CLAIMS

1. A syringe pump (100) comprising:

a housing with a syringe accepting region (112);

a syringe holding system (150, 160) configured to hold a syringe in the syringe accepting region;

a drive mechanism (130) including:

a lead screw (510),

a slide assembly comprising a split nut (520), said split nut comprising a first half nut (520a) and a second half nut (520b) each having threads that engage generally opposed sides of the lead screw,

a clutch assembly (540, 640), and

a drive rod (132); and

a drive head (400) operatively coupled to the drive mechanism, the drive head configured to engage a piston of a syringe held by the syringe holding system,

characterized in that the clutch assembly (540, 640) comprises an anti-ratcheting clutch assembly having first and second clutch members (540a, 540b) that are configured to engage and disengage the first and second half nuts of the split-nut to and from the lead screw, and magnetic members (550a, 550b) for increasing a holding force of the clutch assembly on the split nut and prevent ratcheting between the split nut and the lead screw.

2. The syringe pump of claim 1, wherein the syringe accepting region (112) includes a concave rear wall (114) having a vertex (118), where the concave rear wall includes a top portion (116a) and a bottom portion (116b) that meet to form the vertex, and wherein the top portion is oriented at a first angle with respect to a vertical plane intersecting the vertex.

3. The syringe pump of claim 2, wherein the bottom portion (116b) is oriented at a second angle with respect to a vertical plane intersecting the vertex (118).

4. The syringe pump of claim 3, wherein the first angle and the second angle are the same.

5. The syringe pump of any of claims 1 to 3, wherein the drive head (400) includes first and second plunger hooks (416, 417) disposed on the drive head and configured to grasp onto a plunger thumb flange of a plunger of the syringe, and wherein the first and second plunger hooks are configured to actuate between an open position and a closed position.

6. The syringe pump of claim 5, wherein the drive head (400) includes a plunger lever (409), the plunger lever adapted to move the plunger hooks (416, 417) between the open position and the closed position, and wherein the plunger lever is configured for actuation by a user.

7. The syringe pump of any of claims 1 to 6, wherein the magnetic members (550a, 550b) are further configured to hold the clutch closed to provide additional security against unintended bolus.

8. The syringe pump of any of claims 1 to 7, wherein the syringe holding system (150, 160) includes a barrel clamp (150) and a flange plate (160).

9. The syringe pump of claim 8, wherein the barrel clamp (150) includes a proximal end pivotably attached to the housing and a distal end with a barrel engagement surface, wherein the barrel engagement surface is attached to the barrel clamp via a swivel (156) and is adapted to allow the barrel engagement surface to rotate and contact syringe barrels of at least two different sizes.

10. The syringe pump of claim 8, wherein the flange plate (160) is configured to secure a syringe barrel flange against the housing, the flange plate is biased towards the housing, and the flange plate includes a bottom surface configured to contact the syringe barrel flange, and the flange plate has a surface profile that transitions from a flat surface to an angled surface (162) towards the edge of the flange plate.

11. The syringe pump of any of claims 1 to 10, further comprising an occlusion sensor (884), wherein the occlusion sensor outputs data for determining if an infusion line connected to the syringe barrel is blocked.

12. The syringe pump of claim 11, wherein the data from the occlusion sensor is used by a processor (810) to determine if an infusion line connected to the syringe barrel 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.

13. The syringe pump of any of claims 1 to 12, further comprising an accelerometer (897), wherein the accelerometer outputs data for detecting at least one of an occlusion or whether the syringe pump experienced an external impact.

14. The syringe pump of any of claims 1 to 13, wherein the syringe pump is positioned in a rack with at least one other infusion pump or syringe pump.