



US 20030196292A1

(19) **United States**
(12) **Patent Application Publication** (10) **Pub. No.: US 2003/0196292 A1**
Sams et al. (43) **Pub. Date: Oct. 23, 2003**

(54) **CLEANING MACHINE**

(52) **U.S. Cl. 15/314**

(76) Inventors: **Gary L. Sams**, Grand Rapids, MI (US);
Joseph P. Doyle, Grand Rapids, MI
(US); **Dewey I. Doyle III**, Grand
Rapids, MI (US)

Correspondence Address:
**PRICE HENEVELD COOPER DEWITT &
LITTON**
695 KENMOOR, S.E.
P O BOX 2567
GRAND RAPIDS, MI 49501 (US)

(21) Appl. No.: **10/127,524**

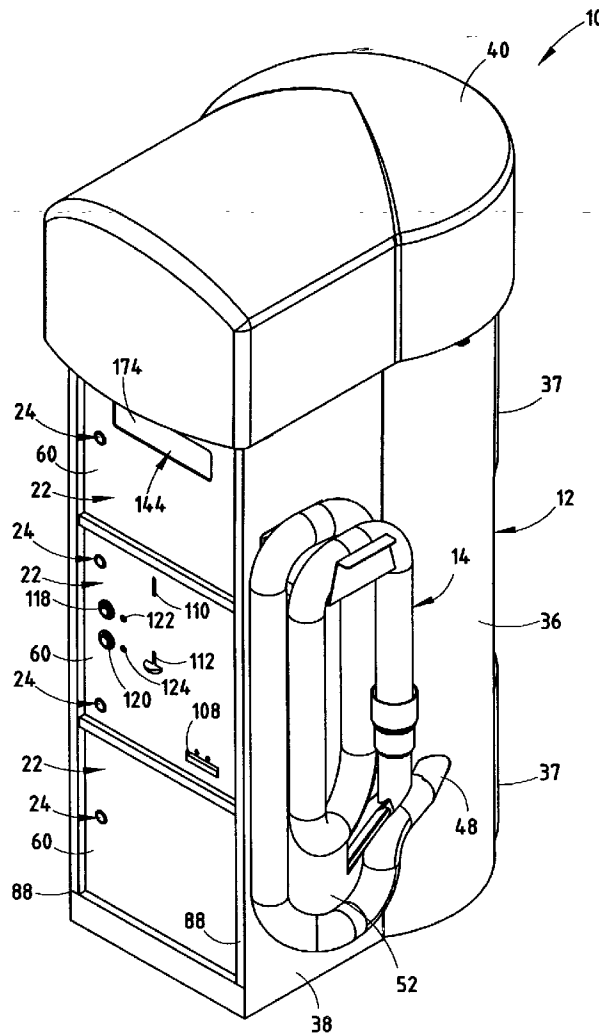
(22) Filed: **Apr. 22, 2002**

Publication Classification

(51) **Int. Cl.⁷ A47L 5/38; A47L 5/00**

(57) **ABSTRACT**

A vehicle cleaning unit comprising a container and a cleaning hose connected to the container. The container has a stock holding compartment, a servicing compartment and a revenue compartment. The container also includes at least three compartment doors providing access to an interior of the container, with each compartment door providing access to only one compartment of the container. Each compartment door includes a lock for locking the door in a closed position, whereby the servicing compartment can be accessed without allowing access to revenue in the revenue compartment. The vehicle cleaning unit can also include a low voltage detection unit for notifying a low or zero voltage condition in the unit. The vehicle cleaning unit can further include a circuitry chassis including circuitry comprising a plurality of circuits. The chassis can further include a plurality of indicators that will provide visual indication when a circuit associated with the indicator is activated.



