

CLAIMS

1. An infusion pump comprising:
 - a housing with a door pivotally mounted to the housing;
 - a tube channel positioned at least partially behind the door on the housing, the tube channel configured to hold a tube in the infusion pump;
 - a pumping mechanism including a shuttle positioned behind the door; and
 - a slide clamp ejection device including a solenoid configured to automatically eject the slide clamp from a channel based on one or more inputs from one or more sensors arranged on the infusion pump.
2. The infusion pump of claim 1, wherein the tube is in an occluded state after the slide clamp is inserted within the channel.
3. The infusion pump of claim 2, wherein the one or more sensors include at least one of a first Hall effect sensor configured to detect when the door is positioned in a closed state, an optical IR sensor configured to detect when the door is latched while positioned in the closed state, a pressure sensor configured to detect the presence of the tube at a load point along the tube channel, and a second Hall effect sensor configured to detect that a valve is closed to place the tube in an occluded state.
4. The infusion pump of claim 3, wherein the infusion pump is configured to initiate an infusion after receiving a confirmation that the slide clamp is in an ejected state and the door is in a closed state.
5. The infusion pump of any of claims 1 to 4, wherein the door is configured to unlock and transition between a closed state and an open state after the slide clamp is inserted within the channel.
6. The infusion pump of any of claims 1 to 5, further including a sensor, wherein the sensor detects the presence of the slide clamp within the channel.

7. The infusion pump of claim 6, wherein the sensor is a Hall effect sensor.
8. The infusion pump of any of claims 1 to 7, further comprising a tube loading guidance system, wherein the tube loading guidance system includes one or more visual cues configured to provide guidance to a user during tube loading.
9. The infusion pump of claim 8, wherein the visual cues include a first light-emitting diode, a second light emitting diode, and a display, wherein the first and second light emitting diodes are configured to indicate whether a tube is properly or improperly loaded at respective load points on the infusion pump.
10. The infusion pump of any of claims 1 to 9, further comprising an occlusion sensor, wherein the occlusion sensor is configured to determine if an infusion line connected to the infusion pump is blocked.
11. The infusion pump of claim 10, wherein the occlusion sensor determines if an infusion line is blocked by calculating one of a slope of a force curve, a slope of a pressure curve, a comparison to a baseline force measurement, a comparison to a baseline pressure measurement, or an area under the force curve.
12. The infusion pump of any of claims 1 to 11, further comprising an accelerometer, wherein the accelerometer is configured to detect at least one of an occlusion or whether the infusion pump experienced an external impact.
13. The infusion pump of any of claims 1 to 12, wherein the infusion pump is positioned in a rack with at least one other infusion pump or syringe pump.
14. A tube loading guidance system for positioning a tube within an infusion pump housing, the positioning system comprising:
 - a first visual cue configured to indicate both proper and improper loading of a slide clamp in the infusion pump;
 - a second visual cue configured to indicate both proper and improper loading of the tube at a first load point in the infusion pump; and

a third visual cue configured to indicate both proper and improper loading of the tube at a second load point in the infusion pump.

15. The tube loading guidance system of claim 14, wherein the second visual cue and the third visual cue include light emitting diodes.

16. The tube loading guidance system of claim 15, wherein the light emitting diodes indicate proper loading by illuminating in a first color, and wherein the light emitting diodes indicate improper loading by illuminating in a second color.

17. The tube loading guidance system of any of claims 14 to 16, wherein the second visual cue is illuminated based on an output from a pressure sensor associated with the first load point.

18. The tube loading guidance system of claim 17, wherein the third visual cue is illuminated based on another output from a different pressure sensor associated with the second load point.

19. A method of detecting an occlusion, the method comprising:
monitoring a pressure measurement, wherein the pressure measurement is based on a current ADC, a baseline ADC, and a slope of an ADC-pressure plot;
comparing the pressure measurement to a threshold based on a selected occlusion detection mode; and
determining an occlusion exists within a tube of an infusion pump when the pressure measurement is greater than the threshold.

20. The method of claim 19, wherein the selected occlusion detection mode includes one of a rapid occlusion detection mode and a non-rapid occlusion detection mode, and wherein the threshold is lower for the rapid occlusion detection mode than the non-rapid occlusion detection mode.