

- (54) **COMPACT PUMP DRIVE SYSTEM** 5,121,019 6/1992 Pradler .
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- (75) Inventor: **Sheldon Moberg**, Granada Hills, CA 5,254,096 10/1993 Rondelet et al. .
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- (73) Assignee: **MiniMed Inc.**, Northridge, CA (US) 5,505,709 4/1996 Funderburk et al. .
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- (22) Filed: **Oct. 28, 1999** 5,779,675 7/1998 Reilley et al. .
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Related U.S. Application Data

- (60) Provisional application No. 60/106,237, filed on Oct. 29, 1998.
- (51) **Int. Cl.⁷** **A61M 5/00**
- (52) **U.S. Cl.** **604/131; 604/151; 128/DIG. 12**
- (58) **Field of Search** **604/131, 151, 604/154, 155; 128/DIG. 1, DIG. 12, DIG. 13**

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Primary Examiner—John D. Yasko
 (74) *Attorney, Agent, or Firm*—MiniMed Inc.

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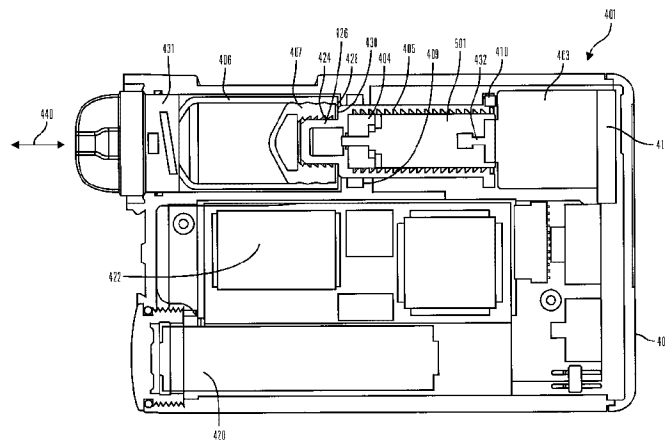
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(57) **ABSTRACT**

An improved pump is provided for controlled delivery of fluids wherein the pump includes a reservoir and a movable piston. A plunger slide is in removable contact with the movable piston. A motor, is operably coupled to a drive member, such as a drive screw. The motor is disposed in-line with the drive member and the plunger slide. The drive member is operably connected to the plunger slide and is disposed to be substantially enclosed by the plunger slide when the plunger slide is in at least one position. The drive member is adapted to advance the plunger slide in response to operation of the motor.