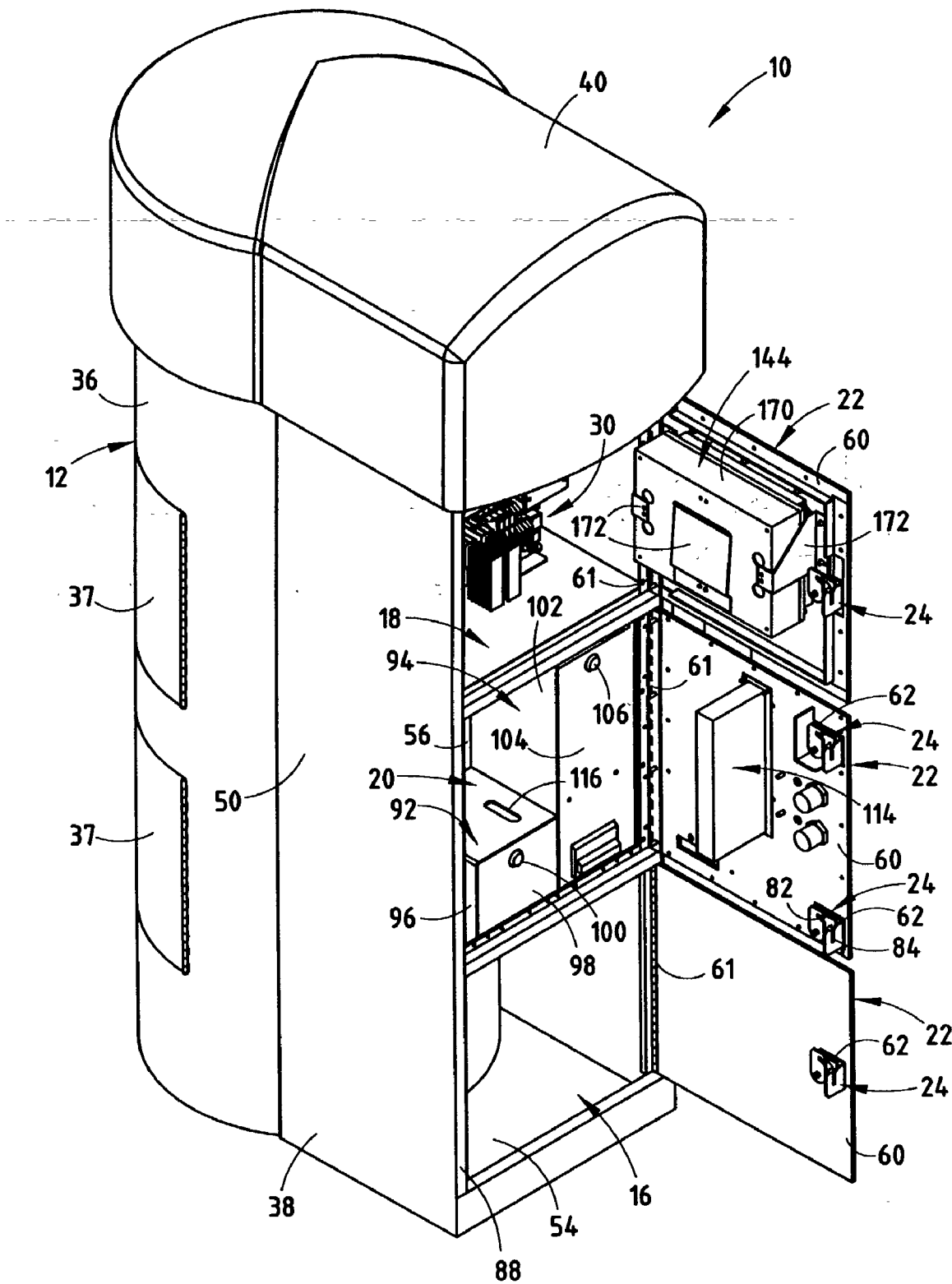


FIG. 1

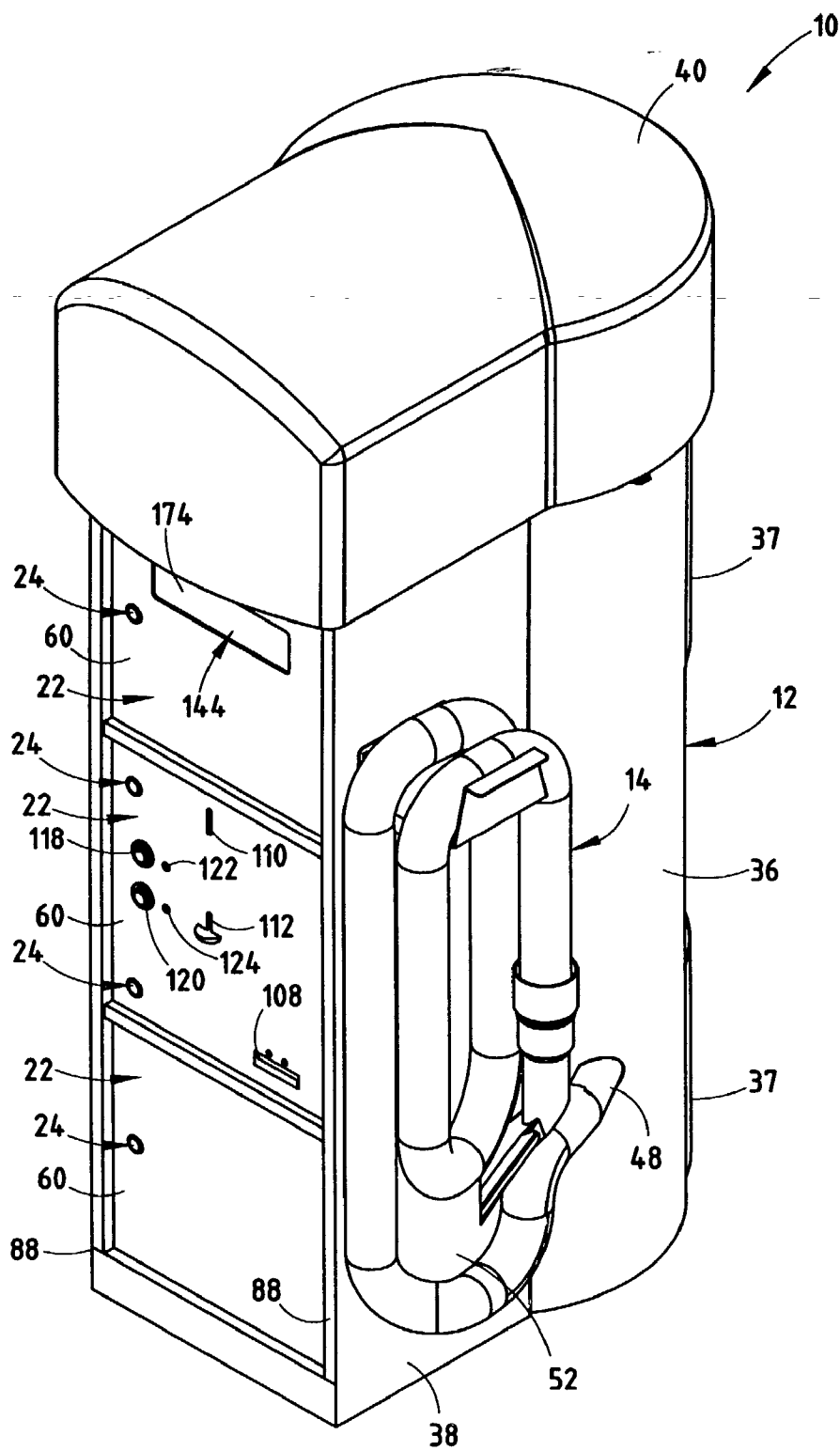


FIG. 2

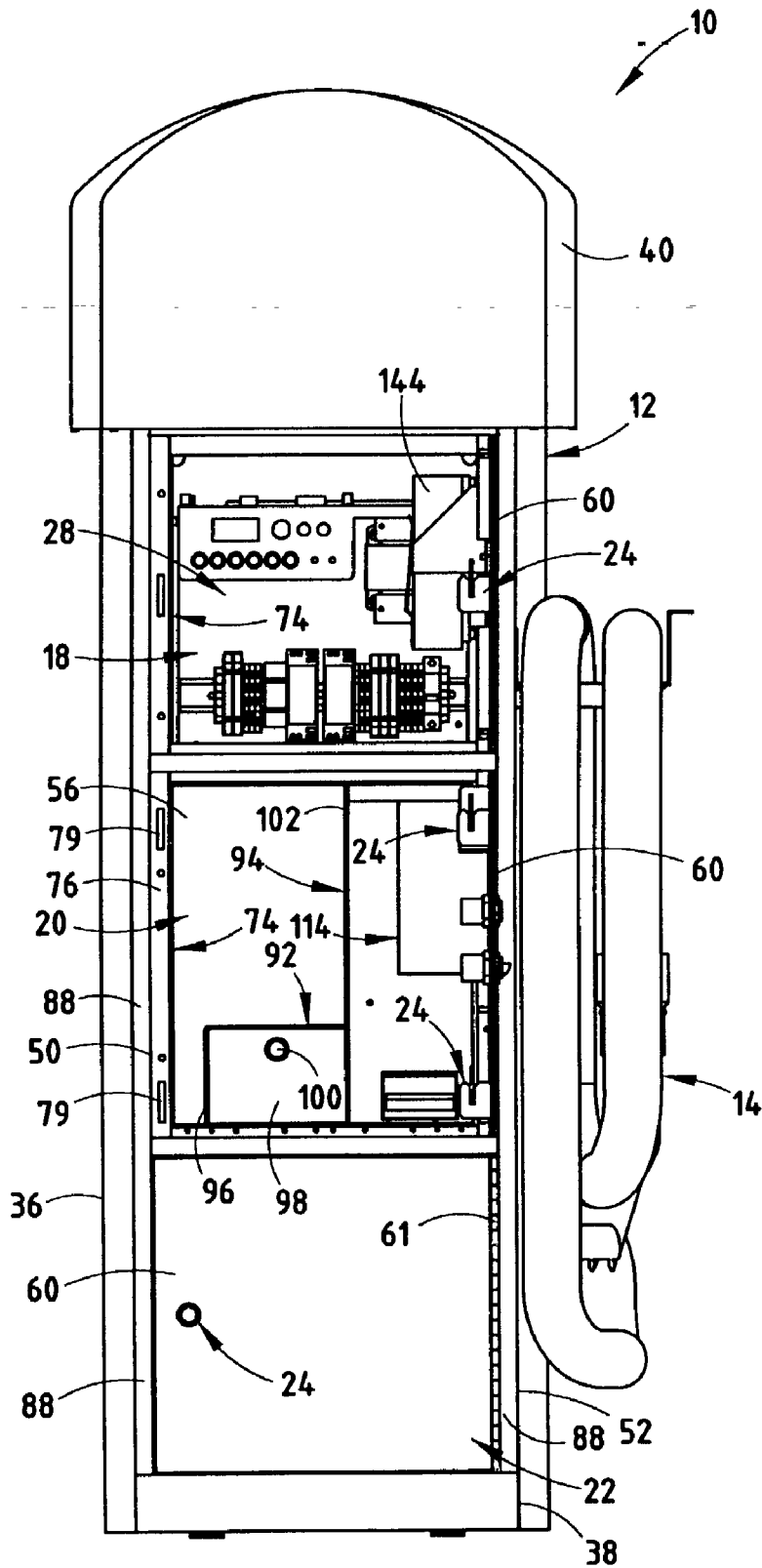


FIG. 3

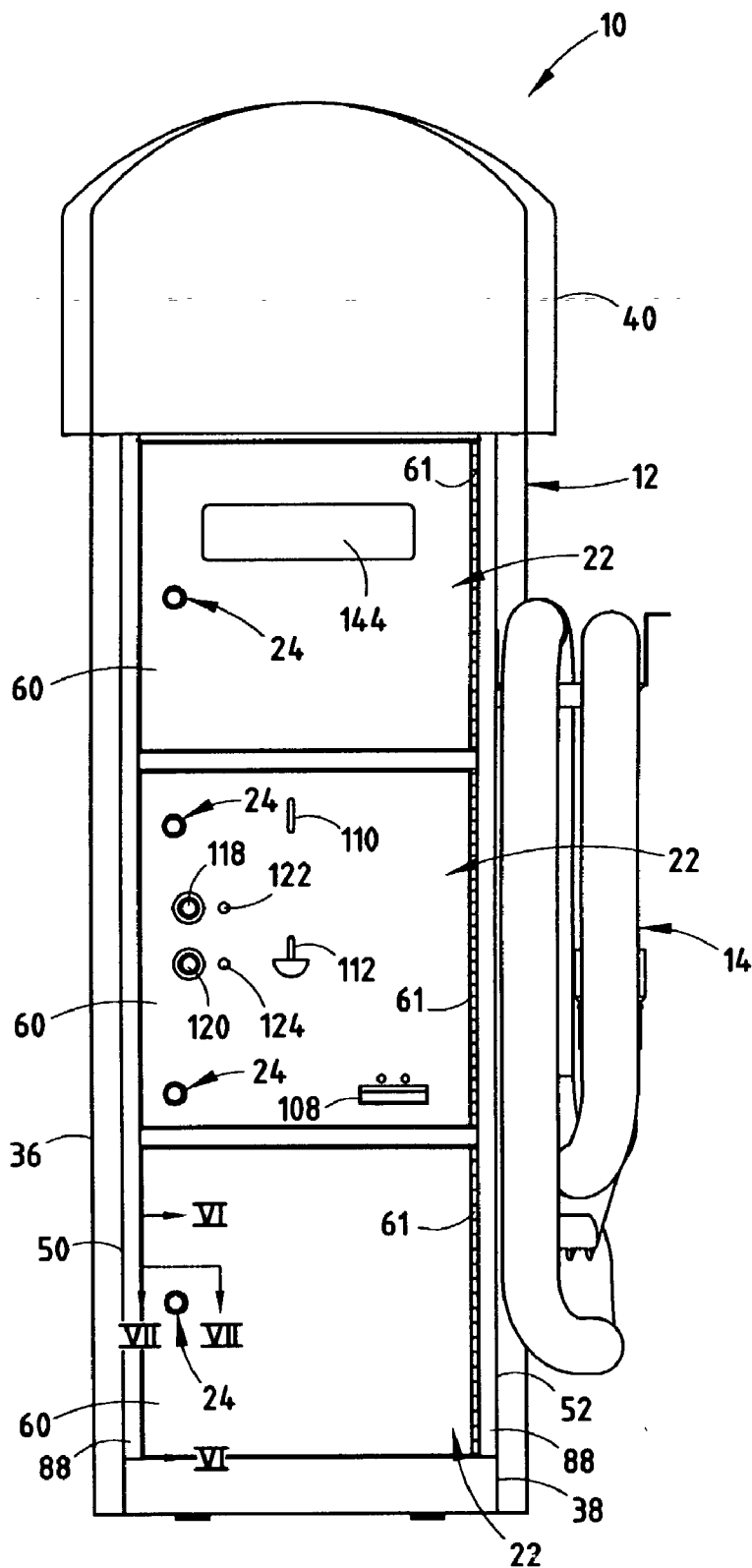
