



162162

- 14 -



G00002

ABSTRACT

METHOD AND APPARATUS FOR FORMING PERIODIC STRUCTURES

5 A method and apparatus for directly forming periodic structures on a substrate by laser irradiation comprises directing a linearly polarized laser beam onto a first location of the substrate; irradiating the substrate for a sustained duration using the linearly polarized laser beam for melting the substrate at the first location to induce a surface wave thereon; the melted substrate having a
10 plurality of ridges corresponding to the wavelengths of the surface wave. The linearly polarized laser beam scans the substrate along a first path to propagate the surface wave on the substrate; and thereafter, substrate is cooled down following scanning of the linearly polarized laser for solidifying the plurality of
15 ridges to form a first group of periodic structure on the substrate. Periodic structures formed according to the invention may be optical gratings such as diffraction or reflective gratings.

(Figures 3A – 3D)