

WHAT IS CLAIMED IS:

1. A valve assembly for a drug delivery device, the valve assembly comprising:
a valve housing having a first side and a second side positioned opposite from the first side;

a cannula having a first end and a second end positioned opposite the first end, the cannula defining a central passageway;

a pierce plate ~~comprising a body defined by a coiled member; and~~

a piercing member ~~extending from the body, the body comprising a coiled elongate member attached directly to the coiled member~~, the piercing member defining a central passageway configured to receive the cannula; and

a valve boot connected to the valve housing and defining an interior space, the valve boot is configured to move from a pre-use position where the first end of the cannula and the piercing member of the pierce plate are received within the interior space to a use position where the piercing member of the pierce plate and the first end of the cannula extend outside of the valve boot and the interior space.

2. The valve assembly of claim 1, further comprising a valve sleeve defining a cannula space, the valve sleeve is configured to move from a pre-use position where the first end of the cannula is received within the cannula space to a use position where the first end of the cannula extends outside of the valve sleeve and the cannula space.

3. The valve assembly of claim 2, wherein the valve sleeve comprises a first cylindrical portion having a convex tip, a second portion extending from the first portion, and a third frustoconical portion extending from the second portion.

4. The valve assembly of any of claims 1-3, wherein the valve boot includes a projection extending radially inward, the pierce plate engaged with the projection of the valve boot.

5. The valve assembly of any of claims 1-4, wherein the coiled ~~member is a coiled elongate~~ member has a first end and a second end axially spaced from the first end, the second end of the coiled elongate member configured to move toward the first end of the coiled elongate member.

6. The valve assembly of claim 5, wherein the coiled elongate member is frustoconical.

7. The valve assembly of claim 6, wherein the coiled elongate member includes a first frustoconical portion and a second frustoconical portion, the first frustoconical portion having a larger angle than the second frustoconical portion.

8. The valve assembly of any of claims 5-7, wherein the piercing member is connected to the second end of the coiled elongate member.

9. The valve assembly of any of claims 1-8, wherein the coiled ~~elongate~~ member comprises a metal wire.

10. The valve assembly of claim 9, wherein the metal wire comprises a shape memory alloy.

11. A drug delivery device comprising:
a housing;
a cartridge received within the housing, the cartridge configured to receive a medicament;
a drive assembly received within the housing and configured to engage the cartridge and dispense medicament from the cartridge;
a needle actuator assembly received within the housing, the needle actuator assembly comprising a patient needle configured to pierce a patient's skin; and
a valve assembly of any of claims 1-10.

~~12. A valve assembly for a drug delivery device, the valve assembly comprising:
a valve housing having a first side and a second side positioned opposite from the first side;
a cannula having a first end and a second end positioned opposite the first end, the cannula defining a central passageway;~~

~~a valve boot connected to the valve housing and defining an interior space, the valve boot is configured to move from a pre-use position where the first end of the cannula is received within the interior space to a use position where the first end of the cannula extends outside of the valve boot and the interior space; and~~

~~a valve sleeve defining a cannula space, the valve sleeve is configured to move from a pre-use position where the first end of the cannula is received within the cannula space to a use position where the first end of the cannula extends outside of the valve sleeve and the cannula space.~~

~~13. The valve assembly of claim 12, wherein the valve sleeve comprises an elastomeric material.~~

~~14. The valve assembly of claim 12 or claim 13, wherein the valve sleeve comprises a first cylindrical portion having a convex tip, a second portion extending from the first portion, and a third frustoconical portion extending from the second portion.~~

~~15. The valve assembly of claim 14, wherein the second portion of the valve sleeve comprises a frustoconical section and a cylindrical section.~~

~~16. The valve assembly of claim 14 or claim 15, wherein the third portion of the valve sleeve comprises at least one recessed portion configured to facilitate a collapse and deformation of the valve sleeve.~~

~~17. The valve assembly of any of claims 12-16, wherein the valve sleeve comprises a rubber material.~~

~~18. The valve assembly of any of claims 12-17, wherein the valve boot comprises an elastomeric material.~~

~~19. The valve assembly of any of claims 12-18, further comprising a pierce plate comprising a body and a piercing member extending from the body, wherein the piercing member of the pierce plate is received within the interior space of the valve boot when the valve boot is in the pre-use position, and wherein the piercing member of the pierce plate~~

~~extends outside of the valve boot and the interior space when the valve boot is in the use position.~~

~~20. A drug delivery device comprising:~~

~~a housing;~~

~~a cartridge received within the housing, the cartridge configured to receive a medicament;~~

~~a drive assembly received within the housing and configured to engage the cartridge and dispense medicament from the cartridge;~~

~~a needle actuator assembly received within the housing, the needle actuator assembly comprising a patient needle configured to pierce a patient's skin; and~~

~~a valve assembly of any of claims 12-19.~~