Claims

1. A fluid transfer device comprising:

a fluid transfer tip, the fluid transfer tip comprising a tapered friction fitting for a corresponding hub;

a lever member pivotally mounted to move relative to the fluid transfer tip; and

a screw thread mounted on the lever member to enable a hub to be connected to the tip by a screw fit in addition to the friction fitting;

wherein the lever member is resiliently biased so that the screw thread is positioned to form a screw fit with the hub;

and wherein the hub can be disconnected by pivoting the lever member against the resilient bias to release the screw fit with the hub and to subsequently release the hub from the friction fitting.

2. A fluid transfer device according to claim 1, wherein the screw thread is an internal thread carried by a partial hemispherical collar.

3. A fluid transfer device according to claim 1, wherein the screw thread mounted on the lever member takes the form of an internally threaded collar.

4. A fluid transfer device according to claim 3, wherein the internally threaded collar extends substantially 360° around the circumference of the fluid transfer tip.

5. A fluid transfer device according to claim 3 or 4, wherein the internally threaded collar is separable into multiple segments that are arranged to be moved apart by pivoting the lever member against the resilient bias, thereby releasing the screw fit with the hub.

6. A fluid transfer connection comprising:

a fluid transfer tip comprising a tapered friction fitting for a corresponding hub;

a lever member pivotally mounted to move relative to the fluid transfer tip; and

an internally threaded collar mounted on the lever member to at least partially surround the fluid transfer tip and enable a hub to be connected to the tip by a screw fit in addition to the friction fitting;

wherein the internally threaded collar is separable into multiple segments; and

wherein a hub is disconnected by pivoting the lever member to move the multiple segments apart and thereby release the screw fit.

7. A fluid transfer connection according to claim 6, wherein the internally threaded collar extends substantially 360° around the circumference of the fluid transfer tip.

8. A fluid transfer connection according to claim 6 or 7, wherein the lever member is resiliently biased so that the internally threaded collar surrounds the fluid transfer tip to form the screw fit.

9. A fluid transfer connection according to claim 8, wherein the segments are moved apart by pivoting the lever member against the resilient bias.

10. A fluid transfer connection according to any of claims 6-9, wherein at least some of the segments move radially outwardly relative to the fluid transfer tip.

11. A fluid transfer connection or device according to any of claims 3-10, wherein the internally threaded collar comprises pre-separated multiple segments.

12. A fluid transfer connection or device according to any of claims 3-10, wherein the internally threaded collar is arranged to be broken into multiple segments.

13. A fluid transfer connection or device according to any of claims 3-12, wherein the internally threaded collar is separable into hinged segments.

14. A fluid transfer connection according to any of claims 6-13, further comprising means for locking the multiple segments apart.

15. A fluid transfer connection according to any of claims 6-14, wherein pivoting the lever member subsequently releases the hub from the friction fitting.

16. A fluid transfer device or connection comprising:

a fluid transfer tip, the fluid transfer tip comprising a tapered friction fitting for a corresponding hub;

a lever member pivotally mounted to move relative to the fluid transfer tip; and

a screw thread mounted on the lever member to enable a hub to be connected to the tip by a screw fit in addition to the friction fitting;

wherein the lever member is operable to move the screw thread between at least two different positions, wherein in a first position the screw thread engages the hub and thereby assists in holding the hub in a locked position and in a second position the screw thread does not engage the hub and the lever member acts to release the hub from the friction fitting.

17. A fluid transfer device or connection according to claim 16, wherein the lever member is manually operable to pivot between the first and second positions

18. A fluid transfer device or connection according to claim 16 or 17, further comprising gripping means arranged to hold the lever member in the first position.

19. A fluid transfer device or connection according to any of claims 16-18, wherein the lever member is resiliently biased to move the screw thread into the first position.

20. A fluid transfer device or connection according to any of claims 16-19, wherein the lever member is operable to move the screw thread into a third position, between the first and second positions, where the screw thread no longer holds the hub in a locked position but allows the hub to remain connected to the fluid transfer tip by the friction fitting.

21. A fluid transfer device or connection comprising:

a fluid transfer tip, the fluid transfer tip comprising a tapered friction fitting for a corresponding hub;

a lever member pivotally mounted to move relative to the fluid transfer tip; and

a latch mounted on the lever member to engage a part mounted on the hub and provide a positive connection in addition to the friction fitting;

wherein the hub is disconnected from the tip by pivoting the lever member to release the latch and to subsequently release the hub from the friction fitting.

22. A fluid transfer device or connection according to claim 21, wherein the lever member is resiliently biased so that the latch provides said positive connection.

23. A fluid transfer device or connection according to any preceding claim, wherein the lever member comprises a front surface that is substantially transverse to the axis of the tip and the front surface is arranged to move along the tip when the lever member is pivoted.

24. A fluid transfer device or connection according to claim 23, wherein the front surface is curved such that initial pivoting movement of the lever member moves the front surface substantially transverse to the fluid transfer tip to release the screw fit and further movement of the lever member moves the front surface along the fluid transfer tip to release the hub from the friction fitting.

25. A fluid transfer device or connection according to any preceding claim, wherein the lever member comprises a front surface having a rim arranged to move forwards along the tip after the segments have been moved apart.

26. A fluid transfer device or connection according to any preceding claim, wherein the lever member comprises a catch means arranged to catch the hub after it has been released from the friction fitting.

27. A fluid transfer device or connection according to claim 26, wherein the lever member is resiliently biased and pivoting the lever member against the resilient bias causes the catch means to catch the hub.

28. A fluid transfer device or connection according to claim 26 or 27, wherein the catch means is arranged to be released by resiliently biased movement of the lever member.

29. A fluid transfer device or connection according to any preceding claim, further comprising means for mounting the lever member.

