



(12) **United States Patent**
Veasey et al.

(10) **Patent No.:** **US 9,408,979 B2**
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **PEN-TYPE INJECTOR**

(71) Applicant: **SANOFI-AVENTIS DEUTSCHLAND GMBH**, Frankfurt am Main (DE)

(72) Inventors: **Robert Frederick Veasey**, Warwickshire (GB); **Robert Perkins**, Warwickshire (GB); **David Aubrey Plumptre**, Worcestershire (GB)

(73) Assignee: **SANOFI-AVENTIS DEUTSCHLAND GMBH**, Frankfurt am Main (DE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/946,203**

(22) Filed: **Nov. 19, 2015**

(65) **Prior Publication Data**

US 2016/0074590 A1 Mar. 17, 2016

Related U.S. Application Data

(60) Continuation of application No. 14/635,573, filed on Mar. 2, 2015, now Pat. No. 9,233,211, which is a continuation of application No. 13/919,251, filed on Jun. 17, 2013, now Pat. No. 9,011,391, which is a

(Continued)

(30) **Foreign Application Priority Data**

Mar. 3, 2003 (GB) 0304822.0

(51) **Int. Cl.**
A61M 5/315 (2006.01)
A61M 5/24 (2006.01)

(52) **U.S. Cl.**
CPC **A61M 5/31551** (2013.01); **A61M 5/31533** (2013.01); **A61M 5/31535** (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC A61M 5/31551; A61M 5/31533; A61M 5/31535; A61M 5/31536; A61M 5/31541; A61M 5/31546; A61M 5/31585; A61M 2005/2407; A61M 2205/581; A61M 2205/582
USPC 604/208–211, 68; 128/DIG. 12, DIG. 13
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,717,597 A * 9/1955 Hein, Jr. A61M 5/30 604/68
2,722,931 A * 11/1955 May A61M 5/30 604/68

(Continued)

FOREIGN PATENT DOCUMENTS

DE 3609555 9/1987
EP 0673482 4/1998

(Continued)

OTHER PUBLICATIONS

Reissue U.S. Appl. No. 10/442,855, "Injection Syringe", filed May 21, 2003.

(Continued)

Primary Examiner — Manuel Mendez

(74) *Attorney, Agent, or Firm* — McDonnell Boehnen Hulbert & Berghoff LLP

(57) **ABSTRACT**

The present invention relates to injectors, such as pen-type injectors, that provide for administration of medicinal products from a multidose-cartridge and permit a user to set the delivery dose. The injector may include a housing, a piston rod adapted to operate through the housing, a dose dial sleeve located between the housing and the piston rod, and a drive sleeve located between the dose dial sleeve and the piston rod. The dose dial sleeve may have a helical thread of first lead and the drive sleeve may have a helical groove of second lead. The first lead of the helical thread and the second lead of the helical groove may be the same.

10 Claims, 7 Drawing Sheets

