CLAIMS

1. A linear ionizing bar for delivering charged carriers to a charge neutralization target comprising:

at least one axis-defining linear ion emitter for establishing an ion cloud of charge carriers along the length thereof in response to receipt of an ionizing voltage thereto, the ion cloud having a plasma region with an outer peripheral boundary;

a reference electrode that presents a non-ionizing electric field within the ion cloud in response to receipt of a non-ionizing voltage, the non-ionizing electric field urging charge carriers to leave the plasma region; and

a gas flow manifold that receives gas from a source and that has a plurality of manifold apertures with a plurality of inserts received within the manifold apertures, at least some of the inserts having at least one nozzle aperture through which the gas may exit the manifold to thereby direct ions away from the linear ion emitter and toward the charge neutralization target in a configurable ionized gas flow pattern, wherein at least some of the inserts are removable such the ionized gas flow pattern is reconfigurable.

2. The linear ionizing bar of claim 1 wherein some of the inserts are removable and define one nozzle aperture through which the gas may flow, and wherein some of the inserts do not define any nozzle aperture through which the gas may flow.

3. The linear ionizing bar of claim 1 wherein at least one of the nozzle inserts defines two eccentric nozzle apertures through which the gas may flow, wherein the at least one insert has a perimeter that is at least substantially circular, and wherein the at least one insert may be rotated in the manifold aperture within which it is received to change the position of the two nozzle apertures relative to the linear ion emitter.

4. The linear ionizing bar of claim 1 wherein the manifold further comprises a plate which defines the apertures, wherein the inserts are formed of a material with a lower modulus of elasticity than the material of which the aperture-defining plate is formed, and wherein gas pressure within the manifold deforms the inserts to thereby seal the interface between the insert and the aperture-defining plate within which it is received.

5. The linear ionizing bar of claim 1 wherein at least one of the inserts defines one eccentric nozzle aperture through which the gas may flow, wherein the insert has a perimeter that is at least

substantially circular, and wherein the insert may be rotated in the manifold aperture within which it is received to change the position of the nozzle aperture relative to the linear ion emitter.

6. The linear ionizing bar of claim 1 wherein at least one of the inserts defines at least one eccentric nozzle aperture through which the gas may flow, and wherein the insert may be rotated in the manifold aperture within which it is received to change the position of the nozzle aperture relative to the linear ion emitter to direct gas flow tangent to the ion cloud.

7. The linear ionizing bar of claim 1 wherein at least one of the inserts defines at least one eccentric nozzle aperture through which the gas may flow, wherein the insert may be rotated in the manifold aperture within which it is received between a finite number of discrete and angularly offset positions to change the position of the nozzle aperture relative to the linear ion emitter.

8. The linear ionizing bar of claim 1 wherein at least one of the inserts defines a nozzle aperture through which the gas may flow, and wherein the nozzle tapers inwardly from an entry end to an opposing exit end.

9. The linear ionizing bar of claim 1 wherein at least one of the manifold apertures defines an axis and the insert received therein has a nozzle aperture that is angled relative to the manifold aperture axis.

10. The linear ionizing bar of claim 9 wherein the insert is integrally formed and further comprises a visual indicator showing the direction of the nozzle aperture relative to the manifold aperture axis.

11. The linear ionizing bar of claim 1 wherein at least one of the manifold apertures defines an axis and the insert received therein has a nozzle aperture that is angled relative to the manifold aperture axis, wherein the nozzle aperture has an exit end, and the insert further comprises a flat surface that surrounds and is perpendicular to the exit end of the nozzle.

12. A reconfigurable ionizing bar for delivering charged carriers to a charge neutralization target comprising:

at least one ion emitter for establishing an ion cloud of charge carriers in response to the application of an ionizing voltage thereto;

a reference electrode that presents a non-ionizing electric field within the ion cloud in response to receipt of a non-ionizing voltage being applied thereto, the non-ionizing electric field urging ions to move away from the ion emitter; and

a manifold that receives pressurized gas and that has a plurality of manifold apertures with a plurality of removable inserts received within the manifold apertures, at least some of the removable inserts having at least one nozzle aperture through which gas may flow, and the plurality of removable inserts being collectively configured to direct ions away from the linear ion emitter and toward the charge neutralization target in a reconfigurable ionized gas flow pattern.

