# Exhibit L

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

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(45) **Date of Patent: Jan. 9, 2018**

(54) **INJECTION DEVICE WITH AN END OF DOSE FEEDBACK MECHANISM**

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

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(65) **Prior Publication Data**

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**Related U.S. Application Data**

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(Continued)

(30) **Foreign Application Priority Data**

Jan. 25, 2005 (EP) ..... 05075187

(51) **Int. Cl.**
***A61M 5/315*** (2006.01)
***A61M 5/20*** (2006.01)
***A61M 5/24*** (2006.01)

(52) **U.S. Cl.**
CPC ..... ***A61M 5/3157*** (2013.01); ***A61M 5/20*** (2013.01); ***A61M 5/24*** (2013.01); ***A61M 5/3155*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC ..... A61M 5/3157; A61M 5/20; A61M 5/24; A61M 5/3155; A61M 2205/581;
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,592,745 A 6/1986 Rex et al.
5,114,406 A * 5/1992 Gabriel ..... A61M 5/2033 604/134
(Continued)

FOREIGN PATENT DOCUMENTS

DE 19819409 A1 11/1999
EP 594357 A1 4/1994
(Continued)

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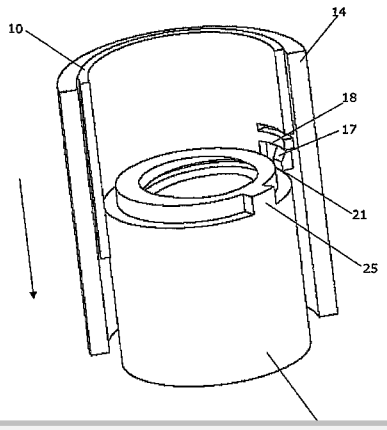
(57) **ABSTRACT**

An injection device with a dose delivering mechanism being adapted to provide a non-visual, e.g. audible and/or tactile, feedback signal when a set dose has been at least substantially injected. A first and a second part of the injection device are adapted to perform a relative rotational movement with respect to each other. The relative rotational movement causes at least two parts of the injection device to abut or engage, and this abutment or engagement causes the non-visual feedback signal to be generated. A very distinct and precise feedback is provided as compared to prior art axial solutions because the generation of the feedback signal is initiated by the relative rotational movement.
Feedback signal may be generated by a change in a rotational velocity of at least one part, e.g. by changing the pitch of a threaded portion or by engaging a non-rotating part and a rotating part, thereby causing the non-rotating part to start rotating. May alternatively be generated by building up and releasing a tension.
The injection device is suitable for injecting insulin.

**12 Claims, 14 Drawing Sheets**



**Related U.S. Application Data**

(60) Provisional application No. 60/647,491, filed on Jan. 27, 2005.

(52) **U.S. Cl.**
CPC ..... *A61M 5/31535* (2013.01); *A61M 5/31551* (2013.01); *A61M 5/31561* (2013.01); *A61M 5/31585* (2013.01); *A61M 2205/581* (2013.01); *A61M 2205/582* (2013.01)

(58) **Field of Classification Search**
CPC ..... A61M 2205/582; A61M 5/31535; A61M 5/31551; A61M 5/31585
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | | | |
|---|---|---|---|---|---|
| 5,391,157 | A * | 2/1995 | Harris | A61M 5/31511 | 604/208 |
| 5,501,670 | A * | 3/1996 | Sak | A61M 5/31511 | 604/110 |
| 5,582,598 | A * | 12/1996 | Chanoch | A61M 5/31551 | 222/309 |
| 5,957,889 | A | 9/1999 | Poulsen et al. | | |
| 6,004,297 | A | 12/1999 | Steenfeldt-Jensen et al. | | |
| 6,221,046 | B1 | 4/2001 | Burroughs et al. | | |
| 6,248,090 | B1 | 6/2001 | Jensen et al. | | |
| 6,277,098 | B1 | 8/2001 | Klitmose et al. | | |
| 6,454,743 | B1 | 9/2002 | Weber | | |
| 6,663,602 | B2 | 12/2003 | Moller | | |
| 6,699,224 | B2 | 3/2004 | Kirchhofer et al. | | |
| 6,796,970 | B1 | 9/2004 | Klitmose et al. | | |
| 7,241,278 | B2 | 7/2007 | Moller | | |
| 8,202,256 | B2 | 6/2012 | Moller | | |
| 8,206,361 | B2 | 6/2012 | Moller | | |
| 8,267,899 | B2 | 9/2012 | Moller | | |
| 8,333,739 | B2 | 12/2012 | Moller | | |
| 2004/0210199 | A1 | 10/2004 | Atterbury et al. | | |

FOREIGN PATENT DOCUMENTS

| | | | |
|---|---|---|---|
| EP | 688571 | A1 | 12/1995 |
| JP | 2002-503116 | A | 1/2002 |
| JP | 2002-513647 | A | 5/2002 |
| RU | 2212254 | | 9/2003 |
| SU | 1528330 | A3 | 12/1989 |
| WO | 9857688 | | 12/1998 |
| WO | 99/56805 | A1 | 11/1999 |
| WO | 2004007002 | A1 | 1/2004 |

