CLAIMS

1. A system for creating a fibre, the system comprising,

a first tube having a first tube outlet for dispensing a first liquid composition at a first dispensing rate;

a second tube having a second tube outlet for dispensing a second liquid composition at a second dispensing rate; and

a rotatable collector for applying a drawing force to draw and collect the fibre, said rotatable collector being configured to rotate about its longitudinal axis that is aligned substantially parallel to a horizontal plane;

wherein the first tube is positioned in proximity with respect to the second tube to allow the first liquid composition from the first tube outlet and the second liquid composition from the second tube outlet to form an interfacial polyelectrolyte complex where a fibre is to be drawn therefrom; and

wherein the first tube and second tube are configured to be movable relative to the rotatable collector along an axis that is substantially parallel to the longitudinal axis of the rotatable collector.

2. The system according to claim 1, wherein the first tube is positioned in proximity with respect to the second tube to:

allow the first liquid composition dispensed from the first tube outlet to flow into the second tube outlet via capillary action to form the interfacial polyelectrolyte complex with the second liquid composition within the second tube, and where the second tube is configured to facilitate a dispensing force provided by the second dispensing rate to eject the fibre from the interfacial polyelectrolyte complex and contact a target location on a surface of the rotatable collector; and/or

allow the first liquid composition dispensed from the first tube outlet and the second liquid composition dispensed from the second tube outlet to form a droplet, said droplet comprising the first and second liquid compositions separated by the interfacial polyelectrolyte complex within the droplet, and where the fibre is drawn from the interfacial polyelectrolyte complex within the droplet

when the droplet travels and contacts with a target location on a surface of the rotatable collector.

3. The system according to claim 2, wherein the rotatable collector is positioned relative to the first and second tubes, such that the fibre moves in a direction away from the outlets of the first and second tubes upon contacting the target location on the surface of the rotatable collector when the rotatable collector is in rotation.

4. The system according to any one of claims 1 to 3, wherein the rotatable collector is configured to facilitate the drawing force that allows the fibre to continuously increase in length, by rotating in a direction to continuously draw the fibre from the interfacial polyelectrolyte complex.

5. The system according to any one of claims 1 to 4, wherein the first and second tube outlets are positioned at a distance falling in the range of 0.5 cm to 5 cm away from the surface of the rotatable collector.

6. The system according to any one of claims 1 to 5, wherein the first and second tubes have an inner diameter falling in the range of from 0.25 mm to 4 mm.

7. The system according to any one of claims 1 to 6, wherein the rotatable collector is configured to rotate about its longitudinal axis at a rotational speed falling in the range of from 1.5 RPM to 8 RPM.

8. The system according to any one of claims 1 to 7, wherein the first and second dispensing rate fall in the range of from 0.1 ml/min to 0.8 ml/min.

9. The system according to any one of claims 1 to 8, further comprising an elongate support member having a longitudinal axis arranged to be substantially parallel to the longitudinal axis of the rotatable collector, wherein

the elongate support member comprises a plurality of the first tube and second tube coupled thereto, and wherein the elongate support member is configured to be movable along its longitudinal axis relative to the rotatable collector.

10. The system according to any one of claims 1 to 9, further comprising a guide member coupled to the first and second tubes, said guide member comprising a surface with one or more grooves formed thereon for guiding a flow direction of the first and second liquid compositions, and a groove tip disposed at one end of the one or more grooves for focusing the first and second liquid compositions prior to leaving the guide member.

11. A method of creating a fibre, the method comprising,

positioning a first tube in proximity with respect to a second tube;

dispensing a first liquid composition from the first tube having a first tube outlet at a first dispensing rate;

dispensing a second liquid composition from the second tube having a second tube outlet at a second dispensing rate;

forming an interfacial polyelectrolyte complex between the first liquid composition from the first tube outlet and the second liquid composition from the second tube outlet;

drawing a fibre from the interfacial polyelectrolyte complex;

applying a drawing force by rotating the rotatable collector about its longitudinal axis that is aligned substantially parallel to a horizontal plane to draw and collect the fibre; and

moving the first tube and second tube relative to the rotatable collector along an axis that is substantially parallel to the longitudinal axis of the rotatable collector, such that newly drawn portions of the fibre are laid adjacent to previously drawn portions of the fibre collected on the rotatable collector.

