

Exhibit O



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

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 (45) **Date of Patent:** **Jul. 23, 2019**

(54) **INJECTION DEVICE WITH AN END OF DOSE FEEDBACK MECHANISM**
 (71) Applicant: **Novo Nordisk A/S**, Bagsvaerd (DK)
 (72) Inventors: **Claus Schmidt Moller**, Fredensborg (DK); **Bo Radmer**, Hilleroed (DK); **Lars Ulrik Nielsen**, Virum (DK); **Christian Peter Enggaard**, Vejby (DK)
 (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.

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 US 2018/0071459 A1 Mar. 15, 2018
Related U.S. Application Data
 (63) Continuation of application No. 15/241,566, filed on Aug. 19, 2016, now Pat. No. 9,861,757, which is a (Continued)

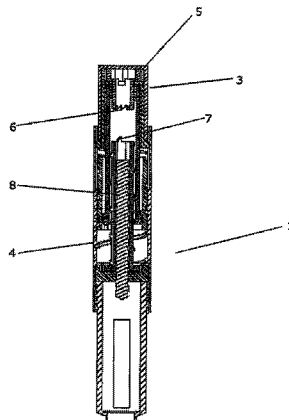
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Primary Examiner — Lauren P Farrar
 (74) *Attorney, Agent, or Firm* — Wesley Nicolas

(30) **Foreign Application Priority Data**
 Jan. 25, 2005 (EP) 05075187

(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.

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A61M 5/24 (2006.01)
A61M 5/315 (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 5/31535**;
 (Continued)

9 Claims, 14 Drawing Sheets



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Related U.S. Application Data

- continuation of application No. 11/813,389, filed as application No. PCT/EP2006/000486 on Jan. 20, 2006, now Pat. No. 9,457,154.
- (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 5/31551; A61M 5/31561; A61M 5/31585; A61M 2205/581; A61M 2205/582

See application file for complete search history.

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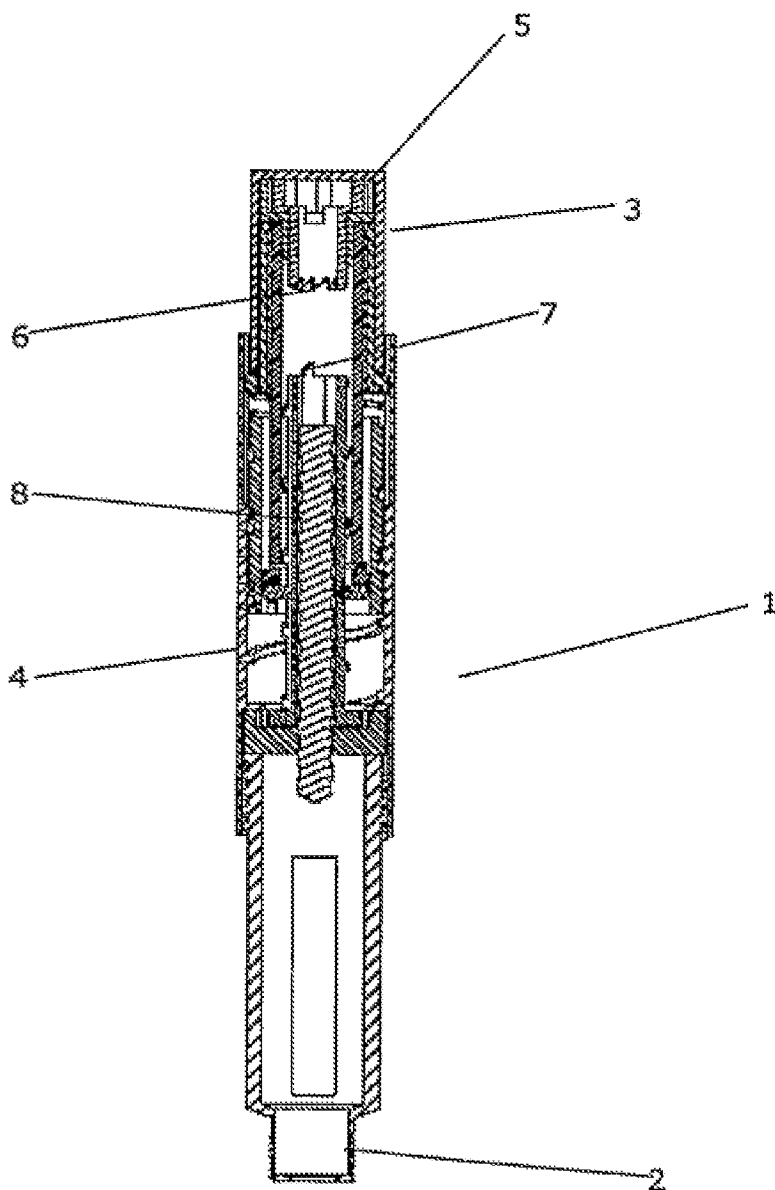


FIG. 1

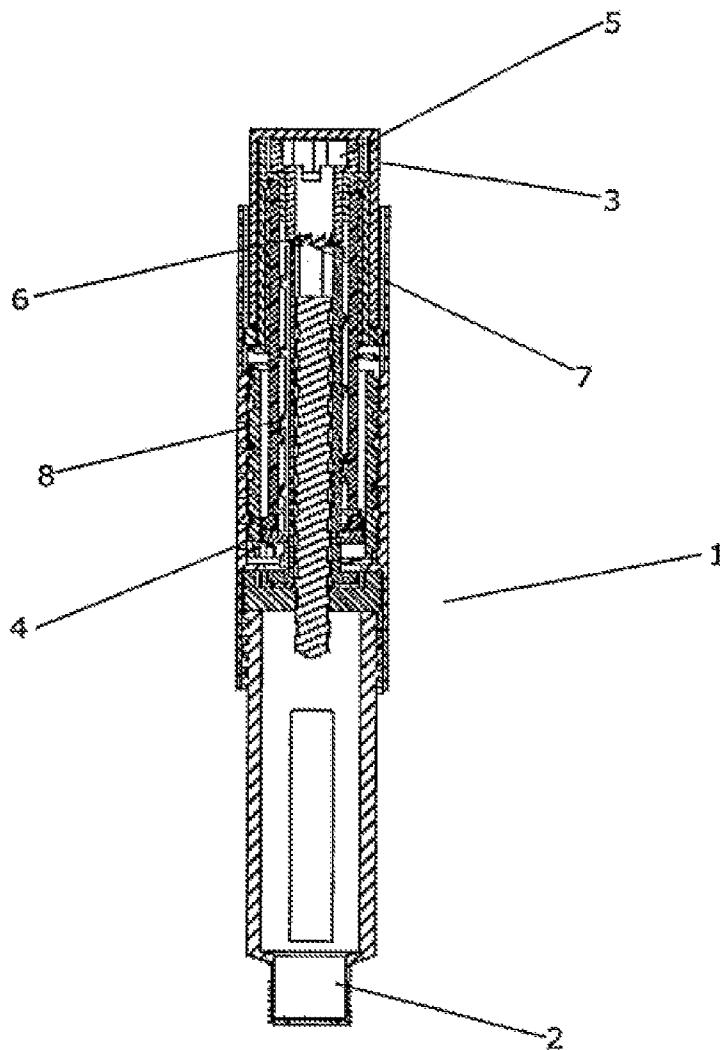


FIG. 2

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