~~In the~~ Claims

1. An apparatus for forming a port fitment, comprising:

an unsterilized vessel having an interior compartment adapted for receiving a fluid, said vessel including a connector having a first wall ~~bounding~~defining a port and including a first locking element; and

an ~~first~~ adapter including a first end portion adapted for insertion in the interior of the first wall, said ~~first~~ adapter having a passage adapted for transmitting the fluid to or from the vessel via the port and a second locking element adapted for forming a locking engagement with the first locking element of the connector;

wherein:

the port comprises a tubular passage, and the first and second locking elements form the locking engagement within the tubular passage; and

the vessel comprises a bag and the adapter and connector are more rigid than the bag.

~~2. The apparatus of claim 1, wherein the port comprises a tubular passage, and the first and second locking elements form the locking engagement within the tubular passage.~~

2~~3~~. The apparatus of claim 1, further including a second adapter having a third locking element adapted for forming a locking engagement with the first locking element of the connector.

3~~4~~. The apparatus of claim ~~3~~2, wherein the second adapter and the (first) adapter are different in at least one characteristic.

4~~5~~. The apparatus of claim 1, wherein the first locking element comprises at least one projection and the second locking element comprises a receiver.

5~~6~~. The apparatus of claim 1, wherein the first locking element comprises a receiver and the second locking element comprises at least one projection.

6~~7~~. The apparatus of claim ~~6~~5, wherein the projection comprises an annular bead for

engaging the receiver in snap-fit engagement.

7~~8~~. The apparatus of claim 1, wherein one of the first or second locking elements comprise one of at least two projections and at least two receivers.

8~~9~~. The apparatus of claim ~~8~~7, wherein the projections comprise lugs and the receivers comprise channels.

9~~10~~. The apparatus of claim ~~8~~7, wherein at least one of the channels comprises at least one segment extending in an axial direction along the connector and at least one segment extending in a circumferential direction along the connector, whereby the lug and channel create a bayonet fitting.

10~~11~~. The apparatus of claim ~~8~~7, wherein the at least two projections of the first locking element comprise flexible arms, each having an end adapted for positioning in one of the receivers.

11~~12~~. The apparatus of claim ~~8~~7, wherein the at least two projections of the second locking element comprise arms projecting axially from a peripheral ledge of the connector.

12~~13~~. The apparatus of claim ~~8~~7, wherein the first locking element comprises a removable fastener and the second locking element comprises an aperture for receiving the fastener.

13~~14~~. The apparatus of claim ~~8~~7, wherein the first locking element comprises a cup-shaped receiver including an opening defining a ledge, and the second locking element comprises a shoulder having a periphery oversized relative to the opening and forming a notch for engaging the ledge.

14~~15~~. The apparatus of claim 1, wherein the first locking element comprises an inwardly flared flexible projection depending from the first wall and the second locking element comprises a shoulder having a periphery oversized relative to the opening and forming a

notch for engaging the projection.

15~~16~~. The apparatus of claim ~~15~~14, wherein the adapter includes a peripheral projection for engaging an upper surface of the first wall when the notch engages the projection.

16~~17~~. The apparatus of claim 1, wherein the first locking element comprises a thread and the second locking element comprises a matching thread.

17~~18~~. The apparatus of claim 1, further including a first barb on a first end of the adapter and a second barb on a second end of the adapter.

18~~19~~. The apparatus of claim ~~18~~17, wherein the first and second barbs are adapted for engaging different sizes of tubing.

19~~20~~. The apparatus of claim 1, wherein the first wall of the connector includes a side opening and a top opening exposing the port.

20~~21~~. The apparatus of claim ~~20~~19, wherein the adapter is configured for insertion through the side opening of the first wall.

21~~22~~. The apparatus of claim ~~21~~20, wherein the adapter comprises a tubular passage communicating with a side drain adapted to receive fluid from a space formed by the first wall.

22~~23~~. The apparatus of claim ~~21~~20, wherein the adapter comprises at least one alignment tab for engaging the side opening in the first wall.

23~~24~~. The apparatus of claim ~~21~~22, wherein the at least one alignment tab is offset from the first locking element in a circumferential direction.

24~~25~~. The apparatus of claim ~~21~~20, wherein the wall is frusto-conical and projects towards an interior compartment of the vessel.

