CLAIMS

What is claimed is:

1. An apparatus comprising:

a chuck to receive a microfluidic plate thereon; a first fluidic port block comprising a first fluidic port, the first fluidic port block moveable

at least one of longitudinally or laterally relative to the chuck, the first fluidic port block comprising one or more first alignment holes to receive one or more corresponding first fluidic port indexing features of a flow cell cartridge; a first rotatable clamp arm rotatable about a first axis parallel to a plane of a surface of the

chuck for receiving the microfluidic plate; a first lateral indexing pin offset laterally from the chuck and extending upwardly relative

to the plane of the surface of the chuck; and a first longitudinal indexing pin offset longitudinally from the chuck and extending

upwardly relative to the plane of the surface of the chuck, the longitudinal indexing pin longitudinally moveable relative to the chuck.

2. The apparatus of claim 1, wherein the chuck is to draw a vacuum on the microfluidic plate.

3. The apparatus of claim 1 or 2, wherein:

the first fluidic port block includes at least two first alignment holes, one of the at least two first alignment holes has a round cross section when viewed along

an axis perpendicular to the plane of the surface of the chuck for receiving the microfluidic plate, and another of the at least two first alignment holes has an obround cross section when viewed along the axis perpendicular to the plane of the surface of the chuck for receiving the microfluidic plate.

4. The apparatus of claim 3, wherein the first alignment holes have chamfered edges

5. The apparatus of any one of the preceding claims, further comprising a second longitudinal indexing pin, the second longitudinal indexing pin fixed relative to the chuck.

6. The apparatus of any one of the preceding claims, further comprising a second fluidic port block comprising a second fluidic port, the second fluidic port block positioned on a

longitudinally opposite side of the chuck relative to the first fluidic port block, the second fluidic port block moveable at least one of longitudinally or laterally relative to the chuck, the second fluidic port block comprising one or more second alignment holes to receive one or more corresponding second fluidic port indexing features of the flow cell cartridge.

7. The apparatus of claim 6, further comprising:

an additional first fluidic port block moveable at least one of longitudinally or laterally relative to the chuck, the additional first fluidic port block comprising one or more additional first alignment holes to receive one or more corresponding additional first fluidic port indexing features of the flow cell cartridge; and an additional second fluidic port block moveable at least one of longitudinally or laterally

relative to the chuck, the additional second fluidic port block comprising one or more additional second alignment holes to receive one or more corresponding additional second fluidic port indexing features of the flow cell cartridge, wherein: the additional first fluidic port block is positioned adjacent to the first fluidic port

block, the additional second fluidic port block is positioned adjacent to the second fluidic

port block, the additional first fluidic port block is moveable relative to the first fluidic port

block, and the additional second fluidic port block is moveable relative to the second fluidic port

block.

8. The apparatus of any one of the preceding claims, wherein the first fluidic port block floats longitudinally and laterally relative to the chuck.

9. The apparatus of any one of the preceding claims, wherein the longitudinal indexing pin is spring-biased towards the chuck.

10. The apparatus of any one of the preceding claims, wherein the first rotatable clamp arm laterally translates along the first axis as the first rotatable clamp arm rotates.

11. The apparatus of claim 10, further comprising a second lateral indexing pin offset laterally from the chuck and extending upwardly relative to the plane of the surface of the chuck, the first lateral indexing pin and the second lateral indexing pin defining a lateral plane,

wherein the rotatable clamp arm laterally translates in a direction towards the lateral plane as the rotatable clamp arm rotates in a first direction.

12. The apparatus of any one of the preceding claims, further comprising a second rotatable clamp arm rotatable about a second axis parallel to the plane of the surface of the chuck for receiving the microfluidic plate, wherein the surface of the chuck for receiving the microfluidic plate is interposed between the first axis and the second axis.

13. The apparatus of any one of the preceding claims, wherein the first rotatable clamp arm is rotatable to a position that overlaps the first fluidic port block when viewed along an axis perpendicular to the plane of the surface of the chuck for receiving the microfluidic plate.