26 Claims, 14 Drawing Sheets



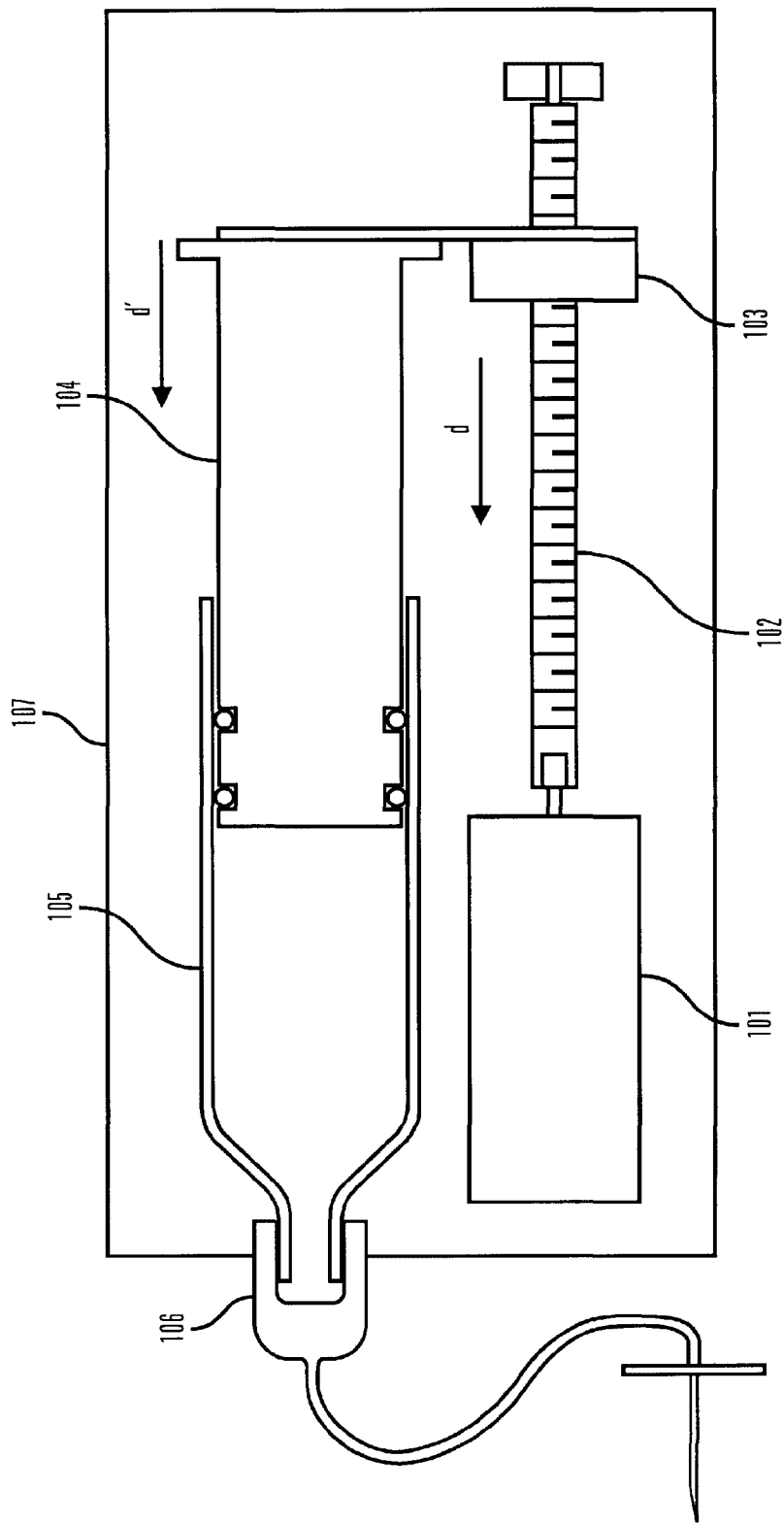


FIG. 1

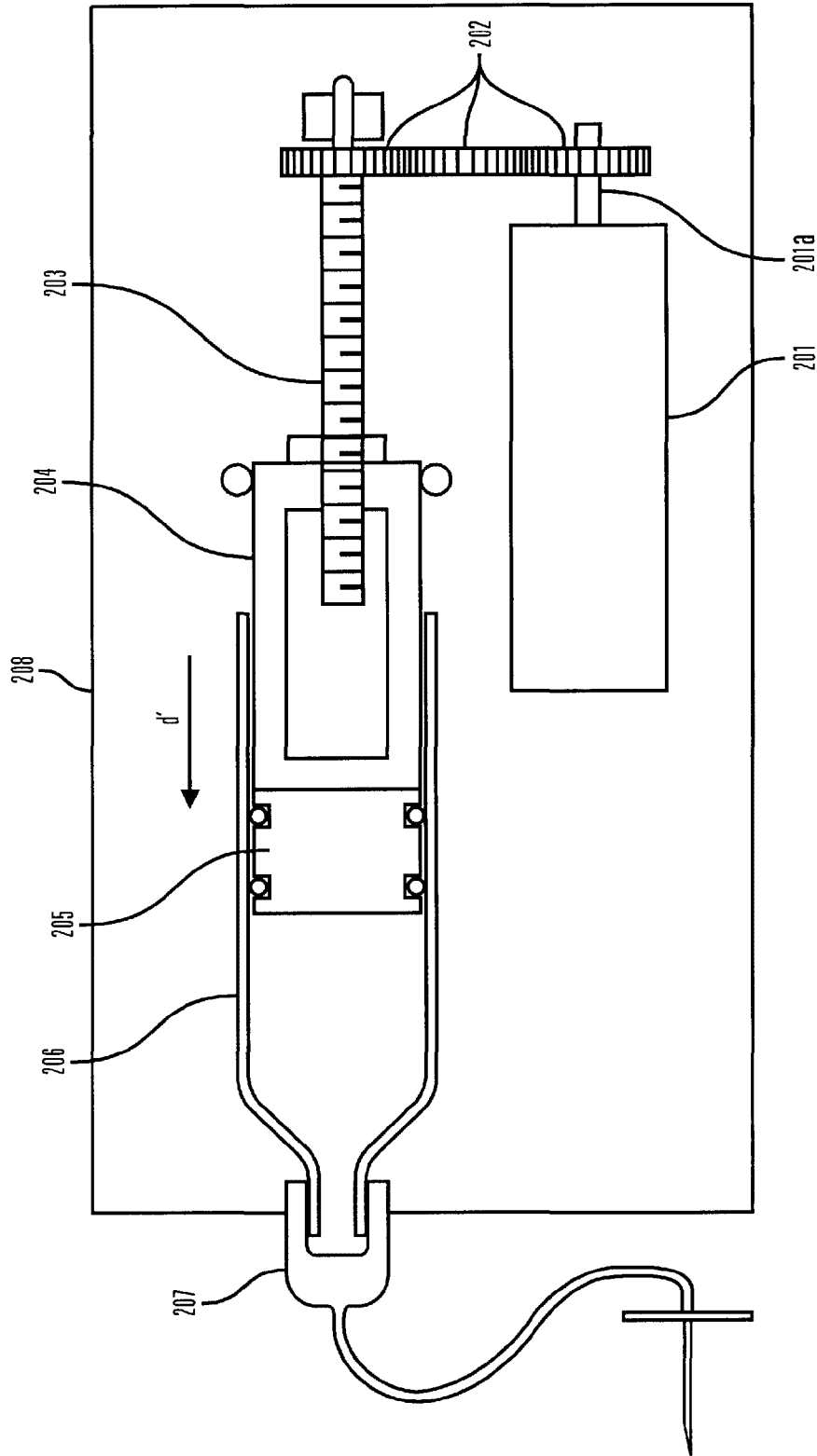


