APPL-P035

FABRICATION OF A POLARIZATION INDEPENDENT MICROLENS ARRAY IN THE HOMEOTROPIC LIQUID CRYSTAL CONFIGURATION

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One of major applications of the liquid crystal (LC) technology is the development of various optical devices for photonic systems such as an optical switch and a light modulator. Recently, the microlens array based on the LC/ultra-violet curable polymer composite has been demonstrated with great switching capability and simple fabrication. However, a solution to polarization insensitivity is required for implementing the microlens array into a real system. In this work, we propose a novel microlens array structure in a homeotropic LC configuration. The symmetry of molecular ordering in the vertical alignment on a circular surface relief structure provides the polarization independent focusing characteristics of the microlens array. The poly-dimethylsiloxane (PDMS) is used to form the surface relief structure because it can be easily modified with great aging property. As shown in Fig.1, because of the difference between the refractive index of the LC and that of the PDMS, the LC microlens focus the incident light with polarization independence. This focusing property makes our novel structure of the LC microlens array be applicable to the real photonic systems.

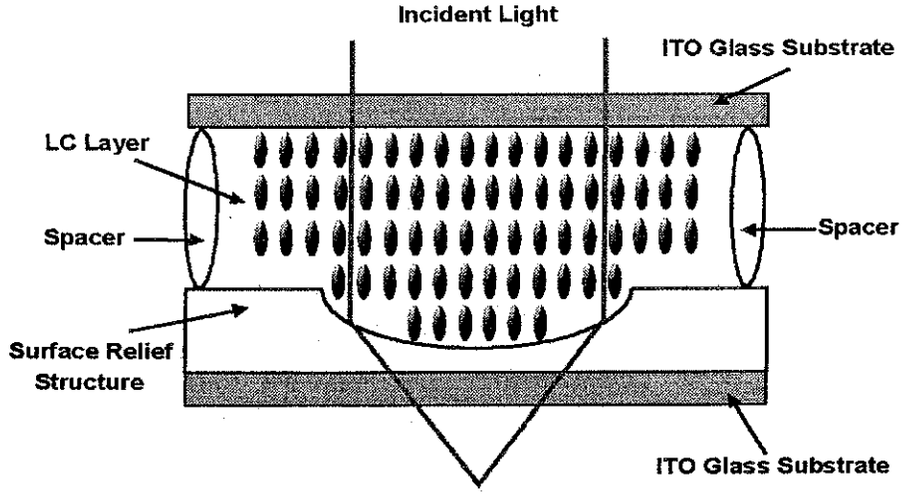

Fig. 1. The LC microlens array in the homeotropic configuration

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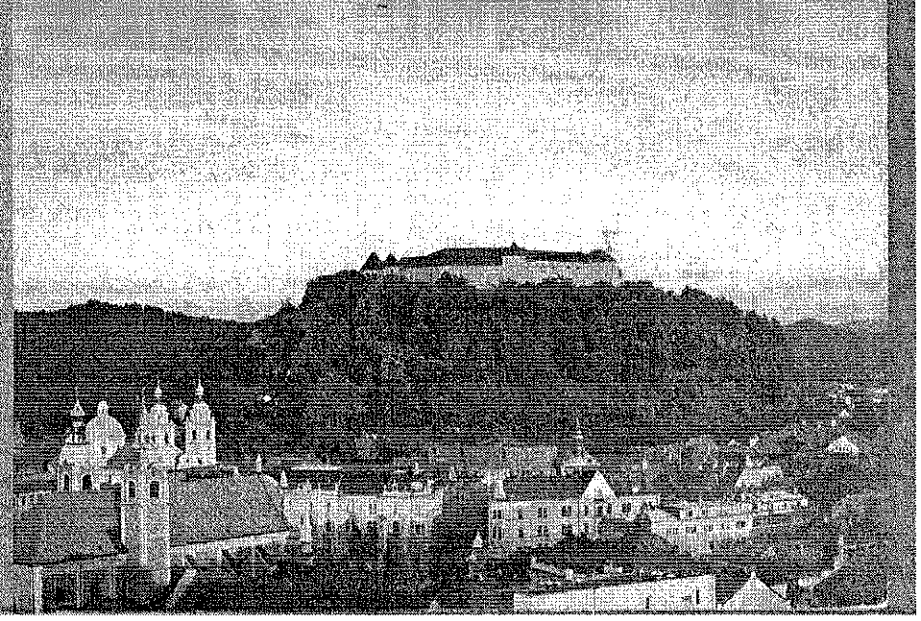

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