14. The apparatus of any one of the preceding claims, wherein the first fluidic port block is also vertically movable.

15. A method comprising:

rotating a clamp arm about an axis in a plane parallel to a plane of a surface of a chuck of a receiver, the rotating clamp arm contacting a surface of a microfluidic plate of a flow cell cartridge disposed on the chuck of the receiver, the microfluidic plate comprising a fluidic port aligned with a gasket fluidic port of a gasket assembly of the flow cell cartridge, the microfluidic plate moveable longitudinally and laterally within a predetermined range of movement relative to a frame of the flow cell cartridge; translating a longitudinal indexing pin offset longitudinally from the chuck to contact a
second edge of the microfluidic plate, the translating longitudinal indexing pin translating the microfluidic plate to contact an opposing edge of the microfluidic plate with a second longitudinal indexing pin; and engaging a fluidic port indexing feature of the flow cell cartridge with an alignment hole of
a fluidic port block of the receiver, the fluidic port block moveable at least one of longitudinally or laterally relative to the chuck of the receiver, the fluidic port block comprising a receiver fluidic port, the receiver fluidic port aligned with the gasket fluidic port of the gasket assembly of the flow cell cartridge responsive to the fluidic port indexing feature of the flow cell cartridge being inserted into the alignment hole of the fluidic port block.

~~16. The method of claim 15, wherein the rotatable clamp arm laterally translates along the axis in the plane parallel to the plane of the surface of the chuck as the rotatable clamp arm rotates.~~

~~17. The method of claim 16, wherein the rotatable clamp arm laterally translates the microfluidic plate relative to the chuck of the receiver.~~

~~18. The method of any one of claims 15 to 17, wherein the gasket assembly comprises a support foot offset from the gasket fluidic port.~~

~~19. The method of claim 18, wherein the support foot is offset longitudinally relative to the gasket fluidic port.~~

~~20. The method of any one of claims 15 to 19, wherein the flow cell cartridge assembly comprises a first support bracket comprising the first gasket assembly, a first indexing feature, and a second indexing feature, the first indexing feature abutting the microfluidic plate at a first edge and the second indexing feature abutting the microfluidic assembly at the second edge when the gasket fluidic port of the first gasket assembly aligns with the fluidic port of the microfluidic plate, wherein the first support bracket floats relative to the microfluidic plate and the frame of the flow cell cartridge.~~

What is claimed is:

1. An apparatus comprising:
a receiver configured to receive a flow cell cartridge containing a microfluidic flow plate, the receiver including:
a chuck having an elongate rectangular area configured to receive the microfluidic plate thereon when the flow cell cartridge is received by the receiver, the elongate rectangular area having a first long side, a second long side opposite the first long side, a first short side, and a second short side opposite the first short side;
a first fluidic port block comprising a first fluidic port, the first fluidic port block configured to move at least one of longitudinally or laterally relative to the chuck and positioned along the first short side and outside of the elongate rectangular area, the first fluidic port block comprising one or more first alignment holes configured to receive one or more corresponding first fluidic port indexing features of the flow cell cartridge;
a first rotatable clamp arm configured to rotate about a first axis parallel to a plane of a surface of the chuck, wherein the first fluidic port is positioned adjacent the first axis and the elongate rectangular area of the chuck;
a first lateral indexing pin positioned adjacent to the first long side, having a corresponding center axis offset from the first long side in a direction perpendicular to the first long side and parallel to the plane of the surface of the chuck, and extending upwardly relative to the plane of the surface of the chuck; and
a first longitudinal indexing pin positioned such that the first fluidic port is closer to the first short side than the first longitudinal indexing pin, having a corresponding center axis offset from the first short side in a direction perpendicular to the first short side and parallel to the plane of the surface of the chuck, and extending upwardly relative to the plane of the surface of the chuck, the first longitudinal indexing pin configured to move longitudinally relative to the chuck.

2. The apparatus of claim 1, wherein the chuck is a vacuum chuck.

3. The apparatus of claim 1, wherein:
the first fluidic port block includes at least two first alignment holes,
one of the at least two first alignment holes has a round cross section when viewed along an axis perpendicular to the plane of the surface of the chuck for receiving the microfluidic plate, and

another of the at least two first alignment holes has an obround cross section when viewed along the axis perpendicular to the plane of the surface of the chuck for receiving the microfluidic plate.

