**Methods for resetting stalled pumps in electronically controlled dispensing systems**

Verfahren zum Zurücksetzen von blockierten Pumpen in elektronisch gesteuerten Abgabesystemen

Procédés pour réinitialiser des pompes bloquées dans des systèmes de distribution à contrôle électronique

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Priority: 12.11.2009 US 616798

Date of filing: 02.11.2010

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The present invention is generally directed to fluid dispensing systems. In particular, the present invention is directed to refill containers which allow only designated refill containers with dispensable material to be installed therein and, if desired, installed by selected distributors. More specifically, the present invention is directed to resetting stalled pumps used in electronically keyed fluid dispensing systems.

BACKGROUND ART

It is well known to provide fluid dispensers for use in restaurants, factories, hospitals, bathrooms and the home. These dispensers may contain fluids such as soap, anti-bacterial cleansers, disinfectants, lotions and the like. It is also known to provide dispensers with some type of pump actuation mechanism wherein the user pushes or pulls a lever to dispense a quantity of fluid into the user’s hands. "Hands-free" dispensers may also be utilized wherein the user simply places their hand underneath a sensor maintained by a dispenser housing and a quantity of fluid is dispensed by a motorized pump. Related types of dispensers may be used to dispense powder, aerosol materials or paper products.

Dispensers may directly hold a quantity of fluid, but these have been found to be messy and difficult to service. As such, it is known to use refill bags or containers that hold a quantity of fluid and provide a pump and nozzle mechanism. These refill bags are advantageous in that they are easily installed without a mess. And the dispenser can monitor usage to indicate when the refill bag is low and provide other dispenser status information.

Refill containers with identifiers such as electronic or mechanical keys have been developed so as to prevent unauthorized persons from substituting inferior product into a dispensing system. Specifically, various types of mechanical or electronic keys may be used so as to associate a refill container and the fluid contained therein with a specific dispenser. Electronic keys may include, but are not limited to, magnetic sensors, optical sensors, radio frequency identification devices, and the like. In these types of dispensers, it is critical that the identifier be properly positioned or associated on the refill container and that the refill container be properly received in the dispenser housing. If an identification key is not properly positioned, then the refill container is not read by the dispensing system and is rendered inoperative. However, it is possible for the refill container to be operatively detected by the dispensing system but still installed in such a way that the pump and nozzle mechanism jams. An improperly installed refill container that stalls or jams may cause damage to the pump actuator maintained by the refill container and/or a motor assembly and associated linkage that moves the pump actuator. An improperly installed refill container or stalled pump actuator may also result in excess fluid being dispensed. WO 2004/086731 discloses a dispenser of the above kind having the features of the preamble of claim 12.

A pump actuator maintained by the dispenser housing or the pump and nozzle mechanism maintained by the refill container may jam or stall for any number of reasons. For example, the pump may be clogged by the fluid material from previous dispense cycles. Debris or other impediments may be blocking movement of the pump actuator or, as noted, the refill container may not be properly installed into a dispensing housing. For example, the pump can be installed underneath the actuator preventing operation of the dispenser and the refill container. In the past, the problem was solved by a user recognizing a stall condition and then the user correctly manually resetting the refill container within the dispenser housing. As such, the method of solving prior pump stalling events was unreliable and, unfortunately, the implemented fix may further damage the system. Therefore a need is present in the art for improved methods of resetting stalled pumps in electronically controlled dispensing systems.

SUMMARY OF THE INVENTION

In view of the foregoing it is a first aspect of the present invention to provide methods for resetting stalled pumps in electronically keyed dispensing systems. Another aspect of the present invention, which shall become apparent as the detailed description proceeds, is achieved by a method for resetting a stalled pump in a fluid dispensing system, the method comprising determining whether a refill container is received in the dispensing system, and moving a pump actuator to a loading position when the refill container is removed. Still another aspect of the present invention is to provide a method for resetting a stalled pump in a fluid dispensing system comprising starting a run timer, starting a pump actuator, determining whether the pump actuator is still dispensing fluid from the fluid dispensing system upon lapsing of the run timer, and moving the pump actuator in an opposite direction to a loading position if the pump actuator is still dispensing upon expiration of the run timer. Yet another aspect of the present invention is to provide a method for resetting a stalled pump in a fluid dispensing system comprising detecting opening of a cover, energizing a motor to move a pump actuator to a loading position, determining when the pump actuator is at the loading position, and turning the motor off. Still another aspect of the present invention is to provide a dispensing system comprising a refill container filled with product, a housing adapted to accept the refill container, a pump maintained by either the refill container or the housing and moved by a pump actuator so as to dispense product from the refill container, where-

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These and other aspects of the present invention, as well as the advantages thereof over existing prior art forms, which will become apparent from the description to follow, are accomplished by the improvements hereinafter described and claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

For a complete understanding of the objects, techniques and structure of the invention, reference should be made to the following detailed description and accompanying drawings, wherein:

