CLAIMS

THE INVENTION CLAIMED IS:

1. A cassette for holding fluid path components for a fluid injector, the cassette comprising:

a body defining at least one feature for holding at least one fluid path component for the fluid injector; and

at least one connecting member for removably connecting the body of the cassette to the fluid injector, the connecting member operatively connected to the body,

wherein the at least one connecting member comprises at least one pivotable connecting feature protruding from the body, and

wherein each of the at least one pivotable connecting feature is configured for removably connecting to a corresponding connecting feature receiver on the fluid injector such that the body is pivotally movable relative to the fluid injector between a first, unlatched position and a second, latched position in which the at least one fluid path component on the body of the cassette is positioned for operative connection to a corresponding feature of the fluid injector.

2. The cassette of claim 1, wherein the at least one fluid path component is selected from at least one of at least one stopcock, at least one air bubble suspension apparatus, one or more fluid line components, at least one fluid path components comprising an air detection region, and at least one removable end cap for a fluid line.

3. The cassette of claim 1 or 2, wherein the at least one feature of the body is at least one extension member that protrudes from the body, wherein the at least one extension member is configured to hold the at least one fluid path component of the fluid injector.

4. The cassette of claim 3, wherein the at least one extension member includes a retaining tab for holding the fluid path component on the at least one extension member.

5. The cassette of claim 3 or claim 4, wherein the cassette comprises a plurality of retention elements, wherein each retention element is configured to hold a fluid path component of the fluid injector.

6. The cassette of claim 5, wherein the at least one fluid component comprises at least one stopcock, wherein the stopcock comprises a first fluid filling position providing fluid communication between a bulk fluid container and a syringe engaged to the fluid injector, a second fluid delivery position providing fluid communication between the syringe and a patient tubing set, and a third stopped position blocking fluid communication between the syringe, the bulk fluid container, and the patient tubing set, and

wherein at least one of the plurality of retention elements retain the at least one stopcock in a position configured to engage at least one stopcock actuator of the fluid injector when the cassette is in the second latched position.

7. The cassette of claim 6, wherein the body further comprises a shield member that prevents a user from accessing the at least one stopcock held in the body of the cassette.

8. The cassette of claim 5, wherein the at least one fluid component comprises the at least one air bubble suspension apparatus fluidly located between the at least one fluid path components comprising the air detection region and the at least one stopcock,

wherein at least one of the plurality of retention elements retain the at least one air bubble suspension apparatus in a position to be movable between a first priming position and a second injection position with movement of a head of the fluid injector between an upright priming position and a downward angled injection position.

9. The cassette of claim 8, wherein the at least one fluid path component comprises the air detection region,

wherein at least one of the plurality of retention elements retains the at least one fluid path components comprising the air detection region in a position to operatively engage an air detector on a receiving surface of a fluid detector on the head of the fluid injector.

10. The cassette of any of claims 3 to 9, wherein the at least one fluid path component comprises at least one removable end cap for the fluid line, wherein the at least one removable end cap covers and prevents inadvertent contamination of a connector element of the fluid line.

11. The cassette of any of claims 1 to 10, wherein the at least one fluid path component of the cassette comprises two stopcocks, two air bubble suspension apparatuses, a plurality of fluid line components, two fluid path components each comprising an air detection region, and a plurality of removable end caps for the fluid line.

12. The cassette of any of claims 1 to 11, wherein the at least one connecting member comprises a flexible locking tab that is configured to be received in a corresponding locking groove on the fluid injector for removably attaching the body of the cassette to the fluid injector.

13. The cassette of any of claims 1 to 11, wherein the at least one pivotable connecting feature of the at least one connecting member comprises at least one hinge member configured to removably connect at least one groove on the corresponding connecting feature receiver on a receiving surface of the fluid injector.

14. The cassette of any of claims 1 to 13, further comprising an identifier positioned on the body of the cassette, wherein the identifier is configured to provide information regarding the cassette including at least one of date of assembly, number of uses of the cassette, and location of the cassette.

15. A fluid injector, comprising:

a housing;

at least one syringe removably held in the housing; and

a cassette for holding fluid path components for a fluid injector, the cassette comprising:

a body defining at least one feature for holding at least one fluid path component for the fluid injector; and

at least one connecting member for removably connecting the body of the cassette to the fluid injector, the connecting member operatively connected to the body,

wherein the at least one connecting member comprises at least one pivotable connecting feature protruding from the body, and

wherein each of the at least one pivotable connecting feature is configured for removably connecting to a corresponding connecting feature receiver on the fluid injector such that the body is pivotally movable relative to the fluid injector between a first, unlatched position and a second, latched position in which the at least one fluid path component on the body of the cassette is positioned for operative connection to a corresponding feature of the fluid injector.

