. In this

embodiment, the reservoir comprises a pouch or bag that collapses upon dispensing the benefit composition. The thickness sensor may comprise a mechanical or electrical sensor. In one exemplary embodiment, the thickness sensor is adapted to activate the user signal of the user interface when the thickness of the reservoir equals or is less than a predetermined threshold level.

5 In another exemplary embodiment, the measuring device comprises a pressure sensor in fluid communication with the fluid handling system. The pressure sensor is adapted to determine the pressure in the fluid handling system. While not being limited by a theory, it is believed that the pressure in the fluid handling system will drop when no more benefit composition remains in the reservoir. The pressure sensor is in electrical communication with the logic control system,
10 wherein the logic control system is configured to send a signal to activate the user signal of the user interface when the pressure level reaches a predetermined level.

In one embodiment of the present invention, the fabric article treating devices comprises multiple reservoirs and/or multiple dispensers. In one exemplary embodiment, the fabric article treating device comprises a reservoir system, wherein the reservoir system may contain one or
15 more reservoirs. In another embodiment, the fabric article treating device comprises at least two reservoirs, wherein one of the reservoirs is a main reservoir and the other reservoir is a secondary reservoir.

As one skilled in the art will appreciate, various measuring devices can be utilized in the present invention to provide information to the user regarding the amount of benefit composition
20 remaining in the reservoir. These measuring devices may be purely mechanical, or electrical, or a combination thereof. In one exemplary embodiment, the measuring device has no moving parts.

Another exemplary embodiment of the present invention is illustrated in Figure 5. In this exemplary embodiment, the measuring device 40 of the fabric article treating device 20 is adapted to sense when the reservoir 30 is empty or substantially empty, i.e. contains less than a
25 predetermined amount of composition. The fabric article treating system 20 comprises a fluid handling system 35, a measuring device 40 an logic control system 85, such as a fuzzy logic control system, a user interface 45, wherein the user interface 45 is adapted to provide the user information regarding the amount of benefit composition remaining in the reservoir 30. In one exemplary embodiment, the fluid handling system 35, comprises a pump, liquid transfer tube and
30 power supply. In this exemplary embodiment, the measuring device 40 comprises a voltage or current sensor.

As noted above, the fabric article treating device 20 may comprise a controller 85. In one embodiment, the controller may be a microcontroller. A suitable microcontroller is manufactured

by MicroChip, of Chandler, Arizona under the Part No. PIC16LS876-04/P. However, other microcontrollers made by different manufacturers could also easily be used. In one exemplary embodiment, the microcontroller includes on-board random access memory (RAM), on-board read only memory (ROM), which comprises electrically programmable non-volatile memory elements, as well as on-board input and output lines for analog and digital signals. The controller may also be used with a crystal clock oscillator, although a RC circuit could be used instead of a clock circuit, if desired. The clock circuit provides the timing of the clock as necessary to operate the controller. In one embodiment, the controller comprises a port that can be interfaced to an optional programmable interface using a communication link, such as an RS-232 communication link. The port also allows the user to alter the program information of the controller, such as dispensing options, etc.

One skilled in the art will appreciate that the controller can be any type of microprocessor or microcontroller circuit commercially available, either with or without on-board RAM, ROM, or digital and analog input/output (I/O). Moreover, a sequential processor may be used to control the fabric article treating device 20, or alternatively a parallel processor architecture or a logic state machine architecture could be used. Furthermore, the controller may be integrated into an Application Specific Integrated Circuit (ASIC) containing many other logic elements that could be used for various functions, as desired, such functions being optional depending on the model of the fabric article treating device 20 that would be sold to a consumer. To change model features, the manufacture need only program the ASIC or the on-board RAM of the controller according to the special parameters of that particular model, while using the same hardware for each of the units.

It will also be understood that discreet digital logic could be used instead of any type of microprocessor, microcontroller unit, or analog control circuitry could be used along the voltage comparators and analog timers, to control the timing events and to make decisions based on input levels of the various sensors which are provided with the fabric article treating device 20.

