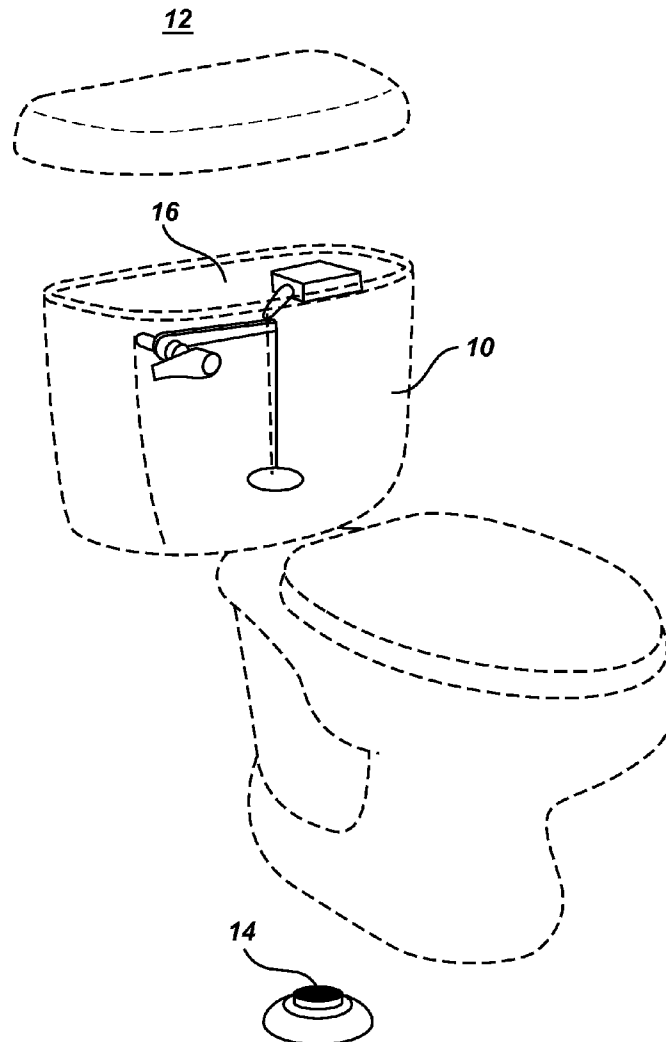


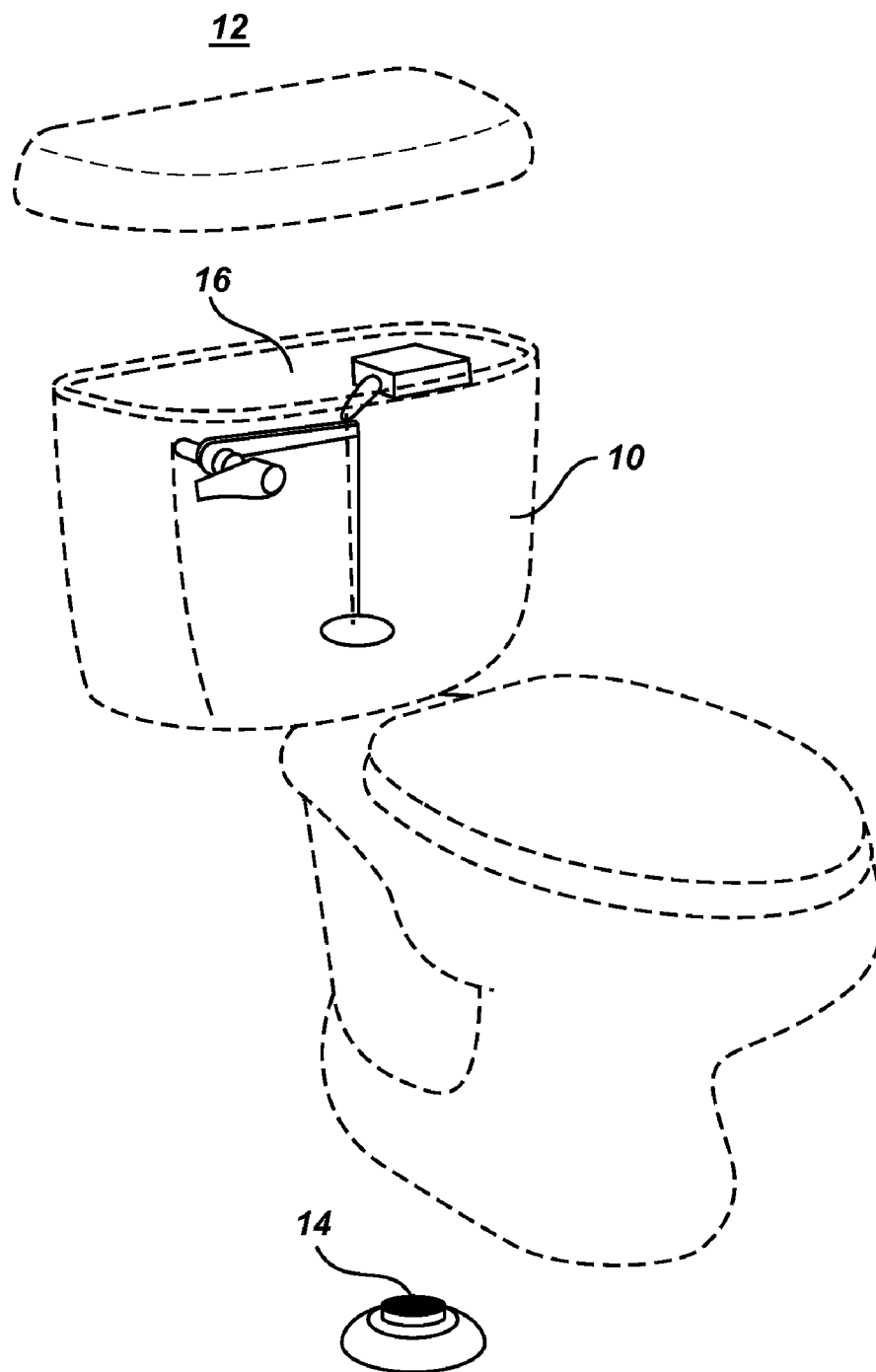


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(19) **United States**(12) **Patent Application Publication**  
**Hogues, JR.**(10) **Pub. No.: US 2009/0235444 A1**(43) **Pub. Date: Sep. 24, 2009**(54) **CORDLESS PEDAL FLUSH SYSTEM FOR A  
TANK-TYPE TOILET**(76) Inventor: **Herman Holt Hogues, JR., (US)**Correspondence Address:  
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**New Orleans, LA 70118 (US)**(21) Appl. No.: **12/053,559**(22) Filed: **Mar. 22, 2008****Publication Classification**(51) **Int. Cl.**  
**E03D 5/00** (2006.01)(52) **U.S. Cl.** ..... **4/405**(57) **ABSTRACT**

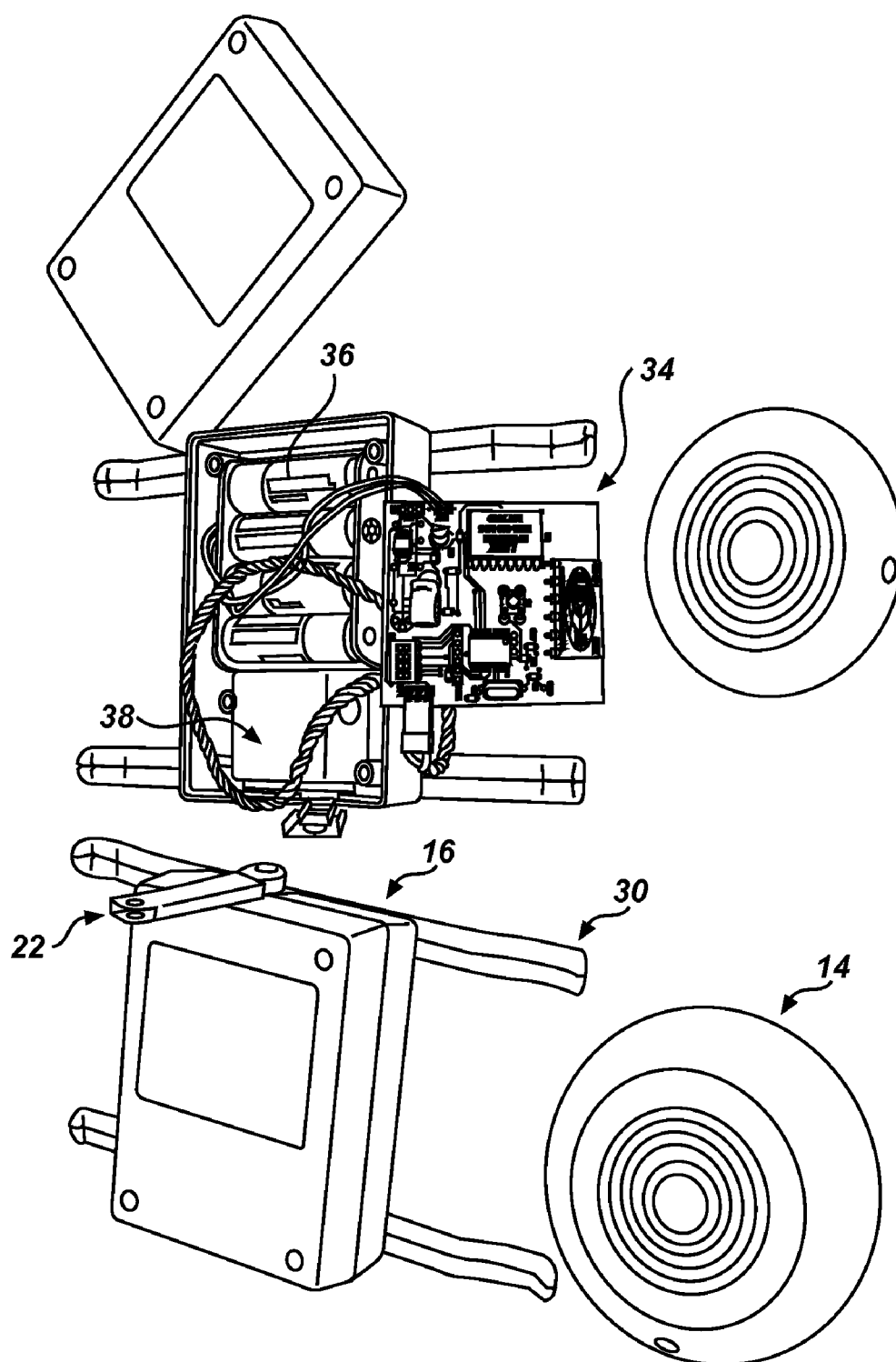
Apparatus and method for a cordless pedal flush system **12** for a tank-type toilet **10**, employing a floor-positioned RF foot pedal transmitter actuator **14** and a tank-mounted RF receiver flusher actuator **16** installed within the tank. The RF receiver flusher actuator **16** operates independently of the manual flush handle lever **24** employed on most tank-type toilets. The system is powered by its own self-contained DC power source and when activated causes a flushing of the toilet. The system is activated when the user depresses and releases, with the foot, a push button foot switch **20** employed on the RF foot pedal transmitter actuator **14**. This action will initiate a toilet flush without the act of touching the flush handle with the hand. Once the RF foot pedal transmitter actuator **14** is activated, it transmits an RF coded command signal to the RF receiver flusher actuator **16**. Once the code is validated by the RF receiver flusher circuit, the RF receiver flusher actuator **16** activates and pivots upwards the connecting automatic flush lever **22** to raise a flapper valve **26** connected via chain from the valve seat of the tank-type toilet **10** causing the toilet to flush. The cordless pedal flush system **12** also allows for the normal manual hand flush.



