~~What is claimed is:~~

CLAIMS

1. A physical vapor deposition (PVD) chamber comprising:

a plurality of cathode assemblies;

~~a shroud below~~each of the plurality of cathode assemblies~~; and~~

~~each cathode assembly~~ comprising a motor which rotationally drives a motor shaft which rotates a magnet assembly coupled to the motor shaft, the magnet assembly comprising a plurality of outer peripheral magnets surrounding an inner magnet, the ~~outer peripheral magnets and an inner~~ magnet assembly mounted to a mounting plate and configured to rotate during a physical vapor deposition process~~.~~, the magnet assembly being slidably mounted to the mounting plate to allow the magnet assembly to be moved toward and away from a peripheral edge of the mounting plate;

each of the plurality of cathode assemblies further comprising a housing surrounding a conductor which surrounds the magnet assembly and the mounting plate, the conductor including a coolant channel to cool each of the plurality of cathode assemblies; and

a balancing weight mounted to the mounting plate opposite the magnet assembly.

2. The PVD chamber of claim 1, further comprising:

a rotating shield below the plurality of cathode assemblies to expose one of the plurality of cathode assemblies ~~through the shroud and~~ through a shield hole of the rotating shield;

a target below each of the plurality of cathode assemblies; and

a rotating pedestal ~~for producing a material~~ to ~~form~~support a carrier ~~over~~, wherein each of the ~~rotating pedestal~~plurality of cathode assemblies further comprises an insulator plate secured to the mounting plate and between the mounting plate and the motor shaft.

3. The PVD chamber of claim 1, wherein the plurality of outer peripheral magnets comprises at least three outer peripheral magnets surrounding the inner magnet.

4. The PVD chamber of claim 1, wherein the plurality of outer peripheral magnets

comprises at least seven outer peripheral magnets surrounding the inner magnet.

5. The PVD chamber of claim 4, wherein the outer peripheral magnets are in contact with the inner magnet.

6. The PVD chamber of claim 1, wherein the plurality of outer peripheral magnets comprises twenty-three magnets.

7. The PVD chamber of claim 1, wherein the plurality of outer peripheral magnets are of a first polarity and the inner magnet is of a second polarity opposite the first polarity.

~~8.~~ The PVD chamber of claim 1, ~~further comprising a balancing weight mounted to the mounting plate opposite the magnet assembly.~~

~~9.~~8. ~~The PVD chamber of claim 8,~~ wherein the mounting plate comprises mounting slots, ~~and the magnet assembly is slidably mounted to mounting plate to allow~~which permit the magnet assembly to be ~~moved toward and away from a peripheral edge of~~slidably mounted to the mounting plate.

~~10.~~9. The PVD chamber of claim 1, wherein the plurality of outer peripheral magnets comprises at least twenty magnets.

~~11.~~10. The PVD chamber of claim 1, wherein the plurality of cathode assemblies comprises at least twelve cathode assemblies.

~~12. A method of depositing a material layer comprising:~~

~~13.~~11. ~~placing a substrate in a~~ A physical vapor deposition (PVD) chamber~~;~~ comprising:

a plurality of rotating ~~a~~ cathode ~~assembly~~assemblies;

each of the rotating cathode assemblies comprising a motor which rotationally drives a motor shaft which rotates a magnet assembly coupled to the motor shaft, the magnet assembly comprising a plurality of outer peripheral magnets surrounding an inner magnet~~, the~~ ;

a mounting plate comprising mounting slots, the magnet assembly being slidably mounted to the mounting plate to allow the magnet assembly to be moved toward and away from a peripheral edge of the mounting plate, the mounting plate configured to rotate during a physical vapor deposition process; and

a balancing weight mounted to the mounting plate opposite the magnet assembly.

12. The PVD chamber of claim 11, each of the plurality of rotating cathode assemblies further comprising a housing surrounding a conductor which surrounds the magnet assembly and the mounting plate, the conductor including a coolant channel to cool each of the plurality of cathode assemblies.

13. The PVD chamber of claim 11, wherein the magnet assembly comprises seven outer peripheral magnets ~~and~~ in contact with the inner magnet.

14. The PVD chamber of claim 11, wherein the magnet assembly comprises at least twenty peripheral magnets.

15. A method of depositing a material layer comprising:

placing a substrate in a multi-cathode PVD chamber comprising a plurality of cathode assemblies;

rotating a portion of each of the plurality of cathode assemblies using a motor to rotationally drive a motor shaft which rotates a mounting plate, a magnet assembly, and a balancing weight mounted to the mounting plate opposite the magnet assembly, the magnet assembly comprising a plurality of outer peripheral magnets surrounding an inner magnet ~~mounted to a mounting plate;~~

~~and~~, the outer peripheral magnets and the inner magnet mounted to the mounting plate, the mounting plate comprising a plurality of mounting slots, and the magnet assembly being slidably mounted to the mounting plate to allow the magnet assembly to be moved toward and away from a peripheral edge of the mounting plate;

cooling each of the plurality of the cathode assemblies with coolant in a coolant channel within a conductor surrounded by a housing, the conductor surrounding the magnet assembly and the mounting plate; and

depositing the material layer on the substrate.

~~14.~~ The method of claim ~~12~~15, wherein ~~the mounting plate comprises a balancing weight mounted on a mounting plate opposite the magnet assembly.~~

~~15.~~16. ~~The method~~each of ~~claim 13, wherein the PVD chamber comprises a~~ the plurality of cathode assemblies further comprises an insulator plate secured to the mounting plate and between the mounting plate and the motor shaft.

17. The method of claim ~~14~~16, wherein the substrate comprises an extreme ultraviolet mask blank~~, the~~.

~~16.~~18. The method of claim 17, further comprising depositing ~~multiple~~a plurality of alternating ~~materials~~material layers, the plurality of alternating material layers comprising a first layer comprising molybdenum and a second layer comprising silicon.