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

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(54) **DRIVE MECHANISMS SUITABLE FOR USE  
IN DRUG DELIVERY DEVICES**

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U.S.C. 154(b) by 164 days.

This patent is subject to a terminal dis-  
claimer.

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CPC ..... **A61M 5/31551** (2013.01); **A61M 5/24**  
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(58) **Field of Classification Search**

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claims, as well as the reissue declaration.

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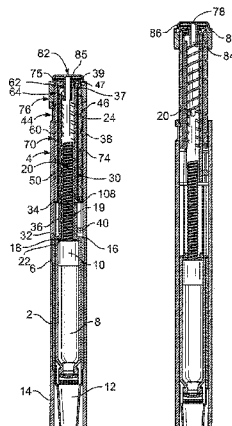
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(57) **ABSTRACT**

A drive mechanism suitable for use in drug delivery devices  
is disclosed. The drive mechanism may be used with injec-  
tor-type drug delivery devices, such as those permitting a  
user to set the delivery dose. The drive mechanism may  
include a housing, a dose dial sleeve, and a drive sleeve. A  
clutch is configured to permit rotation of the drive sleeve and  
the dose dial sleeve with respect to the housing when the  
dose dial sleeve and drive sleeve are coupled through the  
clutch. Conversely, when the dose dial sleeve and drive  
sleeve are in a de-coupled state, rotation of the dose dial  
sleeve with respect to the housing is permitted and rotation  
of the drive sleeve with respect to the housing is prevented.  
In the de-coupled state, axial movement of the drive sleeve

(Continued)



transfers force in a longitudinal direction for actuation of a drug delivery device.

**19 Claims, 13 Drawing Sheets**

**Related U.S. Application Data**

continuation of application No. 12/320,189, filed on Jan. 21, 2009, now Pat. No. 7,850,662, which is a continuation of application No. 11/520,598, filed on Sep. 14, 2006, now Pat. No. 7,935,088, which is a continuation of application No. 10/790,866, filed on Mar. 3, 2004, now abandoned.

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(58) **Field of Classification Search**

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See application file for complete search history.

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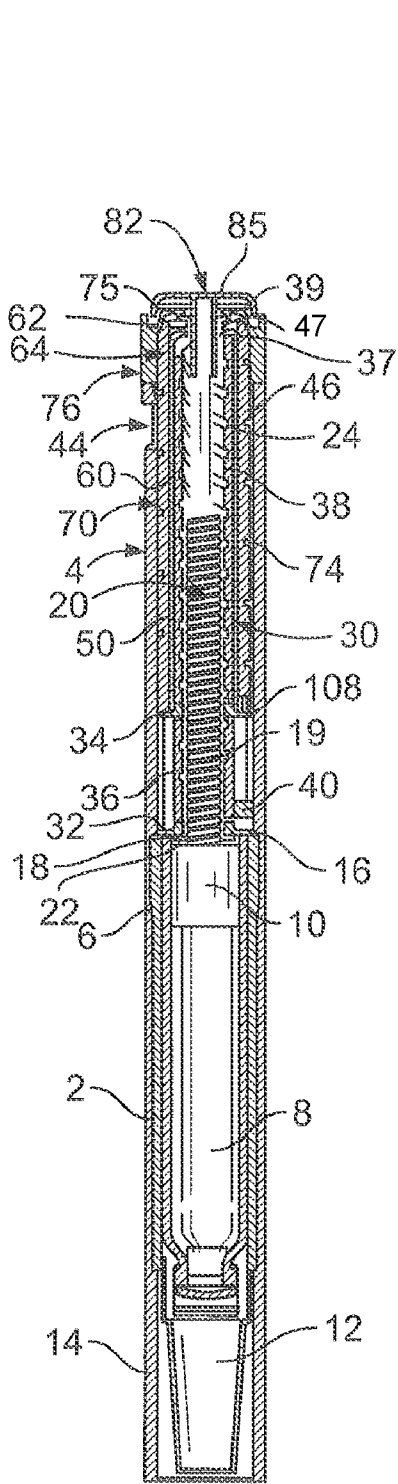


FIG. 1

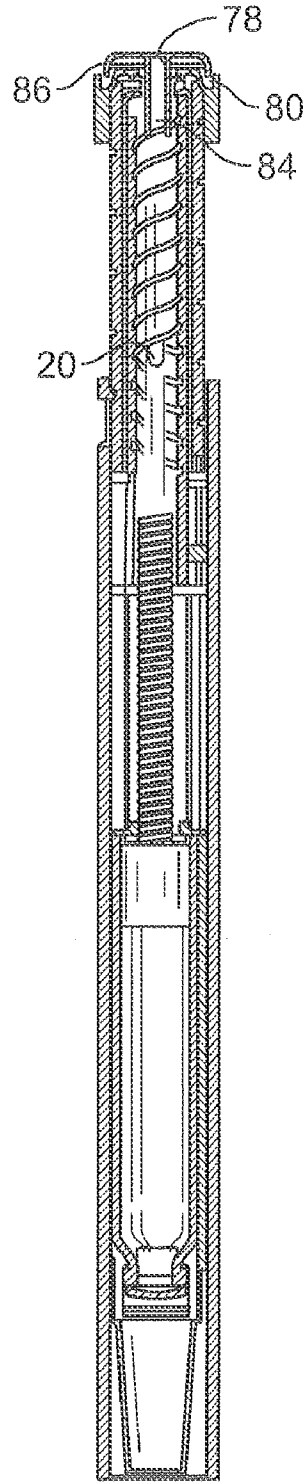


FIG. 2

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