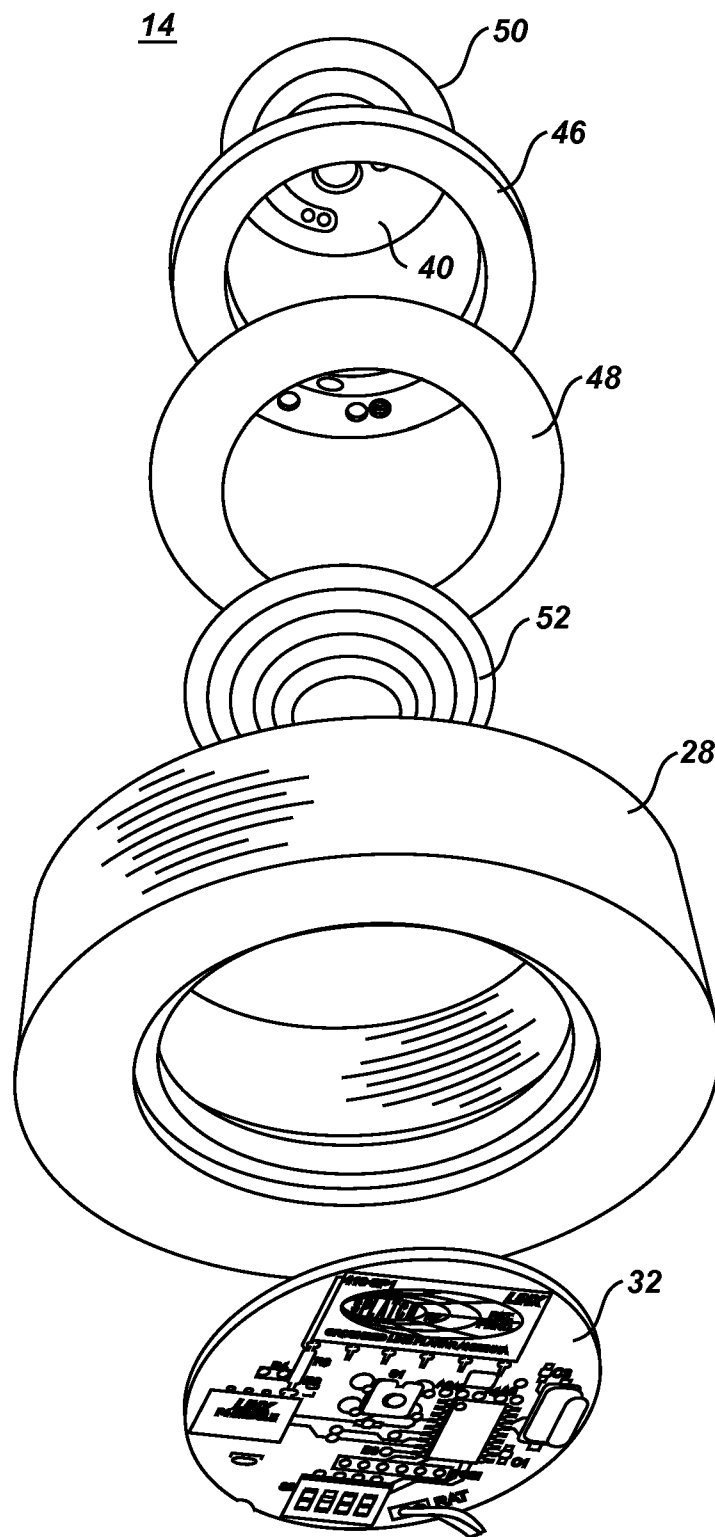


**Fig. 1**

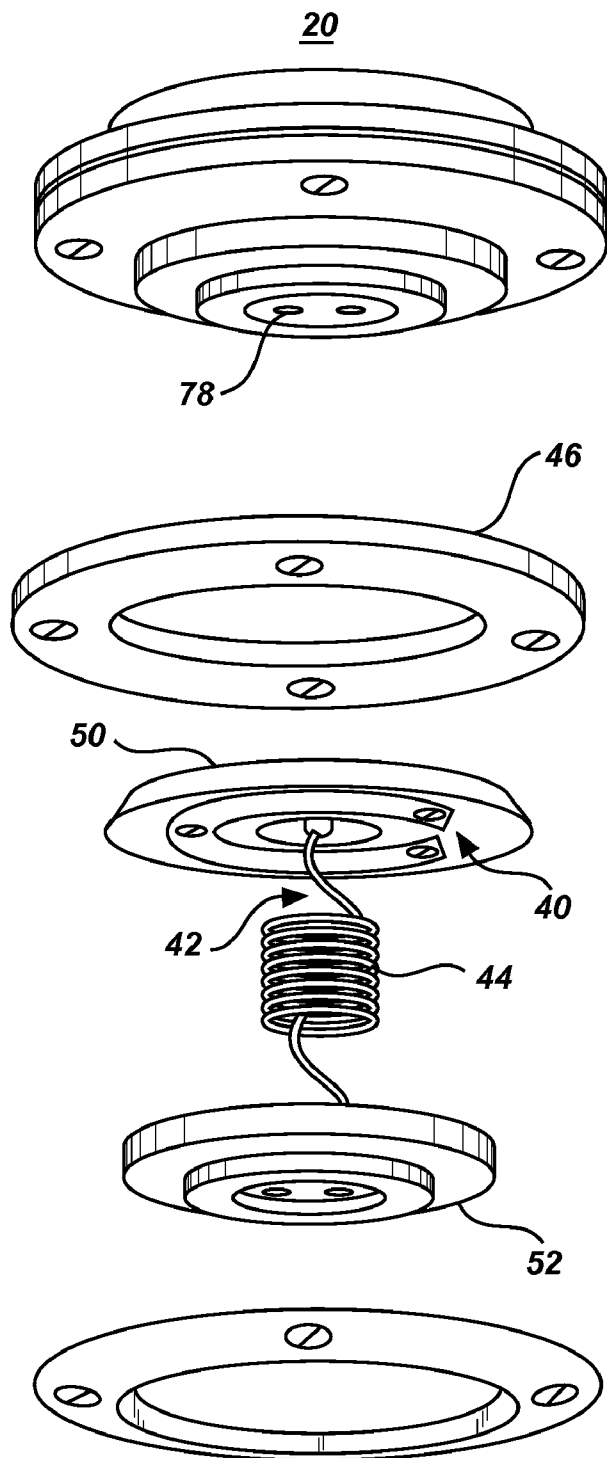




