BRIEF SUMMARY

In one aspect thereof, the present disclosure provides an automatic medication injection device including a user grippable housing having a length extending in an axial direction between a proximal end and a distal end, a container of medication including an outlet that is disposed proximally of the housing proximal end at least during injection, the container including a barrel and a sealing plunger, the sealing plunger in sealing engagement with the barrel,a drive mechanism within the housing which when triggered automatically advances the container of medication within the housing and advances the sealing plunger proximally within the container to force medication from the outlet, the drive mechanism including an advancing portion that inserts within the barrel, a plurality of sound elements located on the advancing portion, and at least one actuating element movable axially within the housing with the container of medication, the at least one actuating element arranged to engage the plurality of sound elements to generate audible notices as the advancing portion moves past the at least one actuating element when advancing the sealing plunger for an injection.

The present disclosure also provides an automatic medication injection device including a user grippable housing having a length extending in an axial direction between a proximal end and a distal end, a container of medication including an outlet that is disposed proximally of the housing proximal end at least during injection, a drive mechanism within the housing which when triggered automatically advances to force medication from the outlet for an injection, a plurality of sound elements within the housing, at least one actuating element within the housing, at least one of the at least one actuating element and the plurality of sound elements configured to travel within the

housing when the drive mechanism advances to force medication from the outlet so that the plurality of sound elements and the at least one actuating element move relative to each other to have the at least one actuating element engage the plurality of sound elements to generate audible notices during the injection. Each of the plurality of sound elements other than a most distal sound element has a spacing in the axial direction from a proximally adjacent one of the sound elements. The spacings are selected to provide a pattern of shortening time intervals between the audible notices throughout at least a portion of time that the drive mechanism advances to force medication from the outlet.

In another aspect of the present disclosure, there is provided an automatic medication injection device comprising:

a user grippable housing having a length extending in an axial direction between a proximal end and a distal end;

a container of medication including an outlet that is disposed proximally of said housing proximal end at least during injection;

a drive mechanism within said housing which when triggered automatically advances to force medication from the outlet for an injection;

a plurality of sound elements within said housing;

at least one actuating element within said housing;

at least one of said at least one actuating element and said plurality of sound elements configured to travel within said housing when said drive mechanism advances to force medication from the outlet so that said plurality of sound elements and said at least one actuating element move relative to each other to have said at least one actuating element engage said plurality of sound elements to generate audible notices during the injection;

wherein each of said plurality of sound elements other than a most distal sound element has a spacing in the axial direction from a proximally adjacent one of said sound elements; and

wherein said spacings are selected to provide a pattern of shortening time intervals between said audible notices throughout at least a portion of time that said drive mechanism advances to force medication from the outlet.

One advantage of the present disclosure is that an automatic medication injection device may be provided with an audible indicator that has a changing cadence to indicate the approaching of an end of dose.

Still another advantage of the present disclosure is that an automatic medication injection device may be provided with an audible indicator in a ready fashion with limited parts modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and other advantages and objects of this invention, and the manner of attaining them, will become more apparent, and the invention itself will be better understood, by reference to the following description of embodiments of the invention taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a front view of an automatic injection device with an audible injecting progress indicator shown prior to use;

Fig. 2 is a cross-sectional side view of the device of Fig. 1 prior to use, wherein portions of the device are omitted or shown schematically;