CLAIMS

~~1. A connector for connection with a fluid transfer device, said connector comprising:~~

~~an outer body having a longitudinal axis;~~

~~a luer lock connection port positioned within the outer body and configured to be coupled with an external port of said fluid transfer device, the luer lock connection port being rotatable about the longitudinal axis in a clockwise direction as well as a counter-clockwise direction at least prior to initiation of coupling thereof with the external port, wherein the outer body is structured, and the luer lock connection port is positioned therewithin, such that to prevent an operator to access, through the outer body, directly by fingertips an exterior of the luer lock connection port after the luer lock connection port has been coupled with the external port; and~~

~~a decoupling facilitating mechanism configured to selectively assume a decoupling disabled state at which it allows rotation of the luer lock connection port about the longitudinal axis thereof at least in the counter-clockwise direction, and a decoupling enabled state at which it restricts the rotation of the luer lock connection port at least in the counter-clockwise direction so as to allow decoupling of the external port from the luer lock connection port.~~

~~2. The connector according to Claim 1, wherein the luer lock connection port is rotatable about the longitudinal axis in both of the clockwise direction and the counter-clockwise direction upon coupling thereof with the external port.~~

~~3. The connector according to Claim 1 or 2, further comprising a coupling facilitating mechanism configured to selectively assume a coupling enabled state at which it restricts the rotation of the luer lock connection port at least in the clockwise direction, and a coupling disabled state at which it allows the rotation of the luer lock connection port at least in the clockwise direction.~~

~~4. The connector according to Claim 3, wherein the coupling facilitating mechanism is configured to assume the coupling enabled state at least during the time when coupling of the luer lock connection port with the external port is under process.~~

~~5. The connector according to Claim 3 or 4, wherein the coupling facilitating mechanism, in its coupling enabled state, is configured to allow rotation of the luer lock connection port about the longitudinal axis in a counter-clockwise direction.~~

6. The connector according to any one of Claims 3 to 5, wherein the coupling facilitating mechanism, in its coupling disabled state, is configured to allow rotation of the luer lock connection port about the longitudinal axis in a counter-clockwise direction.

7. The connector according to any one of Claims 3 to 6, wherein the luer lock connection port is configured to axially displace along the longitudinal axis between a first position associated with the coupling disabled state, and a second position associated with the coupling enabled state.

8. The connector according to Claim 7, wherein the luer lock connection port is configured to freely displace from the first position to the second position upon application of a pushing or pulling force by the external port during the coupling.

9. The connector according to Claim 7 or 8, wherein the coupling facilitating mechanism comprises at least one locking member mounted on an external surface of the luer lock connection port and at least one arresting member mounted on an internal surface of the outer body, wherein at the second position, the locking member engages with the arresting member thereby restricting the rotation of the luer lock connection port at least in the clockwise direction.

10. The connector according to Claim 9, wherein at the first position, the locking member disengages from the arresting member.

11. The connector according to Claim 1, wherein the outer body comprises a sidewall with at least one opening formed therein and configured to be used in conjunction with said decoupling facilitating mechanism so as to provide access to an external surface of the luer lock connection port at least at said decoupling enabled state.

12. The connector according to Claim 11, wherein the decoupling facilitating mechanism comprises an actuator at least partially positioned in the opening, the actuator having an actuator internal surface facing the luer lock connection port and an opposite actuator external surface, the decoupling facilitating mechanism being configured to assume the decoupling enabled state upon application of a pressing force on the actuator, and the decoupling disabled state upon removal of said force.

13. The connector according to Claim 12, wherein at the decoupling enabled state, a minimum distance between the longitudinal axis and the actuator external surface is lesser than a minimum distance between the longitudinal axis and an external surface of a rim of the opening.

14. The connector according to Claim 12 or 13, wherein at the decoupling enabled state, at least a majority of the actuator external surface is positioned below an imaginary surface defined by a rim of the opening.

15. The connector according to any one of Claims 12 to 14, wherein the actuator has a first portion extending from the outer body, and a second portion extending from the first portion, wherein the first portion forms a part of the outer body.

16. The connector according to Claim 15, wherein the first portion and the second portion constitute a lever.

17. The connector according to any one of Claims 12 to 16, wherein the decoupling mechanism comprises a first engaging portion constituting a part of an external surface of the luer lock connection port, and a second engaging portion constituting a part of the actuator internal surface, wherein at the decoupling enabled state, the first engaging portion engages with the second engaging portion thereby restricting the rotation of the luer lock connection port at least in the counter-clockwise direction.