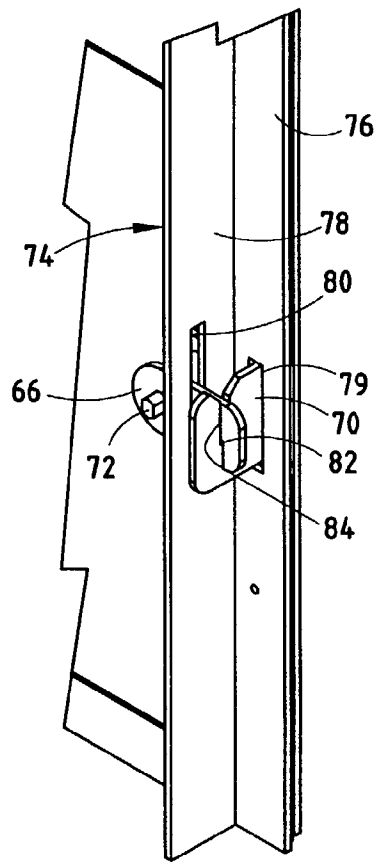
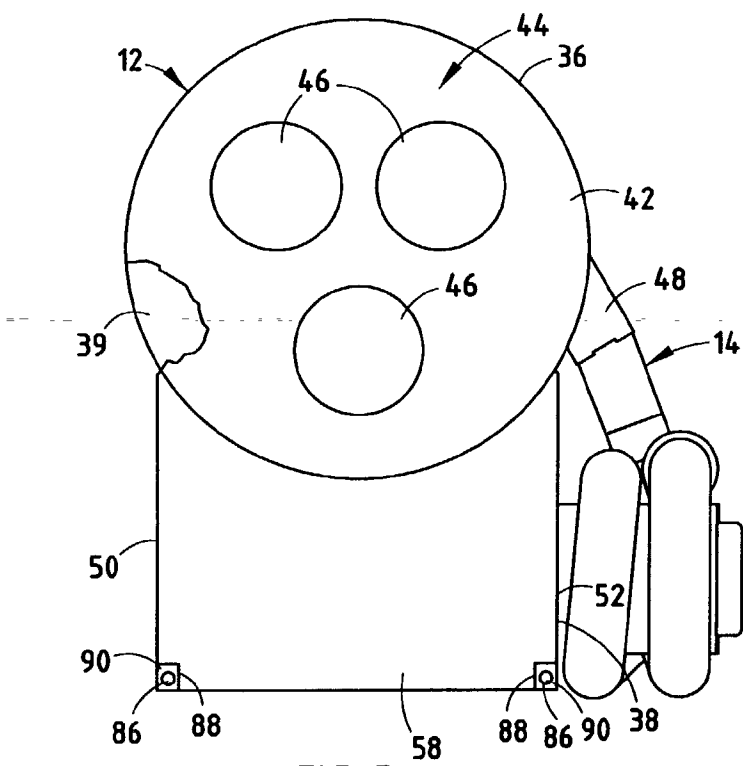
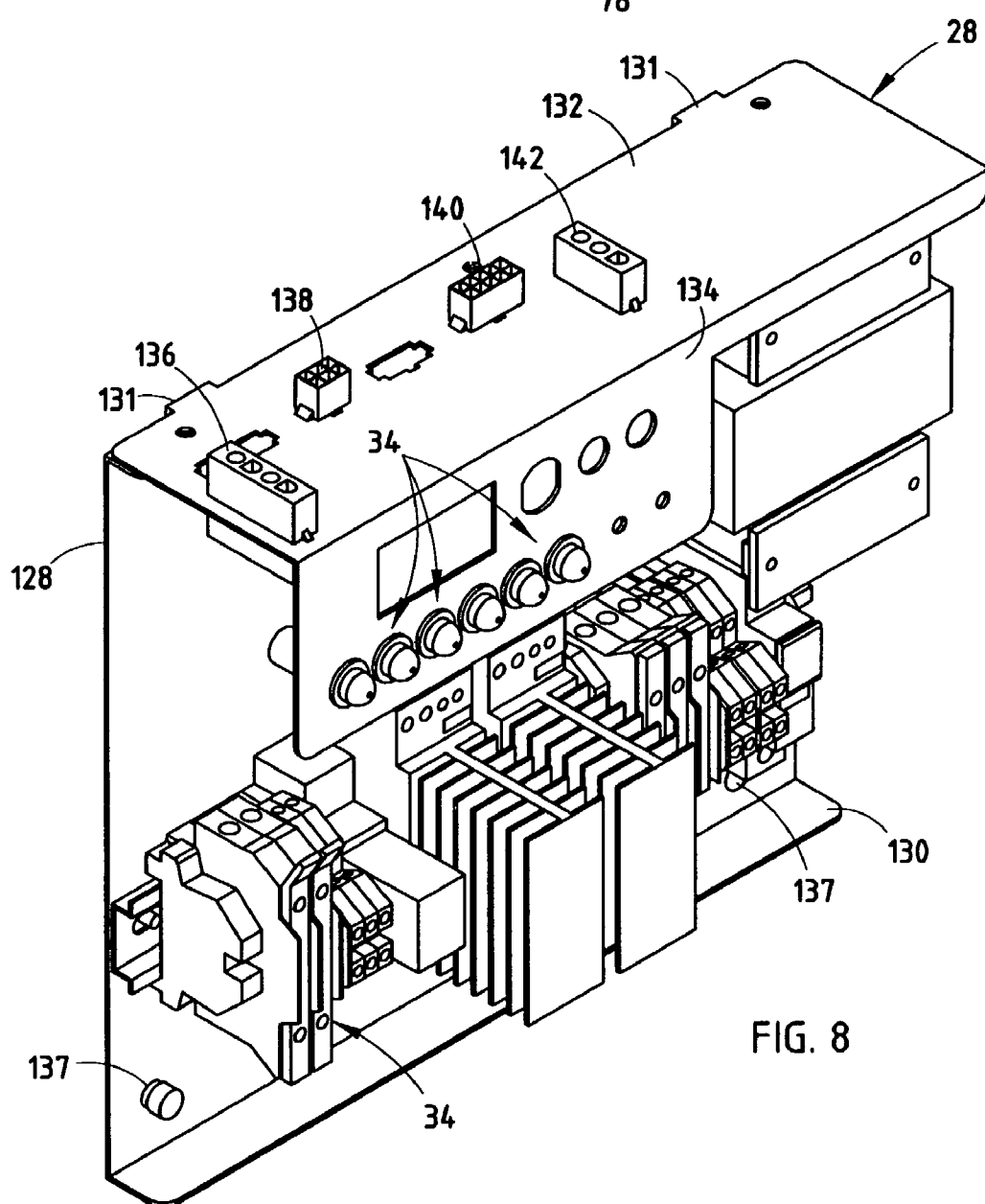
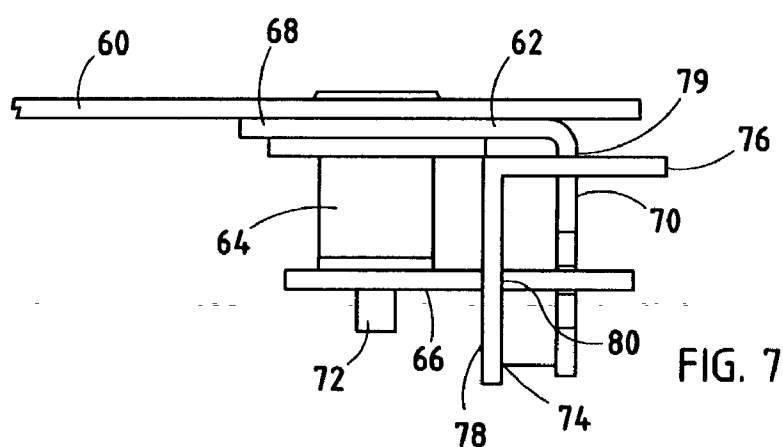