Fig. 1 is a front perspective view of an electronically controlled dispensing system made in accordance with the concepts of the present invention;
Fig. 2 is a schematic diagram of the electronically controlled dispensing system;
Fig. 3 is an operational flow chart of a method for resetting a stalled pump in the dispensing system;
Fig. 4 is an alternative embodiment of an operational flow chart of a method for resetting a stalled pump in the dispensing system; and
Fig. 5 is another alternative embodiment of an operational flow chart of a method for resetting a stalled pump in the dispensing system.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring now to the drawings, and particularly to Figs. 1 and 2, it can be seen that a dispensing system is generally designated by the numeral 10. The dispensing system 10 includes a housing 12 which provides a back plate 14 that may be attached to a wall or other fixed surface. The housing 12 also includes a front cover 16, which is shown in phantom in Fig. 1, that is moveable with respect to the back plate 14. The front cover 16 may be coupled to the back plate 14 by a hinge mechanism, deflectable detents, a frictional fit, fasteners, or the like. Although the present invention is described as a wall-mounted dispensing system, it will be appreciated that the teachings herein are applicable to a counter-mounted, stand-alone or other similar type of dispensing system. In any event, the front cover 16 includes a bottom surface 17 that provides an opening 18 so as to allow for dispensing of fluid material from the dispensing system. Associated with the front cover 16 is a cover sensor 20 which detects the position of a cover with respect to the back plate 14. In other words, the cover sensor 20 detects whenever the front cover 16 is positioned away from or separated from the back plate 14. Such an event typically occurs when the housing is opened to replace a refill container, but may also occur if the front cover is not completely seated with the back plate. A Hall effect switch, magnet sensor, optical sensor, microswitch or other similar configuration may be used for the cover sensor 20. The dispensing system also provides a hand sensor 24 near the opening 18 which detects the presence of an object such as the user’s hands when they are in close proximity to the nozzle so as to initiate a dispensing event. The sensor 24 may be in the form of an infrared or ultrasonic sensor, a capacitive sensor or similar type of sensor.

The dispensing system 10 includes a motor 26 which has a rotatable shaft 27 that may either be unidirectional or reversible. In other words, in some embodiments the motor shaft may rotate in only one direction, but in other embodiments the motor shaft may be reversible such that it rotates in one direction but then changes direction if needed. Power for the dispensing system 10 is provided by at least one battery 28 stored in an appropriately-sized battery compartment. The battery, which may be rechargeable, provides the necessary power and is represented by the symbol V+ in Fig. 2. As will be appreciated by skilled artisans, the sensors 20 and 24 and the motor 26 are powered by the battery, as well as other components within the dispensing system as will be described.

A refill container 32 is received in the housing 12 when the front cover is open from the back cover 14. The refill container 32 carries the fluid or product to be dispensed, which may be soap, lotion, disinfectant, or any other fluid material or product as needed by a particular end use. Each refill container 32 provides an identifier key 34, also referred to as an electronic key. In the present embodiment, the identifier key is a circular wire coil wrapped around the neck of the refill container 32. A detailed explanation regarding this particular type of electronic key is provided in U.S. patent application Serial No. 11/013,727 entitled ELECTRONICALLY KEYED DISPENSING SYSTEMS AND RELATED METHODS UTILIZING NEAR FIELD FREQUENCY RESPONSE, which is incorporated herein by reference. Briefly, the identifier key 34 is a wire coil with a capacitor attached. When the refill container 32 is properly installed in the housing, the identifier key 34 is received between two other spaced apart coils. When one of the spaced apart coils is energized, the wire coil used as the identifier key is energized and emits a coded signal specific to the capacitor. The coded signal is detected by the other spaced apart coil and then compared by a controller to a stored code. If the coded signal is acceptable, the system operates as intended. If the coded signal does not match the stored code, then the system is rendered inoperative. Skilled artisans will appreciate that other electronic, optical or mechanical keying systems could be used in place of the identifier key arrangement described above.

Extending axially from the refill container 32 is a pump 36 from which extends a nozzle. When the refill
container 32 is installed into the housing, the pump is received within or otherwise coupled to a pump actuator 40 carried by the housing which moves the pump so as to dispense fluid from the refill container. The pump actuator 40 is initially in a loading position designated generally by the numeral 42 when the refill container is installed. Mechanical linkage 44, which may comprise gears of various types, interconnects the shaft 27 of motor 26 to the pump actuator 40. As such, when the motor shaft rotates in a particular direction, the linkage 44 converts the rotational motion into linear motion so as to move the pump actuator 40 in the desired direction so as to actuate the pump. An actuator sensor 46 is connected to the mechanical linkage 44 and/or the motor 26, and/or the pump actuator 40 to detect whether the pump actuator is in the loading position 42 or not. Although most embodiments provide the actuator sensor 46, it will be appreciated that in some embodiments the actuator sensor may not be provided.

A key reader is designated generally by the numeral 52 and carried by the housing 12. The reader 52, which is powered by the battery 28, detects the presence of the identifier key 34. As described above, the key reader 52 may be spaced apart wire coils or depending upon the type of identifier used, the reader 52 may be a bar code sensor, a Hall effect sensor to detect a magnet, or any sensor capable of detecting and generating an electronic signal indicating that the refill container is received within the dispensing system 10.