FIG. 2

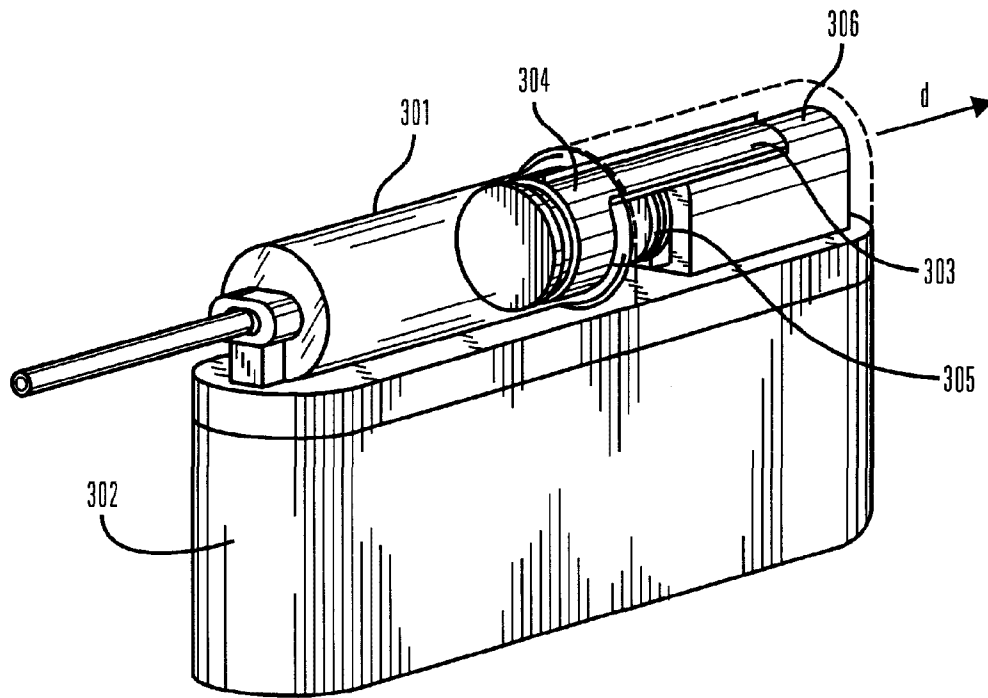


FIG. 3a

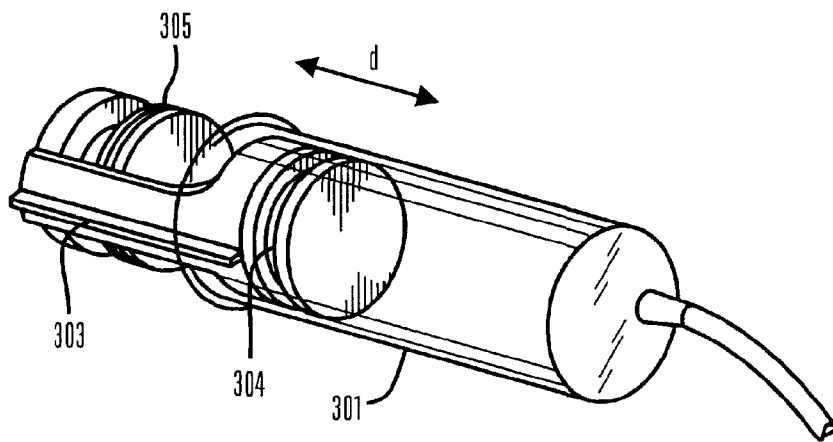


