**CLAIMS**

We claim:

1. An apparatus for applying at least one coating onto at least one substrate, said apparatus comprising:
   - a deposition chamber;
   - at least one evaporant source;
   - at least one energetic beam for impinging said at least one evaporant source forming a vapor plume;
   - at least one anode positioned near said evaporant source for forming an arc discharge between said at least one anode and said at least one evaporant source;
     and
   - at least one carrier gas forming at least one jet laterally-confined transport of said vapor plume toward the substrate.

2. The apparatus of claim 1, wherein said at least one carrier gas jet at least substantially shields said at least one anode from contact with said vapor plume for reducing accumulation of evaporant upon said at least one anode.

3. The apparatus of claim 1, wherein upon said at least one carrier gas jet being ionized, said at least one ionized carrier gas jet has a momentum that can be controlled by electromagnetic forces.

4. The apparatus of claim 1, wherein said energetic beam ionizes said vapor plume, forming a plasma.

5. The apparatus of claim 4, wherein said arc discharge increases the ionization of said plasma to provide a dense plasma region.

6. The apparatus of claim 4, wherein the direction and/or intensity of said at least one carrier gas jets may be controlled for shaping and/or directing of said plasma, or said vapor plume, or both.

7. The apparatus of claim 6, wherein said shaping and/or directing is accomplished by controlling the pressure of said at least one carrier gas jet or controlling the gas flow rate of said at least one carrier gas jet.

8. The apparatus of claim 1, wherein said energetic beam source further comprises means to alter the beam impingement points among said at least one evaporant sources.

9. The apparatus of claim 1, further comprising a bias voltage applied to said substrate for accelerating ions toward said substrate.

10. The apparatus of claim 9, wherein said bias voltage is a DC, AC, or pulsed voltage.

11. The apparatus of claim 10, wherein said pulsed bias voltage is controlled to alter the deposition location on said at least one substrate to control the thickness, structure, composition, residual stress, and/or other coating properties on said at least one substrate.

12. The apparatus of claim 1, wherein said carrier gas jets introduce reactant gases.

13. The apparatus of claim 1, wherein said anode is positioned at least substantially coaxial with said at least one carrier gas jet.

14. The apparatus of claim 13, wherein said anode is segmented to form two or more anode segments.

15. The apparatus of claim 1, wherein said anode further comprises means for creating a magnetic field and for guiding a magnetic flux such that the magnetic field lines in front of said anode are substantially parallel to its surface and radially directed thus forming a closed electron drift track in circumferential direction which is substantially parallel to said anode's surface.

16. The apparatus of claim 1, further comprising a solenoid positioned coaxially and at least partially proximal to said evaporant source.

17. The apparatus of claim 1, wherein said anode is positioned in an elevated position above

said evaporant source.

18. The apparatus of claim 1, wherein said anode is positioned above said substrate.

19. The apparatus of claim 1, wherein said energetic beam is controlled to alter the deposition location on said at least one substrate to control the thickness, structure, composition, residual stress, and/or other coating properties on said at least one substrate.

20. The apparatus of claim 19, wherein said control of said energetic beam provides for a creation of a finite length of vapor plume that arrives at said at least one substrate, whereby said finite length of vapor plume defines a slug.

21. A method for applying at least one coating onto at least one substrate, said method comprising:

- providing the at least one substrate;
- providing a deposition chamber;
- providing at least one evaporant source;
- impinging said at least one evaporant source with at least one energetic beam to generate a vapor plume;
- forming an arc discharge between at least one anode and said at least one evaporant source; and
- emitting at least one carrier gas forming at least one jet in a direction that is at least substantially aligned with said vapor plume for laterally-confined transport of said vapor plume toward said substrate.

22. The method of claim 21, wherein said energetic beam ionizes said vapor plume, forming a plasma.

23. The method of claim 22, further comprising changing the current of said arch discharge to modulate or control the density of said plasma.

