Docket #: S17-487

Metasurface Micro-Cavity for OLED Color Purity

Researchers at Stanford have developed a simpler and low-cost micro-cavity design for color tuning of organic light emitting devices (OLEDs) for display applications. A micro-cavity is an essential part of OLED display for high color purity. White OLED for large display (e.g., TV) uses a micro-cavity with controlled ITO layers, which can work well but is complicated and high cost. A simpler structure and easier fabrication methods would be advantageous. In the new design, the resonance wavelength of the micro-cavity is determined by the phase delay of a meta-mirror back electrode. The phase delay can be controlled by depth and/or width of a phase modulation surface featuring a nano-sized hole array.

Related Technologies:
Stanford docket S17-078 - **Mechanically Tunable Metasurface for Optical Modulation, Beam Steering**
Describing a metasurface with high reflectance and large phase modulation for use as optical phase modulators or beam steering device (Lidar).

Stanford docket S17-079 - **Multi-Wavelength Laser with Perpendicular Polarization**
Describing a multi-wavelength laser with perpendicular polarization, which supports easy and independent measurement in various optical sensors for improved accuracy and speed.

Stanford docket S17-263 - **Holographic Beam Steering Device**
Describing a highly efficient (>90%) holographic beam steering method for obtaining distance information of objects nearby, with applications from autonomous vehicles to home appliances.

Stanford docket S18-193 - **High-Efficiency Broad-Angle Dielectric Diffraction Grating**

Describing a dielectric diffraction grating that provides high (near-unity) diffraction efficiencies in an ultra-compact volume. With applications in a variety of optical systems such as telescopes and VR.

Stanford docket S18-495 - **Metasurface Display for Augmented and Virtual Reality**
Describing a near-eye display enabling both Augmented Reality (AR) and Virtual Reality (VR) modes with dynamically controlled contrast.

Applications

- Large area OLED display
- Mobile OLED display
- White OLED for lighting

Advantages

- Easier and cheaper fabrication of OLED microcavity display for color tuning

Patents

- Published Application: 20190198817
- Issued: 10,615,372 (USA)

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