FIG. 4





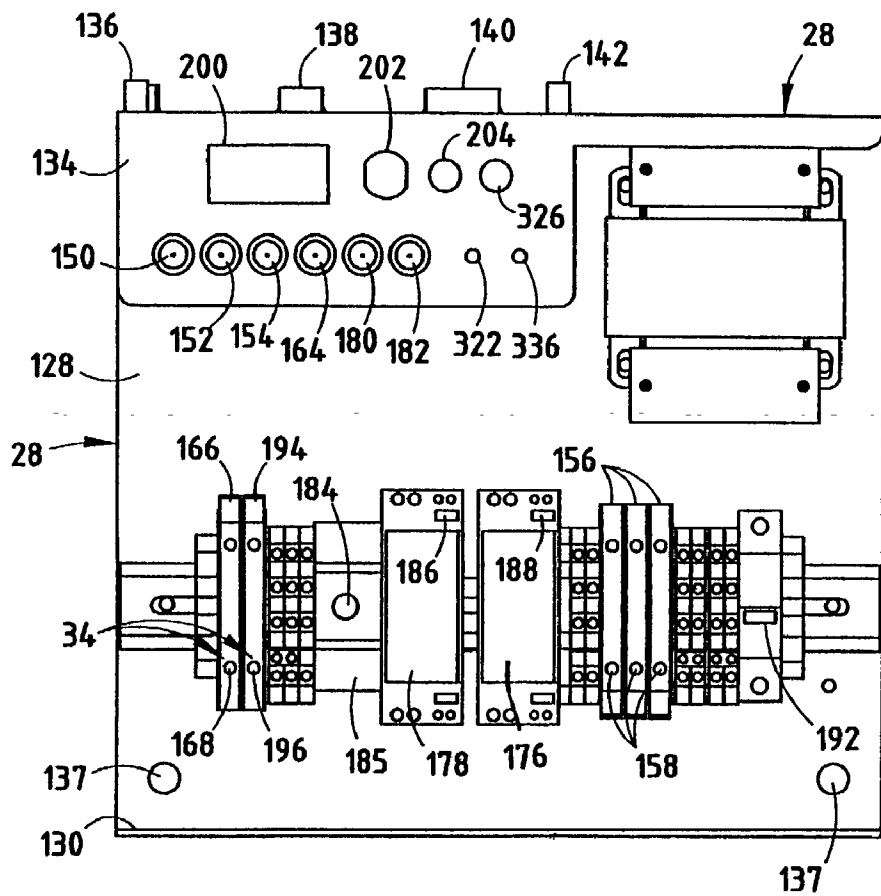


FIG. 9A

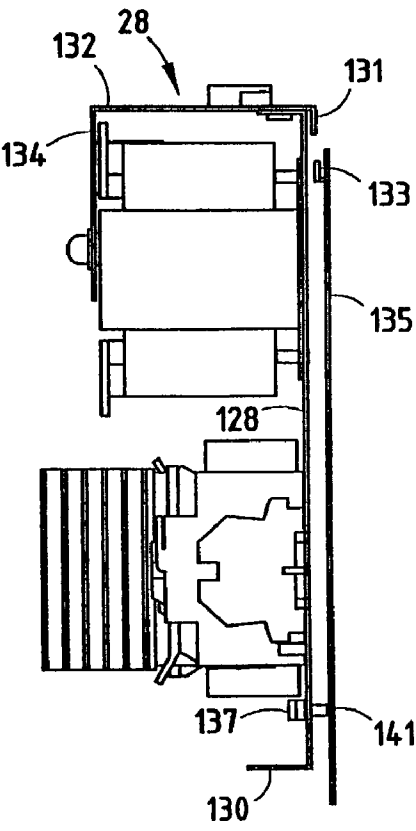


FIG. 9B

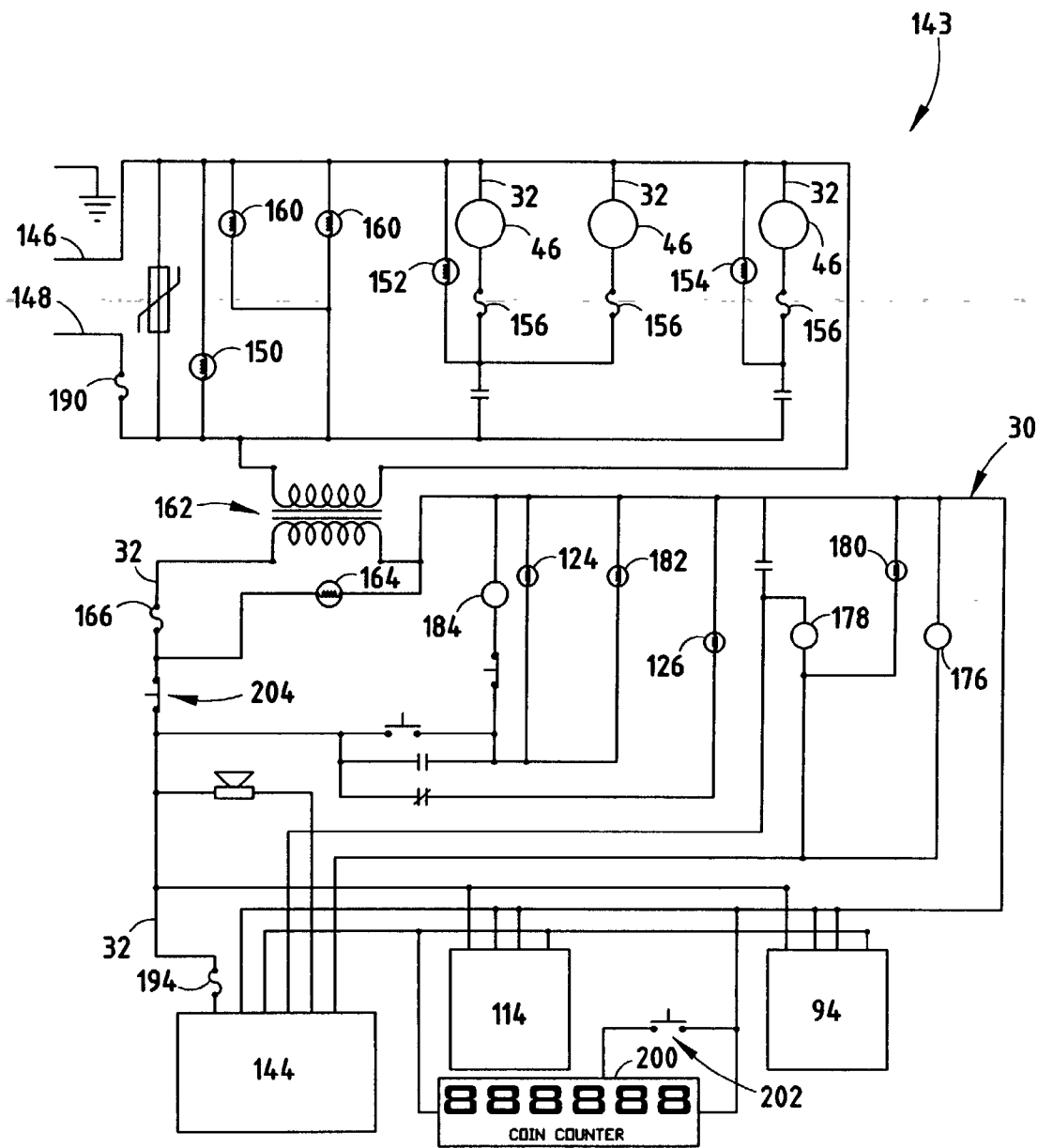


FIG. 10

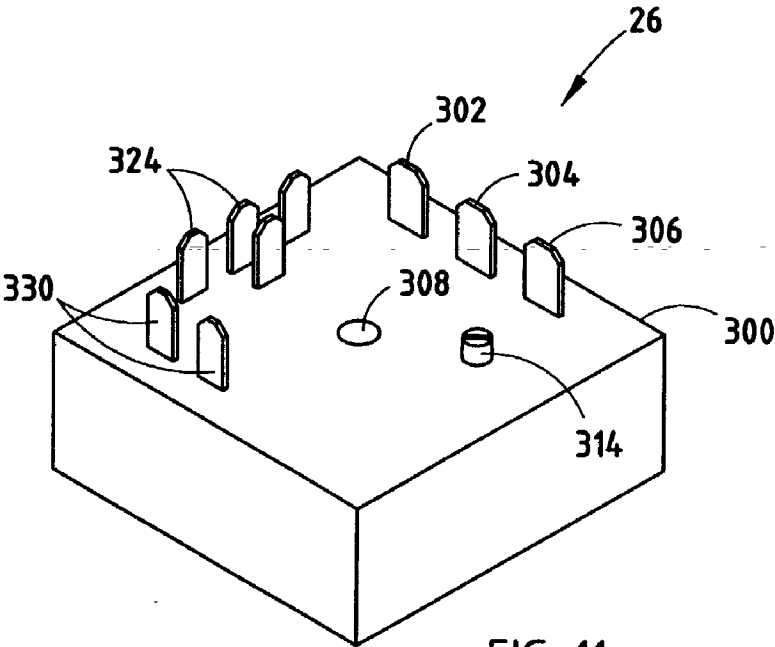


FIG. 11

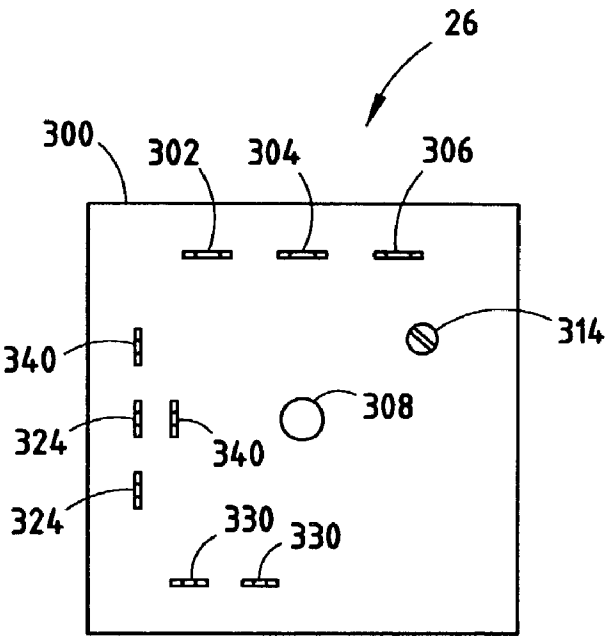


FIG. 12

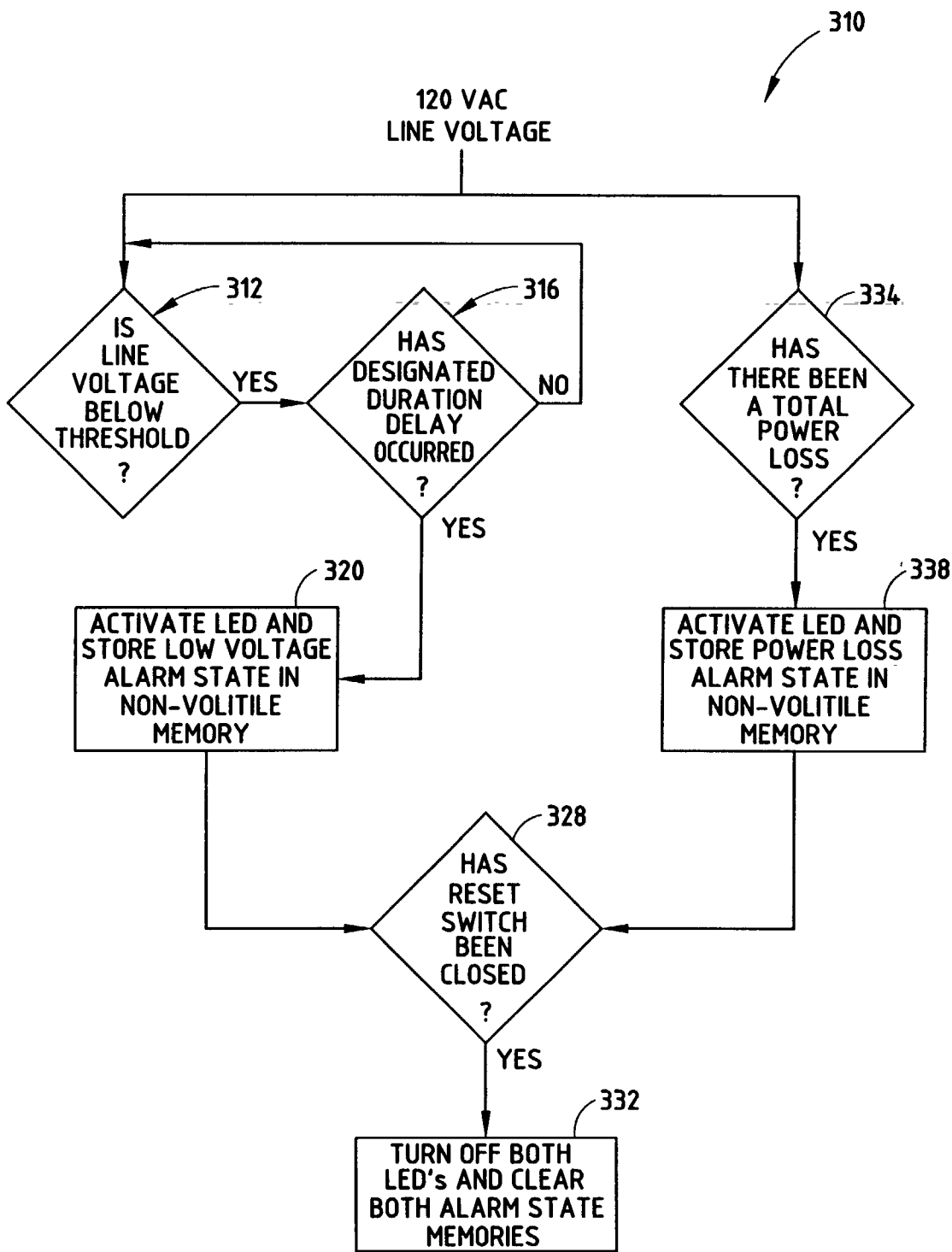


FIG. 13

CLEANING MACHINE

BACKGROUND OF THE INVENTION

[0001] The present invention relates to cleaning machines, and in particular to a cleaning unit for cleaning vehicles.

[0002] Vehicle cleaning units are typically positioned near gas stations and car washes and allow drivers to clean their vehicles. Vehicle cleaning units typically include vacuums for vacuuming dust, dirt, etc within the vehicle, fragrance sprayers for spraying a pleasant fragrance within the vehicle, and foaming brushes for cleaning spots off of the carpet of the vehicles.

[0003] Heretofore, vehicle cleaning units have typically comprised cylindrical housings containing a vacuum and a smaller front housing containing the money collected during use of the vehicle cleaning unit. The front housing has also included the electronics for running the vacuum for a period of time corresponding to the amount of money inserted into the vehicle cleaning unit. Typically, the smaller front housing of the vehicle cleaning unit has included a door with a latch type lock similar to those used in desks. The locks of the vehicle cleaning unit have rotated behind a strike plate when the door is closed to lock the door in position. However, the doors have been able to be easily vandalized by prying a side of the front housing, and thereby the strike plate, outward. Therefore, after vandalism, the interior of the vehicle cleaning unit and any money held therein can be easily accessed. Additionally, the coin vaults can be accessed and the money therein stolen by a person servicing or restocking the vehicle cleaning unit when the door is opened.

[0004] One attempt at trying to protect money within the vehicle cleaning unit has been to place an elongated coin slot with the vehicle cleaning unit that will deposit the coins inserted into the unit in a coin vault at the bottom of the front housing below the compartment enclosed by the door. However, the coin vault at the bottom of the front housing can be inaccessible during wintertime when snow is lodged against the front of the vehicle cleaning unit, thereby blocking access to the coin vault. Additionally, the snow can sometimes freeze an access lock to the coin vault and thereby prevent access to the coin vault.

[0005] Vehicle cleaning units have also experienced problems when connected in series to other vending machines. For example, the vehicle cleaning unit can be connected in series to a power source with a soda machine. Sometimes when the soda machine is running, the power line to the vehicle cleaning unit can experience a drop in voltage such that the vehicle cleaning unit will not be sufficiently powered to operate correctly. Furthermore, the vehicle cleaning units can be difficult to service because it is often difficult to determine which part of the electronic system of the vehicle cleaning unit is malfunctioning.

[0006] Accordingly, a vehicle cleaning unit solving the aforementioned disadvantages and having the aforementioned advantages is desired.

SUMMARY OF THE INVENTION

[0007] One aspect of the present invention is to provide a vehicle cleaning unit comprising a container and at least one vehicle cleaning hose connected to the container. The con-

tainer has a stock holding compartment, a servicing compartment and a revenue compartment. The container includes at least three compartment doors providing access to an interior of the container, with each compartment door providing access to only one compartment of the container. Each compartment door also includes a lock for locking the door in a closed position to enclose the compartment.

[0008] Another aspect of the present invention is to provide a vehicle cleaning unit comprising a container and a vacuum hose connected to the container. The container has a servicing compartment adapted to contain cleaning components therein and a revenue compartment adapted to hold revenue. The container includes a vacuum motor functionally connected to the vacuum hose and a receptacle adapted to collect items vacuumed into the receptacle through the vacuum hose. The container further includes a servicing door providing access to an interior of the servicing compartment, with the servicing door including a servicing door lock for locking the servicing door in a closed position to enclose the servicing compartment. The container also includes a revenue door providing access to an interior of the revenue compartment, with the revenue door including a revenue door lock for locking the revenue door in a closed position to enclose the revenue compartment. Therefore, the servicing compartment can be accessed and the cleaning components serviced without allowing access to the revenue in the revenue compartment.

[0009] Yet another aspect of the present invention is to provide a method of providing notification of a low voltage condition in a vehicle cleaning unit having a container with a vacuum motor within the container for providing a sucking force to a vehicle cleaning hose connected to the container. The method comprises the steps of connecting a source of motor power to the vehicle cleaning unit and connecting a low voltage detection unit to the source of power, with the low voltage detection unit having a reset switch, memory and a notification signal. The method also includes the step of measuring a voltage of the source of power. The method further includes the step of activating the notification signal and storing a low voltage alarm signal in the memory of the low voltage detection unit if the voltage is non-zero and below a predetermined threshold for a predetermined period of time. The method also includes the step of activating the notification signal and storing a zero voltage alarm signal in the memory of the low voltage detection unit if the voltage is zero. Furthermore, the method includes the step of turning off the notification signal and clearing the memory of the low voltage detection circuit if the reset switch is triggered.

[0010] In yet another aspect of the present invention, a method of providing notification of a low voltage condition in a vehicle cleaning unit having a container with a pump and/or vacuum motor within the container for cleaning a vehicle is provided. The method comprises the steps of providing a source of power to the vehicle cleaning unit for powering the motor and sensing a voltage of the source of power. The method further includes the steps of logging a low voltage alarm condition if the voltage is non-zero and below a predetermined threshold for a predetermined period of time, and logging a zero voltage alarm condition if the voltage is zero.

[0011] Another aspect of the present invention is to provide a vehicle cleaning unit comprising a container and a

vacuum hose connected to the container. The container has a machine circuitry compartment including a chassis with circuitry for the vehicle cleaning unit thereon, with the chassis further including a plurality of indicators. The container includes a vacuum motor functionally connected to the vacuum hose and a receptacle adapted to collect items vacuumed into the receptacle through the vacuum hose. The circuitry for the vehicle cleaning unit includes a plurality of circuits, with each circuit being connected to one of the indicators. An individual indicator provides a visual indication when the circuit associated with the indicator malfunctions.

[0012] Yet another aspect of the present invention is to provide a method of providing notification of a low voltage condition in a vehicle cleaning unit having a container with a pump and/or vacuum motor within the container for cleaning a vehicle. The method includes the step of providing a circuitry chassis for the vehicle cleaning unit, with the chassis including circuitry for the vehicle cleaning unit thereon. The circuitry for the vehicle cleaning unit includes a plurality of circuits. The chassis further includes a plurality of indicators. The method also includes the steps of connecting each circuit to one of the indicators and providing visual indication when the circuit associated with the indicator malfunctions.

[0013] Another aspect of the present invention is to provide a vehicle cleaning unit comprising a container having at least one door providing access to an interior of the container and at least one vehicle cleaning hose connected to the container. Each door includes a lock for locking the door in a closed position to enclose the compartment. The container includes an L-shaped flange adjacent each side of the door when the doors are in the closed position. The container also includes a reinforcement rod located between an outer side of the container and the L-shaped flange for fortifying the L-shaped flange to prevent vandalism of the container.

[0014] These and other features, advantages, and objects of the present invention will be further understood and appreciated by those skilled in the art by reference to the following specification, claims and appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a left side perspective view of a vehicle cleaning unit embodying the present invention with compartment doors in an open position.

[0016] FIG. 2 is a right side perspective view of the vehicle cleaning unit with compartment doors in a closed position.

[0017] FIG. 3 is a front view of the vehicle cleaning unit embodying the present invention with two compartment doors in the open position and one compartment door in the closed position.

[0018] FIG. 4 is a front view of the vehicle cleaning unit with compartment doors in the closed position.

[0019] FIG. 5 is a top view of a container of the vehicle cleaning unit with a top removed from the container.

[0020] FIG. 6 is a perspective view of a lock for a door of the container engaged with an L-shaped plate of the container taken along line VI-VI of FIG. 4.

[0021] FIG. 7 is a top view of the lock for the door of the container engaged with the L-shaped plate of the container taken along line VII-VII of FIG. 4.

[0022] FIG. 8 is a perspective view of a chassis holding an electronic system of the present invention with the wiring of the electronic system removed for clarity.

[0023] FIG. 9A is a front view of the chassis of the present invention with the wiring of the electronic system removed for clarity.

[0024] FIG. 9B is a side view of the chassis of the present invention with the wiring of the electronic system removed for clarity.

[0025] FIG. 10 is an electrical circuit diagram in block and schematic form of the present invention.

[0026] FIG. 11 is a perspective view of a low voltage detection unit of the present invention.

[0027] FIG. 12 is a top view of the low voltage detection unit of the present invention.

