CLAIMS:

1. A capillary tube adapted for use in an electrospinning process in which a polymer solution is drawn from the capillary tube, wherein the tube is made from a non-conductive material.

2. The capillary tube according to claim 1, wherein the tube is made from a polymer material.

3. The capillary tube according to claim 1, wherein the tube is made of a ceramic or glass material.

4. The capillary tube according to claim 1, wherein the capillary tube has a first and second end, the first end for receiving the polymer solution into the tube, the second end for drawing the polymer solution out of the tube, wherein the second end includes a plurality of pores for allowing the solution to flow through the pores.

5. The capillary tube according to claim 1, further comprising a pressing pin member having a cavity therein for receiving the capillary tube.

6. The capillary tube according to claim 1, wherein the tube is substantially cylindrical with an inner diameter in the range of from about 20 to about 500 microns.

7. The capillary tube according to claim 1, wherein the tube is substantially transparent.

8. The capillary tube according to claim 1, wherein the tube is translucent.

9. An electrospinning apparatus comprising:

at least a supply unit for supplying a polymer material in a liquid state for producing fibers;

a nozzle rack for mounting a plurality of capillary tubes;

a plurality of capillary tubes mounted in the nozzle rack for discharging the polymer material supplied by the supply unit;

a power supply for applying a predetermined voltage to the polymer material; and

a collector disposed opposite to the nozzle rack for collecting fibers of polymer material discharged from the capillary tubes;

wherein each of capillary tubes is made of a non-conductive material.

10. The apparatus according to claim 8, wherein each of the capillary tubes is made of a ceramic or glass material.

11. The apparatus according to claim 8, wherein each of the capillary tubes is made of a polymer material.

12. The apparatus according to claim 8, wherein the nozzle rack is adapted for receiving the plurality of capillary tubes in a grid array configuration.

13. The apparatus according to claim 10, wherein the nozzle rack further comprises a base plate, a cover plate and an electrode, interposed between the base plate and the cover plate, coupled to said power supply.

14. The apparatus according to claim 12, wherein the base plate includes a plurality of receptacles, wherein each receptacle is adapted for receiving a capillary tube.

15. The apparatus according to claim 8, wherein the pitch between adjacent capillary tubes varies from about 2 mm to about 50 mm.

16. The apparatus according to claim 14, wherein the pitch is about 10 mm.

17. The apparatus according to claim 8, wherein the capillary tubes are substantially cylindrical with an inner diameter in the range of from about 20 to about 500 microns.

18. The apparatus according to claim 8, wherein the capillary tubes are substantially transparent.

19. The apparatus according to claim 8, wherein the capillary tubes are translucent.

20. An electrospinning apparatus for preparing nanofibers, said apparatus comprising, in combination:

at least a supply unit for supplying polymer material in a liquid state;

a spinning unit that receives the polymer material and generates charged filament forms;

a collector that receives the charged filament forms;

a high voltage power supply for charging the polymer material; and

wherein the spinning unit comprises at least one nozzle rack having a plurality of nozzles with non-conductive capillaries.

21. A nozzle rack adapted for use with an electrospinning apparatus, said nozzle rack comprising:

a base plate including a plurality of receptacles adapted for receiving a plurality of capillary tubes;

a plurality of capillary tubes each mounted in one of said receptacles;

a cover plate; and

an electrode interposed between the base plate and the cover plate; wherein each of the capillary tubes is made of a non-conductive material.

CLAIMS:

1. A capillary tube adapted for use in an electrospinning process in which a polymer solution is drawn from the capillary tube, the capillary tube comprising a pressing pin member having a cavity therein for receiving the capillary tube, wherein the tube is made from a non-conductive material.

2. The capillary tube according to claim 1, wherein the tube is made from a polymer material.

3. The capillary tube according to claim 1, wherein the tube is made of a ceramic or glass material.

4. The capillary tube according to any of the claims 1 to 3, wherein the capillary tube has a first and second end, the first end for receiving the polymer solution into the tube, the second end for drawing the polymer solution out of the tube, wherein the second end includes a plurality of pores for allowing the solution to flow through the pores.

5. The capillary tube according to any of the claims 1 to 4, wherein the tube is substantially cylindrical with an inner diameter in the range of 20 to 500 microns.

6. The capillary tube according to any of the claims 1 to 5, wherein the tube is substantially transparent.

7. The capillary tube according to any of the claims 1 to 5, wherein the tube is translucent.

8. An electrospinning apparatus comprising:

at least a supply unit for supplying a polymer material in a liquid state for producing fibers;

a nozzle rack for mounting a plurality of capillary tubes;

a plurality of capillary tubes, each of the capillary tube comprising a pressing pin member having a cavity therein for receiving the capillary tube, mounted in the nozzle rack for discharging the polymer material supplied by the supply unit;

a power supply for applying a predetermined voltage to the polymer material; and

a collector disposed opposite to the nozzle rack for collecting fibers of polymer material discharged from the capillary tubes;

wherein each of capillary tubes is made of a non-conductive material.

9. The apparatus according to claim 8, wherein each of the capillary tubes is made of a ceramic or glass material.

10. The apparatus according to claim 8, wherein each of the capillary tubes is made of a polymer material.

11. The apparatus according to any of the claims 8 to 10, wherein the nozzle rack is adapted for receiving the plurality of capillary tubes in a grid array configuration.

12. The apparatus according to claim 11, wherein the nozzle rack further comprises a base plate, a cover plate and an electrode, interposed between the base plate and the cover plate, coupled to said power supply.

13. The apparatus according to claim 12, wherein the base plate includes a plurality of receptacles, wherein each receptacle is adapted for receiving a capillary tube.

14. The apparatus according to any of the claims 8 to 13, wherein the pitch between adjacent capillary tubes varies from 2 mm to 50 mm.

15. The apparatus according to claim 14, wherein the pitch is 10 mm.

16. The apparatus according to any of the claims 8 to 15, wherein the capillary tubes are substantially cylindrical with an inner diameter in the range of 20 to 500 microns.

17. The apparatus according to any of the claims 8 to 16, wherein the capillary tubes are substantially transparent.

18. The apparatus according to any of the claims 8 to 16, wherein the capillary tubes are translucent.

19. An electrospinning apparatus for preparing nanofibers, said apparatus comprising, in combination:

at least a supply unit for supplying polymer material in a liquid state;

a spinning unit that receives the polymer material and generates charged filament forms;

a collector that receives the charged filament forms;

a high voltage power supply for charging the polymer material; and

wherein the spinning unit comprises at least one nozzle rack having a plurality of nozzles with non-conductive capillaries, each of the capillary comprising a pressing pin member having a cavity therein for receiving the capillary tube,.

20. A nozzle rack adapted for use with an electrospinning apparatus, said nozzle rack comprising:

a base plate including a plurality of receptacles adapted for receiving a plurality of capillary tubes;

a plurality of capillary tubes each mounted in one of said receptacles, each of the capillary tube comprising a pressing pin member having a cavity therein for receiving the capillary tube,;

a cover plate; and

an electrode interposed between the base plate and the cover plate; wherein each of the capillary tubes is made of a non-conductive material.