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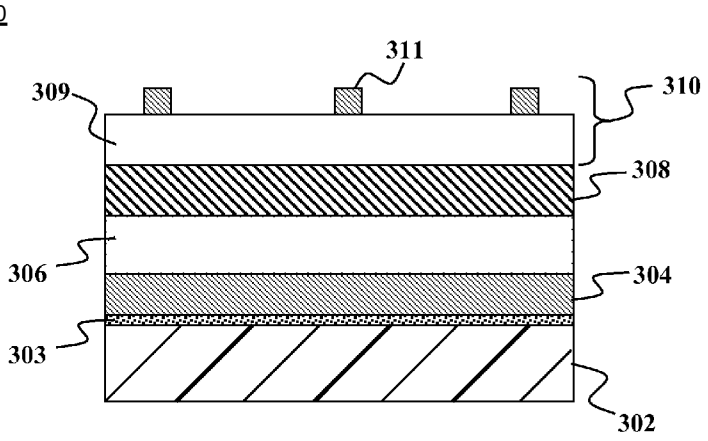
[Continued on next page]

(54) Title: HIGH-THROUGHPUT PRINTING OF SEMICONDUCTOR PRECURSOR LAYER FROM INTER-METALLIC NANOFLAKE PARTICLES



(57) Abstract: Methods and devices are provided for transforming non-planar or planar precursor materials in an appropriate vehicle under the appropriate conditions to create dispersions of planar particles with stoichiometric ratios of elements equal to that of the feedstock or precursor materials, even after selective forces settling. In particular, planar particles disperse more easily, , form much denser coatings (or form coatings with more interparticle contact area), and anneal into fused, dense films at a lower temperature and/or time than their counterparts made from spherical nanoparticles. These planar particles may be nanoflakes that have a high aspect ratio. The resulting dense films formed from nanoflakes are particularly useful in forming photovoltaic devices. . In one embodiment, at least one set of the particles in the ink may be inter-metallic flake particles (microflake or nanoflake) containing at least one group IB-IIIA inter-metallic alloy phase.

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