CLAIMS:

1. An electrostatic spray drying system for drying liquid into powder form comprising:

a powder processing tower including an elongated structural body supported in upright position;

said elongated body having an upper closure arrangement affixed to and closing an upper end of said elongated structural body for forming an upper end of said processing tower and a lower closure arrangement affixed to and closing a lower end of said elongated structural body for forming a bottom of said processing tower with a drying chamber within said elongated structural body between said upper end and lower end closure arrangement;

an electrostatic spray nozzle assembly supported in said upper closure arrangement;

said electrostatic spray nozzle assembly including a nozzle body having a discharge spray tip at a downstream end thereof for directing liquid into said drying chamber;

said electrostatic spray nozzle assembly having a liquid inlet for coupling to a supply of liquid to be discharged into the drying chamber and an electrode for coupling to an electrical source for electrically charging liquid passing through said spray nozzle assembly for discharge from said discharge spray tip into said drying chamber as fine liquid particles.

said upper closure arrangement having a drying gas inlet for directing drying gas into said drying chamber for drying the discharged fine liquid particles into powder,

said lower closure arrangement having a drying gas outlet;

said lower closure arrangement including a powder collection vessel for receiving dried powder from said drying chamber;

a filter collection sock mounted within said powder collection vessel made of a filter material and having an upwardly opening side communicating with said drying chamber for receiving, capturing and collecting dried powder from said drying chamber prior to direction of the drying gas to and through said drying gas outlet;

said drying gas outlet being disposed in said lower closure arrangement above and apart from said powder collection vessel; and

said powder collection vessel having a closed bottom open top configuration removably mounted in underlying relation to said drying chamber; at least a portion of said powder collection vessel being removable from said lower closure arrangement without removal of said drying gas outlet from said lower closure arrangement and any exhaust gas line coupled to the drying gas outlet; said filter collection sock being removable from said lower closure arrangement upon removal of said at least a portion of the powder collection vessel from said lower closure arrangement for enabling removal of said filter collection sock and dispensing of dried powder collected in the filter collection sock and replacement of a filter collection sock within the powder collection vessel without removal of the exhaust gas outlet from said lower closure arrangement and any exhaust gas outlet line coupled to said exhaust gas outlet.

2. The electrostatic spray drying system of claim 1 in which said electrostatic spray nozzle assembly has an atomizing gas inlet for coupling to a pressurized gas supply for directing pressurized atomizing gas through said nozzle body for atomizing electrostatically charged liquid discharging from said nozzle assembly.

3. The electrostatic spray drying system of claim 1 further including an annular support ring supported within said lower closure arrangement adjacent an upper end of said powder collection vessel from which said filter collection sock is removably supported.

4. The electrostatic spray drying system of claim 3 further including an inflatable seal that is inflatable for securing the filter collection sock to said annular support ring and deflatable for enabling removal of a filter element sock from the support ring.

5. The electrostatic spray drying system of claim 4 in which said powder collection vessel has an air inlet communicating with said inflatable seal.

6. The electrostatic spray drying system of claim 1 in which said drying gas outlet includes a HEPA filter for filtering residual powder from said drying gas upon direction through said drying gas outlet.

7. The electrostatic spray drying system of claim 6 in which said drying gas inlet includes a HEPA filter for filtering drying gas directed into said drying chamber, and said HEPA filters each including a housing and a hockey puck configured HEPA filter element disposed within a filter cartridge.

8. The electrostatic spray drying system of claim 1 in which said powder collection vessel has a circumferential footprint corresponding to the outer perimeter of the elongated structural body.

9. The electrostatic spray drying system of claim 1 in which said elongated body has a cylindrical side wall that defines said drying chamber, a scraper arrangement for removing residual powder accumulated on said cylindrical wall of said drying chamber, said scraper arrangement including a scraper blade disposed on an interior surface of said cylindrical wall and a movable driver member disposed on an outer side of said cylindrical wall, and one of said scraper and driver member having a magnet for causing a magnetic attraction between said driver member and said scraper blade for enabling movement of said scraper blade about the interior surface of the cylindrical wall as an incident to movement of the driver member about an outer side of said cylindrical wall.

10. An electrostatic spray drying system for drying liquid into powder form comprising:

a powder processing tower including an elongated structural body supported in upright position;

said elongated body having an upper closure arrangement affixed to an upper end of said elongated structural body and a lower closure arrangement affixed to the lower end of said elongated structural body for forming a drying chamber within said elongated body;

an electrostatic spray nozzle assembly supported in said upper closure arrangement;

said electrostatic spray nozzle assembly including a nozzle body having a discharge spray tip at a downstream end thereof for directing liquid into said drying chamber;

said electrostatic spray nozzle assembly having a liquid inlet for coupling to a supply of liquid to be discharged into the drying chamber and an electrode for coupling to an electrical source for electrically charging liquid passing through said spray nozzle assembly for discharge from said discharge spray tip into said drying chamber as fine liquid particles;

said upper closure arrangement having a drying gas inlet for directing drying gas into said drying chamber for drying the discharged fine liquid particles into powder,

said lower closure arrangement having a drying gas outlet through which drying gas exiting from said drying chamber is directed;

said lower closure arrangement including a powder collection vessel for receiving dried powder from said drying chamber; and

said elongated body has a cylindrical side wall that defines said drying chamber, a scraper arrangement for removing residual powder accumulated on said cylindrical side wall of said drying chamber, said scraper arrangement including an elongated scraper blade disposed on an interior surface of said cylindrical side wall and an elongated movable driver member disposed on an outer side of said cylindrical side wall; one of said scraper blade and driver member having a magnetic component for causing a magnetic attraction between said driver member and said scraper blade , said driver member having a handle portion such that manual operator movement of the driver member by the handle portion circumferentially about the cylindrical side wall results in corresponding movement of the scraper blade circumferentially about the interior surface of the cylindrical side wall.

11. The electrostatic spray drying system of claim 10 in which one of said scraper blade and movable driver member includes said magnetic component and the other of said scraper blade and moveable driver is made of a material that is attracted to the magnetic component of the other.

12. An electrostatic spray drying system of claim 10 in which one of said scraper blade and removable driver member includes said magnetic component and the other of said scraper blade and removable driver member also includes a magnetic component.

13. The electrostatic spray drying system of claim 10 in which a magnetic field of the said magnetic component passes through said cylindrical side wall of the drying chamber.

14. The electrostatic spray drying system of claim 13 in which said cylindrical side wall of said elongated body is made of glass.

15. The electrostatic spray drying system of claim 1 including an exhaust gas outlet line in the form of a recirculation line coupled to said exhaust gas outlet for recirculating drying gas from said drying gas outlet to said drying gas inlet for reuse in said drying chamber, said recirculation line including a pump for directing drying gas from said drying gas exit to said drying gas inlet and a heater for heating the drying gas before redirection into the drying chamber.

16. The electrostatic spray drying method of claim 1 including a releasable securement device within said lower closure arrangement for securing an upper perimeter of said filter collection sock in place during operation of said electrostatic spray drying system, and said securement device being releasable for enabling removal of the filter collection sock from the powder collection vessel.