A controller 56, which is powered by the battery 28, is connected to and receives corresponding signals from the cover sensor 20, the hand sensor 24, the motor 26 and the actuator sensor 46 so as to control the operation thereof. The controller 56 provides the necessary hardware and software for implementing the operation of the dispensing system and any sub-routines related to detection of input or lack of input provided by the various sensors. The controller 56 maintains a matching key 58 which is compared to the electronic key associated with a refill container. In other words, the controller 56 detects the identifier key and the code associated therewith for comparison to a code associated with the matching key 58. If the code and/or keys match, then the dispensing system is enabled. However, if they do not match, then the dispensing system is disabled and rendered inoperative. A timer 60 may be connected to the controller 56, or may be incorporated within the controller as will be appreciated by those skilled in the art.

Skilled artisans will appreciate that together the motor 26, the controller 56, the sensors, the identifier key 34, the key reader 52, and the matching key, wherein the key 34 and the reader 52 may be an optical configuration, may be referred to as an electronic keying mechanism 70. The electronic keying mechanism 70, as shown in Fig. 2, also includes any components directly associated with the controller, the key and the reader and which are utilized to reset a stalled pump in an electronically controlled dispensing system. As described in the methods below, depending upon selected input from any one or combination of components included in the electronic keying mechanism, the mechanism 70 is configured to automatically return the pump actuator to the loading position when a stall condition is detected.

In normal operation, with the refill container properly installed and detected as being an appropriate refill container for the dispensing system 10 and the front cover properly closed on the back plate 14, the controller 56 awaits a detection signal from the hand sensor 24 that an object has been properly placed underneath the opening 18. When this occurs, the controller 56 initiates rotation of the motor shaft 27 controlled by the motor 26 and the rotational motion of the shaft is converted into linear motion by the linkage 44. Movement of the linkage results in movement of the pump actuator 40 which in turn results in a dispensing event. During the dispensing event, the pump actuator 40 moves from a loading position 42 to a dispensing position 64 (shown in phantom in Fig. 2) and then returns to the loading position via either the mechanical linkage, gravity or spring-biasing maintained within the pump.

As discussed in the Background Art, if the refill container is not properly installed with respect to the pump actuator, the system may stall, or stalls may be encountered by virtue of impediments within the system or other problems with the mechanical linkage. It will further be appreciated that upon occasion the software maintained by the controller 56 may seize and result in the pump actuator 40 not returning to the loading position. In order to address a stalled condition, several operational scenarios are disclosed herein so as to return the pump actuator 40 to a loading position so that the dispensing system properly operates.

Referring now to Fig. 3, a method for resetting a stalled pump in an electronic dispensing system is designated generally by the numeral 100. The methodology starts from a main operation routine designated by step 102. This main operation routine controls the normal operation of the dispensing system, such as the detection of the user’s hands, operation of the motor in a normal operation mode, and any other programming features utilized by the dispensing system. When a stalled condition is detected, the user or technician responsible for the dispenser opens the front cover 16 which, at step 104, is detected by the cover sensor 20, which in turn sends an appropriate signal to the controller 56. At step 106, the controller starts the timer 60 to ensure that the reset process proceeds in an efficient manner. Otherwise, without benefit of the timer, the battery may be undesirably drained of power. Although any time period can be set, in an exemplary embodiment a time period of five seconds may be used. In any event, proceeding to step 108, the controller 56 determines whether the refill container 32 has been removed or not. This is done by utilizing the electronic key and the key reader 52. In other words, if the refill container and its associated electronic key is still detected by the key reader, then at step 110...
the controller queries as to whether the timer has expired or not. If the timer has expired, then the methodology or process returns to step 102. As previously noted, use of the timer in this way prevents undesirable battery drain. However, if the timer has not expired, then the process returns to step 108 where it is presumed that the refill container will eventually be removed by the technician.

[0023] Once removal of the refill container is detected at step 108, the process continues to step 112 where the controller 56 via the motor 26 causes the pump actuator to move to the loading position 42. This resets the pump actuator 40 and then the process returns, at step 114, to the main operation procedure maintained by the dispensing system. At this time, the user would then be expected to re-install the refill container in a proper manner and, as a result, the dispensing system operates as it properly should without stalling.

[0024] In summary, the dispensing system 10 is programmed in such a way so as to automatically return the pump actuator to the default "loading" position 42 any time the refill container is removed from the dispensing system. Initially, the controller looks for the refill to be removed by not detecting the electronic key. Once the refill container is removed, the automatic pump actuator reset occurs whether or not the previous pump was stalled, thereby eliminating the need to query the positioning of the pump actuator to determine whether or not the pump was stalled before removal. This is advantageous in that the automatic reset of the pump actuator ensures that the next refill container and its pump is installed in the correct position. Such a configuration is also advantageous in that the reset function times out after a predetermined period of time when the dispensing system is not used.

