CLAIMS

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.

2. The adaptor according to Claim 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.

3. The adaptor according to Claim 1, 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, 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.

4. The adaptor according to Claim 3, 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, 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.

5. The adaptor according to Claim 1, 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, 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, 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, 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.

6. The adaptor according to Claim 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, 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.

7. The adaptor according to Claim 5, wherein the first valve and the second valve are positioned within a single common valve housing.

8. The adaptor according to Claim 5, wherein the first valve and the second valve are integrated as a single valve arrangement, 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, 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, wherein the first predetermined threshold is greater than the second predetermined threshold.

9. The adaptor according to Claim 8, 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, 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;

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

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.

10. The adaptor according to Claim 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.

11. The adaptor according to Claim 8, 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, 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.

12. The adaptor according to Claim 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.

13. The adaptor according to Claim 1, 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, 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.

14. The adaptor according to Claim 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.

15. The adaptor according to Claim 14, 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, 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.

16. The adaptor according to Claim 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.

17. The adaptor according to Claim 14, 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, wherein the actuator is displaceable between the first actuator state and the second actuator state upon application of an external force.

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

19. The adaptor according to Claim 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.

20. The adaptor according to Claim 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.