[0028] FIG. 13 is a block diagram illustrating a methodology for providing notification of a low voltage condition in the vehicle cleaning unit of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] For purposes of description herein, the terms "upper," "lower," "right," "left," "rear," "front," "vertical," "horizontal," and derivatives thereof shall relate to the invention as orientated in FIG. 1. However, it is to be understood that the invention may assume various alternative orientations, except where expressly specified to the contrary. It is also to be understood that the specific devices and processes illustrated in the attached drawings, and described in the following specification are simply exemplary embodiments of the inventive concepts defined in the appended claims. Hence, specific dimensions and other physical characteristics relating to the embodiments disclosed herein are not to be considered as limiting, unless the claims expressly state otherwise.

[0030] The reference number 10 (FIG. 1) generally designates a vehicle cleaning unit embodying the present invention. In the illustrated example, the vehicle cleaning unit 10 comprises a container 12 and at least one cleaning hose 14 connected to the container 12. The container 12 has a stock holding compartment 16, a servicing compartment 18 and a revenue compartment 20. The container 12 also includes at least three compartment doors 22 providing access to an interior of the container 12, with each compartment door 22 providing access to only one compartment of the container 12. Each compartment door 22 includes a lock 24 for locking the door 22 in a closed position, whereby the servicing compartment 18 can be accessed without allowing access to revenue in the revenue compartment 20. The vehicle cleaning unit 10 can also include a low voltage detection unit 26 (FIGS. 11 and 12) for notifying a low or zero voltage condition in the unit 10. The vehicle cleaning unit 10 can further include a circuitry chassis 28 (FIGS. 8-10) including circuitry 30 comprising a plurality of circuits 32. The chassis 28 further includes a plurality of indicators 34 that will illuminate when a circuit 32 associated with the indicator 34 is activated.

[0031] In the illustrated example, the container 12 (FIGS. 1-3) includes a rear cylindrical housing 36, a front rectangular housing 38 and a key-hole shaped top 40. The rear housing 36 comprises a vacuum chamber holding vacuum bags. As illustrated in FIG. 5, the rear housing 36 includes a top plate 42 located adjacent the top of the rear housing 36 separating the rear housing 36 into a top section 44 and a bottom section or receptacle 39. Three vacuum motors 46 are located on the top plate 42 and fluidly communicate with the bottom section of the rear housing 36. The vacuum motors as described in this application are commercially available from AMETEK Lamb Electric located in Kent, Ohio, under the part numbers 116757 and 116472. Preferably, the vacuum motors 46 include two Lamb Electric #116757 vacuum motors and one 116472 vacuum motor 46, although it is contemplated that any combination of vacuum motors may be used. Additionally, those skilled in the art will appreciate that other similarly functioning vacuum motors 46 may be used. Vacuum or filter bags are preferably located within the bottom section or receptacle 39 of the rear housing 36 and stop dirt, dust, etc. from entering the vacuum motors 46. The rear housing 36 also preferably includes a plurality of filter service doors 37 allowing easy access to the vacuum or filter bags located within the rear housing 36. The key-hole shaped top 40 fits over and covers the top of the cylindrical rear housing 36 and the rectangular front housing 38.

[0032] The illustrated rear housing 36 has a cylindrical tube 48 connected thereto communicating with the cleaning hose 14, which is shown as being a vacuum hose. The rear housing 36 works as a vacuum by activating the motors 46 in the top section 44, which will then fluidly communicate with the cleaning hose 14 to suck air into the bottom section of the rear housing 36 through the cylindrical tube 48, through the top plate 42, through the vacuum motors 46 and out the top of the top section 44. As discussed in more detail below, the rear section 36 can be used as a vacuum by running any number of the vacuum motors 46. The rear section 36, the vacuum motors 46 and the vacuum as described directly above are known to those skilled in the art.

[0033] In the illustrated example, the front housing 38 of the container 12 contains the stock holding compartment 16, the servicing compartment 18 and the revenue compartment 20. The front housing 38 includes a first side wall 50 and a second side wall 52, both of which extend along the entire height of the front housing 38. The stock holding compartment 16 is located at a bottom of the front housing 38 and is defined by a bottom plate 54, the first side wall 50, the second side wall 52, a portion of the rear housing 36 and the compartment door 22 enclosing the stock holding compartment 16. The servicing compartment 18 is located at a top of the front housing 38 and is defined by a top plate 58, the first side wall 50, the second side wall 52, a portion of the rear housing 36 and the compartment door 22 enclosing the servicing compartment 18.

[0034] The illustrated revenue compartment 20 is located between the stock holding compartment 16 and the servicing compartment 18. A revenue protection bucket 56 and the compartment door 22 enclosing the revenue compartment 20 define the revenue compartment 20. The revenue protection bucket 56 is located between the first side wall 50 and the second side wall 52 and defines a top of the stock holding

compartment 16 and a bottom of the servicing compartment 18. The revenue protection bucket 56 is spaced about 1 inch from the first side wall 50, the second side wall 52 and a portion of the rear housing 36 such that the revenue protection bucket 56 prevents a person from reaching an arm from the stock holding compartment 16 to the servicing compartment 18 or from the servicing compartment 18 to the stock holding compartment 16. Therefore, the revenue protection bucket 56 thereby effectively separates the stock holding compartment 16 from the servicing compartment 18. It is further contemplated that a plate may be located between each compartment, thereby separating the compartments.

[0035] In the illustrated example, the compartment doors 22 cover the stock holding compartment 16, the servicing compartment 18 and the revenue compartment 20. Each door 22 includes a plate 60 pivotally connected to the second side wall 52 by a hinge 61. The doors 22 are pivotable between an open position allowing access to the compartment associated with the door 22 and a closed position preventing access to the associated compartment. Each compartment door 22 also includes at least one lock 24 for locking the door 22 in a closed position. Preferably, the servicing door 22 and the stock door 22 include one lock 24 and the revenue door 22 includes a pair of locks 24, one adjacent a top of the plate 60 and one adjacent the bottom of the plate 60.

[0036] The illustrated locks 24 (FIGS. 6 and 7) selectively lock the doors 22 of the vehicle cleaning unit 10. The locks 24 include an L-shaped bracket 62, a rotatable key receiving housing 64 and a lock cam 66. The L-shaped bracket 62 includes a first plate 68 connected to the rear surface of the plate 60 of the associated door 22 and a lock tooth 70 extending at a right angle from the first plate 68. The rotatable key receiving housing 64 is connected to and extends through the first plate 68 of the L-shaped bracket 62. The rotatable key receiving housing 64 also extends through the plate 60 of the door 22 to allow a key to be inserted into the key receiving housing 64 to be able to rotate an inner cylinder 72 of the key receiving housing 64. The inner cylinder 72 extends from the key receiving housing 64 in a direction opposite to the first plate 68. The lock cam 66 is connected to the inner cylinder 72 and will rotate with the inner cylinder 72.

[0037] In the illustrated example, the doors 22 are rotated towards the container 12 to position the doors 22 in the closed position. As illustrated in FIG. 3, each compartment includes an L-shaped strike plate 74 extending from the first side wall 50 of the container 12. The L-shaped strike plate 74 includes a first leg 76 perpendicular to the first side wall 50 and a second leg 78 extending rearwardly and perpendicularly from the first leg 76. The first leg 76 of the L-shaped strike plate 74 includes a first slit 79 aligned with the lock tooth 70 of the L-shaped bracket 62 of the lock 24. As the door 22 is rotated towards the first leg 76 of the L-shaped strike plate 74, the lock tooth 70 of the L-shaped bracket 62 of the lock 24 will extend through the first slit 79 as illustrated in FIGS. 6 and 7. After the lock tooth 70 of the L-shaped bracket 62 of the lock 24 is inserted through the first slit 79, the inner cylinder 72 can be rotated with a key (not shown) to rotate the lock cam 66 of the lock 24 through a second slit 80 in the second leg 78 of the L-shaped strike plate 74. As the lock cam 66 is rotated through the second slit 80, a first slot 82 on the lock cam 66 will accept the lock

tooth **70** of the L-shaped bracket **62** of the lock **24** and a second slot **84** on the lock tooth **70** of the L-shaped bracket **62** will accept the lock cam **66** to positively lock the door **22** in the closed position. Although each compartment is shown as having an individual L-shaped strike plate **74**, it is contemplated that the L-shaped strike plate **74** could extend through each compartment. Since the lock **22** includes both the lock cam **66** and the lock tooth **70** of the L-shaped bracket **62**, the lock **22** will prevent access to the associated compartment because prying the first side wall **50** of the container **12** away from the door **22** (e.g., with a crowbar) will not disengage the lock **22**, and in particular the lock cam **66**, from the first side wall **50**.

[0038] In addition to the lock **24**, the first side wall **50** and the second side wall **52** preferably include a reinforcement rod **86** that fortifies the first side wall **50** and the second side wall **52** and thereby prevents vandalism of the container **12**. As illustrated in FIG. 5, the first side wall **50** and the second side wall **52** each include an L-shaped lip **88** extending inward and rearward from a front edge of the first side wall **50** and the second side wall **52**. The L-shaped lip **88** and the inside surface of the first side wall **50** and the second side wall **52** form a channel **90** configured to accept the reinforcement rod **86**. The reinforcement rod **86** is inserted into the channel **90** and extends from the top of the container **12** to the bottom of the container **12**. The reinforcement rod **86** is preferably made of 0.5 inch diameter stainless steel, although it is considered that the reinforcement rod **86** can be made of other materials. Additionally, although the reinforcement rod **86** is shown as having a circular cross-section, it is contemplated that the reinforcement rod **86** could have any geometric cross section, including circular, square, tubular, etc. The reinforcement rod **86** prevents vandalism by fortifying the first side wall **50** and the second side wall **52** adjacent the L-shaped strike plate **74** engaged with the lock **24** and thereby inhibits separation of the L-shaped strike plate **74** and the lock **24**. The reinforcement rod **86** also inhibits separation of the first side wall **50** and the doors **22** to prevent access to the compartments.

[0039] The illustrated stock holding compartment **16** of the vehicle cleaning unit **10** is adapted to hold cleaning supplies, stock material and can include a power line from a power source of the vehicle cleaning unit **10**. Although not shown, it is contemplated that the stock holding compartment could contain fragrance bottles having liquid fragrance therein. The liquid fragrance can be sprayed into a vehicle from the fragrance bottles through a tube in the bottles, a pump, an opening in the first side wall **50** through a fragrance hose and through a spray gun. The liquid fragrance can alternatively be connected directly from the fragrance bottles through a fragrance hose to a spray gun that sprays the fragrance through the spray gun using a venturi. Additionally or alternatively, the stock holding compartment **16** could contain cleansing bottles having a cleansing fluid therein. The cleansing fluid can be drawn from the cleansing bottles using a pump or a venturi and forced through a cleansing hose and a brush to clean spots from the carpet of the vehicle. It is contemplated that the vehicle cleaning unit **10** can contain any combination of one or more of a vacuum as described in detail above, a fragrance sprayer and a carpet cleaner. If the vacuum is not used, the container **12** does not need the rear cylindrical housing **36** as described above and it is contemplated that, even if the vacuum was used, the container **12** could have any configuration.

[0040] In the illustrated example, the revenue compartment **20** is used to collect the coins and dollars inserted into the vehicle cleaning unit **10**. The revenue compartment **20** includes a coin vault **92** and a paper money validator/stacker **94** fixedly connected to the revenue protection bucket **56**. The coin vault **92** is illustrated as being a rectangular box **96** having a coin door **98** and a coin door lock **100** for locking the coin door **98** to the rectangular box **96**. The paper money validator/stacker **94** is also fixedly connected to the revenue protection bucket **56** and includes a rectangular box **102** having a paper money door **104** and a paper money door lock **106** for locking the paper money door **104** to the rectangular box **102**. The paper money validator/stacker **94** as described in this application is commercially available from Mars Electronics International located in West Chester, Pa., under the part number VN 2512-U2EUS or VN 2512-U2MUS. Those skilled in the art will appreciate that other similarly functioning paper money validator/stackers may be used.