30. A fluid transfer device or connection according to claim 29, wherein the means for mounting the lever member are integral with or separate from the fluid transfer tip.

31. A fluid transfer device or connection according to claim 30, wherein the lever member is mounted by a separate attachment.

32. A fluid transfer device or connection according to any preceding claim, wherein the lever member is removably mounted.

33. A fluid transfer device or connection according to any preceding claim, wherein the fluid transfer tip comprises a male connector tip that is tapered to form the friction fitting when inserted into a corresponding female hub.

34. A fluid transfer device or connection according to any preceding claim, wherein a hub is connected to the fluid transfer tip.

35. A fluid transfer device or connection according to claim 34, wherein the hub comprises a tapered internal surface and an outer rim at its base.

36. A fluid transfer device or connection according to claim 34, wherein the hub comprises a tapered internal surface and an outer thread at its base.

37. A fluid transfer device or connection according to claim 34, wherein the hub comprises a tapered internal surface and an outer rim or thread spaced from its base by a skirt portion.

38. A fluid transfer device or connection according to claim 37, wherein the skirt portion is flexible.

39. A fluid transfer device or connection according to any of claims 35-38, wherein the hub further comprises a groove or flange provided on the tapered internal surface for gripping a corresponding flange or groove on the fluid transfer tip.

40. A fluid transfer device or connection according to any of claims 34-39, wherein the hub provides a fluid connection to a catheter, cannula or hypodermic needle.

41. A fluid transfer device or connection according to any preceding claim, wherein the fluid transfer tip is part of a syringe.

42. A fluid transfer device or connection according to claim 34, wherein the hub comprises a socket having a tapered internal surface to form the friction fitting, a screw thread around an outer surface of the socket to form the screw fit, and a flange circumscribing the screw thread so as to lock the screw fit.

43. A hub for directing fluid from a fluid transfer connection, the hub comprising a socket having a tapered internal surface to form a friction fit with a corresponding fluid transfer tip inserted therein, a screw thread around an outer surface of the socket to enable a screw connection in addition to the friction fit, and a flange circumscribing the screw thread so as to lock the screw connection with a corresponding fluid transfer tip.

44. A hub according to claim 43, including a fluid connection to a catheter, cannula or hypodermic needle.

45. A hub according to claim 43 or 44, wherein the screw thread is spaced from a base of the hub by a skirt portion.

46. A hub according to claim 45, wherein the skirt portion is flexible.

47. A hub according to any of claims 43-46, further comprising an additional means for gripping a fluid transfer tip when the hub is connected thereto.

48. A hub according to claim 47, wherein the additional means for gripping a tip comprises a flange or groove provided on the tapered internal surface.

49. A hub according to any of claims 43-48, connected to a fluid transfer tip provided by a fluid transfer device or connection in the form of a syringe, blood collection tube, hose, tubing, IV line, stopper or closing cone.

Claims

1. A fluid transfer device or connection comprising:

a fluid transfer tip;

and a lever member pivotally mounted to move relative to the fluid transfer tip; characterised by:

the fluid transfer tip comprising a tapered friction fitting for a corresponding hub;

a screw thread mounted on the lever member to enable a hub to be connected to the tip by a screw fit in addition to the friction fitting;

wherein the lever member is resiliently biased so that the screw thread is positioned to form a screw fit with the hub;

and wherein the hub can be disconnected by pivoting the lever member against the resilient bias to release the screw fit with the hub and to subsequently release the hub from the friction fitting.

2. A fluid transfer device or connection according to claim 1, wherein the screw thread is an internal thread carried by a collar partially surrounding the fluid transfer tip.

3. A fluid transfer device or connection according to claim 1, wherein the screw thread mounted on the lever member takes the form of an internally threaded collar that extends substantially 360° around the circumference of the fluid transfer tip.

4. A fluid transfer device or connection according to any preceding claim, wherein the lever member comprises a front surface that is substantially transverse to the axis of the tip and the front surface is arranged to move along the tip when the lever member is pivoted.

5. A fluid transfer device or connection according to claim 4, wherein the front surface is curved such that initial pivoting movement of the lever member moves the front surface substantially transverse to the fluid transfer tip to release the screw fit and further movement of the lever member moves the front surface along the fluid transfer tip to release the hub from the friction fitting.

6. A fluid transfer device or connection according to any preceding claim, wherein the lever member comprises a catch means arranged to catch the hub after it has been released from the friction fitting.

7. A fluid transfer device or connection according to claim 6, wherein the lever member is resiliently biased and pivoting the lever member against the resilient bias causes the catch means to catch the hub.

8. A fluid transfer device or connection according to claim 6 or 7, wherein the catch means is arranged to be released by resiliently biased movement of the lever member.

9. A fluid transfer device or connection according to any preceding claim, further comprising means for mounting the lever member wherein the means for mounting the lever member are integral with the fluid transfer tip.

10. A fluid transfer device or connection according to any of claims 1 to 8, further comprising means for mounting the lever member, wherein the lever member is mounted by a separate attachment.

11. A fluid transfer device or connection according to any preceding claim, wherein the lever member is removably mounted.

12. A fluid transfer device or connection according to any preceding claim, wherein the fluid transfer tip comprises a male connector tip that is tapered to form the friction fitting when inserted into a corresponding female hub.

13. A fluid transfer device or connection according to any preceding claim, wherein a hub is connected to the fluid transfer tip.

14. A fluid transfer device or connection according to claim 13, wherein the hub comprises a tapered internal surface and an outer rim at its base or a tapered internal surface and an outer thread at its base.

15. A fluid transfer device or connection according to claim 13, wherein the hub comprises a tapered internal surface and an outer rim or thread spaced from its base by a skirt portion.