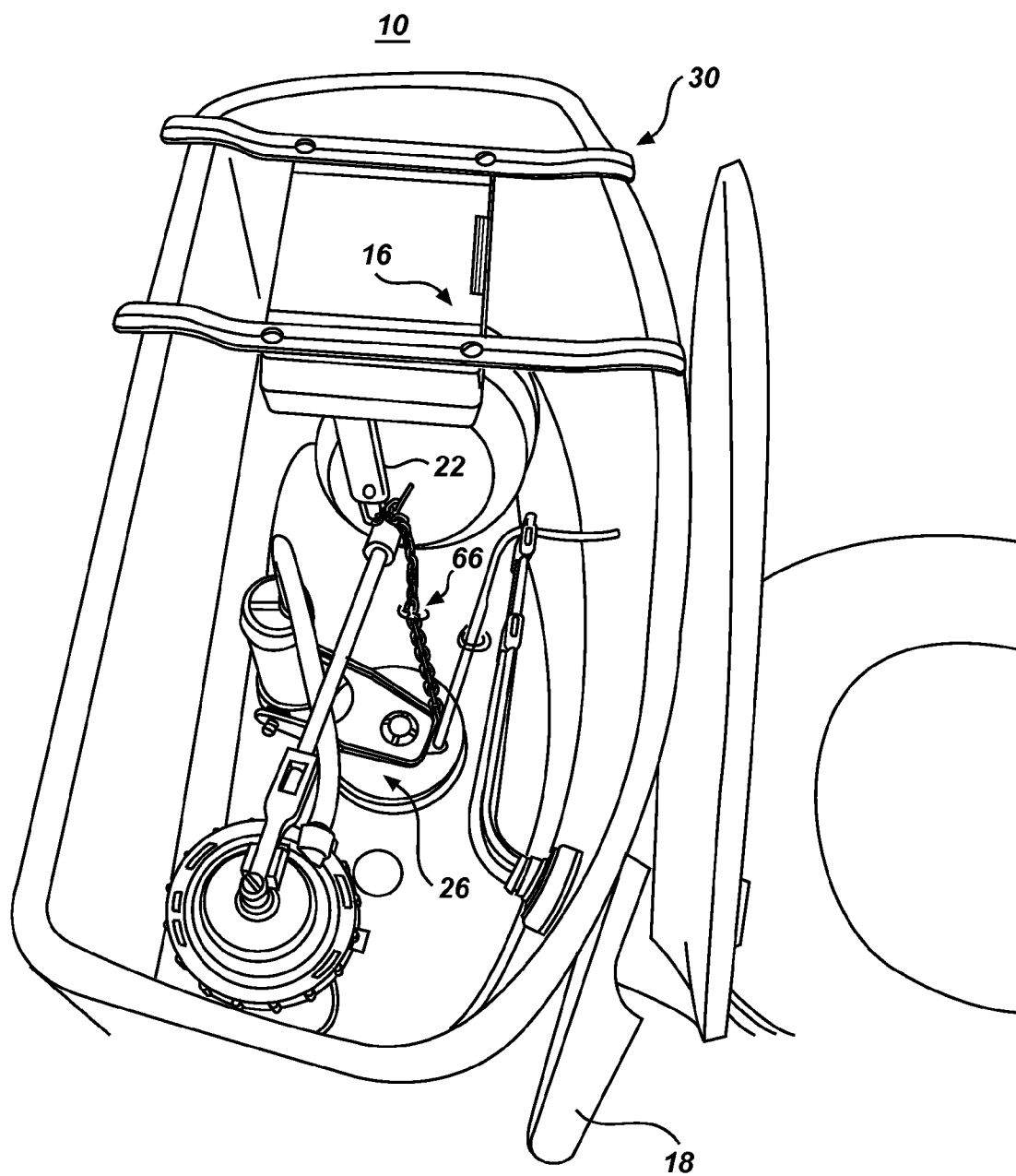
**Fig. 4**



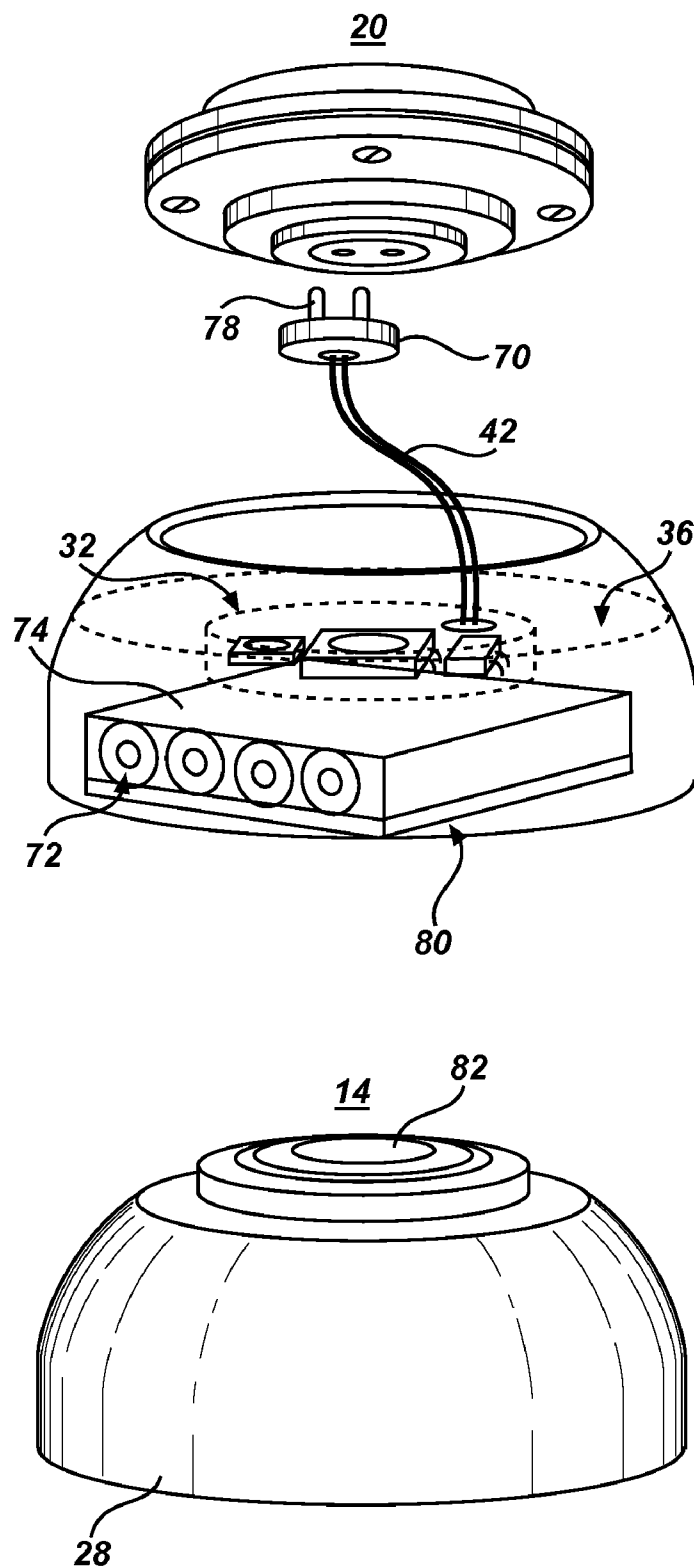