[0041] The illustrated door **22** for the revenue compartment **20** includes a paper money slot **107** aligned with an inlet **108** to the paper money stacker/validator **94**, a first coin slot **110** for accepting coins and a second coin slot **112** for the return of rejected coins. The door **22** for the revenue compartment **20** also includes a coin validator/accepter **114** connected to the rear face of the door **22**. The coin validator/accepter **114** includes an inlet aligned with the first coin slot **110** and adapted to accept coins. The coin validator/accepter **114** also includes a first outlet adapted to return unaccepted coins through the second coin slot **112**. Additionally, the coin validator/accepter **114** includes a second outlet aligned with a coin inlet **116** in the top surface of the rectangular box **96** of the coin vault **92**. When coins are accepted by the coin validator/accepter **114**, the coins will drop through the second outlet of the coin validator/accepter **114** and into the rectangular box **96** of the coin vault **92** through the coin inlet **116**. The coin validator/accepter **114** as described in this application is commercially available from Microsystems Controls Pty. Ltd. located in South Penrith, NSW 2750 Australia, under the name "Microcoin." Those skilled in the art will appreciate that other similarly functioning coin validator/accepters may be used.

[0042] In the illustrated example, the money in the revenue compartment **20** will have a double layer of protection from theft. First, the pair of locks **24** on the door **22** to the revenue compartment **20** will prevent unauthorized access to the interior of the revenue compartment **20**. Second, even if an unauthorized person were able to access the interior of the revenue compartment **20**, the coin door lock **100** and the paper money door lock **106** would prevent unauthorized access to the money within the revenue compartment **20**. It is contemplated that one key may be used to open the pair of locks **24** on the door **22**, the coin door lock **100** and the paper money door lock **106**. Alternatively, one key may be used to open the pair of locks **24** on the door **22** and one key may be used to open both the coin door lock **100** and the paper money door lock **106**. It is contemplated that any combination of keys could be used in the vehicle cleaning unit. For example, a different key could be required for each lock **24** in the doors **22** and a separate key for each of the coin door lock **100** and the paper money door lock **106**.

[0043] The illustrated door **22** to the revenue compartment **20** also preferably includes a top button **118** and a bottom

button **120** for running the vacuum motors **46**. In a preferred embodiment, if the bottom button **120** is depressed, a light **124** adjacent the bottom button **120** will illuminate and two of the vacuum motors **46** will be activated. If the top button **118** is depressed, a light **122** adjacent the top button **118** will illuminate and all three of the vacuum motors **46** will be activated.

[0044] In the illustrated example, the servicing compartment **18** includes a chassis **28** containing most of the electronic circuits used in the vehicle cleaning unit **10**. The chassis **28** includes a retaining plate **128** having a lower flange **130** and an upper flange **132**. The upper flange **132** includes a downwardly extending display section **134**. The chassis **28** is configured to be inserted into the servicing compartment **18**. The upper flange **132** of the chassis **28** includes a first connection **136** that electrically connects the circuitry **30** on the chassis **28** to the vacuum motors **46**. The upper flange **132** of the chassis **28** also includes a second connection **138** that electrically connects the circuitry **30** on the chassis **28** to a timer **144**. The upper flange **132** of the chassis **28** further includes a third connection **140** that electrically connects the circuitry **30** on the chassis **28** to the revenue door **22** and the components thereon and the paper money stacker/validator **94**. Additionally, the upper flange **132** of the chassis **28** includes a fourth connection **142** that electrically connects the circuitry **30** on the chassis **28** to dome lights (not shown). Furthermore, the chassis **28** includes a connection (not shown) configured to be connected to a mating connection (not shown) to a source of power within the servicing compartment **18**. The chassis **28** is connected to the container **12** by inserting the chassis **28** into the servicing compartment **18** and connecting the first connection **136**, the second connection **138**, the third connection **140** and the fourth connection **142** to a mating connection within the servicing compartment **18** and snapping the bottom of the chassis **28** into place. The source of power is then also connected to the chassis **28**. The chassis **28** includes a pair of inverted L-shaped flanges **131** extending off of the rear of the chassis **28** at the junction of the retaining plate **128** and the upper flange **132**. The chassis **28** is connected to the container **12** by inserting the chassis **28** into the servicing compartment **18**, sliding the chassis **28** downward such that the inverted L-shaped flanges **131** is inserted into a channel **133** defined on a rear wall **135** of the servicing compartment **18**, and screwing a pair of screws **137** on the bottom of the retaining plate **128** into mating openings **141** on the rear wall **135** of the servicing compartment **18**. Therefore, the source of power, the vacuum motors **46**, the top button **118**, the bottom button **120**, the paper money validator/stacker **94**, the coin validator/acceptor **114** and the timer **144** connected to the door **22** associated with the servicing compartment **140** are connected.

[0045] The illustrated chassis **28** includes the circuitry **30** comprising a plurality of circuits **32**. With reference to FIGS. 8-10, the chassis **28** further includes the plurality of indicators **34** that will illuminate when one of the circuits **32** associated with the indicator **34** malfunctions. FIG. 10 illustrates an electrical circuit diagram **143** in block and schematic form and shows the circuitry **30** of the vehicle cleaning unit **10**. According to the diagram of FIG. 10, the source of power of 120V A/C is connected to the circuitry **30** at an input **146** and an output **148**. As long as the source of power is connected to the circuitry **30** and operating properly, a main power indicator light **150** on the display

section **134** of the chassis **28** will illuminate. The source of power of 120V A/C also includes a 120V fuse **190** that includes a 120V fuse LED **192** that is illuminated when the 120V fuse **190** is blown. The 120V fuse **190** is preferably a commercially available fuse holder with an illuminated blown fuse indicator, although it is contemplated that the 120V fuse could be any indicator that provides a visual indication of a blown fuse. In the illustrated example, the source of power of 120V A/C is also connected to the three vacuum motors **46**. When the vehicle cleaning unit **10** is operating with the bottom button **120** on the door **22** of the revenue compartment **20** depressed and two of the vacuum motors **46** operating, a power vacuum mode indicator light **152** on the display section **134** of the chassis **28** as well as the light **124** adjacent the bottom button **120** on the door **22** of the revenue compartment **20** will illuminate. Likewise, when the vehicle cleaning unit **10** is operating with the top button **118** on the door **22** of the revenue compartment **20** depressed and three of the vacuum motors **46** operating, a mega vacuum mode indicator light **154** on the display section **134** of the chassis **28** as well as the light **122** adjacent the top button **118** on the door **22** of the revenue compartment **20** will illuminate. Each vacuum motor **46** also includes a fuse **156** in series with one of the vacuum motors **46**. The fuses **156** each include a fuse LED **158** that is illuminated when the fuse **156** in series with circuit **32** containing the particular vacuum motor **46** is blown. The fuse **156** are preferably a commercially available fuse holder with an illuminated blown fuse indicator, although it is contemplated that the fuses could be any indicator that provides a visual indication of a blown fuse. The fuse LED **158** is located on the chassis **28** on the structure of the fuse **156**. The source of power of 120V A/C is also connected to a pair of dome lights **160**.

[0046] In the illustrated example, a 1/2 step-down transformer **162** is connected to the source of power of 120V A/C to produce power of 24V A/C. The display section **134** of the chassis **28** includes a 24 voltage power indicator light **164** that illuminates to indicate the presence of 24V A/C available from the transformer **162**. The transformer **162** is also connected to a 24V fuse **166** that includes a 24V fuse LED **168** that is illuminated when the 24V fuse **166** is blown. The fuse LED **168** is located on the chassis **28** on the structure of the 24V fuse **166**. The 24V fuse **166** is preferably a commercially available fuse holder with an illuminated blown fuse indicator, although it is contemplated that the 24V fuse could be any indicator that provides a visual indication of a blown fuse.

[0047] The illustrated transformer **162** is also connected to the timer **144**. When using the vacuum of the vehicle cleaning unit **10**, using only two vacuum motors **46** includes a monetary charge of a set fee for a certain number of minutes for using the two vacuum motors **46** (e.g., 4 minutes for \$1.00). Additionally, using all three of the vacuum motors **46** also includes a monetary charge of a set fee for a certain number of minutes for using the three vacuum motors **46**, with the set fee being larger than the fee for using only two vacuum motors **46** (e.g., 2 minutes for \$1.00). The timer **144** calculates the amount of time left when a user of the vehicle cleaning unit **10** switches between two and three vacuum motors **46** by pressing the top button **118** and the bottom button **120** on the door **22** of the revenue compartment **20**. The process of calculating the amount of time left for the user is disclosed in U.S. Pat. No. 5,371,681, entitled

“METHOD OF DISPLAYING VENDING PERIODS OF TIME,” the entire contents of which are hereby incorporated herein by reference. The timer **144** preferably includes a box **170** held to the rear face of the door **22** enclosing the servicing compartment **18** by hook brackets **172** (see FIG. 1). The box **170** as described in this application is commercially available from IDX, Inc. located in El Dorado, Ark., under the part name BT902 Big Two Timer Multi-Event Timer with Digital Display. Those skilled in the art will appreciate that other similarly functioning timers may be used. The timer **144** includes a digital display **174** that displays the time remaining. The timer **144** also includes a timer fuse **194** that includes a timer fuse LED **196** that is illuminated when the timer fuse **194** is blown. The timer fuse LED **196** is located on the chassis **28** on the structure of the fuse **194**. The timer fuse **194** is preferably a commercially available fuse holder with an illuminated blown fuse indicator, although it is contemplated that the timer fuse could be any indicator that provides a visual indication of a blown fuse.

[0048] In the illustrated example, the timer **144** is connected to a first solid state relay **176** that powers the vehicle cleaning unit **10** to use only two vacuum motors **46** and a second solid state relay **178** that powers the vehicle cleaning unit **10** to use all three vacuum motors **46**. The transformer **162** is connected to both the first solid state relay **176** and the second solid state relay **178**. The display section **134** of the chassis **28** includes a timer output indicator light **180** that illuminates and shows that energy is passing from the timer **144** to a switch (buttons **118** and **120**) that chooses between the first solid state relay **176** and the second solid state relay **178**. The display section **134** of the chassis **28** also includes a power vacuum indicating light **180** that indicates energy from the timer **144** to the first solid state relay **176** for powering only two vacuum motors **46**. However, when the second solid state relay **178** is selected, the power vacuum indicating light **180** will stay on, and a premium service coil activity light **184** and premium service indicator **182** will illuminate that indicate that the second solid state relay **178** is selected. The premium service coil activity light **184** is located on a control relay **185** that provides power to the lights **122** and **124**, switches neutral leg of the control circuit of the second solid state relay **178** to neutral side of transformer **162** when the three vacuum motors **46** are activated, switches a “two time” circuit of timer **144** to neutral, and that provides power to remain in a closed position when it is energized. The first solid state relay **176** also includes a first relay coil activity status light **188** that indicates that the first solid state relay **176** is energized and the second solid state relay **178** includes a second relay coil activity status light **186** that indicates that the second solid state relay **178** is energized.

[0049] The illustrated chassis **28** also includes a coin counter **200** that displays the number of coins and a coin counter reset key switch **202** that resets the coins counted by the coin counter **200** to zero. The chassis **28** also includes a low voltage circuit reset button **204** that will reset the timer **144**, the paper money validator/stacker **94** and the coin validator/acceptor **114** without interrupting the power to the transformer **162** (i.e., the 24 voltage power indicator light **164** will stay illuminated). Furthermore, the chassis **28** includes connections to the low voltage detection unit **26**.

[0050] In the illustrated example, the low voltage detection unit **26** (FIGS. 11 and 12) will detect the voltage from the source of power of 120V A/C and will notify a low or zero voltage condition in the unit **10**. The low voltage detection unit **26** includes a box **300** having a first line in connection **302** and a second line in connection **304**. The first line in connection **302** and the second line in connection **304** connect the low voltage detection unit **26** to the source of power 120V A/C in parallel. The low voltage detection unit **26** also includes a ground connection **306**. The low voltage detection unit **26** includes a mounting hole **308** allowing the low voltage detection unit **26** to be connected to the container **12**. The low voltage detection unit **26** measures the voltage of the source of power going to the vehicle cleaning unit **10**.

