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<b>UTILITY PATENT APPLICATION TRANSMITTAL</b>  <i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i>	<i>Attorney Docket No.</i>	10-1188-US-CON7
	<i>First Inventor</i>	Robert Frederick Veasey
	<i>Title</i>	RELATING TO A PEN-TYPE INJECTOR
	<i>Express Mail Label No.</i>	

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Continuation     Divisional     Continuation-in-part (CIP)    of prior application No.: 14/635,573.....

Prior application information:                      Examiner: MENDEZ, MANUEL A                      Art Unit: 3763

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## SPECIFICATION

### TITLE

#### **IMPROVEMENTS IN AND RELATING TO A PEN-TYPE INJECTOR**

### CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation of U.S. Patent Application No. U.S. 14/635,573, filed March 2, 2015, which is a continuation of U.S. Patent Application No. 13/919,251, filed June 17, 2013, now U.S. Patent No. 9,011,391, which is a divisional of U.S. Patent Application No. 13/040,198, filed March 3, 2011, now U.S. Patent No. 8,512,297, which is a continuation of U.S. Patent Application No. 11/483,546, filed July 11, 2006, now U.S. Patent No. 7,918,833, which is a continuation of U.S. Patent Application No. 10/790,225, filed March 2, 2004, which claims priority to GB 0304822.0 filed March 3, 2003, the entire contents of which are incorporated herein by reference.

### BACKGROUND

[0002] The present invention relates to pen-type injectors, that is, to injectors of the kind that provide for administration by injection of medicinal products from a multidose cartridge. In particular, the present invention relates to such injectors where a user may set the dose.

[0003] Such injectors have application where regular injection by persons without formal medical training occurs. This is increasingly common amongst those having diabetes where self-treatment enables such persons to conduct effective management of their diabetes.

[0004] These circumstances set a number of requirements for pen-type injectors of this kind. The injector must be robust in construction, yet easy to use both in terms of the manipulation of the parts and understanding by a user of its operation. In the case of those with diabetes, many users will be physically infirm and may also have impaired vision. Where the injector is to be disposable rather than reusable, the injector should be cheap to manufacture and easy to dispose of (preferably being suitable for recycling).

### SUMMARY

[0005] It is an advantage of the present invention that an improved pen-type injector is provided.

[0006] According to a first aspect of the present invention, a pen-type injector comprises a housing;  
a piston rod adapted to operate through housing;  
a dose dial sleeve located between the housing and the piston rod, the dose dial sleeve having a helical thread of first lead;  
a drive sleeve located between the dose dial sleeve and the piston rod, the drive sleeve having a helical groove of second lead;  
characterized in that the first lead of the helical thread and the second lead of the helical groove are the same.

[0007] Preferably, the piston rod has a first threaded portion at a first end and a second threaded portion at a second end;

an insert or radially inwardly extending flange is located in the housing and through which the first threaded portion of the piston rod may rotate;

the dose dial sleeve being rotatable with respect to the housing and the insert;

the drive sleeve being releasably connected to the dose dial sleeve and connected to the piston rod for rotation with respect thereto along the second threaded portion of the piston rod;

a button is located on the dose dial sleeve and rotatable with respect to the dose dial sleeve; and

clutch means are provided which upon depression of the button permit rotation between the dose dial sleeve and the drive sleeve.

[0008] Preferably, the injector further comprises a nut which is rotatable with respect to the drive sleeve and axially displaceable but not rotatable with respect to the housing.

[0009] More preferably, the drive sleeve is provided at a first end with first and second flanges with an intermediate thread between the first and second flanges, the nut being disposed between the first and second flanges and keyed to the housing by spline means. Additionally, a first radial stop may be provided on a second face of the nut and a second radial stop may be provided on a first face of the second flange.

[0010] Preferably, the first thread of the piston rod is oppositely disposed to the second thread of the piston rod.

[0011] Preferably, a second end of the clutch is provided with a plurality of dog teeth adapted to engage with a second end of the dose dial sleeve.

[0012] Preferably, the pen-type injector further includes clicker means disposed between the clutch means and spline means provided on the housing.

[0013] More preferably, the clicker means comprises a sleeve provided at a first end with a helically extending arm, a free end of the arm having a toothed member, and at a second end with a plurality of circumferentially directed saw teeth adapted to engage a corresponding plurality of circumferentially saw teeth provided on the clutch means.

[0014] Alternatively, the clicker means comprises a sleeve provided at a first end with at least one helically extending arm and at least one spring member, a free end of the arm having a toothed member, and at a second end with a plurality of circumferentially directed saw teeth adapted to engage a corresponding plurality of circumferentially directed saw teeth provided on the clutch means.

[0015] Preferably, the main housing is provided with a plurality of maximum dose stops adapted to be abutted by a radial stop provided on the dose dial sleeve. More preferably, at least one of the maximum dose stops comprises a radial stop located between a helical rib and spline means provided at a second end of the housing. Alternatively, at least one of the maximum dose stops comprises a part of a raised window portion provided at a second end of the housing.

[0016] Preferably, the dose dial sleeve is provided with a plurality of radially extending members adapted to abut a corresponding plurality of radial stops provided at a second end of the housing.

#### BRIEF DESCRIPTION OF THE FIGURES

[0017] The invention will now be described with reference to the accompanying drawings in which:

[0018] Figure 1 shows a sectional view of a pen-type injector in accordance with the present invention in a first, cartridge full, position;

[0019] Figure 2 shows a sectional view of the pen-type injector of Figure 1 in a second, maximum first dose dialed, position;

[0020] Figure 3 shows a sectional view of the pen-type injector of Figure 1 in a third, first maximum first dose dispensed, position;

[0021] Figure 4 shows a sectional view of the pen-type injector of Figure 1 in a fourth, final dose dialed, position;

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