[0025] Referring now to Fig. 4, another methodology for resetting a stalled pump in an electronic dispensing system is designated generally by the numeral 140. In the methodology 140, a main operation is designated generally by the numeral 142. In this embodiment, the user is not required to open the front cover and the controller is configured to internally correct a stall situation. Accordingly, at step 144, the hand sensor 24 detects the presence of a user’s hand and starts a run timer at step 146. Although any time period can be set, in an exemplary embodiment a time period of five seconds may be used. In this embodiment, the motor shaft 27 is unidirectional. In other words, the motor is not reversible.

[0026] The above-described resetting method is advantageous in that a technician is not required to open the housing and remove the refill container and then re-install a new container. By utilizing a maximum run time function (steps 146 and 150), which times the actuation of the pump, it can be easily determined whether a stall has occurred. If a stall does occur, then the pump undesirably continues to actuate for a longer period of time. To correct this situation the rotation of the motor shaft is reversed causing the pump actuator to re-position. This embodiment utilizes the actuator sensor 46 which is connected to the controller 56 to monitor the position of the pump actuator via the linkage so as to ensure that the pump actuator returns to the loading position.

[0027] In yet another embodiment shown in Fig. 5, a methodology is designated generally by the numeral 160. A main operation step 162 is also provided in this embodiment and a cover sensor 20 detects when the front cover is opened at step 164. When this occurs, a timer is started at step 166, and following this the motor is incrementally energized to move the pump actuator to the loading position at step 168. Although any time period can be set, in an exemplary embodiment a time period of five seconds may be used. In this embodiment, the motor shaft is unidirectional. In other words, the motor is not reversible.

[0028] At step 170 the controller inquires as to whether the timer has expired or not. If the timer has not expired then at step 170 the controller inquires as to whether the pump actuator is at the loading position or not as determined by the actuator sensor. If it is determined that the pump actuator is not at the loading position, then the methodology at step 174 requires the user to remove the refill container. Upon completion of step 174 the methodology returns to step 168 and the motor is incrementally energized to move the pump actuator, and steps 170 and 172 are repeated. If at step 170 it is determined that the timer is expired, then the controller turns the motor off at step 178. Alternatively, if at step 170 it is determined that the timer has not expired, but that the pump actuator is at the loading position at step 172, then the motor is turned off. Upon completion of step 178 the process, at step 180, returns to main operation when the front cover is closed as determined by the sensor 20.

[0029] This methodology is advantageous in that the dispensing system can be configured to automatically jog or rotate the motor shaft upon opening of the front cover. The motor then gives power somewhat continuously until the pump actuator is returned to the proper position. If the pump is stalled, the pump actuator will not return to its loading position until the stalled pump and refill container are removed. If the pump is not stalled,
then the motor shaft rotates and then shuts off since the pump actuator is in the correct position from the last cycle of the pump actuator. Regardless of whether the pump was stalled or not, the pump actuator would be left in the proper position to accept a new refill container. The timer feature prevents battery drain.

[0030] Accordingly, based on the foregoing methodologies it will be appreciated that various scenarios can be utilized to reset the pump actuator to a loading position so that a stalled pump can be easily corrected without damage to the refill container or the occurrence of undesired dispensing events. This saves on loss of fluid from the refill container and also prevents possible damage to the operating mechanism of the dispensing system.

Claims

1. A method for resetting a stalled pump (36) in a fluid dispensing system (10), characterised in that the method comprising:
   - determining whether a refill container (32) is received in the dispensing system (10); and
   - moving a pump actuator (40) to a loading position (42) when said refill container (32) is removed.

2. The method according to claim 1, wherein the dispensing system (10) includes a housing (12) with a front cover (16), and wherein said refill container (32) is receivable in the housing (12), the method further comprising:
   - detecting whether the front cover (16) is open prior to the determining step; and
   - starting a timer (60) prior to the determining step.

3. The method according to claim 2, wherein said refill container (32) is provided with a detectable key (34) readable by the dispensing system (10), the method further comprising:
   - reading said detectable key (34) to determine whether said refill container (32) is received in the dispensing system (10); and
   - repeating the reading step until said timer (60) expires or until it is determined that said refill container (32) is removed from said housing (12).

4. A method for resetting a stalled pump (36) in a fluid dispensing system (10) comprising:
   - starting a run timer (60);
   - starting a pump actuator (40); and
   - determining whether said pump actuator (40) is still dispensing fluid from the fluid dispensing system (10) upon lapsing of said run timer (60), characterised in moving said pump actuator (40) in an opposite direction to a loading position (42) if the pump actuator (40) is still dispensing upon expiration of said run timer (60).

5. The method according to claim 4, further comprising:
   - detecting the presence of a user's hand to start said run timer (60).

6. The method according to claim 4, further comprising:
   - detecting the presence of a user's hand to start said pump actuator (40).

7. The method according to claim 4, further comprising:
   - associating said pump actuator (40) with a motor (26) having a motor shaft (27) so that rotation of said motor shaft (27) moves said pump actuator (40) in one direction and reversal of said motor shaft (27) moves said pump actuator (40) in an opposite direction; and returning to a main operation routine after said run timer (60) has expired and determining that said motor shaft (27) is no longer rotating.