[0051] The illustrated low voltage detection unit **26** of the present invention measures the voltage of the source of power going to the vehicle cleaning unit **10** and provides notification of a low voltage condition in a vehicle cleaning unit **10**. Referring to FIG. 13, a method **310** of measuring a voltage and providing notification of a low voltage condition is shown. Beginning at decision step **312** of the method **310** of measuring a voltage and providing notification of a low voltage condition, the voltage input through the first line in connection **302** and the second line in connection **304** is measured to determine whether the voltage is below a predetermined threshold. The low voltage detection unit **26** includes a threshold voltage adjustment screw **314** that allows a user of the low voltage detection unit **26** to set the predetermined threshold. Preferably, the threshold voltage adjustment screw **314** is connected to a potentiometer as is known to one of ordinary skill in the art and allows the user to set the predetermined threshold between 90 and 105 volts A/C. Most preferably, the threshold is set at 103 volts A/C, although it is contemplated that any threshold could be set. Once the voltage as measured in decision step **312** drops below the predetermined threshold, the method **310** of measuring a voltage and providing notification of a low voltage condition will proceed to decision step **316**.

[0052] At decision step **316** in the method **310** of measuring a voltage and providing notification of a low voltage condition, the voltage input through the first line in connection **302** and the second line in connection **304** is measured to determine whether the voltage is below the predetermined threshold for a predetermined period of time of consecutive seconds. The predetermined period of time is preferably set at 10 sections, although it is contemplated that the time could be set for any period of time. Additionally, it is contemplated that the low voltage detection unit **26** could include a time adjustment screw that allows a user of the low voltage detection unit **26** to set the predetermined time. Once the voltage as measured in decision step **312** drops below the predetermined threshold for the predetermined time as measured in decision step **316**, the method **310** of measuring a voltage and providing notification of a low voltage condition will proceed to step **320**. However, if the voltage does not drop below the predetermined threshold for the predetermined period of time, the method **310** will proceed back to step **312** to once again measure the voltage to determine if the voltage drops below the predetermined threshold.

[0053] Once the voltage has dropped below the predetermined threshold as measured in step **312** for the predeter-

mined period of time as measured in step 316, the low voltage detection unit 26 will activate a low voltage detection light 322 on the display section 134 of the chassis 28 (see FIG. 9) and will store a low voltage alarm state in non-volatile memory at step 320. The non-volatile memory preferably includes a register that is shown as being either closed (low voltage alarm state) or open (no low voltage alarm state). The low voltage detection light 322 is connected to the box 300 of the low voltage detection unit 26 through a pair of terminals 324 extending from the top of the box 300. Therefore, a low voltage alarm condition is logged if the voltage is non-zero and below a predetermined threshold for a predetermined period of time.

[0054] The low voltage detection light 322 on the display section 134 of the chassis 28 will continue to stay illuminated and the low voltage alarm state will continue to reside in the nonvolatile memory, even after the voltage has risen above the predetermined threshold, until a voltage measuring reset switch 326 is closed at decision step 328. The voltage measuring reset switch 326 is located on the display section 134 of the chassis 28 (see FIG. 9) and is connected to the box 300 of the low voltage detection unit 26 through a pair of terminals 330 extending from the top of the box 300. Once the voltage measuring reset switch 326 has been closed in step 328, the low voltage detection light 322 will turn off and the low voltage alarm state will be cleared from the non-volatile memory at step 332.

[0055] In the illustrated example, in addition to measuring low voltage, the method 310 of measuring a voltage and providing notification of a low voltage condition will measure the voltage input through the first line in connection 302 and the second line in connection 304 to determine whether the voltage is zero at step 334. If the voltage as measured through the first line in connection 302 and the second line in connection 304 is zero, the low voltage detection unit 26 will activate a zero voltage detection light 336 on the display section 134 of the chassis 28 (see FIG. 9) and will store a zero voltage alarm state in non-volatile memory at step 338. The non-volatile memory preferably includes a register that is shown as being either closed (zero voltage alarm state) or open (no zero voltage alarm state). The zero voltage detection light 336 is connected to the box 300 of the low voltage detection unit 26 through a pair of terminals 340 extending from the top of the box 300. Therefore, a zero voltage alarm condition is logged if the voltage is zero.

[0056] The zero voltage detection light 336 on the display section 134 of the chassis 28 will continue to stay illuminated and the zero voltage alarm state will continue to reside in the nonvolatile memory, even after the voltage has risen above zero, until the voltage measuring reset switch 326 is closed at decision step 328. Once the voltage measuring reset switch 326 has been closed in step 328, the zero voltage detection light 336 will turn off and the zero voltage alarm state will be cleared from the non-volatile memory at step 332. The voltage measuring reset switch 236 only turns off the lights and clears the alarm state memory, the reset switch 236 does not reset the entire process (i.e., steps 312, 316, 320, 334 and 338 will run continuously regardless of the closing of the voltage measuring reset switch 326). Additionally, the lights and the alarm state memory are preferably powered by the main power to the system and therefore the lights are not lit during a total power loss, but they will be lit once the power resumes.

[0057] In the above described method 310 of measuring a voltage and providing notification of a low voltage condition, the low voltage detection light 322 and the zero voltage detection light 336 will stay illuminated even after the conditions that caused the lights to be illuminated has passed. Additionally, the low voltage alarm condition and the zero voltage alarm condition will stay in the non-volatile memory even after the conditions that caused the lights to be illuminated has passed. Therefore, a person servicing the vehicle cleaning unit 10 will be able to determine that either the low voltage condition or the zero voltage condition was present and thereby allow the person servicing the vehicle cleaning unit 10 to take steps to prevent their reoccurrence (e.g., removing a drain on the source of power that is in series with the vehicle cleaning unit). Although the low voltage detection unit 26 is described above as being in the box 300, it is contemplated that any device could be used to measure a voltage and providing notification of a low voltage condition.

[0058] In the vehicle cleaning unit 10 of the present invention, the revenue in the revenue compartment 20 remains safe behind a redundant locking system of the lock 24 of the door 22 and the coin door lock 100 and the paper money door lock 106. Additionally, the container 12 will be difficult to vandalize in order to obtain the revenue in the revenue compartment 20 by prying the first side wall 50 and the second side wall 52 of the container 12 away from the revenue door 22 because the reinforcement rod 86 will fortify the container. Additionally, the revenue in the revenue compartment 20 will not be accessible by a person servicing or stocking the vehicle cleaning unit because they will only have access to the service compartment 18 and the stock holding compartment 16 through the service door 22 and the stock holding door 22. Furthermore, the chassis 28 allows the person servicing the vehicle cleaning unit 20 to easily determine the malfunction in the circuitry 30 and fix the malfunction.

[0059] In the forgoing description, it will be readily appreciated by those skilled in the art that modifications may be made to the invention without departing from the concepts disclosed herein. For example, although LEDs and lamps are illustrated in the Figures and discussed herein, either LEDs or lamps can be used interchangeably. Such modifications are to be considered as included in the following claims, unless these claims by their language expressly state otherwise.

We claim:

1. A vehicle cleaning unit comprising:

a container having a stock holding compartment, a servicing compartment and a revenue compartment;

at least one vehicle cleaning hose connected to the container;

the container including at least three compartment doors providing access to an interior of the container, with each compartment door providing access to only one compartment of the container;

each compartment door including a lock for locking the door in a closed position to enclose the compartment.

2. The vehicle cleaning unit of claim 1, wherein:

the at least one vehicle cleaning hose further comprises a vacuum hose.

3. The vehicle cleaning unit of claim 2, wherein:

the container includes at least one vacuum motor fluidly connected to the vacuum hose.

4. The vehicle cleaning unit of claim 3, wherein:

the at least one vacuum motor comprises three vacuum motors.

5. The vehicle cleaning unit of claim 4, wherein:

the compartment door for the revenue compartment includes a first button and a second button;

two of the vacuum motors are activated when the first button is pressed; and

three of the vacuum motors are activated when the second button is pressed.

6. The vehicle cleaning unit of claim 8, wherein:

the at least one vehicle cleaning hose comprises a vacuum hose.

7. The vehicle cleaning unit of claim 6, wherein:

the container includes a vacuum motor connected to the vacuum hose.

8. The vehicle cleaning unit of claim 1, wherein:

the revenue compartment includes a coin vault and a paper money stacker; and

the compartment door providing access to the revenue compartment includes a coin slot and a paper money slot.

9. The vehicle cleaning unit of claim 8, wherein:

the coin vault is fixed to the container and includes a coin door, with the coin door including a lock providing selective access to an interior of the coin vault for retrieval of coins therein.

10. The vehicle cleaning unit of claim 9, wherein:

the paper money stacker is fixed to the container and includes a paper money door, with the paper money door including a lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein.

11. The vehicle cleaning unit of claim 8, wherein:

the paper money stacker is fixed to the container and includes a paper money door, with the paper money door including a lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein.

12. The vehicle cleaning unit of claim 1, wherein:

the container includes at least one panel having a slit therein;

the locks include a lock cam having a first slot and a receiving plate having a second slot; and

the lock cam is adapted to be inserted into one of the slits and the first slot is adapted to be engaged with the second slot to lock a respective one of the compartment doors in the closed position.

13. The vehicle cleaning unit of claim 12, wherein:

the lock cam of each of the locks is adapted to rotate into engagement with the receiving plate when the respective compartment door is in the closed position.

14. The vehicle cleaning unit of claim 1, wherein:

the compartments are vertically stacked.

15. The vehicle cleaning unit of claim 1, wherein:

the servicing compartment includes circuitry for the vehicle cleaning unit thereon, the servicing compartment further including a plurality of indicators;

the circuitry for the vehicle cleaning unit includes a plurality of circuits, with each circuit being connected to one of the indicators; and

an individual indicator will give a visual indication when the circuit associated with the indicator is activated.

16. The vehicle cleaning unit of claim 15, wherein:

the circuitry and the indicators are positioned on a chassis removably located within the servicing compartment.

17. The vehicle cleaning unit of claim 16, wherein:

the indicators are LEDs.

18. The vehicle cleaning unit of claim 1, further including:

a low voltage detection unit for sensing a voltage of a source of power of the vehicle cleaning unit;

wherein the low voltage detection unit logs a low voltage alarm condition if the voltage is non-zero and below a predetermined threshold for a predetermined period of time; and

wherein the low voltage detection unit logs a zero voltage alarm condition if the voltage is zero.

19. The vehicle cleaning unit of claim 18, wherein:

the low voltage detection unit includes memory and a notification signal;

the low voltage detection unit logs the low voltage alarm condition by activating the notification signal and storing a low voltage alarm signal in the memory;

and the low voltage detection unit logs the zero voltage alarm condition by activating the notification signal and storing a zero voltage alarm signal in the memory of the low voltage detection unit.

20. The vehicle cleaning unit of claim 19, wherein:

the low voltage detection unit includes a reset switch configured to turn off the notification signal and clear the memory of the low voltage detection unit when the reset switch is activated.

21. The vehicle cleaning unit of claim 20, wherein:

the notification signal includes an LED.

22. The vehicle cleaning unit of claim 1, wherein:

the container includes an L-shaped flange adjacent each side of the compartment doors when the compartment doors are in the closed position.

23. The vehicle cleaning unit of claim 22, wherein:

the container includes a reinforcement rod located between an outer side of the container and the L-shaped flange for fortifying the L-shaped flange to prevent vandalism of the container.

24. A vehicle cleaning unit comprising:

a container having a servicing compartment adapted to contain cleaning components therein and a revenue compartment adapted to hold revenue;

a vacuum hose connected to the container;

the container including a vacuum motor functionally connected to the vacuum hose and a receptacle adapted to collect items vacuumed into the receptacle through the vacuum hose;

the container including a servicing door providing access to an interior of the servicing compartment, the servicing door including a servicing door lock for locking the servicing door in a closed position to enclose the servicing compartment;

the container further including a revenue door providing access to an interior of the revenue compartment, the revenue door including a revenue door lock for locking the revenue door in a closed position to enclose the revenue compartment;

whereby the servicing compartment can be accessed without allowing access to the revenue in the revenue compartment.

25. The vehicle cleaning unit of claim 24, wherein:

the revenue compartment includes a coin vault and a paper money stacker; and

the revenue door includes a coin slot aligned with the coin vault and a paper money slot aligned with the paper money stacker.

26. The vehicle cleaning unit of claim 25, wherein:

the coin vault is fixed to the container and includes a vault door, with the vault door including a vault lock providing selective access to an interior of the coin vault for retrieval of coins therein, thereby providing a double level of security for access to the coins in the container.

27. The vehicle cleaning unit of claim 26, wherein:

the paper money stacker is fixed to the container and includes a stacker door, with the stacker door including a stacker lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein, thereby providing a double level of security for access to the paper money in the container.