**Fig. 5**



**Fig. 6**

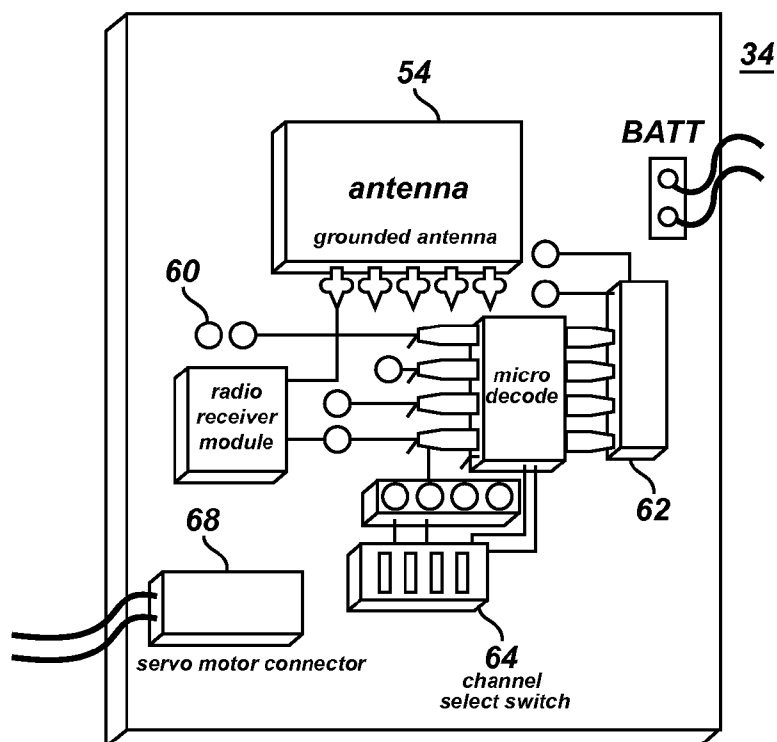
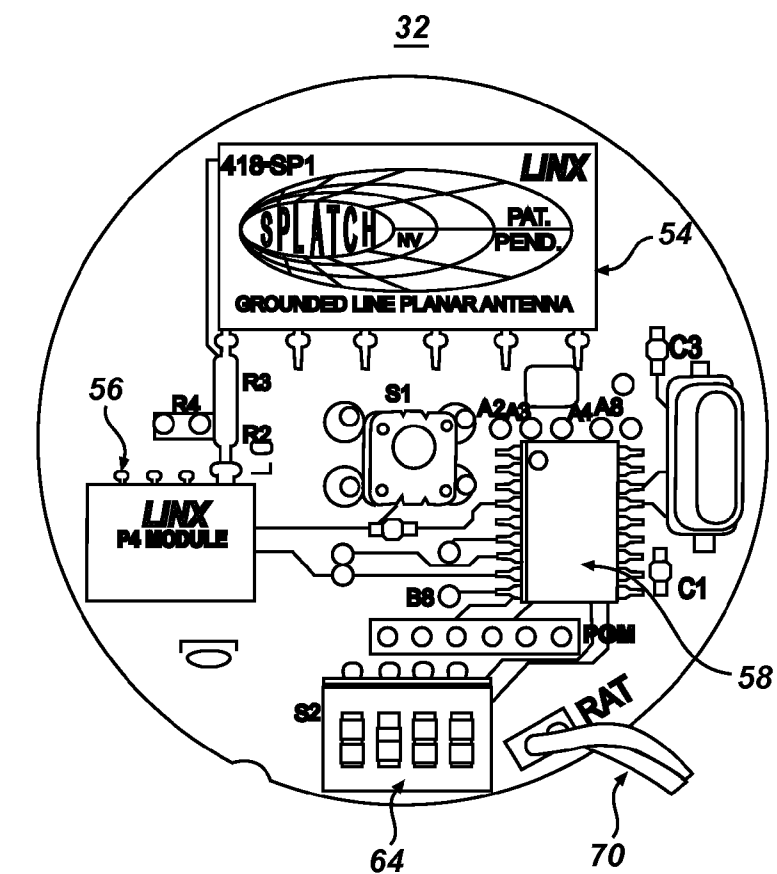


