

Exhibit I



(12) **United States Patent**
Markussen

(10) **Patent No.:** **US 9,616,180 B2**
(45) **Date of Patent:** ***Apr. 11, 2017**

(54) **AUTOMATIC INJECTION DEVICE WITH A TOP RELEASE MECHANISM**

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* (2013.01)

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

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(58) **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.

(73) 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.

(56) **References Cited**

This patent is subject to a terminal disclaimer.

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(21) Appl. No.: **14/797,350**

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(22) Filed: **Jul. 13, 2015**

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(65) **Prior Publication Data**

US 2015/0314076 A1 Nov. 5, 2015

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EP 0293958 B 12/1988
(Continued)

Related U.S. Application Data

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

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(74) *Attorney, Agent, or Firm* — Wesley Nicolas

(30) **Foreign Application Priority Data**

Jan. 21, 2005 (DK) 2005 00113

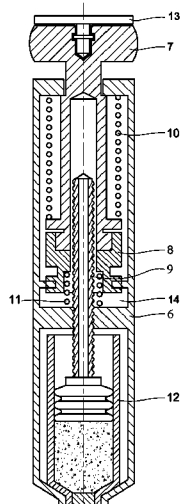
(57) **ABSTRACT**

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

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.

(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);

14 Claims, 13 Drawing Sheets



US 9,616,180 B2

Page 2

Related U.S. Application Data

- continuation of application No. 11/813,435, filed as application No. PCT/DK2006/000032 on Jan. 20, 2006, now Pat. No. 8,096,978.
- (60) Provisional application No. 60/647,320, filed on Jan. 26, 2005.
- (51) **Int. Cl.**
A61M 5/20 (2006.01)
A61M 5/24 (2006.01)

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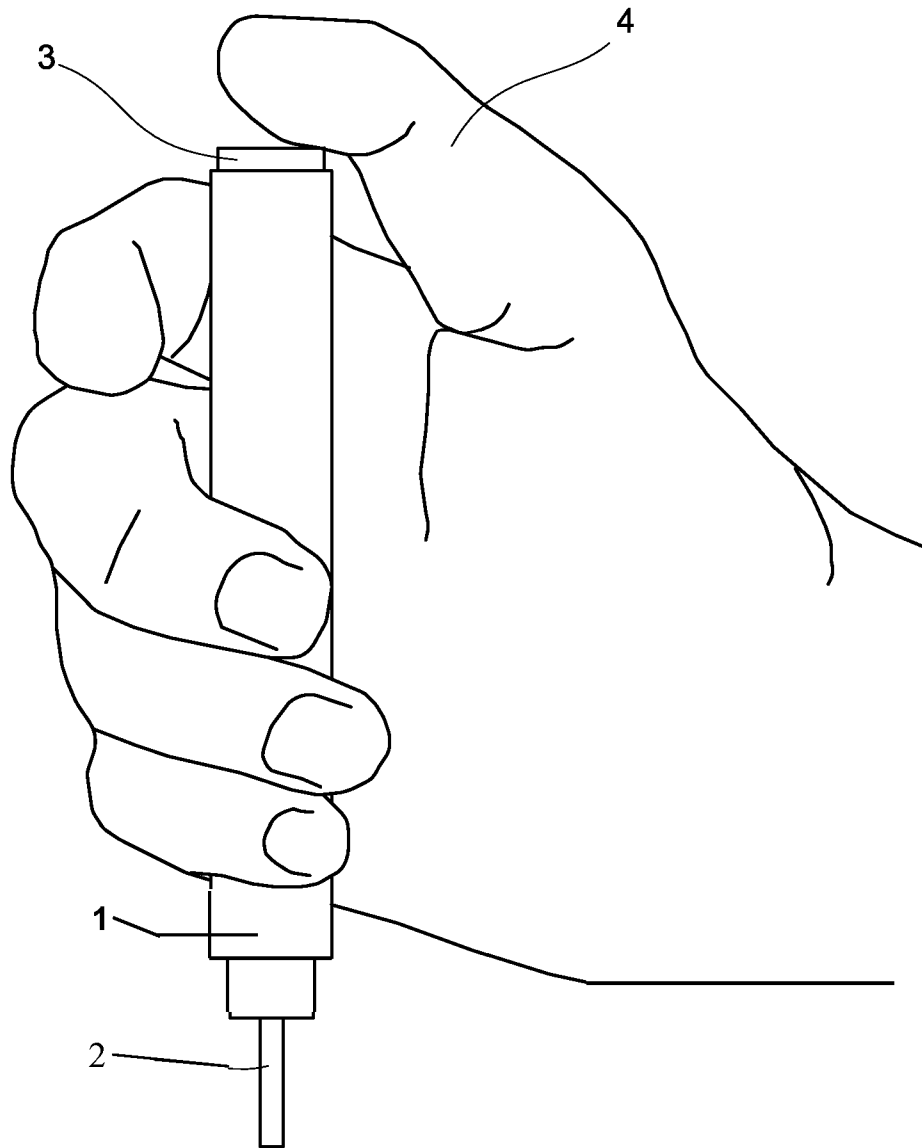