**CLAIMS**

We claim:

1. An apparatus for applying at least one coating onto at least one substrate, said apparatus comprising:
   - a deposition chamber;
   - at least one evaporant source;
   - at least one energetic beam for impinging said at least one evaporant source forming a vapor plume;
   - at least one anode positioned near said evaporant source for forming an arc discharge between said at least one anode and said at least one evaporant source, wherein the at least one anode is a ring-shaped anode;
   and
   - at least one carrier gas forming at least one jet laterally-confined transport of said vapor plume toward the substrate.

2. The apparatus of claim 1, wherein said at least one carrier gas jet at least substantially shields said at least one anode from contact with said vapor plume for reducing accumulation of evaporant upon said at least one anode.

3. The apparatus of claim 1, wherein upon said at least one carrier gas jet being ionized, said at least one ionized carrier gas jet has a momentum that can be controlled by electromagnetic forces.

4. The apparatus of claim 1, wherein said energetic beam ionizes said vapor plume, forming a plasma.

5. The apparatus of claim 4, wherein said arc discharge increases the ionization of said plasma to provide a dense plasma region.

6. The apparatus of claim 4, wherein the direction and/or intensity of said at least one carrier gas jets may be controlled for shaping and/or directing of said plasma, or said vapor plume, or both.

7. The apparatus of claim 6, wherein said shaping and/or directing is accomplished by controlling the pressure of said at least one carrier gas jet or controlling the gas flow rate of said at least one carrier gas jet.

8. The apparatus of claim 1, wherein said energetic beam source further comprises means to alter the beam impingement points among said at least one evaporant sources.

9. The apparatus of claim 1, further comprising a bias voltage applied to said substrate for accelerating ions toward said substrate.

10. The apparatus of claim 9, wherein said bias voltage is a DC, AC, or pulsed voltage.

11. The apparatus of claim 10, wherein said pulsed bias voltage is controlled to alter the deposition location on said at least one substrate to control the thickness, structure, composition, residual stress, and/or other coating properties on said at least one substrate.

12. The apparatus of claim 1, wherein said carrier gas jets introduce reactant gases.

13. The apparatus of claim 1, wherein said anode is positioned at least substantially coaxial with said at least one carrier gas jet.

14. The apparatus of claim 13, wherein said anode is segmented to form two or more anode segments.

15. The apparatus of claim 1, wherein said anode further comprises means for creating a magnetic field and for guiding a magnetic flux such that the magnetic field lines in front of said anode are substantially parallel to its surface and radially directed thus forming a closed electron drift track in circumferential direction which is substantially parallel to said anode's surface.

16. The apparatus of claim 1, further comprising a solenoid positioned coaxially and at least partially proximal to said evaporant source.

17. The apparatus of claim 1, wherein said anode is positioned in an elevated position above said evaporant source.

18. The apparatus of claim 1, wherein said anode is positioned above said substrate.

19. The apparatus of claim 1, wherein said energetic beam is controlled to alter the deposition location on said at least one substrate to control the thickness, structure, composition, residual stress, and/or other coating properties on said at least one substrate.

20. The apparatus of claim 19, wherein said control of said energetic beam provides for a creation of a finite length of vapor plume that arrives at said at least one substrate, whereby said finite length of vapor plume defines a slug.

21. A method for applying at least one coating onto at least one substrate, said method comprising:

- providing the at least one substrate;
- providing a deposition chamber;
- providing at least one evaporant source;
- impinging said at least one evaporant source with at least one energetic beam to generate a vapor plume;
- forming an arc discharge between at least one anode and said at least one evaporant source, wherein the at least one anode is a ring-shaped anode; and
- emitting at least one carrier gas forming at least one jet in a direction that is at least substantially aligned with said vapor plume for laterally-confined transport of said vapor plume toward said substrate.

22. The method of claim 21, wherein said energetic beam ionizes said vapor plume, forming a plasma.

23. The method of claim 22, further comprising changing the current of said arc discharge to modulate or control the density of said plasma.