CLAIMS

1. A method of reconstituting a powdered cell culture media, the method comprising:

providing a mixing apparatus, comprising:

at least one fluid chamber;

a first cap enclosing a lower portion of the fluid chamber;

a second cap enclosing an upper portion of the fluid chamber;

an influent port in at least one of the first cap and the second cap;

a geometric fluid flow aid coupled to the first cap and extending away from the first cap in a direction towards a center of the fluid chamber, wherein the geometric fluid flow aid comprises a geometric shape having a decreasing diameter in the direction towards the center of the fluid chamber;

a filter material associated with the second cap, wherein the filter material is used to keep the powdered cell culture media inside the fluid chamber until dissolved; and

an effluent port in the second cap;

providing a powdered cell culture media to the fluid chamber, prior to introducing fluid to the chamber;

introducing fluid to the chamber through the influent port, wherein the influent port is tangentially oriented relative to an inner wall of the fluid chamber to thereby cause the fluid to follow the wall of the fluid chamber in a circular motion;

creating a vortex flow in the fluid chamber by introducing fluid at a sufficient flow rate;

enhancing the vortex flow with the geometric fluid flow aid by further channeling the fluid around the wall of the fluid chamber, around the geometric flow aid; and

continuing to introduce fluid to the chamber and collecting reconstituted fluid that exits the chamber through the effluent port.

2. The method of claim 1, wherein the mixing apparatus further comprises a second fluid chamber, the second fluid chamber being provided with a powdered additive substance, and wherein the fluid exits the first chamber and moves into the second chamber to reconstitute the additive substance.

3. The method of claim 1, wherein the mixing apparatus further comprises a

second influent flow port in the other of the first cap and the second cap, and wherein the method further comprises introducing fluid to the chamber through the second influent port.

4. The method of claim 3, wherein fluid is introduced through the influent port and the second influent port concurrently.

5. The method of claim 3, wherein the introduction of fluid alternates between the influent port and the second influent port.

6. The method of claim 3, wherein the influent port is in the second cap and the second influent port is in the first cap, and wherein the method further comprises introducing fluid through the influent port in the second cap until fluid has partially filled the fluid chamber and then introducing fluid through the second influent port in the first cap.

7. The method of claim 3, wherein the first and the second influent ports are positioned on the same vertical plane.

8. The method of claim 3, wherein the first and the second influent ports are tangentially oriented relative to an inner wall of the fluid chamber.

9. The method of claim 1, wherein the mixing apparatus further comprises a second geometric fluid flow aid, wherein the first geometric fluid flow aid is positioned at a bottom of the fluid chamber and the second geometric fluid flow aid is positioned at the top of the fluid chamber.

10. The method of claim 9, wherein the first and the second geometric fluid flow aids are substantially cone-shaped.

11. The method of claim 1, further comprising:

decreasing the diameter of an exit at the effluent port, thereby increasing the pressure inside the chamber; and

returning the diameter to the normal diameter, thereby quickly decreasing the pressure inside the chamber, and causing a pulverization of clumps of powdered media in the fluid.

12. The method of claim 1, wherein the powdered cell culture media is formulated with the inclusion of sodium bicarbonate.

13. The method of claim 1, further comprising determining the end point of media preparation by collecting reconstituted fluid in a precalibrated receptacle.

14. The method of claim 1, further comprising determining the end point of media preparation by flowing a predetermined volume of liquid through the mixing apparatus.

15. The method of claim 1, further comprising determining the end point of media preparation by monitoring the volume of reconstituted fluid using a flow meter or accumulator.

16. The method of claim 1, wherein the powdered cell culture media is provided pre-loaded in the mixing apparatus.

17. The method of claim 1, further comprising disposing of the mixing apparatus after a single use.

18. The method of claim 1, wherein the filter material is made from porous polypropylene or polyethylene.

19. The method of claim 1, further comprising filtering the reconstituted fluid using a sterilization filter.

20. The method of claim 19, further comprising using a hydrophobic vent filter positioned between the effluent port and the sterilizing filter to allow air that is entrained in dissolved medium to vent.