* cited by examiner

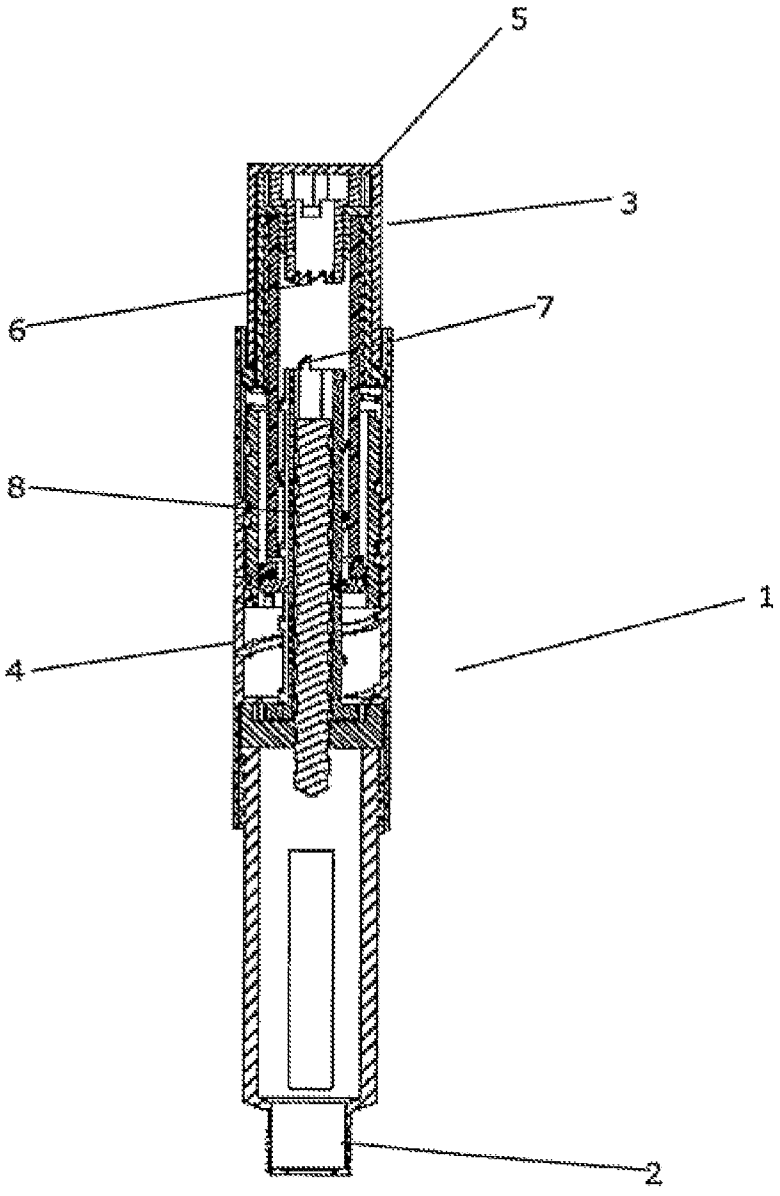



FIG. 1

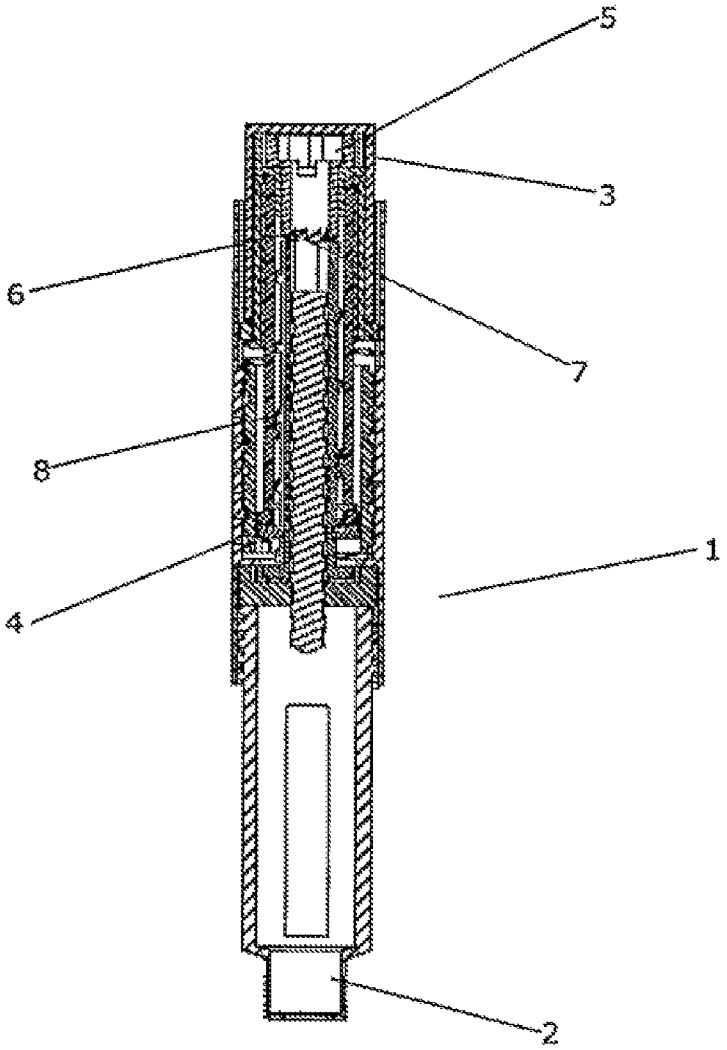



FIG. 2

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