

What is claimed:

1. An RF screen for a microwave powered UV lamp system, comprising:
a unitary sheet of conductive material,
wherein the conductive material defines a predetermined mesh pattern of individual openings across substantially the operative area of the screen,
wherein the mesh pattern includes an open area percentage of greater than about 80% wherein the mesh pattern comprises individual openings in the shape of hexagons,
and
wherein the individual openings comprise 3 or more nodes.
2. The RF screen of claim 1, wherein the individual openings comprise 5 or more nodes.
3. The RF screen of claim 1, wherein the mesh pattern has been photo-chemically etched into the sheet of conductive material.
4. The RF screen of claim 1, wherein the sheet of conductive material comprises copper, brass, stainless steel, tungsten, aluminum, nickel silver, or combinations thereof.
5. The RF screen of claim 1, wherein the mesh pattern is non-uniform.
6. The RF screen of claim 1, wherein the RF screen is self healing in that a broken bridge in the mesh pattern will erode only to the nearest node.
7. The RF screen of claim 1, wherein the RF screen comprises an open area percentage greater than about 85%.
8. The RF screen of claim 1, wherein the RF screen comprises an open area percentage greater than about 90%.
9. The RF screen of claim 1, wherein the RF screen comprises an open area percentage greater than about 92%.
10. The RF screen of claim 1, wherein the sheet comprises a thickness of from about 0.001 in. to about 0.015 in.

11. The RF screen of claim 1, wherein the screen further includes a non-mesh border along at least one of the edges.

12. The RF screen of claim 1, wherein the individual openings in the mesh pattern comprise an area of less than about 0.05 in².

13. The RF screen of claim 1, wherein the RF screen is configured to yield an increase in light transmission in comparison to a screen with a mesh pattern comprising square or rectangular-shaped individual openings of the same open area.

14. An RF screen assembly for a microwave powered UV lamp system comprising the RF screen of claim 1, the RF screen assembly further comprising a metal frame and gasketing.

15. A microwave powered UV lamp system comprising:

- a power supply;

- a cable connected to the power supply;

- an irradiator connected to the cable and powered by the power supply, the irradiator comprising at least one magnetron configured to convert electrical power received from the power supply to radio frequency energy;

- an electrodeless bulb; and

- an RF screen assembly comprising an RF screen attached to the irradiator, the screen comprising a unitary sheet of conductive material that defines a predetermined mesh pattern of individual openings, the mesh pattern having an open area percentage greater than about 80% wherein the mesh pattern comprises individual openings in the shape of hexagons, and the individual openings comprising 3 or more nodes.

16. The microwave powered UV lamp system of claim 15, wherein the individual openings comprise 5 or more nodes.

17. The microwave powered UV lamp system of claim 15, wherein the mesh pattern has been photo-chemically etched into the sheet of conductive material.

18. The microwave powered UV lamp system of claim 15, wherein the sheet of conductive material comprises copper, brass, stainless steel, tungsten, aluminum, or combinations thereof.

- ~~19. The microwave powered UV lamp system of claim 15, wherein the RF screen is linear.~~
- ~~20. The microwave powered UV lamp system of claim 15, wherein the RF screen comprises an open area percentage greater than about 90%.~~
- ~~21. The microwave powered UV lamp system of claim 15, wherein the sheet comprises a thickness of from about 0.001 in. to about 0.015 in.~~
- ~~22. The microwave powered UV lamp system of claim 15, wherein the screen further comprises a non-mesh border along at least one of the edges.~~
- ~~23. The microwave powered UV lamp system of claim 15, wherein the individual openings in the mesh pattern comprise an open area of less than about 0.05 in².~~
- ~~24. The microwave powered UV lamp system of claim 15, wherein the RF screen is configured to yield an increase in light transmission in comparison to a screen with a mesh pattern comprising square or rectangular-shaped individual openings of the same area.~~
- ~~25. A process for forming an RF screen for a microwave powered UV lamp system, comprising:~~
~~forming a mesh pattern into a single sheet of conductive material,~~
~~wherein the mesh pattern comprises individual openings, the individual openings comprising 3 or more nodes,~~
~~wherein the RF screen comprises an open area percentage greater than about 80% and wherein the mesh pattern comprises individual openings in the shape of hexagons.~~
- ~~26. The process of claim 25, further comprising photo-chemically etching the single sheet of conductive material to form the mesh pattern.~~

What is claimed:

1. A microwave powered UV lamp system comprising:

a power supply;

5 a cable connected to the power supply;

an irradiator connected to the cable and powered by the power supply, the irradiator comprising at least one magnetron configured to convert electrical power received from the power supply to radio frequency energy, the irradiator comprising a reflector that includes a curved reflecting surface and end reflectors;

10 an electrodeless bulb positioned in a cavity that is defined by the curved reflecting surface, the end reflectors, and an RF screen; and

an RF screen assembly comprising the RF screen attached to the irradiator, the screen comprising a unitary sheet of conductive material that defines a predetermined mesh pattern of individual openings, the mesh pattern having an open area percentage greater than about 80%
15 wherein the mesh pattern comprises individual openings in the shape of hexagons, and the individual openings comprising 3 or more nodes.

2. The UV lamp system of claim 1, wherein the mesh pattern is non-uniform.

20 3. The UV lamp system of claim 1, wherein the RF screen is self healing in that a broken bridge in the mesh pattern will erode only to the nearest node.

4. The UV lamp system of claim 1, wherein the RF screen comprises an open area percentage greater than about 85%.

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5. The UV lamp system of claim 1, wherein the RF screen comprises an open area percentage greater than about 92%.

30 6. The microwave powered UV lamp system of claim 1, wherein the mesh pattern has been photo-chemically etched into the sheet of conductive material.

7. The microwave powered UV lamp system of claim 1, wherein the sheet of conductive material comprises copper, brass, stainless steel, tungsten, aluminum, nickel silver or combinations thereof.

8. The microwave powered UV lamp system of claim 1, wherein the RF screen is linear.

9. The microwave powered UV lamp system of claim 1, wherein the RF screen comprises an open area percentage greater than about 90%.

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10. The microwave powered UV lamp system of claim 1, wherein the sheet comprises a thickness of from about 0.001 in. to about 0.015 in.

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11. The microwave powered UV lamp system of claim 1, wherein the screen further comprises a non-mesh border along at least one of the edges.

12. The microwave powered UV lamp system of claim 1, wherein the individual openings in the mesh pattern comprise an open area of less than about 0.05 in².

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13. The microwave powered UV lamp system of claim 1, wherein the RF screen is configured to yield an increase in light transmission in comparison to a screen with a mesh pattern comprising square- or rectangular-shaped individual openings of the same area.

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14. The microwave powered UV lamp system of claim 1, wherein the individual openings comprise 5 or more nodes.