CLAIMS

1. An apparatus for use in performing one or more unit operations in cell processing comprising:

a holding element arranged to receive a top section of a container within a first plane;

a moveable plate, spaced apart from the holding element, arranged to operably engage a base section of a container, the moveable plate defining a second plane substantially parallel to the first plane; and

an actuation mechanism operably coupled to the moveable plate to rotate the moveable plate about at least one axis within the second plane, thereby reducing a distance between at least a portion of the second plane and the first plane.

2. An apparatus according to claim 1, wherein the actuation mechanism is arranged to rotate the moveable plate about an axis within the second plane, or about a plurality of axes within the second plane.

3. An apparatus according to any preceding claim, wherein the actuation mechanism is arranged to rotate the moveable plate between 0 degrees and 90 degrees about the or each axis.

4. An apparatus according to any preceding claim, a longitudinal axis, extending perpendicularly to the first plane and the second plane, intersects the second plane at an origin, wherein the actuation mechanism is arranged to pivot the moveable plate about the origin.

5. An apparatus according to claim 4, wherein the origin is centrally located within the second plane.

6. An apparatus according to claim 4 or claim 5, wherein the moveable plate is pivotable about the origin such that each point within the second plane, excluding the origin,

forms an angle with respect to the longitudinal axis between 0 and 180 degrees, excluding 90 degrees.

7. An apparatus according to any preceding claim, wherein the actuation mechanism is further arranged to move the moveable plate along a longitudinal axis, substantially perpendicular to the first plane and the second plane, thereby reducing a distance between the second plane and the first plane.

8. An apparatus according to any preceding claim, wherein the holding element comprises a platform operably engageable with a top section of a container, a clamping mechanism operably engageable with a top section of a container, or a sealing plate operably engageable with a top section of a container.

9. An apparatus according to any preceding claim, wherein the actuation mechanism comprises a base plate spaced apart from, and substantially parallel to, the moveable plate, the base plate being operably coupled to the moveable plate, wherein the base plate comprises at least one actuator, the or each actuator being operably coupled to, or operably engageable with, the moveable plate.

10. An apparatus according to claim 9, wherein the base plate comprises at least one rail, the or each rail upstanding from the base plate substantially perpendicularly to the base plate, the moveable plate being slidably coupled to the or each rail, and wherein at least one actuator is arranged to slide at least a portion of the moveable plate along the or each rail.

11. An apparatus according to claim 9 or claim 10, wherein the base plate comprises:

a first linkage operably coupled to the moveable plate, the first linkage being driven by a first motor;

a second linkage operably coupled to the moveable plate, the second linkage driven by a second motor; and

a third linkage operably coupled to the moveable plate, the third linkage driven by a third motor.

12. An apparatus according to claim 11, wherein the first linkage, the second linkage and the third linkage are operably coupled to the moveable plate in a triangular arrangement.

13. An apparatus according to any one of claims 1 to 8, wherein the actuation mechanism comprises:

a first motor, operably coupled to the moveable plate, configured to rotate the moveable plate about the at least one axis within the second plane;

a second motor, operably coupled to the moveable plate, configured to move the moveable plate along a longitudinal axis, substantially perpendicular to the first plane and the second plane, thereby reducing a distance between at least a portion of the second plane and the first plane; and

a third motor, operably coupled to the moveable plate, configured to move the moveable plate along the longitudinal axis, thereby reducing a distance between at least a portion of the second plane and the first plane.

14. An apparatus according to claim 13, wherein the actuation mechanism further comprises a linkage, the linkage comprising:

a crank housing, comprising a rotatable crank, slidable along a first longitudinal rail, extending substantially parallel to the longitudinal axis; and

a slider portion, operably coupled to the moveable plate, slidable along a second longitudinal rail, extending substantially parallel to the first longitudinal rail, the slider portion being operably coupled to the rotatable crank by a connecting rod;

wherein the second motor is operably coupled to the rotatable crank so as to rotate the same and move the slider portion along the second longitudinal rail, and wherein the third motor is operably connected to the crank housing so as to move the crank housing along the first longitudinal rail.

15. An apparatus according to any preceding claim, further comprising a controller communicatively coupled to the actuation mechanism and one or more positioning sensors, the or each positioning senor communicatively coupled to the controller, wherein the controller generates a signal to the actuation mechanism based upon a signal received from the or each position sensor

16. A system for use in performing one or more unit operations in cell processing comprising:

an apparatus according to any preceding claim; and

a container having a base section, a top section in parallel to the base section, and a compressible wall element extending substantially perpendicularly therebetween;

wherein the container is at least partially disposed between the holding element and the moveable plate, the actuation mechanism arranged to move the moveable plate such that at least a portion of the compressible wall element is at least partially compressed along a longitudinal axis perpendicular to the first plane and the second plane.

17. A system according to claim 16, wherein the base section of the container is fixedly attached to the moveable plate.

18. A method of processing cells, the method comprising:

providing a cell processing medium in a container, the container having a base section, a top section in parallel to the base section, and a compressible wall element extending substantially perpendicularly therebetween;

holding the top section of the container within a first plane;

engaging the base section of the container with a moveable plate defining a second plane substantially parallel to, and spaced apart from, the first plane;

rotating the base section of the container about at least one axis within the second plane, thereby causing turbulence of the cell processing medium within the container.

19. A method of processing cells, the method comprising:

(a) providing a compressible container comprising a population of cells in a liquid medium;

(b) maintaining the population of cells in the liquid medium, while pressure is applied to at least a portion of the compressible container so as to compress the container.

20. A method according to claim 19, wherein the liquid medium is retained in the compressible container after compression is applied and/or wherein processing the population of cells comprises maintaining the population of cells in the liquid medium, while pressure is applied to at least a portion of the container so as to compress the container.