4. The apparatus of claim 3, wherein the at least two first alignment holes have chamfered edges.

5. The apparatus of claim 1, further comprising a second longitudinal indexing pin, the second longitudinal indexing pin fixed relative to the chuck.

6. The apparatus of claim 1, further comprising a second fluidic port block comprising a second fluidic port, the second fluidic port block positioned on a longitudinally opposite side of the chuck relative to the first fluidic port block, the second fluidic port block moveable at least one of longitudinally or laterally relative to the chuck, the second fluidic port block comprising one or more second alignment holes configured to receive one or more corresponding second fluidic port indexing features of the flow cell cartridge.

7. The apparatus of claim 6, further comprising:
an additional first fluidic port block moveable at least one of longitudinally or laterally relative to the chuck, the additional first fluidic port block comprising one or more additional first alignment holes configured to receive one or more corresponding additional first fluidic port indexing features of the flow cell cartridge; and
an additional second fluidic port block moveable at least one of longitudinally or laterally relative to the chuck, the additional second fluidic port block comprising one or more additional second alignment holes configured to receive one or more corresponding additional second fluidic port indexing features of the flow cell cartridge, wherein:
the additional first fluidic port block is positioned adjacent to the first fluidic port block,
the additional second fluidic port block is positioned adjacent to the second fluidic port block,
the additional first fluidic port block is configured to move relative to the first fluidic port block, and
the additional second fluidic port block is configured to move relative to the second fluidic port block.

8. The apparatus of claim 1, wherein the first fluidic port block floats longitudinally and laterally relative to the chuck.

9. The apparatus of claim 1, wherein the first longitudinal indexing pin is spring-biased towards the chuck.

10. The apparatus of claim 1, wherein the first rotatable clamp arm is configured to laterally translate along the first axis with rotation of the first rotatable clamp arm about the first axis.

11. The apparatus of claim 10, further comprising a second lateral indexing pin offset laterally from the chuck and extending upwardly relative to the plane of the surface of the chuck, the first lateral indexing pin and the second lateral indexing pin defining a lateral plane, wherein the rotatable clamp arm is configured to laterally translate towards the lateral plane when the rotatable clamp arm is rotated in a first direction.

12. The apparatus of claim 1, further comprising a second rotatable clamp arm configured to rotate about a second axis parallel to the plane of the surface of the chuck for receiving the microfluidic plate, wherein the surface of the chuck for receiving the microfluidic plate is interposed between the first axis and the second axis.

13. The apparatus of claim 1, wherein the first rotatable clamp arm is configured to rotate to a position that overlaps the first fluidic port block when viewed along an axis perpendicular to the plane of the surface of the chuck for receiving the microfluidic plate.

14. The apparatus of claim 1, wherein the first fluidic port block is also configured to move vertically relative to the chuck.

15. An apparatus comprising:
a microfluidic plate comprising a first fluidic port and having a plate width, a first edge, and a second edge; and
a first support bracket comprising a first gasket assembly, a first indexing feature, and a second indexing feature, the first indexing feature abutting the microfluidic plate at the first edge and the second indexing feature abutting the microfluidic plate

at the second edge when a gasket fluidic port of the first gasket assembly aligns with the first fluidic port of the microfluidic plate, the first edge being non-parallel to the second edge; and

a frame comprising an overlapping portion, a retaining clip, and opposing sidewalls defining an opening,

the opposing sidewalls defining an opening width, the opening width greater than the plate width,

the retaining clip retaining the first support bracket laterally relative to the frame, the retaining clip defining a predetermined gap for the first support bracket to float laterally relative to the retaining clip of the frame, and

at least a portion of the microfluidic plate disposed between, when viewed along a direction perpendicular to the microfluidic plate, the overlapping portion of the frame and the first support bracket, wherein the microfluidic plate floats at least laterally relative to the frame within the opening.