It will be understood that the present invention can be readily used in other types of fabric article drying appliances, and is not limited solely to clothes “dryers”. In the context of this patent document, the terms “dryer” or “drying apparatus” or “fabric article drying appliance” include apparatuses that may or may not perform a true drying function, but may involve treating fabric without attempting to literally dry the fabric itself. As noted above, the terms “dryer” or “drying appliance” or “fabric article drying appliance” may include a “dry cleaning” process or apparatus, which may or may not literally involve the step of drying. The term “fabric article

drying appliance” as used herein, also refers to any fabric treating apparatus that utilizes moving air directed upon one or more fabric articles, a non-limiting example of which includes a clothes dryer and modification thereof. Such apparatuses include both domestic and commercial drying units used in dwellings, laundromats, hotels, and/or industrial settings. In addition, it should be
5 noted that some drying appliances include a drying chamber (or “drum”) that does not literally move or rotate when the drying appliance is operated in the drying cycle. Some such dryers use moving air that passes through the drying chamber, and the chamber does not move while the drying cycle occurs. Such an example dryer has a door or other type of access cover that allows a person to insert the clothing to be dried into the chamber. In many cases, the person hangs the
10 clothes on some type of upper rod within the drying chamber. Once this has been done, the door or access cover is closed, and the drying can begin its drying function. Dispensing of a benefit composition can take place within such the unit, however, care should be taken to ensure that the benefit composition becomes well dispersed within the drying chamber, so that certain fabric items do not receive a very large concentration of the benefit composition while other fabric items
15 receive very little of the benefit composition.

Exemplary fabric article treating devices and systems include those described in copending U.S. Application Nos. U.S. Application No. 10/697,735 filed on October 29, 2003; U.S. Application No. 10/697,685 filed on October 29, 2003; U.S. Application No. 10/697,734
20 filed on October 29, 2003; U.S. Application No. 10/697,736 filed on October 29, 2003; U.S. Application No. 10/762,152 filed on January 21, 2004; U.S. Application No. 10/926,925 filed on August 26, 2004; and U.S. Application No. 10/927,211 filed on August 26, 2004.

All documents cited in the Detailed Description of the Invention are, in relevant part, incorporated herein by reference. A citation of any document is not to be construed as an admission that it is prior art with respect to the present invention.

25 While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appending claims all such changes and modifications that are within the scope of this invention.

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What is claimed is:

1. A fabric article treating device, comprising:
 - a dispenser;
 - 5 a reservoir configured to contain a benefit composition;
 - a fluid handling system, wherein the fluid handling system is configured to transport benefit composition from the reservoir to the dispenser, and wherein the dispenser is configured to deliver benefit composition to one or more fabric articles in a fabric article treating appliance;
 - a measuring device adapted to determine an amount of benefit composition remaining in
 - 10 the reservoir; and
 - a user interface in communication with the measuring device, wherein the user interface comprises a user signal adapted to provide a user with information relating to an amount of benefit composition in the reservoir.
- 15 2. The fabric article treating device of claim 1, wherein the fluid handling system comprises a pump, a controller and a power supply, wherein the pump compels benefit composition from the reservoir to a desired location, and wherein the power supply is adapted to provide electric current to the pump; and
 - wherein the controller is in communication with the power supply and the measuring
 - 20 device, and wherein the controller initiates dispensing of benefit composition and is adapted to prevent the power supply from energizing the pump when the reservoir contains less than a predetermined amount of benefit composition.
3. The fabric article treating device of claim 2, wherein the measuring device comprises a
- 25 current sensor and a logic control system in communication with the power supply and wherein the measuring device is adapted to activate the user signal when the current sensor detects a current less than a predetermined current level.
4. The fabric article treating device of claim 1, wherein the measuring device comprises a
- 30 weight sensor adapted to weigh the amount of benefit composition in the reservoir, and wherein the measuring device is adapted to activate the user signal when the weight sensor detects a weight at less than a predetermined weight level.

5. The fabric article treating device of claim 1, wherein the measuring device comprises a flow sensor in communication with the fluid handling system, and wherein the measuring device is adapted to activate the user signal when the flow sensor detects a flow rate at less than a predetermined flow rate.