25~~26~~. The apparatus of any one of the foregoing claims, further including a seal for sealing the adapter to the connector.

26~~27~~. The apparatus of claim ~~26~~25, wherein the seal comprises an O-ring.

27~~28~~. The apparatus of claim ~~27~~26, wherein one of the adapter or connector includes a circumferential groove adapted for receiving the O-ring.

28~~29~~. The apparatus of any one of claims 1-~~25~~27, wherein the connector comprises a boat-shaped structure.

29~~30~~. The apparatus of any one of claims 1 -~~25~~28, wherein mating portions of the adapter and connector have matching cross-sectional shapes selected from the group consisting of circular, oval, polygonal, and cross-shaped.

~~31. The apparatus of any of claims 1 -25, wherein the vessel comprises a bag and the adapter and connector are more rigid than the bag.~~

30~~32~~. The apparatus of any one of claims 1 -~~25~~29, wherein the connector includes a plurality of ports, and further including an adapter for engaging each of said ports.

31~~33~~. The apparatus of claim ~~32~~30, wherein at least three ports form a substantially linear row.

32~~34~~. The apparatus of any one of claims 1-~~25~~31, wherein the adapter includes crenellations.

33~~35~~. The apparatus of any one of claims 1-~~25~~32, wherein one of the first or second locking elements is adapted for permanently deforming as the result of disengagement with the other of the first or second locking elements.

34~~36~~. The apparatus of any one of claims 1-~~25~~33, wherein the adapter projects at least partially beyond a base of the connector and into the interior compartment of the vessel.

3537. The apparatus of any one of claims 1-2534, wherein the adapter includes a peripheral projection having a diameter greater than the diameter of the port positioned external to the interior compartment of the vessel.

3638. The apparatus of any one of claims 1-2535, further including a fluid-agitating element for positioning in the vessel.

39. An apparatus for forming a fitment on a vessel, comprising:

an adapter including a structure selected from the group consisting of a barb adapted for connecting with a tubing, a valveless plug for sealing the port of the connector, and a tubular fitting adapted for charging the vessel with powder or receiving a probe; and

a connector adapted for connecting to the vessel and including a port;

first and second locking elements for forming a locking engagement between the connector and the adapter, wherein the first locking element and second locking element. respectively, are selected from the group consisting of:

(a) at least one removable fastener and an aperture for receiving the fastener;

(b) a projection and a shoulder having a periphery including a notch for engaging the projection;

(c) at least one lug and a channel adapted for receiving the lug;

(d) at least two arms and a receiver for receiving an end of each of the arms; and

(e) notches for receiving the ends of at least two arms projecting axially from a peripheral ledge of the connector. [all figures ]

40. An apparatus for forming a port fitment, comprising:

an unsterilized vessel adapted for receiving a fluid, said vessel including a connector forming a tubular port for providing fluid access to an interior compartment; and

a first adapter adapted for being inserted into the tubular port in an insertion direction from a point external to the interior compartment so as to form a snap-fit engagement with the connector such that movement opposite a direction of insertion is prevented.

41. The apparatus according to claim 40, wherein the adapter projects at least partially through the port into an interior compartment of the vessel.

42. The apparatus according to claim 40, wherein the adapter includes a peripheral projection having a diameter greater than the diameter of the port for positioning external to the port.

43. An apparatus for associating with a vessel, comprising:

a connector adapted for attachment to the vessel and having a port, said connector further including a wall adjacent the port, said wall defining a side opening and a top opening; and

an adapter including a first locking element for forming a locking engagement with the connector.

44. The apparatus of claim 43, wherein the adapter is configured for insertion through the side opening of the wall.

45. The apparatus of claim 43, wherein the adapter comprises a tubular passage communicating with a side drain port adapted to receive fluid from a space formed by the wall.

46. The apparatus of claim 43, wherein the adapter comprises at least one alignment tab for engaging the side opening in the wall.

47. The apparatus of claim 43, wherein the at least one alignment tab is offset from the first locking element in a circumferential direction.

48. The apparatus of claim 47, wherein the wall is frusto-conical and projects towards an interior compartment of the vessel.