18. The connector according to Claim 17, wherein at the decoupling disabled state, the first engaging portion disengages from the second engaging portion.

19. The connector according to Claim 17 or 18, wherein the first engaging portion comprises at least one protrusion formed on the external surface of the luer lock connection port, and the second engaging portion comprises at least one tooth projecting from the actuator internal surface, wherein at the decoupling enabled state, the at least one tooth engages with the at least one protrusion thereby restricting the rotation of the luer lock connection port at least in the counter-clockwise direction.

20. The connector according to Claim 19, wherein the actuator is configured to be pressed only when the at least one protrusion is radially displaced with respect to the at least one tooth.

~~21. The connector according to Claim 19 or 20, wherein the at least one protrusion has a protrusion side surface extending from the external surface of the luer lock connection port towards the actuator, and the at least one tooth has a tooth side surface extending from the actuator internal surface towards the luer lock connection port, wherein at the decoupling enabled state, the tooth side surface engages the protrusion side surface.~~

~~22. The connector according to any one of Claims 19 to 21, wherein at the decoupling disabled state, the at least one tooth disengages from the at least one protrusion.~~

~~23. The connector according to Claim 7 or any one of Claims 8 to 22, when dependent on Claim 7, wherein the luer lock connection port is configured to axially displace along the longitudinal axis into a third position.~~

~~24. The connector according to Claim 23, wherein the third position is the first position, or any position between the first position and the second position, or the second position is any position between the first position and the third position, or the first position is any position between the second and third position.~~

~~25. The connector according to Claim 23 or 24, wherein the luer lock connection port is configured to freely displace from the first or second position to the third position upon application of a pushing or pulling force during decoupling the external port from the luer lock connection port.~~

~~26. The connector according to any one of Claims 23 to 25, wherein the decoupling facilitating mechanism is configured to assume the decoupling enabled state upon the luer lock connection port displacing into the second or third position.~~

~~27. The connector according to any one of the preceding claims, wherein the luer lock connection port is a male luer lock connection port comprising an elongate central member and a collar surrounding the elongate central member, wherein the male luer lock connection port is configured to be coupled to the external port by threadingly receiving the external port between the collar and the elongate central member, such that upon coupling, the collar is positioned between the external port and the outer body.~~

~~28. The connector according to Claim 27, wherein the collar extends parallel to the elongate central member, and a length of the collar ranges between 5.4 mm to 8 mm.~~

~~29. The connector according to Claim 28, wherein the outer body covers at least a majority of the collar.~~

~~30. The connector according to any one of Claims 27 to 29, wherein the collar and the elongate central member are integrally formed.~~

~~31. The connector according to any one of the preceding claims, wherein the outer body radially covers at least a majority of the luer lock connection port.~~

~~32. The connector according to any one of the preceding claims, wherein the outer body radially covers at least 90% of the luer lock connection port.~~

~~33. The connector according to any one of the preceding claims, wherein the outer body radially covers at least a majority of a sidewall of the luer lock connection port.~~

~~34. The connector according to any one of the preceding claims, wherein the outer body radially covers at least 90% of a sidewall of the luer lock connection port.~~

~~35. An adaptor configured for use in medical fluid transfer devices, the adaptor comprising the connector according to any one of the preceding claims.~~

~~36. The adaptor according to Claim 35, the adaptor comprising a septum positioned at a distal end thereof configured to receive at least one needle of a syringe therethrough.~~

~~37. The adaptor according to Claim 35 or 36, wherein the connector constitutes a proximal portion of the adaptor.~~

~~38. A connector for connection with a fluid transfer device, said connector comprising:~~

~~a luer lock connection port configured to be coupled with an external port of said fluid transfer device;~~

an outer body covering at least a portion of the luer lock connection port, wherein the luer lock connection port is configured to axially displace along the longitudinal axis between a first position and a second position; and

a decoupling facilitating mechanism configured to selectively assume a decoupling disabled state at which it allows rotation of the luer lock connection port about a longitudinal axis thereof at least in a counter-clockwise direction, and a decoupling enabled state at which it restricts the rotation of the luer lock connection port at least in the counter-clockwise direction so as to allow decoupling of the external port from the luer lock connection port, wherein the decoupling facilitating mechanism is configured to assume the decoupling enabled state upon the luer lock connection port displacing into one of the first position and the second position.