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6. The fabric article treating device of claim 1, wherein the measuring device comprises a timer in communication with the fluid handling system, wherein the timer is adapted to measure the amount of time the fluid handling system is transporting benefit composition, and wherein the measuring device is adapted to activate the user signal when the timer reaches a predetermined level.

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7. The fabric article treating device of claim 1, wherein the measuring device comprises an opacity sensor in visual communication with the reservoir, wherein the opacity sensor is adapted to detect the amount of benefit composition in the reservoir, and wherein the measuring device is adapted to activate the user signal when the opacity sensor detects less than a predetermined level of the benefit composition remaining in the reservoir.

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8. The fabric article treating device of claim 1, wherein the measuring device comprises a thickness sensor, wherein the thickness sensor is adapted to measure a thickness of the reservoir, and wherein the measuring device is adapted to activate the user signal when the thickness of the reservoir is less than a predetermined level.

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9. The fabric article treating device of claim 1, wherein the measuring device comprises a pressure sensor in fluid communication with the fluid handling system, wherein the pressure sensor is adapted to determine the pressure in the fluid handling system, and wherein the measuring device is adapted to activate the user signal when the pressure sensor detects less than a predetermined pressure level in the fluid handling system.

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10. The fabric article treating device of claim 1, further comprising a RFID reader, and wherein the reservoir comprises a RFID tag, wherein the RFID reader is adapted to read data from the RFID tag, and wherein the data comprises an identification code of the reservoir.

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11. The fabric article treating device of claim 1, wherein the measuring device comprises an electrical sensor and at least one electrode in electrical communication with the benefit composition in the reservoir, wherein the electrical sensor is adapted to detect a change in at least one electrical property of the electrode in the reservoir.

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12. The fabric article treating device of claim 1, further comprising:
a controller that initiates dispensing of the benefit composition, wherein the controller is in communication with the measuring device and further wherein the controller is configured to prevent the fluid handling system from attempting to dispense the benefit composition from the
10 reservoir when the reservoir contains less than a predetermined amount of benefit composition.

13. A fabric article treating system having a dosing system, comprising:

a fabric article drying appliance having a chamber and a closure structure, the closure structure having a closed position and at least one open position, the closure structure allowing
15 access to the chamber;

a reservoir for containing a benefit composition;

a dispenser in communication with the chamber;

a fluid handling system that compels benefit composition from the reservoir toward the dispenser, thereby dispensing benefit composition into the chamber;

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a closure structure sensor;

a controller that initiates dispensing of the benefit composition, wherein the controller is configured to prevent benefit composition from being dispensed when the closure structure sensor indicates that the closure structure is not in the closed position;

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a measuring device adapted to determine an amount of benefit composition remaining in the reservoir; and

a user interface in communication with the measuring device, wherein the user interface comprises a user signal adapted to provide a user with information relating to an amount of benefit composition in the reservoir.

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14. The fabric article treating device of claim 1, further comprising a communication link adapted for connection with a fabric article drying appliance.

