



US010391249B2

(12) **United States Patent**
Hassanzadeh

(10) **Patent No.:** **US 10,391,249 B2**
(45) **Date of Patent:** **Aug. 27, 2019**

(54) **DROPPER SYRINGE APPARATUS**

(71) Applicant: **Belal Hassanzadeh**, Tabriz (IR)

(72) Inventor: **Belal Hassanzadeh**, Tabriz (IR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 267 days.

(21) Appl. No.: **15/642,240**

(22) Filed: **Jul. 5, 2017**

(65) **Prior Publication Data**

US 2018/0214638 A1 Aug. 2, 2018

(30) **Foreign Application Priority Data**

Jan. 30, 2017 (IR) 13955014000301383

(51) **Int. Cl.**

- A61M 5/31* (2006.01)
- A61F 9/00* (2006.01)
- A61J 7/00* (2006.01)
- A61M 5/32* (2006.01)
- B01L 3/02* (2006.01)
- A61M 5/315* (2006.01)
- A61D 7/00* (2006.01)
- A61M 5/19* (2006.01)

(52) **U.S. Cl.**

- CPC *A61M 5/3137* (2013.01); *A61F 9/0008* (2013.01); *A61J 7/0053* (2013.01); *A61M 5/31531* (2013.01); *A61M 5/3202* (2013.01); *B01L 3/0217* (2013.01); *B01L 3/0241* (2013.01); *A61D 7/00* (2013.01); *A61M 5/19* (2013.01); *A61M 2005/3126* (2013.01); *B01L 2200/087* (2013.01); *B01L 2300/0672* (2013.01); *B01L 2300/0832* (2013.01); *B01L 2300/123* (2013.01); *B01L 2400/0478* (2013.01)

(58) **Field of Classification Search**

CPC *A61M 5/3137*; *A61M 5/3202*; *A61M 2005/3126*; *A61M 5/31531*; *A61J 7/0053*; *A61D 7/00*; *A61F 9/0008*; *B01L 3/0217*; *B03L 3/0241*

See application file for complete search history.

(56)

References Cited

U.S. PATENT DOCUMENTS

- 3,464,412 A * 9/1969 Boris *A61B 5/15003* 222/386
- 5,383,906 A * 1/1995 Burchett *A61J 7/0046* 222/133
- 5,775,546 A * 7/1998 Buehler *B01L 3/021* 222/209
- 6,238,120 B1 * 5/2001 Mark *A45D 19/02* 401/134

(Continued)

Primary Examiner — Theodore J Stigell

(57)

ABSTRACT

A dropper syringe apparatus includes a cylindrical barrel, a plunger assembly, and a needle. The cylindrical barrel storing the fluid includes a flanged first opening and a second opening. The plunger assembly, inserted into the cylindrical barrel, includes a plunger shaft and a flexible hollow bulb. The plunger shaft includes a flanged upper end, a lower end, and a central lumen. The plunger shaft moves in an upward and a downward direction within the cylindrical barrel. The central lumen extends from the lower to the flanged upper end of the plunger shaft for accommodating the fluid. The flexible hollow bulb is fixedly attached to the flanged upper end and in fluid communication with the central lumen. An external force exerted on the flexible hollow bulb exerts a pressure on the fluid accommodated within the lumen. The needle draws or dispenses the fluid from or to the external body.

16 Claims, 9 Drawing Sheets

