

(12) United States Patent

Markussen

AUTOMATIC INJECTION DEVICE WITH A TOP RELEASE MECHANISM

(71) Applicant: Novo Nordisk A/S, Bagsværd (DK)

Tom Hede Markussen, Bagsvaerd Inventor:

Assignee: Novo Nordisk A/S, Bagsvaerd (DK)

(*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

This patent is subject to a terminal dis-

claimer.

Appl. No.: 14/797,350

(22) Filed: Jul. 13, 2015

(65)**Prior Publication Data**

> US 2015/0314076 A1 Nov. 5, 2015

Related U.S. Application Data

Continuation of application No. 13/326,738, filed on Dec. 15, 2011, now Pat. No. 9,108,002, which is a (Continued)

(30)Foreign Application Priority Data

Jan. 21, 2005 (DK) 2005 00113

(51) Int. Cl. A61M 5/31 (2006.01)A61M 5/315

(2006.01)

(Continued)

(52) U.S. Cl.

CPC A61M 5/31551 (2013.01); A61M 5/20 (2013.01); A61M 5/3156 (2013.01); A61M *5/31525* (2013.01); *A61M 5/31528* (2013.01); (10) Patent No.: US 9,616,180 B2

*Apr. 11, 2017 (45) **Date of Patent:**

A61M 5/31553 (2013.01); A61M 5/31585

(2013.01); A61M 5/24 (2013.01); A61M 5/31583 (2013.01); A61M 5/31593 (2013.01); A61M 2005/202 (2013.01); A61M 2005/3126

Field of Classification Search

CPC A61M 5/31525; A61M 5/31553; A61M 5/3156; A61M 5/20; A61M 5/24

See application file for complete search history.

References Cited (56)

U.S. PATENT DOCUMENTS

5,104,380 A 4/1992 Holman et al. 5,308,340 A 5/1994 Harris (Continued)

FOREIGN PATENT DOCUMENTS

EP 0293958 A1 12/1988 EP 0293958 B 12/1988 (Continued)

Primary Examiner — Laura Bouchelle (74) Attorney, Agent, or Firm — Wesley Nicolas

(57)ABSTRACT

The present invention relates to a handheld mechanical injection device by which set doses of a liquid medicament can be injected from a medical reservoir. The medicament is expelled through an injection needle by release of a power reservoir in the device, the power reservoir being fully or partially released by actuation of a user operable release member being positioned at or near an upper end of the injection device, the upper end being that end of the injection device which is opposite the injection needle.

14 Claims, 13 Drawing Sheets