8. A method for resetting a stalled pump (36) in a fluid dispensing system (10), characterised in that the method comprising:
   - detecting opening of a cover (16);
   - energizing a motor to move a pump actuator (40) to a loading position (42);
   - determining when said pump actuator (40) is at said loading position (42); and
   - turning said motor (26) off.

9. The method according to claim 8, further comprising:
   - starting a timer (60) prior to energizing said motor (26); and
   - turning said motor (26) off if said timer (60) expires.

10. The method according to claim 9, further comprising:
    - removing a refill container (32) from the dispensing system (10) if said timer (60) has not expired and said pump actuator (40) is not at said loading position (42).

11. The method according to claim 10, further comprising:
    - energizing said motor (26) after said refill container (32) is removed to move said pump actuator (40) to said loading position (42) while said timer (60) has not yet expired; and
    - turning said motor (26) off if said pump actuator (40) is at said loading position (42).
12. A dispensing system (10) comprising:
a refill container (32) filled with product;
a housing (12) adapted to accept said refill container (32);
a pump (36) maintained by either said refill container (32) or said housing (12) and moved by a pump actuator (40) so as to dispense product from said refill container (32), wherein said pump actuator (40) has a loading position (42) and a dispensing position (64); and an electronic keying mechanism (70) associated with said pump actuator (40), characterised in that said electronic keying mechanism (70) is configured to automatically return said pump actuator (40) to said loading position (42), and in that said pump actuator (40) is moved to said loading position (42) when a stall condition is detected.

13. The system according to claim 12, wherein said electronic keying mechanism (70) comprises
a cover sensor (20) associated with a front cover (16) of said housing (12) to determine when said front cover (16) is open; and a detectable key (34) provided on said refill container (32) to determine whether said refill container (32) is received in said housing (12), wherein if said front cover (16) is open and said refill container (32) is not detected, said electronic keying mechanism (70) moves said pump actuator (40) to said loading position (42).

14. The system according to claim 12, wherein said electronic keying mechanism (70) comprises
a controller (56) connected to said pump actuator (40), and maintaining a timer (60); a hand sensor (24) connected to said controller (56); and a motor (26) with a reversible shaft (27), said motor (26) connected to said controller (56) and engageable with said pump actuator (40), wherein if said hand sensor (24) detects a hand, said controller (56) starts said timer (60) and said pump actuator (40) through said motor (26), and said controller (56) rotates said reversible shaft (27) in an opposite direction to return said pump actuator (40) to said loading position (42) if said timer (60) expires and said motor (26) is still rotating.

15. The system according to claim 12, wherein said electronic keying mechanism (70) comprises
a controller (56) connected to said pump actuator (40), and maintaining a timer;
Nachfüllbehälter (32) aus dem Gehäuse (12) entfernt ist.

4. Verfahren zum Zurücksetzen einer blockierten Pumpe (36) in einem Flüssigkeitsabgabesystem (10), umfassend:
   Starten eines Laufzeitgebers (60),
   Starten eines Pumpenstellglieds (40) und
   Bestimmen, ob das Pumpenstellglied (40) bei Ablauf des Laufzeitgebers (60) noch Flüssigkeit aus dem Abgabesystem (10) abgibt,
   **gekennzeichnet durch**
   Bewegen des Pumpenstellglieds (40) in entgegengesetzter Richtung zu einer Ladeposition (42), wenn das Pumpenstellglied (40) bei Ablauf des Laufzeitgebers (60) noch Flüssigkeit aus dem Abgabesystem (10) abgibt.

5. Verfahren nach Anspruch 4, ferner umfassend:
   Bestimmen des Vorhandenseins einer Hand des Benutzers, um den Laufzeitgeber (60) zu starten.

6. Verfahren nach Anspruch 4, ferner umfassend:
   Bestimmen des Vorhandenseins einer Hand des Benutzers, um das Pumpenstellglied (40) zu starten.

7. Verfahren nach Anspruch 4, ferner umfassend:
   in Verbindung bringen des Pumpenstellglieds (40) mit einem Motor (26), der eine Motorwelle (27) aufweist, so dass die Drehung der Motorwelle (27) das Pumpenstellglied (40) in eine Richtung bewegt und eine Umkehrung der Motorwelle (27) das Pumpenstellglied (40) in eine entgegengesetzte Richtung bewegt, und Zurückkehren zu einer Hauptbetriebsroutine nachdem der Laufzeitgeber (60) abgelaufen ist und Bestimmen, dass sich die Motorwelle (27) nicht länger bewegt.

8. Verfahren zum Zurücksetzen einer blockierten Pumpe (36) in einem Flüssigkeitsabgabesystem (10), **daher gekennzeichnet, dass** das Verfahren umfasst:
   Erfassen des Öffners einer Abdeckung (16),
   Betätigen eines Motors, um ein Pumpenstellglied (40) zu einer Ladeposition (42) zu bewegen,
   Bestimmen, wann das Pumpenstellglied (40) in der Ladeposition (42) ist, und
   Abschalten des Motors (26).

