Claims

1. A cap comprising:

a housing comprising

a top wall,

a sidewall having an inner surface defining a cavity,

an open bottom formed by said cylindrical sidewall with an opening to the cavity within said housing for receiving a hub of a male luer connector;

an outer thread on an outer surface of the cylindrical sidewall, said outer thread being sufficient to interlock with a mating feature of said male luer connector;

a ball disposed within the cavity;

a disinfectant or antimicrobial agent,

one or more ribs disposed on an inner surface of the cavity;

the cavity having an inner surface having a first portion adjacent to the open bottom having a straight cylindrical sidewall having a first diameter which is smaller than the diameter of the ball, a second tapered portion disposed adjacent to the first portion wherein the second tapered portion having a second diameter that increases along the y-axis in a direction from the open bottom toward a top wall of the cavity, and a third portion having a straight cylindrical sidewall having a plurality of ribs protruding toward the central axis of the cavity, the third portion of the inner surface of the cavity disposed adjacent to the second portion and having a third diameter that is equal to or greater than the diameter of the ball.

2. The cap of claim 1, wherein when a hub of said male luer connector is received within said inner surface of said cavity, said hub is secured within said inner surface of said cavity by interlocking at least a portion of said outer thread with a mating feature on said hub of said male luer connector.

3. The cap of claim 1, wherein said cavity extends essentially from an inner surface of said top wall toward said open bottom of said housing.

4. The cap of claim 1, wherein the thread has an inclined thread pattern.

5. The cap of claim 1, wherein the thread has a helical-shaped thread pattern.

6. The cap of claim 1, further comprising a removable cover sealing said opening of the cavity to seal said ball and disinfectant or antimicrobial agent within said cavity prior to use of said cap.

7. The cap of claim 1, wherein an exterior wall surface of the sidewall of the housing includes a plurality of grip members.

8. The cap of claim 1, wherein the upper portion of the sidewall is tapered outward toward the top wall and the lower portion of the sidewall is cylindrical.

9. The cap of claim 8, wherein the upper portion of the sidewall includes a slanted surface.

10. The cap of claim 9, wherein the slanted surface includes one or more finger grips.

11 The cap of claim 10, wherein the one or more finger grips are made of an elastomeric material.

12. The cap of claim 1, wherein a compression of the ball toward the top wall of the housing occurs upon connection to the male luer connector.

13. The cap of claim 12, wherein compression of the ball disinfects the male luer connector.

14. The cap of claim 1, wherein the ball is under radial compression by a ringed indent on said inner surface of the cavity to retain the ball in the cavity.

15. The cap of claim 1, wherein the disinfectant or the antimicrobial agent is selected from the group consisting essentially of isopropyl alcohol, ethanol, 2-propanol, butanol, methylparaben, ethylparaben, propylparaben, propyl gallate, butylated hydroxyanisole (BHA), butylated hydroxytoluene, t-butyl-hydroquinone, chloroxylenol, chlorohexidine, chlorhexidine diacetate, chlorohexidine gluconate, povidone iodine, alcohol, dichlorobenzyl alcohol, dehydroacetic acid, hexetidine, triclosan, hydrogen peroxide, colloidal silver, benzethonium chloride, benzalkonium chloride, octenidine, antibiotic, and mixtures thereof.

16. The cap of claim 15, wherein the disinfectant or antimicrobial agent comprises at least one of chlorhexidine gluconate and chlorhexidine diacetate.

17. A cap comprising:

a housing comprising

a top wall,

an essentially cylindrical sidewall forming a cavity, the cavity having an inner surface;

a ball disposed within an indented portion of the cavity, the indented portion positioned adjacent to a second portion of the cavity, the indented portion and the ball forming a liquid seal;

a plurality of top flow channels disposed on a surface of the second portion of the cavity, the second portion having a diameter D1, the diameter D1 being larger than a diameter of the ball; wherein the plurality top flow channels extend radially into the housing,

a disinfectant or antimicrobial agent disposed within the second portion of the cavity;

an open bottom formed by said cylindrical sidewall with an opening to the cavity within said housing for receiving a hub of a male luer connector; and,

the cavity having an inner surface having a first portion adjacent to the open bottom having a tapered sidewall, the first portion having a second diameter D2 which is smaller than the diameter of the ball, the second diameter D2 increasing along the y-axis in a direction from the open bottom toward a top wall of the cavity.

18. The cap of claim 17, wherein an outer thread on an outer surface of the cylindrical sidewall, said outer thread being sufficient to interlock with a mating feature of said male luer connector.

19. The cap of claim 17, wherein the first portion includes a plurality of tabs configured to have an interference fit with the hub of the male luer connector.

20. The cap of claim 17, wherein a plurality of lower channels are disposed on the first portion.

21. The cap of claim 17 further comprising:

an absorbent material disposed within the cavity; and

a disinfectant or antimicrobial agent.

22. The cap of claim 21, wherein a compression of the absorbent material toward the top wall of the housing occurs upon connection to the male luer connector.