CLAIMS

What is claimed is:

1. A method, comprising:

linearly moving a lift plate and a system plunger assembly carried by the lift plate toward a reagent cartridge plunger assembly of a reagent cartridge, the system plunger assembly including at least one system plunger, the reagent plunger assembly including at least one reagent cartridge plunger;

actuating the at least one reagent cartridge plunger a first predetermined distance to contact a gasket assembly of a flow cell assembly responsive to the at least one system plunger contacting the at least one reagent cartridge plunger, the flow cell assembly including a flow cell including at least one channel, a flow cell inlet, and a flow cell outlet, a first fluidic coupling fluidically coupled to the flow cell inlet and a second fluidic coupling fluidically coupled to the flow cell outlet, and the gasket assembly fluidically coupled to the first and second fluidic couplings and having an inlet gasket having a through bore and being fluidically coupled to the flow cell inlet via the first fluidic coupling, and an outlet gasket having a through bore and being fluidically coupled to the flow cell outlet via the second fluidic coupling; and

fluidically coupling the inlet gasket to a first reagent cartridge port of the reagent cartridge and fluidically coupling the outlet gasket to a second reagent cartridge port of the reagent cartridge responsive to the at least one system plunger actuating the at least one reagent cartridge plunger a second predetermined distance to allow fluid communication between the reagent cartridge ports and the flow cell via the flow cell inlet and the flow cell outlet.

2. The method of claim 1, wherein the first fluidic coupling and the second fluidic coupling of the flow cell assembly are each a flexible fluidic coupling such that the flow cell is moveable at least one of vertically, longitudinally, or laterally relative to the gasket assembly while the inlet gasket is fluidically coupled to the first reagent cartridge port of the reagent cartridge and the outlet gasket is fluidically coupled to the second reagent cartridge port of the reagent cartridge.

3. The method of any one of the preceding claims, further comprising moving the system plungers in a direction opposite a direction of movement of the lift plate and against a spring force.

4. The method of claim 3, wherein the lift plate applies a first compressive force on a reagent cartridge body while the spring force and the system plungers apply a second, different compressive force on the inlet gasket and the outlet gasket.

5. The method of any one of the preceding claims, wherein the first fluidic coupling and the second fluidic coupling are combined.

6. An apparatus, comprising:

a system, including:

a reagent cartridge receptacle;

a lift plate assembly including a lift plate, a system plunger assembly carried by the lift plate and including a plurality of system plungers, and a lift plate drive assembly operatively coupled to the lift plate;

a flow cell assembly, including:

a flow cell including at least one channel, a flow cell inlet, and a flow cell outlet;

a fluidic coupling fluidically coupled to each of the flow cell inlet and the flow cell outlet; and

a gasket assembly fluidically coupled to the fluidic coupling and having a flow cell inlet gasket and a flow cell outlet gasket, the flow cell inlet gasket having a through bore and being fluidically coupled to the flow cell inlet via the fluidic coupling, the flow cell outlet gasket having a through bore and being fluidically coupled to the flow cell outlet via the fluidic coupling;

a reagent cartridge receivable within the reagent cartridge receptacle, the reagent cartridge, comprising:

a reagent cartridge plunger assembly having a plurality of reagent cartridge plungers, wherein each reagent cartridge plunger is adapted to be aligned with a corresponding system plunger of the system plunger assembly and a corresponding flow cell gasket of the flow cell assembly when the reagent cartridge is received within the reagent cartridge receptacle; and

a pair of reagent cartridge ports adapted to be fluidically coupled to the flow cell inlet gasket and the flow cell outlet gasket.

7. The apparatus of claim 6, wherein the lift plate drive assembly is adapted to linearly move the lift plate and the system plungers and cause the system plungers to engage and move the reagent cartridge plungers into engagement with the gasket assembly to allow fluid

communication between the pair of reagent cartridge ports and the flow cell via the flow cell inlet and the flow cell outlet.

8. The apparatus of any one of claims 6 – 7, wherein the system plungers comprise a pair of system plungers and the reagent cartridge plungers comprise a pair of reagent cartridge plungers.

9. The apparatus of claim 8, wherein the flow cell assembly further comprises a leveler gasket.

10. The apparatus of claim 9, wherein the system plungers comprise a leveler system plunger, the reagent cartridge plungers further comprise a leveler reagent cartridge plunger, and the reagent cartridge comprises a reagent cartridge engagement surface.

11. The apparatus of claim 10, wherein the lift plate drive assembly is adapted to linearly move the lift plate and the leveler system plunger to engage and move the leveler reagent plunger into engagement with the gasket assembly to allow engagement between the leveler gasket and the reagent cartridge engagement surface.

12. The apparatus of any one of claims 10 – 11, wherein the leveler gasket, the flow cell inlet gasket, and the flow cell outlet gasket are arranged in a triangular pattern.

13. The apparatus of any one of claims 6 – 12, wherein the flow cell assembly has a flow cell housing that carries the flow cell, the fluidic coupling, and the gasket assembly.

14. The apparatus of claim 13, wherein the flow cell housing has a dimensional envelope and the gasket assembly is disposed within the dimensional envelope of the flow cell housing.

15. The apparatus of any one of claims 13 – 14, wherein the flow cell housing includes an opening that corresponds to each flow cell gasket.

16. The apparatus of claim 15, wherein the openings are arranged to allow the flow cell gaskets to protrude from the dimensional envelope of the flow cell housing after the reagent cartridge plungers move the gasket assembly a predetermined distance.

17. The apparatus of any one of claims 6 – 16, wherein the flow cell gaskets have flat surfaces and the reagent cartridge comprises a reagent cartridge engagement surface that faces a flow cell receptacle of the reagent cartridge.

18. The apparatus of claim 17, wherein the flat surfaces of the flow cell gaskets are arranged to engage the reagent cartridge engagement surface to fluidically couple the pair of reagent cartridge ports with the flow cell.

19. The apparatus of any one of claims 6 – 18, wherein the reagent cartridge comprises alignment receptacles that face a flow cell receptacle of the reagent cartridge and the gasket assembly has alignment protrusions that are adapted to be received by the alignment receptacles.

20. The apparatus of any one of claims 6 – 19, wherein the gasket assembly has a plurality of engagement protrusions that comprise corresponding plunger receptacles, each plunger receptacle being adapted to be engaged or surrounded by a distal end of a corresponding reagent cartridge plunger.

21. The apparatus of any one of claims 6 – 20, wherein the lift plate comprises plunger bores and wherein each system plunger is slidably disposed within a corresponding plunger bore.

22. The apparatus of claim 21, further comprising a spring disposed in each of the plunger bores.

23. The apparatus of claim 22, wherein the springs act on the system plungers to urge a distal end of the system plungers into engagement with a corresponding reagent cartridge plunger.

24. The apparatus of any one of claims 21 – 23, further comprising a seal carried by the system plunger.

25. The apparatus of any one of claims 6 – 24, wherein the reagent cartridge comprises a flow cell receptacle adapted to receive the flow cell assembly.