**Fig. 7**



**Fig. 8**





**Fig. 9**

## CORDLESS PEDAL FLUSH SYSTEM FOR A TANK-TYPE TOILET

### CROSS REFERENCE TO RELATED APPLICATION

[0001] This is a Continuation In Part of U.S. patent application Ser. No. 359,784, filed 7 Feb. 2003, which is hereby incorporated by reference in its entirety.

### BACKGROUND

[0002] The present invention is a cordless pedal flush system for a tank-type toilet and more particularly a system with a radio frequency (RF) pedal transmitter flush activation and an RF receiver flusher activator that captures the signal and directs an operational current to a servo motor and motorized flush lever used in activating the flushing of a tank-type toilet.

[0003] For various well-understood reasons, such as the transmission of germs that could lead to sickness, it is desirable to flush a toilet without touching the toilet handle.

[0004] One way in which the need to make physical contact with the flushing of public toilets has been reduced is the incorporation of automatic flushing systems. Not only are these automatic flushing systems expensive for the average home, but they can be very ineffective and cause such problems as excessive water consumption or unflushed conditions when the detection device malfunctions. Some automatic flushing systems use infrared detection systems. These elaborate systems are very expensive and require highly skilled technicians for service and installation.

[0005] Although the existing automatic flushing systems reduce the need to make physical contact with toilets they can only work effectively in public restrooms where the toilets are placed in enclosed areas such as stalls. These existing automatic-flushing systems would not work well in home bathrooms because of the bathroom configuration. The detection system would be ineffective due to the different movements of the occupant. For example, the infrared detector would activate a flush even if the occupant was passing to get into the shower or bathtub or simply replacing bath towels, etc.

### SUMMARY OF INVENTION

[0006] The present invention is a cordless pedal flush system for a tank-type toilet.

[0007] The cordless pedal flush system employs a tank mounted radio frequency (RF) receiver flusher unit that employs an RF receiver circuit that captures and decodes a coded command signal transmitted by the RF pedal transmitter actuator. Both the pedal transmitter and the receiver flusher units are powered by self-contained DC batteries. The receiver flusher unit circuit includes decoding hardware employed to identify and verify a TIC match for each cordless pedal flush system. The cordless pedal flush system is designed to avoid interference when multiple systems are operated within the same general area.

[0008] A receiver flusher actuator is installed replacing the conventional manual flush handle employed on most tank-type toilets. The receiver flusher actuator is a motorized gear driven mechanism powered by a small DC motor engaged in gear reduction to rotate and pivot upwards the motorized flush lever to lift the plunger of flapper valve from the valve seat to cause the flushing of a tank-type toilet. The receiver flusher actuator also allows for the conventional manual flushing of the toilet.

[0009] The cordless pedal flush system employs adjustable mounting arms for adjustment when mounted on the rim of different sized toilet tanks. The installation and operation of the cordless pedal flush system is designed to be an inexpensive simple system that is affordable to the average household.

[0010] The cordless pedal flush system invention can be used to flush a toilet more conveniently and with less effort, and prevent the transmission of germs that could lead to sickness. The cordless pedal flush system has additional advantages in that it permits the average household to afford a healthier yet simple means for flushing a toilet without the use of ones hands. It remedies common flush problems associated with tank-type toilets due to worn or misaligned fixtures such as short cycle flushes that require the user to hold down the flush handle in order to get a complete flush. It also allows for flushing while being seated on a toilet, avoiding an awkward reaching behind the back.

[0011] A complete understanding of this invention will be obtained from the detailed description that follows.

### BRIEF DESCRIPTION OF DRAWINGS

[0012] FIG. 1 shows a perspective view of a typical tank-type toilet **10** equipped with a cordless pedal flush system **12**.