39. The connector according to Claim 38, wherein the outer body comprises a sidewall with at least one opening formed therein and configured to be used in conjunction with said decoupling facilitating mechanism so as to provide access to an external surface of the luer lock connection port at least at said decoupling enabled state.

40. The connector according to Claim 39, wherein the decoupling facilitating mechanism comprises an actuator at least partially positioned in the opening, the actuator having an actuator internal surface facing the luer lock connection port and an opposite actuator external surface, the decoupling facilitating mechanism being configured to assume the decoupling enabled state upon application of a pressing force on the actuator, and the decoupling disabled state upon removal of said force.

41. The connector according to Claim 40, wherein at the decoupling enabled state, a minimum distance between the longitudinal axis and the actuator external surface is lesser than a minimum distance between the longitudinal axis and an external surface of a rim of the opening.

43. The connector according to Claim 40 or 41, wherein at the decoupling enabled state, at least a majority of the actuator external surface is positioned below an imaginary surface defined by a rim of the opening.

43. The connector according to any one of Claims 40 to 42, wherein the actuator has a first portion extending from the outer body, and a second portion extending from the first portion, wherein the first portion forms a part of the outer body.

44. The connector according to Claim 40, wherein the first portion and the second portion constitute a lever.

45. The connector according to any one of Claims 40 to 44, wherein the decoupling facilitating mechanism comprises a first engaging portion constituting a part of an external surface of the luer lock connection port, and a second engaging portion constituting a part of the actuator internal surface, wherein at the decoupling enabled state, the first engaging portion engages with the second engaging portion thereby restricting the rotation of the luer lock connection port at least in the counter-clockwise direction.

46. The connector according to Claim 45, wherein at the decoupling disabled state, the first engaging portion disengages from the second engaging portion.

47. The connector according to Claim 45 or 46, wherein the first engaging portion comprises at least one protrusion formed on the external surface of the luer lock connection port and the second engaging portion comprises at least one tooth projecting from the actuator internal surface, wherein at the decoupling enabled state, the at least one tooth engages with the at least one protrusion thereby restricting the rotation of the luer lock connection port at least in the counter-clockwise direction.

48. The connector according to Claim 47, wherein the actuator is configured to be pressed only when the at least one protrusion is radially displaced with respect to the at least one tooth.

49. The connector according to Claim 47 or 48, wherein the at least one protrusion has a protrusion side surface extending from the external surface of the luer lock connection port towards the actuator, and the at least one tooth has a tooth side surface extending from the actuator internal surface towards the luer lock connection port, wherein at the decoupling enabled state, the tooth side surface engages the protrusion side surface.

50. The connector according to any one of Claims 47 to 49, wherein at the decoupling disabled state, the at least one tooth disengages from the at least one protrusion.

~~51. The connector according to any one of Claims 38 to 50, wherein at the first position, the luer lock connection port is a first extent inside the outer body and at the second position, the luer lock connection port is a second extent, different from the first extent, inside the outer body.~~

~~52. The connector according to Claim 51, wherein the luer lock connection port is configured to displace from the first position to the second position upon application of a pulling or a pushing force.~~

~~53. The connector according to Claim 51 or 52, wherein the luer lock connection port is configured to axially displace along the longitudinal axis into a third position.~~

~~54. The connector according to Claim 53, wherein the third position is the first position, or any position between the first position and the second position, or the second position is any position between the first position and the third position, or the first position is any position between the second and third position.~~

~~55. The connector according to Claim 54, wherein the luer lock connection port is configured to displace from the first or second position to the third position upon application of a pulling or a pushing force.~~

~~56. The connector according to any one of Claims 53 to 55, wherein the decoupling facilitating mechanism is configured to assume the decoupling enabled state upon the luer lock connection port displacing into the third position.~~

~~57. The connector according to any one of Claims 38 to 56, further comprising a coupling facilitating mechanism configured to selectively assume a coupling enabled state at which it restricts the rotation of the luer lock connection port at least in a clockwise direction, and a coupling disabled state at which it allows the rotation of the luer lock connection port at least in the clockwise direction.~~

~~58. The connector according to Claim 57, wherein the coupling facilitating mechanism is configured to assume the coupling enabled state at least during the time when coupling of the luer lock connection port with the external port is under process.~~

~~59. The connector according to Claim 57 or 58, wherein the coupling facilitating mechanism, in its coupling enabled state, is configured to allow rotation of the luer lock connection port about the longitudinal axis in the counter-clockwise direction.~~