13. The reconfigurable ionizing bar of claim 12 wherein some of the inserts each define one eccentric nozzle aperture through which one of the plural gas streams may flow, and wherein some of the inserts do not define any nozzle apertures through which gas may flow.

14. The reconfigurable ionizing bar of claim 12 wherein at least one of the inserts has a perimeter that is at least substantially circular and defines two eccentric nozzles apertures through which two of the plural gas streams may flow, and wherein the at least one insert may be rotated in the manifold aperture within which it is received to change the position of the plural gas streams exiting the nozzle aperture relative to the ion emitter.

15. The reconfigurable ionizing bar of claim 12 wherein the inserts are formed of a material with a lower modulus of elasticity than the material of which the aperture-defining plate is formed, and wherein gas pressure within the manifold deforms the inserts to thereby seal the interface between the insert and the aperture-defining plate within which it is received.

16. The reconfigurable ionizing bar of claim 12 wherein at least one of the inserts defines one eccentric nozzle aperture through which one of the plural gas streams may flow and has a perimeter that is at least substantially circular, and wherein the insert may be rotated in the manifold aperture within which it is received to change the position of the plural gas stream relative to the ion emitter.

17. The reconfigurable ionizing bar of claim 12 wherein at least one of the inserts defines at least one eccentric nozzle aperture through which one of the plural gas streams may flow, and wherein the insert may be rotated in the manifold aperture within which it is received to change the

position of the gas stream exiting the nozzle relative to the ion emitter to direct gas flow tangent to the ion cloud.

18. The reconfigurable ionizing bar of claim 12 wherein at least one of the inserts defines at least one eccentric nozzle aperture through which the gas may flow, wherein the insert may be rotated in the manifold aperture within which it is received between a finite number of discrete and angularly offset positions to change the position of the gas stream exiting the nozzle relative to the ion emitter.

19. The reconfigurable linear ionizing bar of claim 12 wherein at least one of the inserts defines a nozzle aperture through which the gas may flow, and wherein the nozzle tapers inwardly from an entry end to an opposing exit end.

20. The reconfigurable linear ionizing bar of claim 12 wherein at least one of the manifold apertures defines an axis and the insert received therein has a nozzle aperture that is angled relative to the manifold aperture axis.

21. The reconfigurable linear ionizing bar of claim 20 wherein the insert is integrally formed and further comprises a visual indicator showing the direction of the nozzle aperture relative to the manifold aperture axis.

22. The reconfigurable linear ionizing bar of claim 12 wherein at least one of the manifold apertures defines an axis and the insert received therein has a nozzle aperture that is angled relative to the manifold aperture axis, wherein the nozzle has an exit end, and the insert further comprises a flat surface that surrounds and is perpendicular to the exit end of the nozzle.

23. A method of changing the pattern of gas flow exiting a manifold of the type that receives gas from a source and directs the gas past a linear ion emitter to urge charge carriers from the emitter toward a charge neutralization target, the manifold having a plurality of manifold apertures and a plurality of inserts received within the manifold apertures, at least some of the inserts having at least one eccentric nozzle aperture through which the gas may flow and the plurality of inserts being collectively configured in a reconfigurable pattern, the method consisting essentially of:

rotating at least one of the nozzle inserts without removing the insert from the manifold aperture within which it is received to change the position of the nozzle relative to the linear ion emitter.

24. A method of changing the pattern of gas flow exiting a manifold of the type that receives gas from a source and directs the gas past a linear ion emitter to urge charge carriers from the emitter toward a charge neutralization target, the manifold having a plurality of manifold apertures and a plurality of inserts received within the manifold apertures, at least some of the inserts having at least one nozzle aperture through which the gas may flow and the plurality of inserts being collectively configured in a reconfigurable pattern, the method consisting essentially of:

removing at least one of the inserts from the manifold aperture within which it is received and inserting another insert into the manifold aperture from which the at least one insert was removed to change insert pattern of the manifold.