Claims

1. An apparatus for operating a microfluidic device, comprising a carrier portion, the apparatus comprising: a platen having a platen face with one or more fluid ports therein and one or more check valve purge actuators, the fluid ports spatially corresponding to one or more inlets on a surface of the carrier portion of the microfluidic device and the one or more check valve purge actuators comprising one or more pins; a platform for holding the microfluidic device relative to the platen; a platen actuator for urging the platen against the microfluidic device so that at least one of the fluid ports of the platen is urged against one of the inlets to form a pressure chamber comprising the inlet and the port, so that when pressurized fluid is introduced or removed into or from the pressure chamber though one of the ports, fluid pressure is changed therein; and a fluid line in fluid communication with at least a portion of the platen actuator, wherein the fluid line is configured to deliver a pressurized fluid to at least one of the fluid ports.

2. The apparatus as in claim 1 wherein the platen actuator comprises a robotic platen actuator.

3. The apparatus as in claim 2 wherein the platen actuator is under electronic control by a controller.

4. The apparatus as in claim 3 wherein the controller is a computer or under computer control.

5. The apparatus as in claim 4 wherein the computer is following a program.

6. The apparatus as in claim 5 wherein the program was customized by a user of the apparatus.

7. The apparatus as in claim 1, wherein the fluid line is configured to deliver the pressurized fluid to the at least one fluid pressure port using a pressure between about one (1) psi and about thirty-five (35) psi.

8. The apparatus as in claim 7, wherein the pressurized fluid is a gas.

9. The apparatus as in claim 8, wherein the gas is air.

10. An apparatus for operating a microfluidic device comprising a carrier portion, the apparatus comprising: a platen having a platen face with a plurality of fluid ports therein and one or more check valve purge actuators, the fluid ports spatially corresponding to one or more inlets on a surface of the carrier portion of the microfluidic device and the one or more check valve purge actuators comprising one or more pins; a platform for holding the micrOfluidic device relative to the platen; and a platen actuator for urging the platen against the microfluidic device so that at least one of the fluid ports of the platen is urged against one of the inlets to form a pressure chamber comprising the inlet and the port, so that when pressurized fluid is introduced or removed into or from the pressure

chamber through one of the ports, fluid pressure is changed therein, and wherein the platen actuator is configured to deliver a pressurized fluid to the at least one fluid pressure port using a pressure between about one (1) psi and about thirty-five (35) psi.

11. The apparatus as in claim 10, wherein the pressurized fluid is a gas.

12. The apparatus as in claim 11, wherein the gas is air.

13. A carrier for holding a microfluidic device comprising: a non-elastomeric substrate comprising a plurality of wells, wherein each of the plurality of wells has a well opening with a center point and the plurality of wells is spatially arranged such that the center point to center point spacing is about 4.5 mm; a plurality of channels within the substrate wherein each of the plurality of wells is in fluid communication with at least one of the plurality of channels; and a receiving portion on the non-elastomeric substrate for receiving the microfluidic device and placing the microfluidic device in fluid communication with the plurality of wells, wherein the microfluidic device comprises an elastomeric material.

14. The carrier of claim 13 comprising one or more well rows.

15. The carrier of claim 14 comprising a plurality of well rows and wherein the plurality of rows is divided into more than one well bank.

16. The carrier of claim 14 wherein the well rows are divided into a first well region and a second well region wherein the first well region and the second well region are adapted to receive up to 48 reagents into the wells.

17. The carrier of claim 13 wherein the receiving portion further comprises a thermal control device.

18. The carrier of claim 13 wherein the wells further comprise an upper face and wherein the wells are adapted to form a pressure cavity when a platen is urged against the upper face.

19. The carrier of claim 18 further comprising a pressure accumulator.

20. The carrier of claim 13 wherein the plurality of wells is spatially arranged such that the center-to-center spacing of each well is that of the center-point spacing of a microtiter plate having a format selected from the group consisting of a 96 well microtiter plate, a 384 well microtiter plate, a 864 well microtiter plate, a 1536 well microtiter plate, and a 6144 well microtiter plate.

21. The carrier of claim 18 further comprising a microfluidic device, the microfluidic device comprising a chamber wherein the chamber is coupled to a well through a channel in the substrate.

22. The carrier of claim 19 further comprising a microfluidic device, the microfluidic device comprising a chamber and a valve wherein the chamber is coupled to a well through a channel in the substrate and wherein the valve is coupled to an accumulator through a channel in the substrate.

23. The carrier of claim 17 further comprising a pressure accumulator and a microfluidic device, the microfluidic device comprising a chamber and a valve wherein the chamber is coupled to a well through a channel in the substrate and wherein the valve is coupled to an accumulator through a channel in the substrate.

24. The carrier of claim 13, wherein the non-elastomeric substrate comprises acrylic or polypropylene.

25. The carrier of claim 13, wherein the elastomeric material of the microfluidic device comprises polydimethylsiloxane.

26. A carrier for holding a microfluidic device, the carrier comprising: a carrier substrate comprising at least a plurality of wells, wherein each of the plurality of wells has an exposed top opening to receive a fluid from outside the carrier, and wherein each of the plurality of wells has a center point and the plurality of wells are spatially arranged such that the center point to center point spacing is about 4.5 mm; a plurality of channels within the carrier substrate wherein each of the plurality of wells is in fluid communication with at least one of the plurality of channels; and a receiving portion on the carrier substrate for receiving the microfluidic device and placing the microfluidic device in fluid communication with the plurality of wells.

27. A carrier for holding a microfluidic device, the carrier comprising: a carrier substrate comprising at least a plurality of wells, wherein each of the plurality of wells has a center point and the plurality of wells are spatially arranged such that the center point to center point spacing is about 4.5 mm; a plurality of channels within the carrier substrate, wherein each of the channels has a first terminus that is fluidly coupled to one of the plurality of wells and a second terminus operable to be fluidly coupled to the microfluidic device; and a receiving portion on the carrier substrate for receiving the microfluidic device and coupling the microfluidic device to the second termini of the plurality of channels to place the microfluidic device in fluid communication with the plurality of wells.

28. The carrier of claim 27, wherein the first termini of the channels is coupled to a bottom side of the wells that is opposite an exposed top side of each of the wells.