9. Verfahren nach Anspruch 8, ferner umfassend:
   Starten eines Zeitgebers (60) vor dem Betätigen des Motors (26) und
   Abschalten des Motors (26), wenn der Zeitgeber (60) abläuft.

10. Verfahren nach Anspruch 9, ferner umfassend:
    Entfernen eines Nachfüllbehälters (32) aus dem Abgabesystem (10), wenn der Zeitgeber (60) nicht abgelaufen ist und sich das Pumpenstellglied (40) nicht in der Ladeposition (42) befindet.

11. Verfahren nach Anspruch 10, ferner umfassend:
    Betätigen des Motors (26), nachdem der Nachfüllbehälter (32) aus dem Abgabesystem (10) entfernt wurde, um das Pumpenstellglied (40) zu der Ladeposition (42) zu bewegen, während der Zeitgeber (60) noch nicht abgelaufen ist, und
    Abschalten des Motors (26), wenn sich das Pumpenstellglied (40) in der Ladeposition (42) befindet.

12. Abgabesystem (10), umfassend:
   einen Nachfüllbehälter (32), der mit Produkt gefüllt ist,
   ein Gehäuse (12), das beschaffen ist, den Nachfüllbehälter (32) aufzunehmen,
   eine Pumpe (36), die entweder vom Nachfüllbehälter (32) oder vom Gehäuse (12) getragen wird, und von einem Pumpenstellglied (40) bewegt wird, um Produkt aus dem Nachfüllbehälter (32) abzugeben, wobei das Pumpenstellglied (40) eine Ladeposition (42) und eine Abgabeposition (64) aufweist, und
dadurch gekennzeichnet, dass der elektronische Schlüsselmechanismus (70) beschaffen ist, das Pumpenstellglied (40) in die Ladeposition (42) zurückzubringt, und
dadurch, dass das Pumpenstellglied (40) zur Ladeposition (42) bewegt wird, wenn ein Blockierungszustand erfasst wird.

13. System nach Anspruch 12, wobei der elektronische Schlüsselmechanismus (70) umfasst:
   einen Abdeckungssensor (20), der einer Frontabdeckung (16) des Gehäuses (12) zugeordnet ist, um zu bestimmen, wenn die Frontabdeckung (16) geöffnet ist, und
einen Erkennungsschlüssel (34), der am Nachfüllbehälter (32) vorgesehen ist, um zu bestimmen, ob der Nachfüllbehälter (32) in dem Gehäuse (12) aufgenommen ist, wobei, wenn die Frontabdeckung (16) geöffnet ist und der Nachfüllbehälter (32) nicht erfasst wird, der elektronische Schlüsselmechanismus (70) das Pum-
14. System nach Anspruch 12, wobei der elektronische Schlüsselmechanismus (70) umfasst:

eine Steuerung (56), die mit dem Pumpenstellglied (40) verbunden ist, und einen Zeitgeber (60) trägt,
en einen Handsensor (24), der mit der Steuerung (56) verbunden ist, und
-den Motor (26) mit einer umkehrbaren Welle (27), wobei der Motor (26) mit der Steuerung (56) verbunden ist und mit dem Pumpenstellglied (40) in Eingriff gebracht werden kann, wo-
bei, wenn der Handsensor (24) eine Hand er-
fasst, die Steuerung (56) den Zeitgeber (60) und
das Pumpenstellglied (40) durch den Motor (26) startet, und die Steuerung (56) die umkehrbare Welle (27) in entgegengesetzter Richtung dreht, um das das Pumpenstellglied (40) in die Lade-
position (42) zurückzubringen, wenn der Zeitge-
ber (60) abläuft und sich der Motor (26) noch
dreht.

15. System nach Anspruch 12, wobei der elektronische Schlüsselmechanismus (70) umfasst:

eine Steuerung (56), die mit dem Pumpenstell-
10 glied (40) verbunden ist, und einen Zeitgeber
 trägt,
en einen Abdeckungssensor (20), der einer
Frontabdeckung (16) des Gehäuses (12) zuge-
ordnet ist, um zu bestimmen, wenn die Frontab-
deckung (16) geöffnet ist,
en einen Motor (26), der mit der Steuerung (56) ver-
bunden ist und mit dem Pumpenstellglied (40) in Eingriff gebracht werden kann,
en einem Stellgliedsensor (46), der mit der Steue-
rung (56) verbunden ist und das Pumpenstell-
glied (40) überwacht, und
-einen Erkennungsschlüssel (34), der am Nach-
füllbehälter (32) vorgesehen ist, wobei der Zeit-
geber (60) startet und die Steuerung schrittwei-
se den Motor (26) betätigt, um das Pumpenstell-
glied (40) zur Ladeposition (42) zu bewegen,
sowie durch den Stellgliedsensor (46) bestimmt
wird, wenn die Frontabdeckung (16) geöffnet ist,
und wobei, wenn das Pumpenstellglied (40) nicht zur Ladeposition (42) zurückgebracht ist
bevor der Zeitgeber (60) abläuft, ein Nutzer den
Nachfüllbehälter (32) entfernt, wie durch das
Vorhandensein des Erkennungsschlüssels (34)
bestimmt, und die Steuerung (56) den Motor
(26) betätigt, um das Pumpenstellglied (40) zur
Ladeposition (42) zu bewegen.