16. The apparatus of claim 15, wherein the gasket assembly comprises a seal surrounding the gasket fluidic port of the first gasket assembly.

17. The apparatus of claim 15, wherein the gasket assembly comprises a support foot offset from the gasket fluidic port.

18. The apparatus of claim 17, wherein the support foot is offset longitudinally relative to the gasket fluidic port.

19. The apparatus of claim 18, wherein the support foot and the gasket fluidic port extend towards the microfluidic plate by the same amount from a surface of the first support bracket facing the microfluidic plate.

20. The apparatus of claim 15, wherein the retaining clip comprises a first retaining clip on a first side of the opposing sides of the frame and a second retaining clip on a second side of the opposing sides of the frame.

21. The apparatus of claim 15, wherein the microfluidic plate is moveable longitudinally relative to the frame.

22. The apparatus of claim 15, wherein the first gasket assembly is co-molded into

the first support bracket.

23. The apparatus of claim 15, wherein the first edge is perpendicular to the second edge.

24. The apparatus of claim 15, wherein the opening width and the plate width are both in a direction parallel to the second edge.

25. The apparatus of claim 15, wherein the microfluidic plate has a plate length in a direction perpendicular to the plate width and the plate length is longer than a length of the opening in a direction perpendicular to the opening width.

26. The apparatus of claim 15, the first support bracket further comprising a third indexing feature abutting the microfluidic plate at a third edge of the microfluidic plate on a side of the microfluidic plate opposite the first edge when the gasket fluidic port of the first gasket assembly aligns with the first fluidic port of the microfluidic plate.

27. The apparatus of claim 15, the first support bracket further comprising an additional indexing feature located proximate to a third edge of the microfluidic plate, the third edge on an opposite side of the microfluidic plate from the first edge, and the closest distance between the first indexing feature and the additional indexing feature being larger than a width of a portion of the microfluidic plate interposed therebetween.

28. The apparatus of claim 15, wherein the opening is substantially rectangular.

29. The apparatus of claim 28, wherein:
the substantially rectangular opening has a short dimension and a long dimension that is larger than the short dimension, and
the opening includes one or more notches along each of two opposing edges of the opening that are perpendicular to a direction of the long dimension.

30. The apparatus of claim 15, further comprising a second support bracket comprising a second gasket assembly, a third indexing feature, and a fourth indexing feature, the third indexing feature abutting the microfluidic plate at the first edge and the fourth indexing feature abutting the microfluidic plate at a third edge of the

microfluidic plate when a second gasket fluidic port of the second gasket assembly aligns with a second fluidic port of the microfluidic plate and such that the microfluidic plate is interposed between the first indexing feature and the fourth indexing feature.

31. The apparatus of claim 30, the first support bracket further comprising a fifth indexing feature, the second support bracket further comprising a sixth indexing feature, the fifth indexing feature abutting the first edge of the microfluidic plate when the gasket fluidic port of the first gasket assembly aligns with the first fluidic port of the microfluidic plate, and the sixth indexing feature abutting the third edge of the microfluidic plate when the second gasket fluidic port of the second gasket assembly aligns with the second fluidic port of the microfluidic plate.

32. The apparatus of claim 31, the first support bracket further comprising a seventh indexing feature, the second support bracket further comprising an eighth indexing feature, the seventh indexing feature located proximate to a fourth edge of the microfluidic plate such that the microfluidic plate is interposed between the seventh indexing feature and the first indexing feature, the eighth indexing feature located proximate to the fourth edge of the microfluidic plate, the closest distance between the first indexing feature and the seventh indexing feature being larger than a first portion of the microfluidic plate interposed therebetween, and the closest distance between the third indexing feature and the eighth indexing feature being larger than a second portion of the microfluidic plate interposed therebetween.

33. The apparatus of claim 30, wherein the microfluidic plate includes a flow channel extending between the first and second fluidic ports.

34. The apparatus of claim 30, the frame further comprising an additional retaining clip retaining the second support bracket laterally relative to the frame, the additional retaining clip defining an additional predetermined gap for the second support bracket to float laterally relative to the additional retaining clip of the frame.