~~60. The connector according to any one of Claims 57 to 59, wherein the coupling facilitating mechanism, in its coupling disabled state, is configured to allow rotation of the luer lock connection port about the longitudinal axis in a counter-clockwise direction.~~

~~61. The connector according to any of Claims 57 to 60, when dependent on Claim 53, wherein the coupling disabled state is associated with the first position and the coupling enabled state is associated with the second or the third position.~~

~~62. The connector according to Claim 63, wherein the coupling facilitating mechanism comprises at least one locking member mounted on an external surface of the luer lock connection port and at least one arresting member mounted on an internal surface of the outer body, wherein at the second or the third position, the locking member engages with the arresting member thereby restricting the rotation of the luer lock connection port at least in the clockwise direction.~~

~~63. The connector according to Claim 62, wherein at the first position, the locking member disengages from the arresting member.~~

~~64. The connector according to any one of Claims 38 to 63, wherein the luer lock connection port is a male luer lock connection port comprising an elongate central member and a collar surrounding the elongate central member, wherein the male luer lock connection port is configured to be coupled to the external port by threadingly receiving the external port between the collar and the elongate central member, such that upon coupling, the collar is positioned between the external port and the outer body.~~

~~65. The connector according to Claim 64, wherein the collar extends parallel to the elongate central member, and a length of the collar ranges between 5.4 mm to 8 mm.~~

~~66. The connector according to Claim 65, wherein the outer body covers at least a majority of the collar.~~

~~67. The connector according to any one of Claims 64 to 66, wherein the collar and the elongate central member are integrally formed.~~

~~68. The connector according to any one of Claims 38 to 67, wherein the outer body radially covers at least a majority of the luer lock connection port.~~

~~69. The connector according to any one of Claims 38 to 68, wherein the outer body radially covers at least 90% of the luer lock connection port.~~

~~70. The connector according to any one of Claims 38 to 69, wherein the outer body radially covers at least a majority of a sidewall of the luer lock connection port.~~

~~71. The connector according to any one of Claims 38 to 70, wherein the outer body radially covers at least 90% of a sidewall of the luer lock connection port.~~

~~72. An adaptor configured for use in medical fluid transfer devices, the adaptor comprising the connector according to any one of Claims 38 to 71.~~

~~73. The adaptor according to Claim 72, the adaptor comprising a septum positioned at a distal end thereof configured to receive at least one needle of a syringe therethrough.~~

~~74. The adaptor according to Claim 72 or 73, wherein the connector constitutes a proximal portion of the adaptor.~~

~~75. A connector for connection with a fluid transfer device, said connector comprising:~~

~~an outer body having a longitudinal axis;~~

~~a luer lock connection port positioned within the outer body and configured to be coupled with an external port of said fluid transfer device, the luer lock connection port being rotatable about the longitudinal axis in a clockwise direction as well as a counter-clockwise direction at least prior to initiation of coupling thereof with the external port, wherein the outer body radially covers a majority of the luer lock connection port; and~~

~~a decoupling facilitating mechanism configured to selectively assume a decoupling disabled state at which it allows rotation of the luer lock connection port about the longitudinal axis thereof at least in the counter-clockwise direction, and a decoupling enabled state at which~~

~~it restricts the rotation of the luer lock connection port at least in the counter-clockwise direction so as to allow decoupling of the external port from the luer lock connection port.~~

~~76~~1. An adaptor configured for connection to a syringe having an air chamber and a liquid chamber, the adaptor comprising:

a liquid channel configured to be in communication with the liquid chamber;

an air channel configured to be in communication with the air chamber;

a first valve in fluid communication with the air channel, and having a first valve open state at which it allows air in the air channel to escape into ambiance, and a first valve normally closed state.

~~77~~2. The adaptor according to Claim ~~76~~1, wherein the first valve is configured to automatically displace into the first valve open state in response to air pressure within the air channel exceeding a first predetermined threshold.

~~78~~3. The adaptor according to Claim ~~76~~1 ~~or 77~~, wherein the first valve comprises a first valve seating member at least partially defining a first valve passage being in fluid communication with the air channel at said first valve open state, and a first valve sealing member engaging the first valve seating member at said first valve normally closed state thereby sealing said first valve passage~~.~~

~~79. The adaptor according to Claim 78~~, wherein at the first valve open state, the first valve sealing member at least partially disengages from the first valve seating member thereby unsealing the first valve passage.