Revendications

1. Procédé permettant de réinitialiser une pompe blo-
quée (36) dans un système distributeur de fluide
(10), caractérisé en ce que le procédé consiste :

to determine if a recharging container (32)
is lodged in the distribution system (10) ; et
to displace a pump actuator (40) until it
arrives at the charging position (42) when
said recharging container (32) is removed.

2. Procédé selon la revendication 1, dans lequel le sys-
tème distributeur (10) comprend un boîtier (12) ayant
une couvercle frontal (16), et procédé dans lequel ledit
contenant de rechange (32) peut être logé dans le
boîtier (12), le procédé consistant en outre :

to detect if the couvercle frontal (16) is open
before the determination step ; et
to start a timer (60) before the determination step.

3. Procédé selon la revendication 2, dans lequel ledit
contenant de rechange (32) est doté d’une clé d’iden-
tification détectable (34) pouvant être lue par le sys-
tème distributeur (10), le procédé consistant en
outre :

to read said detectable identification (34),
temple to determine if said recharging container
(32) is lodged in the distribution system (10) ; et
to determine the step of reading until the expired
minute (60) arrives, or when determined that said
containing of rechange (32) has been removed
boîtier (12).

4. Procédé permettant de réinitialiser une pompe blo-
quée (36) dans un système distributeur de fluide
(10), le procédé consistant :

to start a clock (60) ; et
to start a pump actuator (40) ; et
to determine if said pump actuator (40) is still
in a distribution state since the distribution system
(10), at the moment when said clock (60) arrives
at expiration,
le procédé est caractérisé par le fait de dé-
placer l’acteur de pompe (40) dans une direc-
tion opposée à une position de charge (42),
si l’acteur de pompe (40) est encore en
process of distribution, at the moment when said
minute (60) arrives at expiration.

5. Procédé selon la revendication 4, consistant en
outre :
à détecter la présence d’une main d’utilisateur, pour
démarrer ladite minuterie de marche (60).

6. Procédé selon la revendication 4, consistant en
   outre :
à détecter la présence d’une main d’utilisateur, pour
démarrer ledit actionneur de pompe (40).

7. Procédé selon la revendication 4, consistant en
   outre :
à associer ledit actionneur de pompe (40) à un
moteur (26) ayant un arbre de moteur (27), de
sorte que la rotation dudit arbre de moteur (27)
déplace ledit actionneur de pompe (40) dans une
direction, et l’inversion de marche dudit arbre
de moteur (27) fait que ledit actionneur de pompe
(40) se déplace dans une direction opposée ; et
à revenir à un programme d’opération principale
une fois que ladite minuterie de marche (60) est
arrivée à expiration, et à déterminer le fait que
ledit arbre de moteur (27) n’est plus en rotation.

8. Procédé permettant de réinitialiser une pompe blo-
quée (36) dans un système distributeur de fluide
(10), caractérisé en ce que le procédé consiste :
à détecter l’ouverture d’un couvercle (16) ;
à actionner un moteur pour déplacer un action-
neur de pompe (40) jusqu’à une position de
charge (42) ;
à déterminer à quel moment ledit actionneur de
pompe (40) est à ladite position de charge (42) ; et
à arrêter ledit moteur (26).

9. Procédé selon la revendication 8, consistant en
   outre :
à démarrer une minuterie (60) avant d’actionner
ledit moteur (26) ; et
à arrêter ledit moteur (26) si ladite minuterie (60)
arive à expiration.

10. Procédé selon la revendication 9, consistant en
    outre :
à retirer du système distributeur (10), un contenant
de recharge (32), si ladite minuterie (60) n’est pas
arrivée à expiration et si ledit actionneur de pompe
(40) n’est pas à ladite position de charge (42).

11. Procédé selon la revendication 10, consistant en
    outre :
à actionner ledit moteur (26) une fois que ledit
contenant de recharge (32) a été retiré, ledit mo-
teur servant à déplacer ledit actionneur de pom-
pe (40) jusqu’à ladite position de charge (42),
alors que ladite minuterie (60) n’est pas encore
arrivée à expiration ; et
à arrêter ledit moteur (26) si ledit actionneur de
pompe (40) est à ladite position de charge (42).