FIG. 1

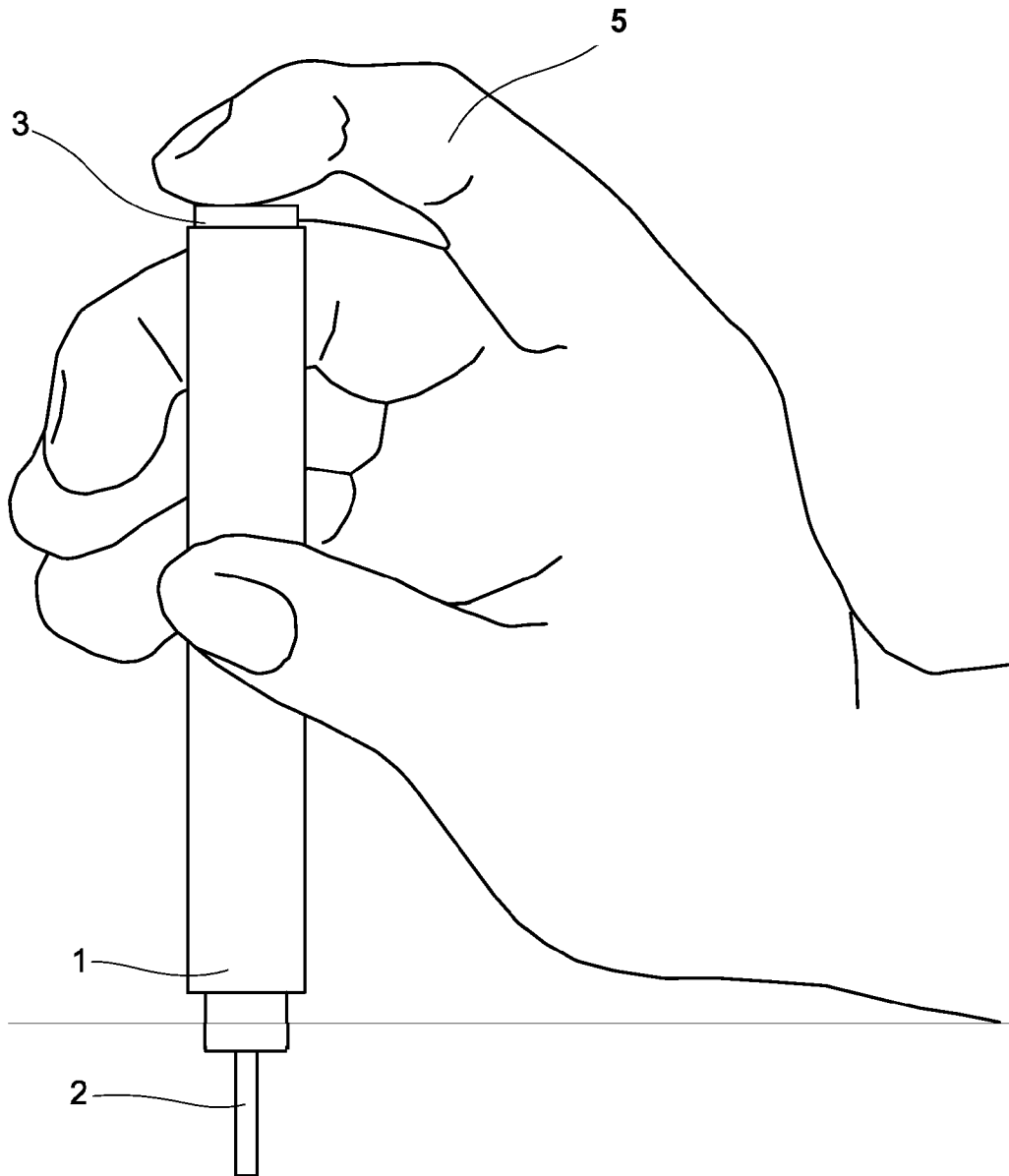


FIG. 2

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