FIG. 3b

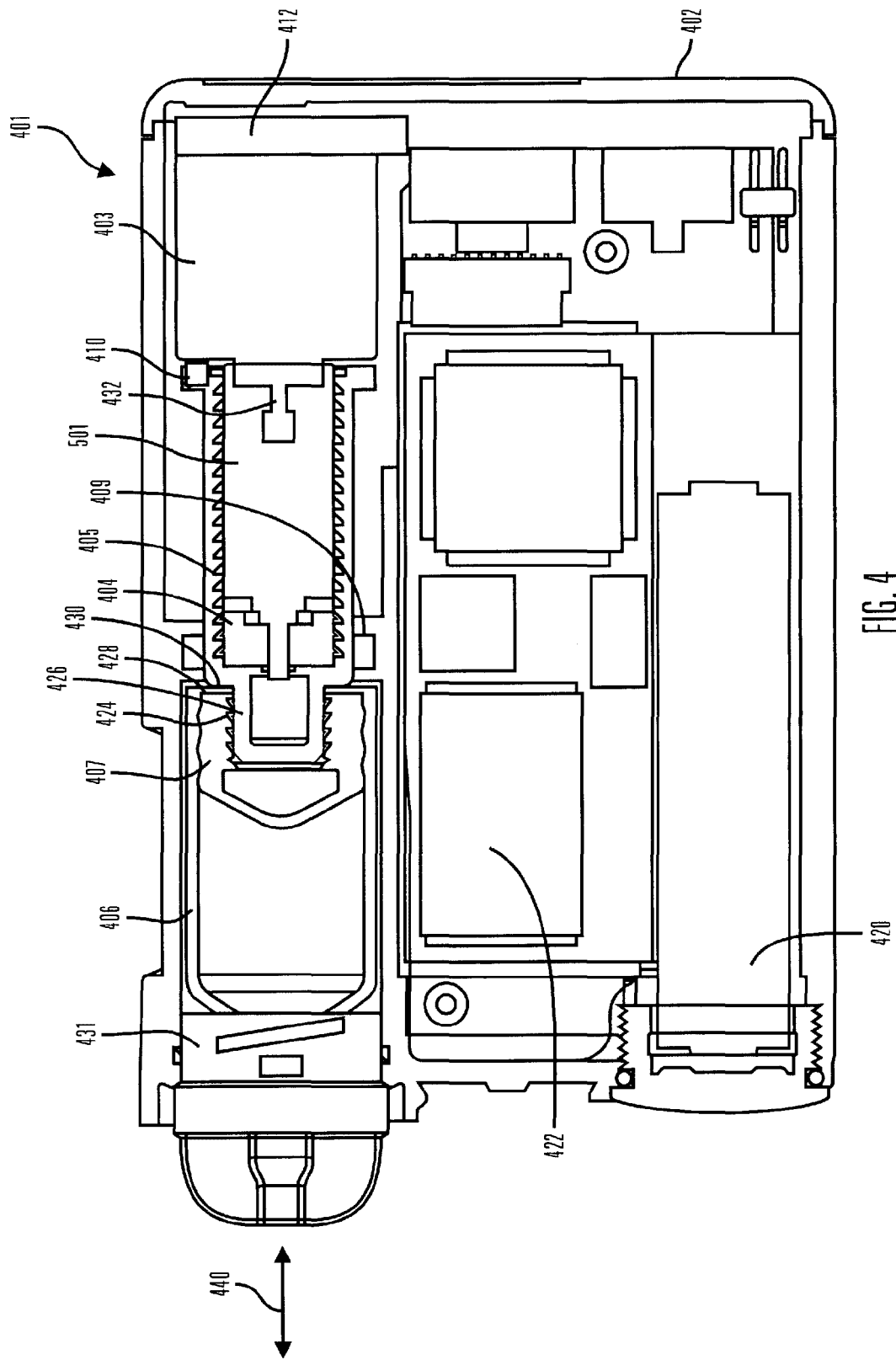


FIG. 4

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