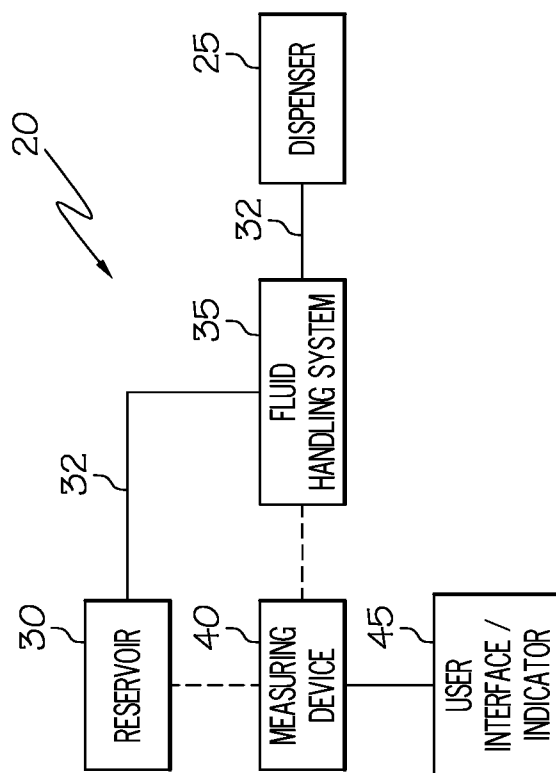


FIG. 1

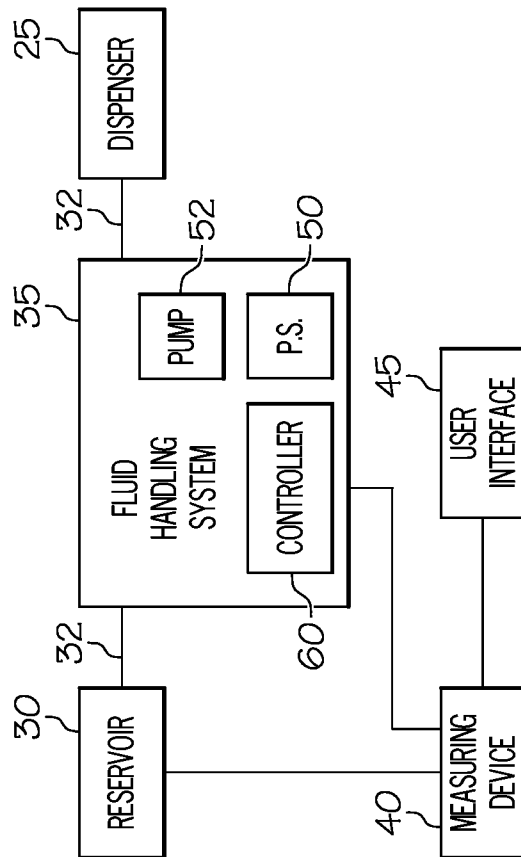


FIG. 2

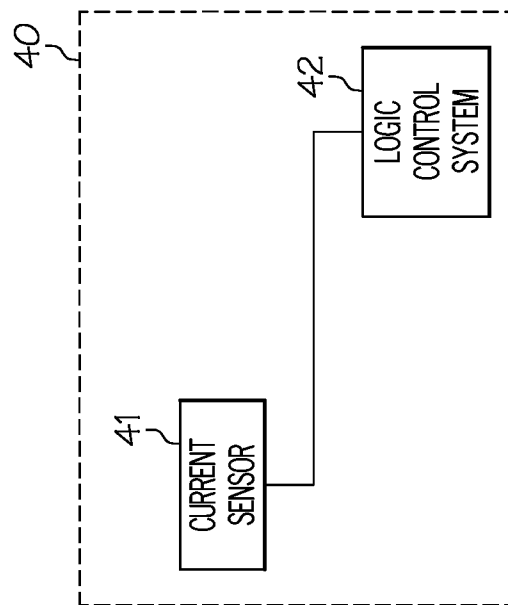


FIG. 3

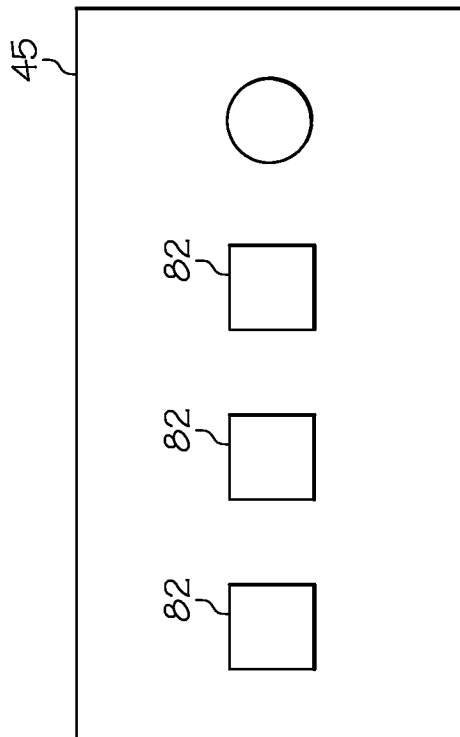


FIG. 4

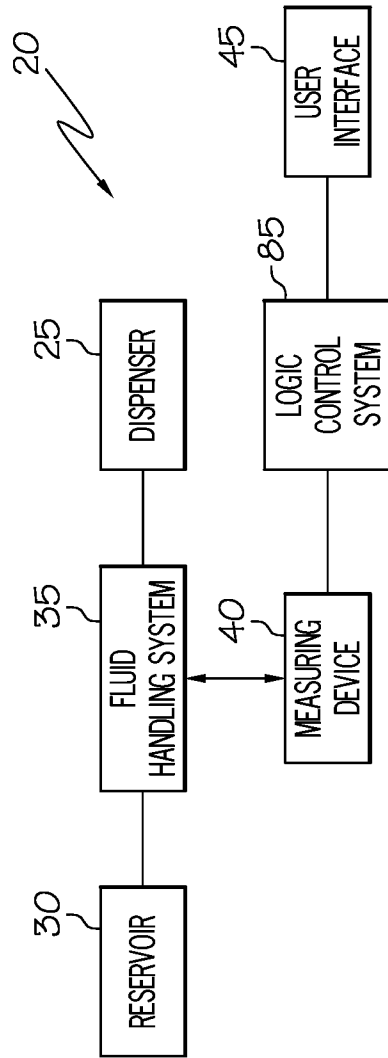


FIG. 5

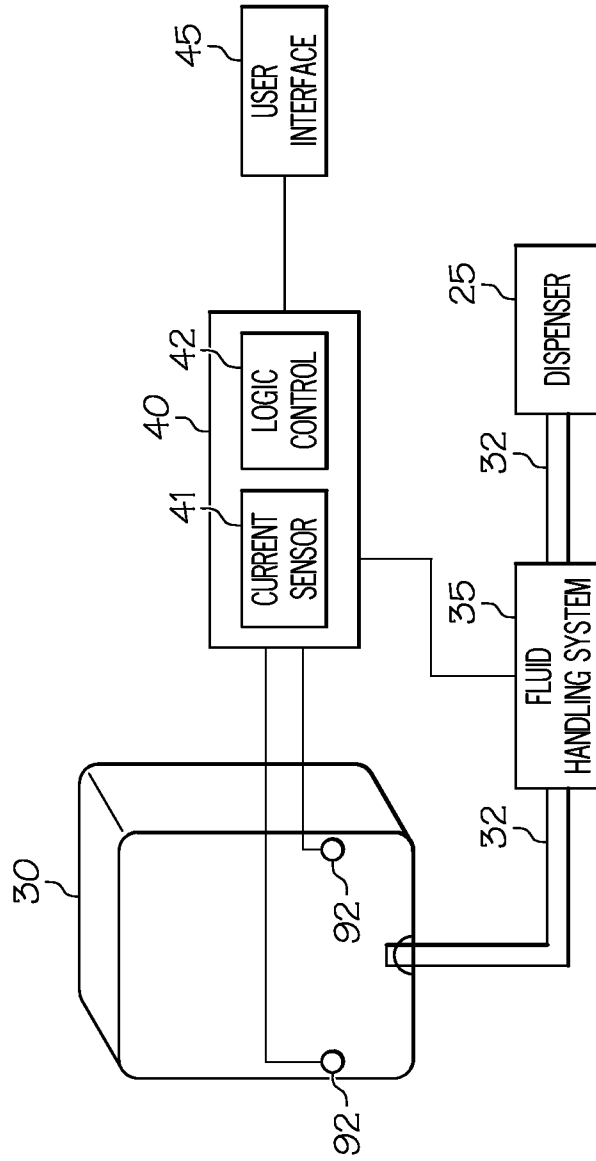


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2006/052187

A. CLASSIFICATION OF SUBJECT MATTER
 INV. D06F58/20 D06F39/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 D06F A47L

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search

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Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Prosig, Christina

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2006/052187

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