~~80~~4. The adaptor according to Claim ~~78~~3 ~~or 79~~, wherein the first valve passage defines at least a portion of a first fluid path extending between the air channel and the ambiance, the first fluid path being selectively sealable by the first valve at the first valve normally closed state~~.~~

~~81. The adaptor according to Claim 80~~, wherein the first valve, at the first valve normally closed state, seals the first fluid path, and at the first valve open state, unseals the first fluid path to allow air in the air channel to escape into the ambiance.

~~82~~5. The adaptor according to Claim 1 ~~any one of Claims 76 to 81~~, further comprising a second valve in fluid communication with the air channel, and having a second valve open state

at which it allows air to enter into the air channel from the ambiance, and a second valve normally closed state.

83. The adaptor according to Claim 82, wherein the second valve is configured to automatically displace into the second valve open state in response to air pressure within the air channel falling below a second pre-determined threshold lesser than the first predetermined threshold.

84. The adaptor according to Claim 82 or 83, wherein the second valve comprises a second valve seating member having a second valve passage being in fluid communication with the air channel at said second valve open state, and a second valve sealing member engaging the second valve seating member at said second valve normally closed state thereby sealing said second valve passage.

85. The adaptor according to Claim 84, wherein at the second valve open state, the second valve sealing member at least partially disengages from the second valve seating member thereby unsealing the second valve passage.

866. The adaptor according to Claim 84 or 85 5, wherein the second valve passage defines at least a portion of a second fluid path extending between the air channel and the ambiance, the second fluid path being selectively sealable by the second valve at the second valve normally closed state.

87. The adaptor according to Claim 86, wherein the second valve, at the second valve normally closed state, seals the second fluid path, and at the second valve open state, unseals the second fluid path to allow air to enter in the air channel from the ambiance.

887. The adaptor according to Claim 5 any one of Claims 82 to 87, wherein the first valve and the second valve are positioned within a single common valve housing.

898. The adaptor according to Claim 5 any one of Claims 82 to 88, wherein the first valve and the second valve are integrated as a single valve arrangement.

90. The adaptor according to Claim 89, wherein the valve arrangement comprises the first and second sealing members configured as a single integrated sealing member configured to

displace the valve arrangement into a first valve open state at which it allows the air in the air channel to escape into the ambiance, a second valve open state at which it allows air to enter into the air channel from the ambiance, and a normal fully closed state.

91. The adaptor according to Claim 90, the valve arrangement being normally at the normal fully closed state, wherein the valve arrangement automatically displaces into the first valve open state in response to an air pressure within the valve arrangement rising above the first predetermined threshold, wherein the valve arrangement automatically displaces into the second valve open state in response to the air pressure within the valve arrangement falling below the second predetermined threshold.

92. The adaptor according to Claim 91, wherein the first predetermined threshold is greater than the second predetermined threshold.

93. The adaptor according to any one of Claims 90 to 92, wherein the sealing member is monolithic.

949. The adaptor according to Claim 8 any one of Claims 90 to 93, wherein the valve arrangement further comprises the first valve seating member and the second valve seating member, the single integrated sealing member having a sealing member first portion configured to selectively engage and at least partially disengage the first valve seating member thereby selectively sealing and unsealing the first valve passage, and a sealing member second portion configured to selectively engage and at least partially disengage the second valve seating member thereby selectively sealing and unsealing the second valve passage.

95. The adaptor according to Claim 94, wherein:

at the normal fully closed state, the sealing member first portion engages with the first valve seating member thereby sealing the first valve passage and the sealing member second portion engages with the second valve seating member thereby sealing the second valve passage;

at the first valve open state, the sealing member first portion at least partially disengages from the first valve seating member thereby unsealing the first valve passage, wherein at the first valve open state, the sealing member second portion engages with the second valve seating member, thereby sealing the second valve passage; and

at the second valve open state, the sealing member second portion at least partially disengages from the second valve seating member thereby unsealing the second valve passage, wherein at the second valve open state, the sealing member first portion engages with the first valve seating member, thereby sealing the first valve passage; and

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96. The adaptor according to Claim 95, wherein at the first valve open state, the valve arrangement allows the air to escape from within the valve arrangement to outside the valve arrangement via the first valve passage, and at the second valve open state, the valve arrangement allows the air to enter into the valve arrangement from outside the valve arrangement via the second valve passage.

