What is claimed is:

CLAIMS

1. A apparatus to inject medical liquid comprising:
a housing;
a syringe barrel with a fitting at the closed end, the syringe attached to the housing; a plunger including a lead screw, the plunger disposed in the syringe barrel
a mechanism to drive the lead screw toward the closed end of the syringe barrel;
an electric motor to drive the mechanism; and
wherein the mechanism is configured to be selectively disengaged from the lead screw and allowing the plunger to freely move axially in the syringe barrel.

2. The apparatus of claim 1 further comprising a second syringe that is configured to engage the fitting on the syringe barrel, wherein the second syringe may draw the plunger toward the closed end of the syringe barrel when the mechanism is selectively disengaged from the lead screw.

3. The apparatus of claim 1, wherein the lead screw has at least one flat surface parallel to the lead screw axis.

4. The apparatus of claim 3, the mechanism comprising:
a drive gear mechanically driven by the electric motor, the drive gear including an interal thread that engages the threads of the lead screw;
an anti-rotation flexure, the anti-rotation flexure have a first position wherein the lead screw can not rotate and a second position wherein the lead screw is free to rotate; and wherein the rotation of the drive gear moves the lead screw along its axis when the anti-rotation flexure is in the first position and the lead screw can rotate and move long its axis when the drive gear is fixed and the anti-rotation flexure is in a second position.

5. The apparatus of claim 4, further comprising a key mounted in the housing,
and the anti-rotation flexure comprises at least one arm that engage the at least one flat surface on the lead screw in the first position and the at least one arm extends to the key,

wherein the key is configured to rotate in the housing and push the at least one arms away from the lead screw to put the anti-rotation flexure in the second position.

6. The apparatus of claim 4 wherein the anti-rotation flexure is configured to rotate about an axis perpendicular to the lead screw, wherein in the first position the anti-rotation flexure engages the at least one flat surface on the lead screw and is configured to rotate to a second position wherein the anti-rotation flexure does not touch the at least one flat surface of the lead screw.

7. The apparatus of claim 3, wherein the mechanism comprising:
a drive gear mechanically driven by the electric motor, the drive gear including a plurality of petal elements extending approximately on the axis of the of the lead screw, the petal elements have a thread surface that engages the lead screw in a first position and disengage from the lead screw in a second position.

8. The apparatus of claim 1, wherein the plunger further includes a tip with a distal face that contacts the liquid and proximal surface that is detachable connected to the distal end of the lead screw, wherein the tip detaches from the lead screw when a negative pressure is applied to distal face.

9. The apparatus of claim 1, wherein the plunger further includes a tip with a distal face that contacts the liquid and proximal surface that is configured to rotate relative to the lead screw.

10. The apparatus of claim 1, the mechanism comprising a drive gear mechanically driven by the electric motor, wherein the electric motor may be displaced to disengage from the drive gear whereby lead screw may freely turn the drive gear as it moves axially.

11. The apparatus of claim 1, further comprising a controller that receives input from a pressure sensor, at least one user input and controls the speed and direction of the electric motor.

12. The apparatus of claim 11, wherein the at least one user input includes a trigger and a direction switch.

13. The apparatus of claim 11 further comprising a battery connected to the controller.

14. The apparatus of claim 12 further comprising a battery switch

15. The apparatus of claim 14, further comprising:
a first circuit that is configured to be energized by the battery switch, the first circuit including a latch relay
a circuit that connect the battery to the controller through the latch relay, wherein the latch relay is closed by the first full pull of the trigger.

16. The apparatus of claim 1, further comprising status outputs comprising at least one of an LCD display, a vibratory element and one or more status lights.

17. The apparatus of claim 1, further comprising status outputs comprising an LCD display and a status light, wherein the status light and LCD displays are controlled by the controller.

18. The apparatus of claim 1, wherein the mechanism comprises a reduction gear train on the the motor output shaft.

19. The apparatus of claim 18 further comprising a rotation sensor that detects the number of rotations of an element in the mechanism.

20. The apparatus of claim 18, where the rotation sensor measured rotations of a magnet on the end of the output shaft of the reduction gear train.

21. The apparatus of claim 1, wherein the apparatus is disposable.

22. The apparatus of claim 1, wherein the apparatus is only used for a single treatment.

23. The apparatus of claim 1, wherein the housing, the drive mechanism, the plunger, the electric motor and syringe barrel are disposable after a single treatment.

24. The apparatus of claim 1, wherein the housing, the drive mechanism, the plunger, the electric motor and syringe barrel are disposable are sterilized as a unit before use.

25. The apparatus of claim 1, wherein the housing, the drive mechanism, the plunger, the electric motor and syringe barrel are disposable are sterilized with ethylene oxide.

26. A treatment kit comprising the apparatus of claim 1, tubing, insertion needles, and transfer tubing, and a tray to hold the elements, wherein the treatment kit is sterilized with ethylene oxide.