[0004] Additional problems have also been experienced with infusion pumps. For example, certain sensing systems that detect whether an occlusion is present in an infusion line have proven to be unreliable or too complex in construction. Certain syringe plunger position detectors and syringe barrel size detectors have also proven to be unreliable. In addition, drive mechanisms for syringe plungers have also proven to be unreliable as certain components become stripped or jammed adversely affecting the mechanism.

SUMMARY

[0005] The present invention is generally directed to a syringe pump for delivering a flowable material, such as a fluid medication, to a patient through an infusion line.

[0005a] In an aspect, the present disclosure refers to a syringe pump comprising: a housing with a syringe accepting region; a syringe holding system configured to hold a syringe in the syringe accepting region; a drive mechanism including: a lead screw, a slide assembly comprising a split nut, said split nut comprising a first half nut and a second half nut each having threads that engage generally opposed sides of the lead screw, a clutch assembly, and a drive rod; and a drive head 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 comprises an anti-ratcheting clutch assembly having first and second clutch members 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 for increasing a holding force of the clutch assembly on the split nut and prevent ratcheting between the split nut and the lead screw.

[0006] Aspects of the subject matter described herein may be useful alone or in combination with one or more other aspects described herein. In an example of the present disclosure, a syringe pump includes a housing with a syringe-accepting region.

[0006a] According to an example, the present disclosure refers to a syringe pump comprising: a housing with a syringe accepting region; a syringe holding system configured to hold a syringe in the syringe accepting region; characterized in that the syringe pump further comprises: a drive mechanism including: a lead screw, at least one half nut, a clutch assembly, and a drive rod, wherein the clutch assembly is configured to engage and disengage the at least one half nut to and from the lead screw; and a drive head operatively coupled to the drive mechanism, the drive head configured to engage a piston of a syringe held by the syringe holding system, wherein the clutch assembly includes a magnet configured to increase a holding force of the clutch assembly and prevent ratcheting between the lead screw and the at least one half nut.

[0007] In accordance with an example of the present disclosure, which may be used in combination with any one or more of the preceding aspects, the syringe pump includes a syringe holding system configured to hold a syringe in the syringe-accepting region.

[0008] In accordance with an example of the present disclosure, which may be used in combination with any one or more of the preceding aspects, the syringe pump includes a drive mechanism.

[0009] In accordance with an example of the present disclosure, which may be used in combination with any one or more of the preceding aspects, the syringe pump includes a drive head operatively coupled to the drive mechanism. The drive head may be configured to engage a piston of a syringe held by the syringe holding system.

[0010] In accordance with an example of the present disclosure, which may be used in combination with any one or more of the preceding aspects, the syringe-accepting region includes a concave rear wall having a vertex, where the concave rear wall includes a top portion and a bottom portion that meet to form the vertex.

[0011] In accordance with an example of the present disclosure, which may be used in combination with any one or more of the preceding aspects, the top portion is oriented at a first angle with respect to a vertical plane intersecting the vertex.