9710. The adaptor according to Claim 95 or 96 9, wherein at the first valve open state, the sealing member second portion engages with the second valve seating member further tighter as compared to that at the normally fully closed state; and

at the second valve open state, the sealing member first portion engages with the first valve seating member further tightly as compared to that at the normally fully closed state.

98. The adaptor according to any one of Claims 90 to 97, wherein the sealing member first portion and the sealing member second portion are positioned at opposite ends of the sealing member.

99. The adaptor according to any one of Claims 76 to 98, wherein the adaptor further comprises a first outlet in fluid communication with the first valve and the ambiance, wherein the first outlet is configured to receive therewithin a lever button operational to disconnect the adaptor from an external female connector.

100. The adaptor according to Claim 99, when dependent on Claim 80, wherein the first fluid path extends via the first outlet.

101. The adaptor according to any one of Claims 82 to 100, wherein the adaptor further comprises a second outlet in fluid communication with the second valve and the ambiance, wherein the second outlet is an opening formed in a sidewall of an outer body of a luer lock connection port constituting a proximal end of the adaptor.

~~102. The adaptor according to Claim 101, when dependent on Claim 86, wherein the second fluid path extends via the second outlet.~~

~~103~~11. The adaptor according to Claim 8 ~~any one of Claims 89 to 98~~, wherein the second valve seating member comprises a valve seat having a valve seat opening, and the first valve seating member comprises a central member extending through the valve seat opening, the sealing member being positioned at least partially within the valve seat opening and radially between the valve seat and the central member~~.~~

~~104. The adaptor according to Claim 103~~, wherein the sealing member first portion is configured to selectively engage and at least partially disengage the central member thereby selectively displacing the valve arrangement into its first valve open state allowing the air to pass through the first valve passage defined between the central member and the sealing member, and the sealing member second portion is configured to selectively engage and at least partially disengage the valve seat thereby selectively displacing the valve arrangement into its second valve open state allowing the air to pass through the second valve passage defined between the valve seat and the sealing member.

~~105~~12. The adaptor according to Claim ~~103 or 104~~11, the valve seat having a valve seat internal surface facing the air channel, and an opposite valve seat external surface, wherein the sealing member second portion engages the valve seat internal surface, the sealing member further comprising a sealing member third portion having a fixing member configured to engage the external surface of the valve seat, thereby holding the sealing member in its position.

~~106~~13. The adaptor according to Claim 1 ~~any one of Claims 76 to 105~~, wherein the adaptor further comprises an actuator configured to selectively switch the adaptor between a fully operational state at which the adaptor is fully operable for transfer of liquid through the liquid channel, and an at least partial inoperational state at which the adaptor is at least partially inoperable for said transfer of liquid through the liquid channel~~.~~

~~107. The adaptor according to Claim 106~~, wherein at the at least partial inoperational state, the actuator is configured to at least partially block the transfer of liquid through the liquid channel indirectly.

~~108~~14. The adaptor according to Claim ~~106 or 107~~13, wherein the transfer of fluid through the liquid channel at least partially depends upon passage of air through the first valve, and the actuator is configured to selectively prevent said passage of air thereby displacing the adaptor into its at least partial inoperational state and thereby indirectly at least partially blocking the transfer of liquid through the liquid channel.

~~109~~15. The adaptor according to Claim 14 ~~any one of Claims 106 to 108~~, wherein at the fully operational state, the adaptor is operable for the transfer of liquid through the liquid channel in a first direction and an opposite second direction, and at the at least partial inoperational state, the adaptor is inoperable for transfer of liquid through the liquid channel in at least one of first and the second direction~~.~~

~~110. The adaptor of Claim 109~~, wherein the transfer of liquid through the liquid channel in the first direction depends upon discharge of air from within the adaptor through the first valve, and at the at least partial inoperational state, the actuator prevents said discharge of air thereby rendering the adaptor inoperable for the transfer of liquid through the liquid channel in the first direction.

~~111~~16. The adaptor ~~of~~ according to Claim ~~109 or 110~~15, wherein the transfer of liquid through the liquid channel in the second direction depends upon intake of air into the adaptor through the first valve, and at the at least partial inoperational state, the actuator prevents said intake of air thereby rendering the adaptor inoperable for the transfer of liquid through the liquid channel in the second direction.