16. The fluid injector of claim 15, wherein the at least one fluid path component is selected from at least one of at least one stopcock, at least one air bubble suspension apparatus, one or more fluid line components, at least one fluid path components comprising an air detection region, and at least one removable end cap for a fluid line.

17. The fluid injector of claim 15 or 16, wherein the at least one feature of the body is at least one extension member that protrudes from the body, wherein the at least one extension member is configured to hold the at least one fluid path component of the fluid injector.

18. The fluid injector of any of claims 15 to 17, wherein the cassette comprises a plurality of retention elements, wherein each retention elements is configured to hold a fluid path component of the fluid injector.

19. The fluid injector of claim 18, wherein the at least one fluid component comprises at least one stopcock, wherein the stopcock comprises a first fluid filling position providing fluid communication between a bulk fluid container and a syringe engaged to the fluid injector, a second fluid delivery position providing fluid communication between the syringe and a patient tubing set, and a third stopped position blocking fluid communication between the syringe, the bulk fluid container, and the patient tubing set, and

wherein at least one of the plurality of retention elements retain the at least one stopcock in a position configured to engage at least one stopcock actuator of the fluid injector when the cassette is in the second latched position.

20. The fluid injector of 19, wherein the body further comprises a shield member that prevents a user from accessing the at least one stopcock held in the body of the cassette.

21. The fluid injector of claim 18, wherein the at least one fluid component comprises the at least one air bubble suspension apparatus fluidly located between the at least one fluid path components comprising the air detection region and the at least one stopcock,

wherein at least one of the plurality of retention elements retain the at least one air bubble suspension apparatus in a position to be movable between a first priming position and a second injection position with movement of a head of the fluid injector between an upright priming position and a downward angled injection position.

22. The fluid injector of any of claims 16 to 21, wherein the at least one fluid path component comprises the air detection region, and

wherein at least one the plurality of retention elements retain the at least one fluid path components comprising an air detection region in a position to operatively engage an air detector on a receiving surface of the fluid detector.

23. The fluid injector of any of claims 16 to 22, wherein the at least one fluid path component comprises at least one removable end cap for the fluid line, wherein the at least one removable end cap covers and prevents inadvertent contamination of a connector element of the fluid line.

24. The fluid injector of any of claims 15 to 23, wherein the at least one fluid path component of the cassette comprises two stopcocks, two air bubble suspension apparatuses, a plurality of fluid line components, two fluid path components each comprising an air detection region, and a plurality of removable end caps for the fluid line.

25. The fluid injector of any of claims 15 to 24, wherein the at least one connecting member comprises a flexible locking tab that is configured to be received in a corresponding locking groove on the fluid injector for removably attaching the body to the fluid injector.

26. The fluid injector of any of claims 15 to 24, wherein the at least one pivotable connecting feature of the at least one connecting member comprises at least one hinge member configured to removably connect at least one groove on the corresponding connecting feature receiver on a receiving surface of the fluid injector.

27. The fluid injector of any of claims 15 to 26, further comprising an identifier positioned on the body of the cassette, wherein the identifier is configured to provide information regarding the cassette including at least one of date of assembly, number of uses of the cassette, and location of the cassette.

28. A method of attaching at least one component to a fluid injector, the method comprising:

removably connecting a cassette to a housing of the fluid injector by operatively connecting at least one connecting member of the cassette to a corresponding connecting feature receiver on a receiving surface of the fluid injector,

wherein the cassette comprises a body defining at least one retention element for holding at least one fluid path component and the at least one connecting member having at least one pivotable connecting feature protruding from the body, and

wherein the connection of the cassette to the housing of the fluid injector is configured to position the at least one component at a predetermined location on the housing of the fluid injector.

29. The method of claim 28, wherein the at least one fluid path component is at least one of at least one stopcock, at least one air bubble suspension apparatus, at least one fluid line, and at least one removable end cap for the at least one fluid line.

30. The method of claim 28 or claim 29, further comprising evaluating an identifier attached to the cassette to determine whether the cassette has already been previously used.

31. A connection interface between a cassette and a fluid injector, wherein the cassette is configured to hold at least one fluid path component of the fluid injector, the connection interface comprising:

a first connecting member provided on the cassette that engages the fluid injector; and

a second connecting member provided on a receiving surface of on the fluid injector that receives the first connecting member,

wherein a connection of the first connecting member to the second connecting member is configured to position the at least one at least one fluid path component at a predetermined location on the fluid injector,

wherein the at least one fluid path component is selected from the group consisting of at least one stopcock, at least one air bubble suspension apparatus, one or more fluid line components, and at least one fluid path component comprising an air detection region.