result in a trigger part deforming when in use. This deforming may compromise the efficiency of the trigger operation and make it more difficult for a person to operate the trigger. And, making trigger assemblies bigger or out of relatively expensive materials so as to better accommodate larger operational forces may not be an option due to a cost or space constraints with a suitably sized automatic injection device.

Thus, it would be desirable to provide a trigger assembly for an automatic injection device which can overcome one or more of these and other shortcomings of the prior art.

BRIEF SUMMARY OF THE INVENTION

In one aspect, there is provided a trigger assembly for an automatic injection device including a biased element and a housing, the biased element releaseable by operation of the trigger assembly for movement in a first axial direction relative to the housing, the device further including at least one latch surface and a support surface, the trigger assembly comprising:

a button shiftable relative to the housing from a first axial position to a second axial position, said button including an actuating element extending in the first axial direction and including a radially inward face and a radially outward face, said radially inward face comprising a prong-engaging surface;

a single prong extending from the biased element toward said button and including at least one latching surface and a button-engaging surface for sliding engagement with said prong-engaging surface of said actuating element, wherein at least one of said prong-engaging surface and said button-engaging surface is angled relative to the axial direction to provide a ramp;

said button-engaging surface and the support surface of the device defining a radially extending opening in which said actuating element fits for said radially outward face of said actuating element to be backed up by the support surface; and

said actuating element and said single prong structured and arranged such that when said button is in said first axial position, said at least one latching surface is in a radial position at which the at least one latch surface is engagable to prevent movement of the biased element in the first axial direction, and such that movement of said button from said first axial position to said second axial position shifts said at least one latching surface radially for disengagement from the at least one latch surface, whereby motion of said actuating element in a direction away from

said prong is limited by said radially outward face of said actuating element abutting the support surface.

In another aspect, there is provided an automatic injection device comprising:

a housing;

a syringe filled with medication and including a needle, said syringe shiftable within said housing from a first position at which said needle is disposed within said housing, to a second position at which said needle projects beyond said housing;

drive means including a biased element for shifting said syringe from said first position to said second position and for forcing medication through said needle;

at least one latch surface and a support surface disposed within said housing;

a trigger assembly for triggering said drive means to allow said biased element to move in a first axial direction relative to the housing, said trigger assembly including;

a button shiftable relative to the housing from a first axial position to a second axial position, said button including an actuating element extending in the first axial direction and including a radially inward face and a radially outward face, said radially inward face comprising a prong-engaging surface;

a single prong extending from said biased element toward said button and including at least one latching surface and a button-engaging surface for sliding engagement with said prong-engaging surface of said actuating element, wherein at least one of said prong-engaging surface and said button-engaging surface is angled relative to the axial direction to provide a ramp;

said button-engaging surface and the support surface defining a radially extending opening in which said actuating element fits for said radially outward face of said actuating element to be backed up by the support surface; and

said actuating element and said single prong structured and arranged such that when said button is in said first axial position, said at least one latching surface is in a radial position at which the at least one latch surface is engagable to prevent movement of the biased element in the first axial direction, and such that movement of said button from said first axial position to said second axial position shifts said at least one latching surface radially for disengagement from the at least one latch surface, whereby motion of said actuating element in a direction away from said prong is limited by said radially outward face of said actuating element abutting the support surface.

In one form thereof, the present ~~invention~~ disclosure provides a trigger assembly for an automatic injection device. The trigger assembly by its operation releases a biased element of the device for movement in a first axial direction relative to a housing of the device. The trigger assembly includes a button shiftable relative to the housing from a first axial position to a second axial position. The button includes an actuating element extending in a first axial direction and including a radially inward face and a radially outward face. The radially inward face includes a prong-engaging surface. The trigger assembly includes a single prong extending from the biased element toward the button and includes at least one latching surface and a button-engaging surface for sliding engagement with the prong-engaging surface of the actuating element. At least one of the prong-engaging surface and the button-engaging surface is angled relative to the axial direction to provide a ramp. The button-engaging surface and a support surface of the device define a radially extending opening in which the actuating element fits for the radially outward face of the actuating element to be backed up by the support surface.

The actuating element and the single prong are structured and arranged such that when the button is in the first axial position, the at least one latching surface is in a radial position at which an at least one latch surface of the device is engagable to prevent movement of the biased element in the first axial direction, and such that movement of the button from the first axial position to the second axial position shifts the at least one latching surface radially for disengagement from the at least one latch surface, whereby the motion of the actuating element in a direction away from the prong is limited by the radially outward face of the actuating element abutting the support surface.

One advantage of the present ~~invention~~ disclosure is that a trigger assembly for an automatic injection device may be provided which allows for a convenient operation by a user, and which trigger assembly, from device to device, is readily repeatable in production so that it provides a consistent experience for users of the type of injection device in which it is employed.

Another advantage of the present ~~invention~~ disclosure is that a trigger assembly for an automatic injection device may be provided which is suitably robust without being overly large or costly.

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 the embodiments of the invention taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a side view of an automatic injection device with a trigger assembly of the present invention, which device is shown in a locked arrangement prior to use;