Claims

1. A fluid transfer device, comprising:

a syringe barrel having an inside surface defining a chamber and a distal end portion comprising a passageway;

a first plunger slidably movable inside the chamber, the first plunger comprising a proximal end portion, an elongate body portion, and a distal end portion, the distal end portion of the first plunger providing a circumferential seal against the inside surface of the syringe barrel; and

a second plunger slidably movable inside the chamber, the second plunger comprising a proximal end portion, an elongate body portion, and a distal end portion, the distal end portion of the second plunger providing a circumferential seal against the inside surface of the syringe barrel, wherein

the distal end portion of the first plunger is engageable with the proximal end portion of the second plunger such that when the distal end portion of the first plunger and the proximal end portion of the second plunger are engaged, the second plunger is movable by the first plunger.

2. The fluid transfer device of claim 1, wherein the elongate body portion of the first plunger comprises an internal channel and the distal end portion of the first plunger has a pass-through into the internal channel; and

the elongate body portion of the second plunger is slidably movable through the pass-through, and the proximal end portion of the second plunger is engageable with the distal end portion of the first plunger.

3. The fluid transfer device of claim 2, wherein the pass-through in the distal end portion of the first plunger provides a circumferential seal against the elongate body portion of the second plunger.

4. The fluid transfer device of claim 3, wherein a sealed first volume is defined between the distal end portion of the first plunger and the distal end portion of the second plunger when the first plunger is proximally moved relative to the second plunger, and a second volume is defined between the distal end portion of the second plunger and the distal end portion of the syringe barrel when the second plunger is proximally moved by the first plunger.

5. The fluid transfer device of claim 4, wherein the elongate body portion of the second plunger has an internal passageway in fluid communication with the sealed first volume.

6. The fluid transfer device of claim 5, wherein the second plunger further comprises a check valve in the distal end portion.

7. The fluid transfer device of claim 6, wherein the distal portion of the second plunger comprises a seal member and the check valve is integrated in the seal member.

8. The fluid transfer device of claim 1, further comprising a housing enclosing the fluid transfer device or distal portion thereof, wherein the housing has an opening covered by a protective film and comprises an interface structure.

9. The fluid transfer device of claim 8 wherein the interface structure comprises one or more grooves that are complementary with one or more tongues on a sampling device, or wherein the interface structure comprises one or more tongues that are complementary with one or more grooves on a sampling device.

10. The fluid transfer device of claim 8, wherein the protective film is removably attached to the interface structure.