28. The vehicle cleaning unit of claim 25, wherein:

the paper money stacker is fixed to the container and includes a stacker door, with the stacker door including a stacker lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein, thereby providing a double level of security for access to the paper money in the container.

29. The vehicle cleaning unit of claim 24, wherein:

the container further includes a stock holding compartment;

the container also including a stock door providing access to an interior of the stock holding compartment, the stock door including a stock door lock for locking the stock door in a closed position to enclose the stock compartment.

30. The vehicle cleaning unit of claim 24, wherein:

the container includes at least one panel having a slit therein;

the locks include a lock cam having a first slot and a receiving plate having a second slot; and

the lock cam is adapted to be inserted into one of the slits and the first slot is adapted to be engaged with the second slot to lock a respective one of the compartment doors in the closed position.

31. The vehicle cleaning unit of claim 30, wherein:

the lock cam of each of the locks is adapted rotate into engagement with the receiving plate when the respective compartment door is in the closed position.

32. The vehicle cleaning unit of claim 24, wherein:

the compartments are vertically stacked.

33. The vehicle cleaning unit of claim 24, wherein:

the servicing compartment includes circuitry for the vehicle cleaning unit thereon, the servicing compartment further including a plurality of indicators;

the circuitry for the vehicle cleaning unit includes a plurality of circuits, with each circuit being connected to one of the indicators; and

an individual indicator will give a visual indication when the circuit associated with the indicator is activated.

34. The vehicle cleaning unit of claim 33, wherein:

the circuitry and the indicators are positioned on a chassis removably located within the servicing compartment.

35. The vehicle cleaning unit of claim 34, wherein:

the indicators are LEDs.

36. The vehicle cleaning unit of claim 24, further including:

a low voltage detection unit for sensing a voltage of a source of power of the vehicle cleaning unit;

wherein the low voltage detection unit logs a low voltage alarm condition if the voltage is non-zero and below a predetermined threshold for a predetermined period of time; and

wherein the low voltage detection unit logs a zero voltage alarm condition if the voltage is zero.

37. The vehicle cleaning unit of claim 36, wherein:

the low voltage detection unit includes memory and a notification signal;

the low voltage detection unit logs the low voltage alarm condition by activating the notification signal and storing a low voltage alarm signal in the memory;

and the low voltage detection unit logs the zero voltage alarm condition by activating the notification signal and storing a zero voltage alarm signal in the memory of the low voltage detection unit.

38. The vehicle cleaning unit of claim 37, wherein:

the low voltage detection unit includes a reset switch configured to turn off the notification signal and clear the memory of the low voltage detection unit when the reset switch is activated.

39. The vehicle cleaning unit of claim 38, wherein:

the notification signal includes an LED.

40. The vehicle cleaning unit of claim 24, wherein:

the container includes an L-shaped flange adjacent each side of the compartment doors when the compartment doors are in the closed position.

41. The vehicle cleaning unit of claim 40, wherein:

the container includes a reinforcement rod located between an outer side of the container and the L-shaped flange for fortifying the L-shaped flange to prevent vandalism of the container.

42. A method of providing notification of a low voltage condition in a vehicle cleaning unit having a container with a vacuum motor within the container for providing a sucking force to a vehicle cleaning hose connected to the container, the method comprising:

connecting a source of motor power to the vehicle cleaning unit;

connecting a low voltage detection unit to the source of power, the low voltage detection unit having a reset switch, memory and a notification signal;

measuring a voltage of the source of power;

activating the notification signal and storing a low voltage alarm signal in the memory of the low voltage detection unit if the voltage is non-zero and below a predetermined threshold for a predetermined period of time;

activating the notification signal and storing a zero voltage alarm signal in the memory of the low voltage detection unit if the voltage is zero;

turning off the notification signal and clearing the memory of the low voltage detection circuit if the reset switch is triggered.

43. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 42, further including:

providing the vehicle cleaning unit with a container having a servicing compartment adapted to contain cleaning components therein and a revenue compartment adapted to hold revenue;

connecting the vehicle cleaning hose to the container;

fluidly connecting the vacuum motor to the vacuum hose and to a receptacle adapted to collect items vacuumed into the receptacle through the vacuum hose;

providing a servicing door adapted to allow access to an interior of the servicing compartment, the servicing door including a servicing door lock for locking the servicing door in a closed position to enclose the servicing compartment; and

providing a revenue door adapted to allow access to an interior of the revenue compartment, the revenue door including a revenue door lock for locking the revenue door in a closed position to enclose the revenue compartment;

whereby the servicing compartment can be accessed without allowing access to the revenue in the revenue compartment.

44. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 43, further including:

providing the revenue compartment with a coin vault and a paper money stacker; and

providing the revenue door with a coin slot aligned with the coin vault and a paper money slot aligned with the paper money stacker.

45. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 44, further including:

fixing the coin vault to the container; and

providing the coin vault with a vault door, with the vault door including a vault lock providing selective access to an interior of the coin vault for retrieval of coins therein, thereby providing a double level of security for access to the coins in the container.

46. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 45, further including:

fixing the paper money stacker to the container; and

providing the paper money stacker with a stacker door, with the stacker door including a stacker lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein, thereby providing a double level of security for access to the paper money in the container.

47. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 44, further including:

fixing the paper money stacker to the container; and

providing the paper money stacker with a stacker door, with the stacker door including a stacker lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein, thereby providing a double level of security for access to the paper money in the container.

48. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 43, further including:

providing the container further includes a stock holding compartment;

providing a stock door adapted to allow access to an interior of the stock holding compartment; and

providing a stock door lock for locking the stock door in a closed position to enclose the stock compartment.

49. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 43, further including:

providing the container with at least one panel having a slit therein;

providing the locks with a lock cam having a first slot and a receiving plate having a second slot; and

locking a respective one of the compartment doors in a closed position by inserting the lock cam into one of the slits and the first slot, and engaging the first slot with the second slot.

50. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 49, wherein:

the step of locking a respective one of the compartment doors in the closed position includes rotating the lock cam into engagement with the receiving plate.

51. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 43, wherein:

the compartments are vertically stacked.

52. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 43, wherein:

the container includes an L-shaped flange adjacent each side of the compartment doors when the compartment doors are in the closed position.

53. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 52, wherein:

the container includes a reinforcement rod located between an outer side of the container and the L-shaped flange for fortifying the L-shaped flange to prevent vandalism of the container.

54. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 42, further including:

providing circuitry for the vehicle cleaning unit;

connecting indicators to circuits of the circuitry;

providing an visual indication when the circuit associated with the one of the indicator is activated.

55. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 54, further including:

positioning the circuitry and the indicators on a chassis removably located within the vehicle cleaning unit.

56. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 55, wherein:

the indicators are LEDs.

57. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 42, wherein:

the notification signal includes an LED.

58. A method of providing notification of a low voltage condition in a vehicle cleaning unit having a container with a pump and/or vacuum motor within the container for cleaning a vehicle, the method comprising:

providing a source of power to the vehicle cleaning unit for powering the motor;

sensing a voltage of the source of power;

logging a low voltage alarm condition if the voltage is non-zero and below a predetermined threshold for a predetermined period of time; and

logging a zero voltage alarm condition if the voltage is zero.

59. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 58, further including:

providing the vehicle cleaning unit with a container having a servicing compartment adapted to contain cleaning components therein and a revenue compartment adapted to hold revenue;

connecting the vehicle cleaning hose to the container;

fluidly connecting the vacuum motor to the vacuum hose and to a receptacle adapted to collect items vacuumed into the receptacle through the vacuum hose;

providing a servicing door adapted to allow access to an interior of the servicing compartment, the servicing door including a servicing door lock for locking the servicing door in a closed position to enclose the servicing compartment; and

providing a revenue door adapted to allow access to an interior of the revenue compartment, the revenue door including a revenue door lock for locking the revenue door in a closed position to enclose the revenue compartment;

whereby the servicing compartment can be accessed and the cleaning components serviced without allowing access to the revenue in the revenue compartment.

60. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 59, further including:

providing the revenue compartment with a coin vault and a paper money stacker; and

providing the revenue door with a coin slot aligned with the coin vault and a paper money slot aligned with the paper money stacker.

61. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 60, further including:

fixing the coin vault to the container; and

providing the coin vault with a vault door, with the vault door including a vault lock providing selective access to an interior of the coin vault for retrieval of coins therein, thereby providing a double level of security for access to the coins in the container.

62. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 61, further including:

fixing the paper money stacker to the container; and

providing the paper money stacker with a stacker door, with the stacker door including a stacker lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein, thereby providing a double level of security for access to the paper money in the container.

63. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 60, further including:

fixing the paper money stacker to the container; and

providing the paper money stacker with a stacker door, with the stacker door including a stacker lock providing selective access to an interior of the paper money stacker for retrieval of paper money therein, thereby providing a double level of security for access to the paper money in the container.

64. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 59, further including:

providing the container with a stock holding compartment;

providing a stock door adapted to allow access to an interior of the stock holding compartment; and

providing a stock door lock for locking the stock door in a closed position to enclose the stock compartment.

65. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 59, further including:

providing the container with at least one panel having a slit therein;

providing the locks with a lock cam having a first slot and a receiving plate having a second slot; and

locking a respective one of the compartment doors in a closed position by inserting the lock cam into one of the slits and the first slot, and engaging the first slot with the second slot.

66. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 65, wherein:

the step of locking a respective one of the compartment doors in the closed position includes rotating the lock cam into engagement with the receiving plate.

67. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 59, wherein:

the compartments are vertically stacked.

68. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 59, wherein:

the container includes an L-shaped flange adjacent each side of the compartment doors when the compartment doors are in the closed position.

69. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 68, wherein:

the container includes a reinforcement rod located between an outer side of the container and the L-shaped flange for fortifying the L-shaped flange to prevent vandalism of the container.

70. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 58, further including:

providing circuitry for the vehicle cleaning unit;

connecting indicators to circuits of the circuitry;

providing a visual indication when the circuit associated with the one of the indicator is activated.

71. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 70, further including:

positioning the circuitry and the indicators on a chassis removably located within the vehicle cleaning unit.

72. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 71, wherein:

the indicators are LEDs.

73. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 58, wherein:

the step of logging a low voltage alarm condition includes activating a notification signal and storing a low voltage signal in memory of the low voltage detection unit.

74. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 73, wherein:

the step of logging a zero voltage alarm condition includes activating a notification signal and storing a zero voltage signal in memory of the low voltage detection unit.

75. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 74, wherein:

the memory is non-volatile.

76. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 74, wherein:

the notification signal includes an LED.

77. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 58, wherein:

the step of logging a zero voltage alarm condition includes activating a notification signal and storing a zero voltage signal in memory of the low voltage detection unit.

78. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 77, wherein:

the memory is non-volatile.

79. The method of providing notification of a low voltage condition in a vehicle cleaning unit of claim 77, wherein:

the notification signal includes an LED.

80. A vehicle cleaning unit comprising:

a container having a machine circuitry compartment including a chassis with circuitry for the vehicle cleaning unit thereon, the chassis further including a plurality of indicators; and

a vacuum hose connected to the container;

the container including a vacuum motor functionally connected to the vacuum hose and a receptacle adapted to collect items vacuumed into the receptacle through the vacuum hose;

wherein the circuitry for the vehicle cleaning unit includes a plurality of circuits, with each circuit being connected to one of the indicators; and

wherein an individual indicator provides a visual indication when the circuit associated with the indicator is activated.

81. A method of providing notification of a low voltage condition in a vehicle cleaning unit having a container with a pump and/or vacuum motor within the container for cleaning a vehicle, the method comprising:

providing a circuitry chassis for the vehicle cleaning unit, the chassis including circuitry for the vehicle cleaning unit thereon, the circuitry for the vehicle cleaning unit includes a plurality of circuits, the chassis further including a plurality of indicators;

connecting each circuit to one of the indicators; and

providing visual indication when the circuit associated with the indicator is activated.

82. A vehicle cleaning unit comprising:
a container having at least one door providing access to an interior of the container;
at least one vehicle cleaning hose connected to the container;
each door including a lock for locking the door in a closed position to enclose the compartment;

the container includes an L-shaped flange adjacent each side of the door when the doors are in the closed position; and
the container includes a reinforcement rod located between an outer side of the container and the L-shaped flange for fortifying the L-shaped flange to prevent vandalism of the container.

* * * * *