12. The method according to claim 11, wherein forming the interfacial polyelectrolyte complex and drawing the fibre from the interfacial polyelectrolyte complex comprise,

allowing the first liquid composition dispensed from the first tube outlet to flow into the second tube outlet via capillary action to form the interfacial polyelectrolyte complex with the second liquid composition within the second tube, ejecting the fibre from the interfacial polyelectrolyte complex through a dispensing force provided by the second dispensing rate in the second tube, and contacting the fibre on a target location on a surface of the rotatable collector;

and/or

allowing the first liquid composition dispensed from the first tube outlet and the second liquid composition dispensed from the second tube outlet to form a droplet, said droplet comprising the first and second liquid compositions separated by the interfacial polyelectrolyte complex within the droplet, allowing the droplet to travel and contact a target location on a surface of the rotatable collector, and drawing the fibre from the interfacial polyelectrolyte complex within the droplet that is in contact with the target location on the surface of the rotatable collector.

13. The method according to claim 12, wherein the fibre is allowed to move in a direction away from the outlets of the first and second tubes upon contacting the target location on the surface of the rotatable collector when the rotatable collector is in rotation.

14. The method according to any one of claims 11 to 13, wherein rotating the rotatable collector comprises drawing the fibre from the interfacial polyelectrolyte complex with the drawing force that allows the fibre to be continuously increasing in length.

15. The method according to any one of claims 11 to 14,

wherein the first liquid composition comprises a crosslinker and the second liquid composition comprises a polyion; or

wherein the first liquid composition comprises a first polyion and the second liquid composition comprises a second polyion, where the first polyion and the second polyion are oppositely charged.

16. The method according to claim 15,

wherein the first liquid composition comprising the crosslinker has a concentration falling in the range of from 0.5% (w/v) to 5% (w/v) of the first liquid composition, and the second liquid composition comprising the polyion has a concentration falling in the range of from 0.5% (w/v) to 1.2% (w/v) of the second liquid composition; or

wherein the first liquid composition comprising the first polyion has a concentration falling in the range of from 0.5% (w/v) to 2.5% (w/v) of the first liquid composition, and the second liquid composition comprising the second polyion has a concentration falling in the range of from 0.5% (w/v) to 1.2% (w/v) of the second liquid composition.

17. The method according to claim 15 or 16, wherein the first and/or second liquid compositions further comprise one or more of the following components:

5% (w/v) to 20% (w/v) of at least one protein isolate;

5% (w/v) to 20% (w/v) of at least one flour;

5% (v/v) to 20% (v/v) of at least one oil; and

0.5% (w/v) to 2.5% (w/v) of at least one gum.

18. The method according to any one of claims 15 to 17, wherein the second liquid composition comprising the polyion or second polyion has a viscosity of from 5,000 to 50,000 cPs.

19. The method according to any one of claims 11 to 18, wherein the rotatable collector is rotated about the longitudinal axis at a rotational speed falling in the range of from 1.5 RPM to 8 RPM.

20. The method according to any one of claims 11 to 19, wherein the first and second dispensing rates fall in the range of from 0.1 ml/min to 0.8 ml/min.

21. The method according to any one of claims 11 to 20, wherein the fibre has an average diameter falling in the range of from 0.05 mm to 0.50 mm.

22. The method according to any one of claims 11 to 21, further comprising maintaining the first and second tubes in a fixed position relative to the longitudinal axis of the rotatable collector, such that newly drawn portions of the fibre are overlaid on top of previously drawn portions of the fibre collected on the rotatable collector.

23. The method according to any one of claims 11 to 22, further comprising

dispensing the first and second liquid compositions from a plurality of the first tube and second tube, wherein the plurality of the first tube and second tube are coupled to an elongate support member having a longitudinal axis arranged to be substantially parallel to the longitudinal axis of the rotatable collector; and

moving the elongate support member along its longitudinal axis relative to the rotatable collector.