PUMP ASSEMBLY WITH SWITCH

RELATED APPLICATION(S)

[0001] This application is a continuation of U.S. patent application Ser. No. 13/858,569, filed on Apr. 8, 2013, which is a continuation of U.S. patent application Ser. No. 12/347,984 filed on Dec. 31, 2008, which claims the benefit of the following provisional patent applications, each of which is herein incorporated by reference in their entirety: U.S. Ser. No. 61/018,054, filed Dec. 31, 2007; U.S. Ser. No. 61/018,042, filed Dec. 31, 2007; U.S. Ser. No. 61/017,989, filed Dec. 31, 2007; U.S. Ser. No. 61/018,002, filed Dec. 31, 2007; U.S. Ser. No. 61/018,339, filed Dec. 31, 2007; U.S. Ser. No. 61/023,645, filed Jan. 25, 2008; U.S. Ser. No. 61/101,053, filed Sep. 29, 2008; U.S. Ser. No. 61/101,077, filed Sep. 29, 2008; and U.S. Ser. No. 61/101,105, filed Sep. 29, 2008.

FIELD OF THE INVENTION

[0002] This application relates generally to fluid delivery systems, and more particularly to infusion pump assemblies.

BACKGROUND

[0003] Many potentially valuable medicines or compounds, including biologicals, are not orally active due to poor absorption, hepatic metabolism or other pharmacokinetic factors. Additionally, some therapeutic compounds, although they can be orally absorbed, are sometimes required to be administered so often it is difficult for a patient to maintain the desired schedule. In these cases, parenteral delivery is often employed or could be employed.

[0004] Effective parenteral routes of drug delivery, as well as other fluids and compounds, such as subcutaneous injection, intramuscular injection, and intravenous (IV) administration include puncture of the skin with a needle or stylet. Insulin is an example of a therapeutic fluid that is self-injected by millions of diabetic patients. Users of parenterally delivered drugs may benefit from a wearable device that would automatically deliver needed drugs/compounds over a period of time.

[0005] To this end, there have been efforts to design portable and wearable devices for the controlled release of therapeutics. Such devices are known to have a reservoir such as a cartridge, syringe, or bag, and to be electronically controlled. These devices suffer from a number of drawbacks including the malfunction rate. Reducing the size, weight and cost of these devices is also an ongoing challenge. Additionally, these devices often apply to the skin and pose the challenge of frequent re-location for application.

SUMMARY OF THE INVENTION

[0006] According to a first implementation, a wearable infusion pump assembly includes a reusable housing assembly, and a disposable housing assembly including a reservoir for receiving an infusible fluid. A releasable engagement assembly is configured to allow the reusable housing assembly to releasably engage the disposable housing assembly. A switch assembly is configured to effectuate a functionality of the infusion pump assembly.

[0007] One or more of the following features may be included. The functionality may include a bolus infusion functionality, and the wearable infusion pump assembly may further include at least one processor, and a computer readable medium coupled to the at least one processor. The computer readable medium may include a plurality of instructions stored thereon which, when executed by the at least one processor, may cause the at least one processor to perform operations including receiving an initiation signal from the switch assembly indicative of a bolus infusion event. The computer readable medium may also include instructions for receiving a dose signal from the switch assembly indicative of at least a portion of a bolus quantity of the infusible fluid. The computer readable medium may also include instructions for rendering an audible quantity signal in response to the dose signal. The computer readable medium may also include instructions for receiving an approval signal from the switch assembly indicative of a concurrence with the audible quantity signal. Further, the computer readable medium may include instructions for administering the bolus quantity of the infusible fluid.

[0008] The functionality may include a separation detection functionality, and the wearable infusion pump assembly may further include at least one processor, and a computer readable medium coupled to the at least one processor. The computer readable medium may include a plurality of instructions stored thereon which, when executed by the at least one processor, may cause the at least one processor to perform operations including transmitting a ping signal to a remote control assembly. The computer readable medium may also include instructions for monitoring for receipt of a reply signal from the remote control assembly in response to the ping signal, and if the reply signal is not received within a defined period of time, rendering an audible separation alarm.

[0009] The computer readable medium may further include instructions for receiving an alarm override signal from the switch assembly indicative of a desire to silence the separation alarm. The computer readable medium may also include instructions for silencing the separation alarm.

[0010] The functionality may include a pairing functionality. The wearable infusion pump assembly may further include at least one processor, and a computer readable medium coupled to the at least one processor. The computer readable medium may include a plurality of instructions stored thereon which, when executed by the at least one processor, may cause the at least one processor to perform operations including receiving a pairing initiation signal from the switch assembly indicative of a pairing event. The computer readable medium may also include instructions for monitoring for receipt of a pairing request from a remote control assembly. The computer readable medium may also include instructions for, if the pairing request is received, providing an acknowledgment message to the remote control assembly, wherein the acknowledgement message uniquely identifies the wearable infusion pump assembly. The acknowledgement message may include a serial number of the wearable infusion pump assembly.

[0011] The wearable infusion pump assembly may further include an external infusion set configured to deliver the infusible fluid to a user. The reusable housing assembly may include a mechanical control assembly including a pump assembly and at least one valve assembly. The mechanical control assembly may include at least one shape-memory actuator.

[0012] According to another implementation, a wearable infusion pump assembly includes a reusable housing assembly including a mechanical control assembly, the mechanical