12. Système distributeur (10) comprenant :
   un contenant de recharge (32) rempli d’un
produit ;
   un boîtier (12) adapté pour recevoir ledit conte-
nant de recharge (32) ;
   une pompe (36) maintenue soit par ledit conte-
nant de recharge (32), soit par ledit boîtier (12),
et déplacée par un actionneur de pompe (40), de
façon à distribuer un produit depuis ledit conte-
nant de recharge (32), où ledit actionneur de
pompe (40) a une position de charge (42) et une
position de distribution (64) ; et
   un mécanisme de manipulation électronique
(70) associé audit actionneur de pompe (40),
caractérisé en ce que ledit mécanisme de manipulation
électronique (70) est configuré pour faire revenir
automatiquement ledit actionneur de pompe
(40) à ladite position de charge (42), et
en ce que ledit actionneur de pompe (40) est
déplacé jusqu’à ladite position de charge (42)
quand un état de blocage est détecté.

13. Système selon la revendication 12, dans lequel ledit
mécanisme de manipulation électronique (70) comprend :
   un capteur de couvercle (20) associé à un cou-
vercle frontal (16) dudit boîtier (12), pour déter-
miner à quel moment ledit couvercle frontal (16)
est ouvert ; et
   une clé d’identification détectable (34) prévue
sur ledit contenant de recharge (32), pour déter-
miner si ledit contenant de recharge (32) est
logé dans ledit boîtier (12) où, si ledit couvercle
frontal (16) est ouvert et si ledit contenant de
recharge (32) n’est pas détecté, ledit mécanis-
me de manipulation électronique (70) déplace
ledit actionneur de pompe (40) jusqu’à ladite po-
sition de charge (42).

14. Système selon la revendication 12, dans lequel ledit
mécanisme de manipulation électronique (70) comprend :
   un contrôleur (56) connecté audit actionneur de
pompe (40) et maintenant une minuterie (60) ;
   un capteur de détection de main (24) connecté
audit contrôleur (56) ; et
un moteur (26) ayant un arbre réversible (27),
ledit moteur (26) étant connecté audit contrôleur
(56) et pouvant venir en prise avec ledit action-
neur de pompe (40) où, si ledit capteur de dé-
tection de main (24) détecte une main, ledit con-
trôleur (56) fait démarrer ladite minuterie (60) et
ledit actionneur de pompe (40), par ledit moteur
(26), et ledit contrôleur (56) fait tourner ledit ar-
bre réversible (27) dans une direction opposée,
pour faire revenir ledit actionneur de pompe (40)
à ladite position de charge (42), si ladite minu-
terie (60) arrive à expiration et si ledit moteur
(26) est encore en train de tourner.

15. Système selon la revendication 12, dans lequel ledit
mécanisme de manipulation électronique (70)
comprend :

- un contrôleur (56) connecté audit actionneur de
  pompe (40) et maintenant une minuterie ;
- un capteur de couvercle (20) associé à un cou-
  vercle frontal (16) dudit boîtier (12), pour déter-
  miner à quel moment ledit couvercle frontal (16)
est ouvert ;
- un moteur (26) connecté audit contrôleur (56)
et pouvant venir en prise avec ledit actionneur
de pompe (40) ;
- un capteur d’actionneur (46) connecté audit
  contrôleur (56) et surveillant ledit actionneur de
  pompe (40) ;
- une clé d’identification détectable (34) prévue
  sur ledit contenant de recharge (32), où ladite
  minuterie (60) démarre et ledit contrôleur (56)
  actionne ledit moteur (26) de manière progres-
sive, ledit moteur servant à déplacer ledit action-
neur de pompe (40) jusqu’à ladite position de
  charge (42), comme cela est déterminé par ledit
  capteur d’actionneur (46) quand ledit couvercle
  frontal (16) est ouvert, et où, si ledit actionneur
  de pompe (40) n’est pas revenu à ladite position
de charge (42) avant que ladite minuterie (60)
arrive à expiration, un utilisateur retire ledit con-
tenant de recharge (32), comme cela est déter-
miné par la présence de ladite clé d’identification
détectable (34), et ledit contrôleur (56) actionne
ledit moteur (26) pour déplacer ledit actionneur
de pompe (40) jusqu’à ladite position de charge
(42).
FIG - 3

100

102 MAIN OPERATION

104 COVER SENSOR DETECTS OPEN FRONT COVER

106 START TIMER

108 REFILL REMOVED ?

110 TIMER EXPIRED ?

112 MOVE PUMP ACTUATOR TO LOADING POSITION

114 RETURN TO MAIN OPERATION
MAIN OPERATION

HAND SENSOR DETECTS HAND

START RUN TIMER

START PUMP ACTUATION CYCLE

RUN TIMER EXPIRED?

MOTOR STILL RUNNING?

REVERSE MOTOR, RETURN ACTUATOR TO LOADING POSITION CONFIRMED BY ACTUATOR SENSOR

FIG-4
160
162
MAIN OPERATION

164
COVER SENSOR DETECTS OPEN FRONT COVER

166
START RUN TIMER

168
INCREMENTALLY ENERGIZE MOTOR TO MOVE ACTUATOR TO LOADING POSITION

170
TIMER EXPIRED?

172
ACTUATOR AT LOADING POSITION?

174
REMOVE REFILL

178
TURN MOTOR OFF

180
RETURN TO MAIN OPERATION WHEN FRONT COVER IS CLOSED

FIG-5
REFERENCES CITED IN THE DESCRIPTION

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