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Portney

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(54) **REFRACTIVE-DIFFRACTIVE SWITCHABLE OPTICAL ELEMENT**

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See application file for complete search history.

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(57) **ABSTRACT**

A lens in accordance with the present invention includes an switchable cell consisting of optical substrate with diffraction surface, elastic film in contact with the diffraction surface of the substrate, optical fluid that fills the space between the film and diffraction surface and the mean to transfer the optical fluid in and out of the space between the film and diffraction surface. The refractive index of the optical fluid matches the refractive index of the optical substrate. The switchable cell changes focus positions between refractive focus in relaxed state when the pressure at both sides of the film is the same and diffraction focus when the optical fluid is transported from the space between the film and optical substrate for the film to largely conform to the diffraction surface shape of the optical substrate.

20 Claims, 6 Drawing Sheets