~~112. The adaptor according to Claim 111, wherein at the at least partial inoperational state, the actuator is configured to at least partially block the transfer of liquid through the liquid channel directly.~~

~~113~~17. The adaptor according to Claim 14 ~~any one of Claims 106 to 112~~, wherein the actuator has a first actuator state associated with the fully operational state of the adaptor, and a second actuator state associated with the at least partial inoperational state of the adaptor~~.~~

~~114. The adaptor according to Claim 113~~, wherein the actuator is displaceable between the first actuator state and the second actuator state upon application of an external force.

~~115~~18. The adaptor according to Claim ~~114~~17, wherein the actuator is configured to remain in each of the first and the second actuator states upon removal of the external force.

~~116~~19. The adaptor according to Claim ~~114~~17, wherein the actuator is configured to be normally at one of the first and the second actuator state and is configured to be displaced into other one of the first and the second actuator state upon application of the external force, and to automatically return to said one of the first and the second actuator state upon removal of the external force.

~~117~~20. The adaptor according to Claim ~~116~~19, wherein the actuator is configured to be normally at the second actuator state, and is configured to be displaced into the first actuator state upon application of the external force, and to automatically return to the second actuator state upon removal of the external force.

~~118. The adaptor according to any one of Claims 113 to 117, when dependent on Claim 101, wherein at the second actuator state, the actuator is configured to engage the sealing member third portion and to prevent the passage of air from between the central member and the sealing member, thereby disabling the discharge of air from the valve arrangement irrespective of the state of the valve arrangement.~~

~~119. A valve arrangement comprising:~~

~~a sealing member configured to displace the valve arrangement into a first valve open state at which it allows air to escape from within the valve arrangement into ambiance, a second valve open state at which it allows air to enter into the valve arrangement from the ambiance, and a normal fully closed state.~~

~~120. The valve arrangement according to Claim 119, the valve arrangement being normally at the normal fully closed state, wherein the sealing member automatically displaces the valve arrangement into the first valve open state in response to an air pressure within the valve arrangement rising above a first predetermined threshold, into the second valve open state in response to the air pressure within the valve arrangement falling below a second predetermined threshold.~~

~~121. The valve arrangement according to Claim 120, wherein the first predetermined threshold is greater than the second predetermined threshold.~~

~~122. The valve arrangement according to any one of Claims 119 to 121, wherein the valve arrangement further comprises a first valve seating member at least partially defining a first valve passage and a second valve seating member at least partially defining a second valve passage, the sealing member having a sealing member first portion configured to selectively engage and at least partially disengage the first valve seating member thereby selectively sealing and unsealing the first valve passage, and a sealing member second portion configured to selectively engage and at least partially disengage the second valve seating member thereby selectively sealing and unsealing the second valve passage.~~

~~123. The valve arrangement according to Claim 122, wherein:~~

~~at the normal fully closed state, the sealing member first portion engages with the first valve seating member thereby sealing the first valve passage and the sealing member second portion engages with the second valve seating member thereby sealing the second valve passage;~~

~~at the first valve open state, the sealing member first portion at least partially disengages from the first valve seating member thereby unsealing the first valve passage, wherein at the first valve open state, the sealing member second portion engages with the second valve seating member, thereby sealing the second valve passage; and~~

~~at the second valve open state, the sealing member second portion at least partially disengages from the second valve seating member thereby unsealing the second valve passage, wherein at the second valve open state, the sealing member first portion engages with the first valve seating member, thereby sealing the first valve passage.~~

~~124. The valve arrangement according to Claim 123, wherein at the first valve open state, the valve arrangement allows the air to escape from within the valve arrangement to outside the valve arrangement via the first valve passage, and at the second valve open state, the valve arrangement allows the air to enter into the valve arrangement from outside the valve arrangement via the second valve passage.~~

~~125. The adaptor according to Claim 123 or 124, wherein at the first valve open state, the sealing member second portion engages with the second valve seating member further tighter as compared to that at the normally fully closed state; and~~

~~at the second valve open state, the sealing member first portion engages with the first valve seating member further tightly as compared to that at the normally fully closed state.~~

~~126. The valve arrangement according to any one of Claims 122 to 125, wherein the sealing member first portion and the sealing member second portion are positioned at opposite ends of the sealing member.~~

~~127. The valve arrangement according to any one of Claims 119 to 126, wherein the sealing member includes a central portion having a first end constituting the sealing member first portion and a second end, wherein a resilient skirt portion extends from a periphery of the second end, the skirt portion being defined between a first rim proximal to the second end and a second rim distal from the second end.~~

