therefore such devices are typically complicated from a manufacturing, from an assembly and an handling standpoint. For example, certain typical resettable pen type devices are not intuitive as to how a user must replace an empty cartridge and reset the device. In addition, because such resettable devices use a large number of components parts, such resettable devices tend to be large and bulky, and therefore not easy to carry around or easy to conceal.

It is therefore the object of the present invention to improve the drug delivery device as well as the dosing mechanism with regard to these disadvantages associated with resetting issues. Such desired drug delivery devices would tend to reduce the number of component parts and also tend to reduce manufacturing costs while also making the device less complex to assemble and manufacture. Such desired devices would also tend to simplify the steps required for a user to reset a dose setting mechanism while also making the device less complex and more compact in size.

SUMMARY

According to an exemplary embodiment ~~of the present invention solving above object~~, a resettable dosing mechanism comprises a dose button and a dial grip operatively coupled to the dose button. The dial grip is rotatable to set a dose. A spindle acts on a bung of a cartridge and a driver is operatively coupled between the dose button and the spindle. During an injection of the dose, said dose button moves in an axial direction to cause said spindle to administer said dose. The dosing mechanism further comprises a resetting mechanism, wherein during resetting of the dose setting mechanism using said resetting mechanism, the spindle is preferably retracted back into the dose setting mechanism. The dial grip is operable to be pulled in a proximal direction (D_2) in order to activate said resetting mechanism.

In another exemplary embodiment, a resettable dose setting mechanism comprises a preferably inner housing preferably having a helical groove. A dose dial sleeve is rotationally engaged with the housing, preferably with the helical groove of the housing. A driver is provided within the inner housing. The dose setting mechanism takes at least three different conditions using a first clutch provided between the dial sleeve and the driver and a second clutch provided between said housing and said driver. When a

dose is set, the first clutch engages ~~and~~ the dial sleeve and the driver to rotate together relative to the housing. When the dose is injected, the first clutch disengages the dose dial sleeve from the driver while the second clutch couples the driver to the inner housing, so that the dose dial sleeve rotates and the driver is prevented from rotating but moves axially against a spindle to expel the set dose. When resetting the dose setting mechanism, the first clutch decouples the driver from the dial sleeve and said second clutch decouples said driver from said housing, allowing the driver to be moved to a reset position.

In yet another arrangement, a resettable drug delivery device comprises a cartridge holder comprising a releasable mechanical interlock. A preferably above described resettable dose setting mechanism (dosing mechanism) is releasably coupled to the interlock. The dose setting mechanism comprises a dose button, a transfer sleeve, and a rotatable dose setting sleeve. The transfer sleeve is operatively engaged with said dose button or a dose dial grip. The rotatable dose setting sleeve preferably surrounds the transfer sleeve. When the dose setting sleeve is rotated to reach a predetermined position, the dose setting sleeve releases the mechanical interlock and places the resettable dose setting mechanism in a reset condition.

The above inventive solution requires a low part count and low complexity at the heart of the drug delivery device where space is limited. Further, the inventive solution does not expose plastic features to prolonged periods of load and has stiff and direct load paths.

These as well as other advantages of various aspects of the present invention will become apparent to those of ordinary skill in the art by reading the following detailed description, with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments are described herein with reference to the drawings, in which:

Figure 1 illustrates a first embodiment of a resettable drug delivery device;