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(54) Title: APPARATUS, SYSTEMS, AND METHODS OF A COMPACT, HIGH NUMERICAL APERTURE LIGHT ENGINE

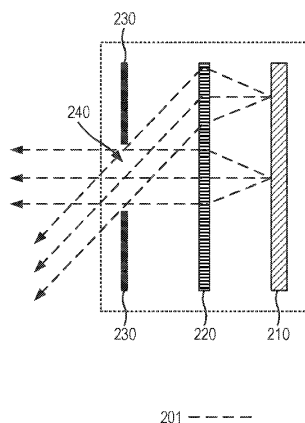


FIG. 2

(57) Abstract: Implementations of the present disclosure relate to apparatus, systems, and methods of a compact, high numerical aperture light engine, for example thin optics-based light engine systems using meta-surfaces for wearable displays. One implementation includes an optical device. The optical device includes one or more spatial light modulators, wherein each spatial light modulator is an array of pixels that are individually controllable to output visible light. The optical device also includes a surface defining an exit pupil that is arranged to allow the output visible light to exit the optical device via the exit pupil. The optical device also includes one or more meta-surfaces disposed between the one or more spatial light modulators and the exit pupil. The one or more metasurfaces are to focus the visible light that is output by the one or more spatial light modulators.

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