49. An apparatus for forming a port fitment on a vessel, comprising:

a connector adapted for connection to the vessel, said connector having an

elongated, generally upstanding sidewall forming a tubular port; and

a first adapter including a first portion adapted for insertion in the interior of the tubular port;

wherein a first part of the adapter has a first outer diameter greater than an inner diameter of at least a first portion of the sidewall of the connector, and a second part of the adapter has a second outer diameter greater than the inner diameter.

50. The apparatus of claim 49, further a sealing element for forming a seal between the adapter, and wherein the adapter includes a first locking element for forming a locking engagement with a second locking element of the connector.

51. The apparatus of claim 49, wherein the connector includes a plurality of generally upstanding sidewalls, each forming a tubular port, and further including a plurality of different adapters for positioning in the ports.

52. The apparatus of claim 49, wherein the first locking element and second locking element, are selected from the group consisting of:
(a) at least one removable fastener and an aperture for receiving the fastener;
(b) a projection and a shoulder having a periphery including a notch for engaging the projection;
(c) at least one lug and a channel adapted for receiving the lug;
(d) at least two arms and a receiver for receiving an end of each of the arms; and
(e) notches for receiving the ends of at least two amis projecting axially from a peripheral ledge of the connector.

53. An apparatus for forming a port fitment on a vessel having an interior compartment, comprising:

a connector adapted for connection to the vessel, said connector having an elongated, generally upstanding sidewall forming a tubular port and including an inwardly flared, flexible projection; and

a first adapter including a first portion adapted for insertion in the interior of the tubular port and having an oversized shoulder adapted for engaging the inwardly flared, flexible projection of the connector.

54. The apparatus of claim 53, wherein the flexible projection bounds the interior compartment of the vessel.

55. An apparatus for forming a port fitment on a vessel, comprising:

a connector adapted for connection to the vessel, said connector having an elongated, generally upstanding sidewall forming a tubular port including a first locking element; and

a first adapter including a first portion adapted for insertion in the interior of the tubular port and a second, generally concentric second portion, said first and second portions forming a receiver, and one of said first or second portions including a second locking element for forming a locking engagement with the first locking element of the connector.

56. An apparatus for forming a port fitment, comprising:

a vessel having an interior compartment adapted for receiving a fluid under sterile conditions, said vessel including a connector having a first locking element; and

a first adapter including a second locking element connected to the first locking element of the connector to form a locking engagement, such that breaking the locking engagement deforms one or the first or second locking elements in a manner that prevents use under sterile conditions.

57. The apparatus of claim 56, wherein the first and second locking elements are selected from the group consisting of:

(a) at least one removable fastener and an aperture for receiving the fastener;

(b) a projection and a shoulder having a periphery that is oversized and including a notch for engaging the projection;

(c) at least two arms and a receiver for receiving an end of each of the arms; and

(d) notches for receiving the ends of at least two arms projecting axially from a peripheral ledge of the connector.

58. A kit for forming a port fitment on a vessel including a connector having a generally upstanding sidewall forming a tubular port and including first locking element,

comprising:

a plurality of tubular adapters, each including a first portion adapted for insertion in the interior of the tubular port and including a second locking element for forming a locking engagement with the first locking element of the connector.

59. The kit of claim 58, wherein each adapter includes a first locking element for engaging a second locking element of the corresponding connector, wherein the first locking element and second locking element, respectively, are selected from the group consisting of:

(a) at least one removable fastener and an aperture for receiving the fastener;

(b) a projection and a shoulder having a periphery that is oversized and including a notch for engaging the projection;

(c) at least one lug and a channel adapted for receiving the lug;

(d) at least two arms and a receiver for receiving an end of each of the anus; and

(e) notches for receiving the ends of at least two amis projecting axially from a peripheral ledge of the connector.

60. A method of forming a sterilized vessel for an end user, comprising:

providing an unsterilized vessel including a connector having a port;

forming a locking engagement between the adapter and the connector; and

prior to delivery to the end user, sterilizing the vessel with the adapter associated with the connector.

61. The method according to claim 60, wherein the connector includes a plurality of ports, and further including the step of positioning a different adapter in each port of the connector.

62. The method according to claim 60, wherein the connector includes a first locking element for engaging a second locking element of the adapter to form the locking engagement, and further including the step of providing the locking elements such that, upon disengagement, one of the adapter or the connector cannot form the locking engagement again.