

Inertial Masking Assembly

Researchers at the University of South Florida have created a novel apparatus that modifies the way in which thin film structures can be deposited on a substrate.

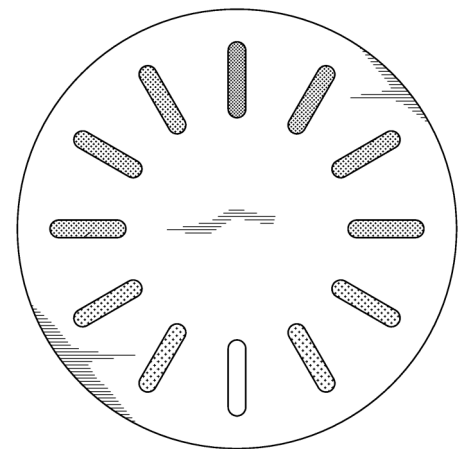
Thin film deposition is the technology of applying a very thin film of material between a few nanometers to about hundred micrometers onto a substrate surface to be coated, or onto a previously deposited coating to form layers. Currently, the techniques that exist for the deposition of multiple samples on a single substrate require the involvement of many motors and excessive computer controls. These technologies are expensive and time intensive. Other problems include the contamination incurred by inserting and removing individual substrates for the same number of samples to be deposited. Many tools which are currently being used in this process have a limited temperature range for its operation resulting in decreased efficiency.

Our researchers at USF have developed a cost effective technique for the deposition of thin films using a shadow mask that rotates relative to the substrate. This masking assembly may be used with any vacuum-based physical deposition tool such as sputtering, electron-beam evaporation, molecular beam epitaxy, laser ablation and pulsed electron deposition. These tools finds application in the fabrication of semiconductor devices. It is also applicable for non-vacuum-based deposition tools such as electrodeposition. This technique makes the deposition of multiple samples on a single substrate quicker and more efficiently.

ADVANTAGES:

- Reduces sample contamination
- Cost-effective technique
- Ease of integration
- Compatible with vacuum deposition tools

Utilizes a Single Substrate for Multiple Sample Depositions



Top-View of a Substrate with Multiple Thin Film Structures Deposited

Tech ID # 08A028

Patent #: [8,236,108](#)