~~128. The valve arrangement according to any one of Claims 119 to 124, wherein the second valve seating member comprises a valve seat having a valve seat opening, and the first valve seating member comprises a central member extending through the valve seat opening, the sealing member being positioned at least partially within the valve seat opening and radially between the valve seat and the central member.~~

~~129. The valve arrangement according to Claim 128, wherein the sealing member first portion is configured to selectively engage and at least partially disengage the central member thereby selectively displacing the valve arrangement into its first valve open state allowing the air to pass through the first valve passage defined between the central member and the sealing member, and the sealing member second portion is configured to selectively engage and at least partially disengage the valve seat thereby selectively displacing the valve arrangement into its second valve open state allowing the air to pass through the second valve passage defined between the valve seat and the sealing member.~~

~~130. The valve arrangement according to Claim 128 or 129, the valve seat having a valve seat internal surface facing the air channel, and an opposite valve seat external surface, wherein the sealing member second portion engages the valve seat internal surface, the sealing member further comprising a sealing member third portion having a flange configured to engage the external surface of the valve seat, thereby holding the sealing member in its position.~~

~~131. The valve arrangement according to any one of Claims 119 to 130, wherein the sealing member is monolithic.~~

~~132. The valve arrangement according to any one of Claims 119 to 131, wherein the valve arrangement further comprises an actuator configured to control the flow of the air through the valve arrangement.~~

~~133. The valve arrangement according to Claim 132, wherein the actuator is configured to displace the valve arrangement into at least one of the first valve open state and the second valve open state from the normal fully closed state upon application of an external force.~~

~~134. The valve arrangement according to Claim 132 or 133, wherein the actuator is configured to selectively prevent the flow of air through the valve arrangement irrespective of the state of the valve arrangement.~~

~~135. An adaptor comprising:~~

~~a liquid channel configured for facilitating transfer of liquid therethrough;~~

~~an actuator configured to selectively switch the adaptor between a fully operational state at which the adaptor is fully operable for said transfer of liquid, and an at least partial inoperational state at which the adaptor is at least partially inoperable for said transfer of liquid, wherein at the at least partial inoperational state, the actuator is configured to at least partially block the transfer of liquid through the liquid channel indirectly.~~

~~136. The adaptor according to Claim 135, wherein the adaptor further comprises an air channel configured for facilitating passage of air therethrough, wherein the transfer of fluid through the liquid channel at least partially depends upon the passage of air through the air channel, and the actuator is configured to selectively prevent said passage of air thereby displacing the adaptor into its at least partial inoperational state and at least partially blocking the transfer of liquid through the liquid channel.~~

~~137. The adaptor according to Claim 135 or 136, wherein at the fully operational state, the adaptor is operable for the transfer of liquid through the liquid channel in a first direction and a second direction, and at the at least partial inoperational state, the adaptor is inoperable for transfer of liquid through the liquid channel in at least one of first and the second direction.~~

~~138. The adaptor of Claim 137, wherein the transfer of liquid through the liquid channel in the first direction depends upon discharge of air from within the adaptor through the air channel, and at the at least partial inoperational state, the actuator prevents said discharge of~~

~~air thereby rendering the adaptor inoperable for the transfer of liquid through the liquid channel in the first direction.~~

~~139. The adaptor of Claim 137 or 138, wherein the transfer of liquid through the liquid channel in the second direction depends upon intake of air into the adaptor, and at the at least partial inoperational state, the actuator prevents said intake of air thereby rendering the adaptor inoperable for the transfer of liquid through the liquid channel in the second direction.~~

~~140. The adaptor according to any one of Claims 135 to 139, wherein the actuator has a first actuator state associated with the fully operational state of the adaptor, and a second actuator state associated with the at least partial inoperational state of the adaptor.~~

~~141. The adaptor according to Claim 140, wherein the actuator is displaceable between the first actuator state and the second actuator state upon application of an external force.~~

~~142. The adaptor according to Claim 141, wherein the actuator is configured to remain in each of the first and the second actuator states upon removal of the external force.~~

~~143. The adaptor according to Claim 141, wherein the actuator is configured to be normally at one of the first and the second actuator state and is configured to be displaced into other one of the first and the second actuator state upon application of the external force, and to automatically return to said one of the first and the second actuator state upon removal of the external force.~~

~~144. The adaptor according to Claim 143, wherein the actuator is configured to be normally at the second actuator state, and is configured to be displaced into the first actuator state upon application of the external force, and to automatically return to the second actuator state upon removal of the external force.~~