[0013] FIG. 2 shows a perspective view of an RF receiver flusher actuator **16** with the accompanying motorized flush lever **22**, with the access door **80** closed.

[0014] FIG. 3 shows a perspective view of an RF receiver flusher actuator **16** with the accompanying motorized flush lever **22**, with the access door **80** open showing the enclosed battery compartment **36**.

[0015] FIG. 4 shows a perspective view of an assembled and unassembled RF receiver flusher actuator **16** with the accompanying RF foot pedal transmitter actuator **14**.

[0016] FIG. 5 shows an unassembled perspective view of an RF pedal transmitter actuator **14**.

[0017] FIG. 6 shows an assembled and unassembled perspective view of a push-button foot switch **20**.

[0018] FIG. 7 shows top perspective view of an RF receiver flusher actuator **16** mounted within a typical tank-type toilet.

[0019] FIG. 8 shows an unassembled and assembled perspective view of an RF foot pedal transmitter actuator **14** including a hidden view of the transmitter circuit board **32** and batteries **22**.

[0020] FIG. 9 shows a perspective view of the RF transmitter circuit board **32** and the RF receiver circuit board **34**.

### REFERENCE NUMBERS

- [0021] **10**. Tank-type toilet
- [0022] **12**. Cordless pedal flush system
- [0023] **14**. RF foot pedal transmitter actuator
- [0024] **16**. RF receiver flusher actuator
- [0025] **18**. Manual flush handle
- [0026] **20**. Push-button foot switch
- [0027] **22**. Motorized flush lever
- [0028] **24**. Manual flush handle/lever
- [0029] **26**. Flapper valve
- [0030] **28**. Rubber base enclosure
- [0031] **30**. Adjustable mounting arms
- [0032] **32**. RF transmitter circuit board
- [0033] **34**. RF receiver circuit board
- [0034] **36**. Circuit/battery compartment
- [0035] **38**. Servo motor

[0036] 40. Electrical contact  
 [0037] 42. Circuit wiring  
 [0038] 44. Spring  
 [0039] 46. Top metal ring  
 [0040] 48. Bottom metal ring  
 [0041] 50. Top push-button  
 [0042] 52. Bottom push-button  
 [0043] 54. Antenna  
 [0044] 56. RF radio transmitter  
 [0045] 58. Microcontroller—encoder  
 [0046] 60. RF radio receiver  
 [0047] 62. Microcontroller—decoder  
 [0048] 64. Channel select switch  
 [0049] 66. Chain  
 [0050] 68. Servo motor connector  
 [0051] 70. Power supply connector  
 [0052] 72. Battery  
 [0053] 74. Battery holder  
 [0054] 76. Power supply wiring  
 [0055] 78. Power supply receptacle  
 [0056] 80. Access door  
 [0057] 82. LED (Light Emitting Diode)

#### DISCLOSURE OF INVENTION

[0058] An embodiment of the cordless pedal flush system 12 is shown generally in FIGS. 1 and 7. This embodiment is based on a functioning prototype. The RF foot pedal transmitter actuator 14 is shown positioned on the floor near a typical tank-type toilet. The RF receiver flusher actuator 16 is shown installed within the toilet tank showing the motorized flush lever 22 connected to the flapper valve 26 of the toilet via chain 66 or linkage. The cordless pedal flush system 12 is used to initiate a flush sequence of a tank-type toilet 10. The user will press and release the push-button switch of the RF foot pedal transmitter actuator 14 to transmit a coded RF signal to the RF receiver flusher actuator 16. The RF receiver flusher actuator 16 will receive the RF signal and will initiate a timed sequential flush by activating the power circuit of the receiver flusher. The motorized flush lever 22 will pivot the lever upwards to lift the flapper valve 26 for flushing of the toilet. A receiver flusher actuator 16 is shown installed to accentuate the conventional manual flush lever. A motorized flush lever is shown connected to a chain or flapper valve 26 positioned to lift the valve from the valve seat to facilitate the flushing of a tank-type toilet.

[0059] Referring to FIGS. 2 and 3, a typical embodiment of a cordless pedal flush system 12 is illustrated with the access door shown closed in FIG. 2 and in FIG. 3 is shown with the access door open, providing access to the battery compartment 36 shown. The case frame enclosure of the RF receiver flusher actuator 16 is of a rigid molded plastic or other suitable material to provide a sealed watertight assembly employed to protect the enclosed RF receiver circuit board 34 including the batteries and servo motor 38.

[0060] A motorized flush lever 22 also of a rigid molded plastic, generally known in the art, is attached to the output shaft of the servo motor 38 that extends from the center of the case frame enclosure. Two adjustable mounting arms 30 are shown extended from the case frame enclosure of the RF receiver flusher actuator 16. The adjustable mounting arms are employed to attach the RF receiver flusher actuator 16 to the inside rim of the tank of the tank-type toilet. The adjustable mounting arms are constructed of a rigid molded plastic or light metal alloy. The unassembled case frame enclosure of

the RF receiver flusher actuator 16 is shown, detailing the circuit battery compartment 36 and servo motor 38.

[0061] Referring to FIGS. 5, 6 and 8, a typical embodiment of an RF pedal transmitter actuator 14 is illustrated. The design of the RF foot pedal transmitter actuator 14 is constructed of a push-button foot switch 20 enclosed within a rubber base enclosure 28 that houses a RF transmitter circuit board 32, antenna, and battery 72. The design of the push-button foot switch 20 is mostly constructed of two mating halves of a top metal ring 46 and a bottom metal ring 48 with an access opening in the middle for insertion of a top push-button 50 and a bottom push-button 52. The push-button is preferably of a rigid molded plastic with circular electrical contacts 40 and circuit wiring 42 are attached at the base of each push-button. A compression spring is positioned between both push-buttons. As can be seen, the push-button foot switch 20 is compressed into a detachable rubber base enclosure 28 constructed of a rubber material with a circular shape and sloping surface sized to enclose the bottom half portion of the push-button foot switch 20. Finally, an RF transmitter circuit board 32 and batteries are enclosed within the circuitry/battery compartment 36 recessed into the bottom portion of the rubber base enclosure 28.

