CLAIMS

1. A device structurally configured to render a continuous layer of semiconducting material to form on a substrate, the device comprising:

one or more blade structures, wherein each of the one or more blade structures have (i) one end which a precursor source is to be placed proximal to and (ii) the other end spaced apart from the substrate with a vertical gap between the other end and the substrate; and

a supporting structure arranged peripheral to the one or more blade structures for supporting the substrate to be placed thereon or therewith,

wherein the one or more blade structures are arranged to define one or more spaces which direct vapor produced from the precursor source toward the other end of each of the one or more blade structures, and

wherein (i) the supporting structure, (ii) the substrate to be placed thereon, and (iii) the one or more blade structures define an area which confines the vapor to the area, thereby having the continuous layer of semiconducting material formed on a surface of the substrate which is adjacent to the area.

2. The device of claim 1, wherein the one or more blade structures are shorter in height compared to the supporting structure.

3. The device of claim 1 or 2, wherein the one or more blade structures are arranged apart to define the one or more spaces which direct the vapor toward the area.

4. The device of claim 3, wherein each of the one or more spaces has a width ranging from 3 mm to 6 mm.

5. The device of any one of claims 1 to 4, wherein the one or more blade structures comprise:

one blade structure arranged in parallel with respect to the supporting structure;

two blade structures arranged in parallel;

a vertically erected spiral structure which emanates from a point and revolves around an axis of the point at a constant or continuously varying distance while remaining parallel to the axis; or

vertically erected structures arranged in concentric circles.

6. The device of any one of claims 1 to 5, wherein each of the one or more blade structures has a thickness of at least 1 mm.

7. The device of any one of claims 1 to 6, wherein the one or more blade structures have a height ranging from 3 mm to 5 mm.

8. The device of any one of claims 1 to 7, wherein the supporting structure defines an enclosure surrounding the one or more blade structures.

9. The device of claim 8, wherein the enclosure, when viewed from top-down, is a circular enclosure or a four-sided enclosure.

10. The device of claim 8 or 9, wherein the supporting structure comprises two intersecting supporting elements configured within the enclosure, wherein the two intersecting supporting elements have the same height as the supporting structure.

11. The device of claim 10, wherein the two intersecting supporting elements are arranged perpendicular to each other and each of the two intersecting supporting elements has two opposing ends adjoined to the supporting structure.

12. The device of any one of claims 1 to 11, further comprising a shower head arranged proximal to the one or more blade structures, wherein the shower head is operable to disperse the vapor through the one or more spaces toward the area.

13. The device of any one of claims 1 to 12, wherein the precursor source comprises:

(i) a transition metal oxide and a chalcogen; or

(ii) a transition metal halide and a hydrogen chalcogenide.

14. The device of any one of claims 1 to 13, wherein the one or more blade structures and the supporting structure are formed of sapphire, quartz, graphite, a carbide, or a nitride.

15. The device of any one of claims 1 to 14, wherein the semiconducting material comprises a transition metal dichalcogenide.