ADAPTER FOR CANISTER FILLING SYSTEM AND METHOD FOR FILLING A GAS CANISTER

FIELD OF THE INVENTION

[0001] The present invention relates to gas canisters, e.g., for use in carbonation machines. More particularly, the present invention relates to an adapter for a canister filling system and a method for filling a gas canister.

BACKGROUND OF THE INVENTION

[0002] Carbonation machines are commonly used in homes, offices, cafeterias, and other settings. A typical carbonation machine may be operated to inject carbon dioxide into water or another liquid that is in a bottle that may be attached to the machine. Other types of carbonation machines may be configured to dispense carbonated beverages into cups or other containers.

[0003] The carbon dioxide gas that is injected into liquid to carbonate the liquid is typically provided in canisters of compressed or liquefied gas. The carbonation machine includes a user-operable mechanism for releasing gas from the cylinder and conducting the gas to the liquid to be carbonated. Typically, operation of the gas release mechanism causes the mechanism to open a valve of the cylinder. When the gas canister is installed in the carbonation machine, a valve head that includes the valve is connected to a gas canister connector of the carbonation machine.

[0004] When a cylinder has been emptied of gas, the empty cylinder may be replaced with a full cylinder. This replacement is typically performed by a user of the machine. For example, a valve head of the cylinder may be provided with exterior male threading which may be connected to the gas canister connector by screwing into interior threading of a socket of the connector.

SUMMARY OF THE INVENTION

[0004a] According to a first aspect of the present invention, there is provided an adapter for a canister filling system comprising:

a body comprising:

an opening that is shaped to enable insertion of a valve of a gas canister for holding a pressurized or liquefied gas, into an interior space of the body,

a sealing structure that forms a sealed gap between at least a portion of a lateral aspect of the valve and an internal surface of the body facing the interior space; and

at least one channel that is configured to conduct pressurized or liquified gas from a canister filling system into the sealed gap in the interior space, so as to reach one or more lateral exterior ports of the valve of the gas canister that open laterally to a longitudinal axis of a body of the gas canister, when the valve is inserted in the interior space, to facilitate filling of the gas canister with the pressurized or liquified gas through said one or more lateral exterior ports of the gas canister.

[0004b] According to a second aspect of the present invention, there is provided a method for filling a gas canister with pressurized or liquified gas from a canister filling system, the gas canister having a valve with one or more lateral exterior ports located on at least a portion of a lateral aspect of the valve, the method comprising:

inserting a valve of the gas canister into an interior space of a body of an adapter, leaving a sealed gap between at least a portion of a lateral aspect of the valve and an internal surface of the body facing the interior space;

conducting pressurized or liquified gas from the canister filling system into the sealed gap in the interior space, via at least one channel so as to reach one or more lateral exterior ports of the valve of the gas canister that open laterally to a longitudinal axis of a body of the gas canister, when the valve is inserted in the interior space; and

filling of the gas canister with the pressurized or liquified gas through said one or more lateral exterior ports of the gas canister.

[0005] There is thus provided, in accordance with an embodiment of the invention, an adapter for a canister filling system, The adapter may include a body comprising: an opening that is shaped to enable insertion of a valve of a gas canister for holding a pressurized or liquefied gas, into an interior space of the body, leaving a sealed gap between at least a portion of a lateral aspect of the valve and an internal surface of the

CLAIMS

1. An adapter for a canister filling system comprising:

a body comprising:

an opening that is shaped to enable insertion of a valve of a gas canister for holding a pressurized or liquefied gas, into an interior space of the body,

a sealing structure that forms a sealed gap between at least a portion of a lateral aspect of the valve and an internal surface of the body facing the interior space; and

at least one channel that is configured to conduct pressurized or liquified gas from a canister filling system into the sealed gap in the interior space, so as to reach one or more lateral exterior ports of the valve of the gas canister that open laterally to a longitudinal axis of a body of the gas canister, when the valve is inserted in the interior space, to facilitate filling of the gas canister with the pressurized or liquified gas through said one or more lateral exterior ports of the gas canister.

2. The adapter of claim 1, wherein the at least one channel comprises at least one laterally oriented channel that is configured to be in fluidic communication with said one or more lateral exterior ports of the valve when the adapter is attached to the filling system.

3. The adapter of claim 1, configured to connect to a filling head of the filling system.

4. The adapter of claim 3, where the at least one channel comprises a longitudinally oriented channel at a distal end that is configured to be in fluidic communication with a filling port when the distal end is connected to the filling head.

5. The adapter of claim 1, wherein the sealing structure comprises a gasket configured to fluidically isolate an exterior surface of a plunger of the valve when the valve is inserted in the interior space from said at least a portion of the lateral aspect of the valve.

6. The adapter of claim 1, further comprising a pin actuator for actuating a plunger of the valve, when the valve is inserted in the interior space.

7. The adapter of claim 6, wherein the actuator pin is static.

8. The adapter of claim 7, wherein the static actuator pin extends inwardly into the interior space.

9. The adapter of claim 6, wherein the actuator pin is dynamic.

10. The adapter of claim 9, wherein the actuator pin is positioned and movable within a bore in the body.

11. The adapter of claim 10, wherein the bore extends form an external surface of the body to an internal surface facing the interior space.

12. A method for filling a gas canister with pressurized or liquified gas from a canister filling system, the gas canister having a valve with one or more lateral exterior ports located on at least a portion of a lateral aspect of the valve, the method comprising:

inserting a valve of the gas canister into an interior space of a body of an adapter, leaving a sealed gap between at least a portion of a lateral aspect of the valve and an internal surface of the body facing the interior space;

conducting pressurized or liquified gas from the canister filling system into the sealed gap in the interior space, via at least one channel so as to reach one or more lateral exterior ports of the valve of the gas canister that open laterally to a longitudinal axis of a body of the gas canister, when the valve is inserted in the interior space; and

filling of the gas canister with the pressurized or liquified gas through said one or more lateral exterior ports of the gas canister.

13. The method of claim 12, wherein the at least one channel comprises at least one laterally oriented channel, the method further comprises placing said at least one laterally oriented channel in fluidic communication with said one or more lateral exterior ports of the valve when the adapter is attached to the filling system.

14. The method of claim 12, further comprising connecting the adapter to a filling head of the filling system.

15. The method of claim 14, further comprising placing a longitudinally oriented channel of the at least one channel in fluidic communication with a filling port when the distal end is connected to the filling head.

16. The method of claim 12, further comprising fluidically isolating an exterior surface of a plunger of the valve when the valve is inserted in the interior space from said at least a portion of the lateral aspect of the valve using a gasket.

17. The method of claim 12, further comprising actuating a plunger of the valve using an actuator pin, when the valve is inserted in the interior space.

18. The method of claim 17, wherein the actuator pin is static.

19. The method of claim 17, wherein the actuator pin is dynamic.