[0062] Referring to FIG. 7, an RF receiver flusher actuator 16 is shown installed within a typical toilet tank of a tank-type toilet 10. The RF receiver flusher actuator 16 is attached to the tank by adjustable mounting arms 30 connected to the rim of the tank. The adjustable mounting arms 30 will allow the adjustable arms well as the adjustment of the body of enclosure along the axis of the arms to accommodate the different sizes and different components of toilet tanks. The motorized flush lever 22 is shown attached to a typical chain 66 or linkage connected to a typical flapper valve 26. The shaft (not shown) on the motorized flush lever is adjustable and designed to lock and unlock in place with telescopic movement while avoiding interference with other toilet tank components.

[0063] Referring to FIG. 9, an RF receiver circuit board 34 is shown and sized to fit within the enclosure of the RF receiver flusher actuator 16. The circuit board integrates the electrical components known in the arts such as batteries (not shown) integrated RF radio receiver 60 comparable to a Linx RF module model, integrated antenna 54 module comparable to a splash model, channel selector switch 64 Microcontroller-Decoder 62 servo motor connector 68 etc.

[0064] Referring again to FIG. 9, an RF transmitter circuit board 32 is shown and sized to fit within the RF pedal transmitter actuator 14 enclosure. The circuit board integrates the electrical components known in the arts such as batteries integrated RF radio transmitter 56 comparable to a Linx RF module model, integrated antenna 54 module comparable to a splash model, microcontroller-encoder 58 channel selector switch 64 etc.

[0065] While this invention has been described in detail with particular reference to its preferred embodiments, the principles and modes of operation of the invention have also been described in this specification. The invention should not be construed as being limited to the particular forms disclosed, which are illustrative rather than restrictive. Modifications, variations, and changes may be made by those skilled in the art without departure from the spirit and scope of the invention as described by the following claims.

I claim:

1. A cordless pedal flush system for flushing a tank-type toilet, said system comprising: a cordless pedal housing having a suitable transmitting means for transmitting an encoded command signal wherein electrical power for operation of said transmitting means is derived solely from a Direct Current power source; a receiver housing having a reception means for capturing said encoded command signal transmitted by said transmitting means wherein electrical power for operation of said reception means is derived solely from a Direct Current power source; a decoding means for determining and validating the encoded signal captured by said reception means; a control means for executing programmed steps indicative of verification of said encoded signal verified by said decoding means; and a motorized flush mechanism to complement the conventional manual flush handle employed on tank-type toilets, said motorized flush mechanism having a flushing means for mechanically emulating a manual flushing of a tank-type toilet.

2. The system according to claim 1 wherein said transmitting means is a radio frequency transmitter circuit employed within said cordless pedal housing.

3. The system according to claim 1 wherein said reception means is a radio frequency receiver circuit employed within said receiver housing.

4. The system according to claim 1 wherein said encoded command signal is a transmitter identification code encoded with circuit hardware employed with the transmitter circuitry.

5. The system according to claim 1 wherein said decoding means is microprocessor hardware employed with the receiver circuitry.

6. The system according to claim 1 wherein said control means is microprocessor hardware employed with the receiver circuitry.

7. The system according to claim 6 further comprising a timer circuit employed with said control means.

8. A cordless pedal flush system for flushing a tank-type toilet, said system comprising: a cordless pedal housing having a suitable transmitting means for transmitting an encoded command signal wherein electrical power for operation of said transmitting means is derived solely from a self contained Direct Current power source; a receiver housing having a detection means for capturing said encoded command signal transmitted by said transmitting means wherein elec-

trical power for operation of said detection means is derived solely from a Direct Current power source; a decoding means for determining and validating the encoded signal detected by said detection means; a control means for executing programmed steps subject to verification of said encoded signal verified by said decoding means; and a motorized flush mechanism having a flushing means for mechanically emulating a manual flushing of a tank-type toilet.

9. The system according to claim 8 wherein said transmitting means is an infrared transmitter circuit employed within said cordless pedal housing.

10. The system according to claim 8 wherein said detection means is an infrared detection circuit employed within said receiver housing.

11. The system according to claim 8 wherein said encoded command signal is a transmitter identification code encoded with circuit hardware employed with the transmitter circuitry.

12. The system according to claim 8 wherein said decoding means is microprocessor hardware employed with the detection circuitry.

13. The system according to claim 8 wherein said control means is microprocessor hardware employed with the detection circuitry.

14. The system according to claim 14 further comprising a timer circuit employed with said control means.

15. A method for flushing a tank-type toilet comprising: providing a cordless pedal housing having a suitable transmitting means for transmitting an encoded command signal wherein electrical power for operation of said transmitting means is derived solely from a Direct Current power source; providing a receiver housing having a reception means for capturing said encoded command signal transmitted by said transmitting means wherein electrical power for operation of said reception means is derived solely from a Direct Current power source; providing a decoding means for determining and validating the encoded signal captured by said reception means; providing a control means for executing programmed steps indicative of verification of said encoded signal verified by said decoding means; and providing a motorized flush mechanism to complement the conventional manual flush handle employed on tank-type toilets, said motorized flush mechanism having a flushing means for mechanically emulating a manual flushing of a tank-type toilet.

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