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- (54) **Title:** CRITICAL ANGLE OPTICAL SENSOR APPARATUS

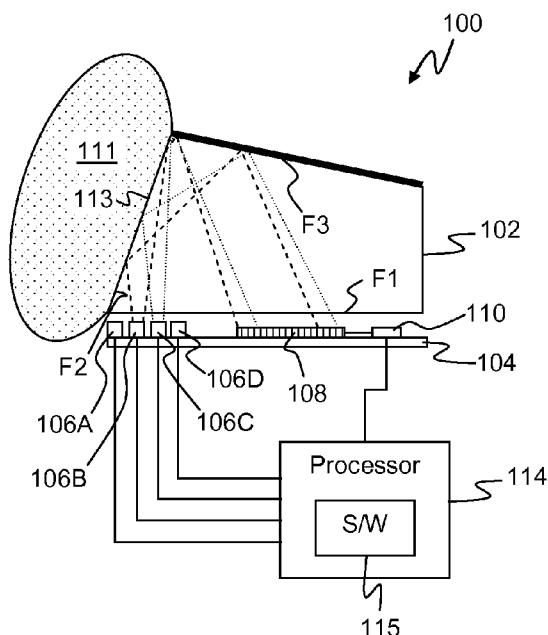


FIG. 1B

(57) **Abstract:** An optical sensor apparatus includes an optically transmissive structure having planar first, second, and third faces, light sources located outside the structure adjacent the first face, and a photo detector array located outside the prism adjacent the first face. The structure, light sources, and photodetector array are configured such that light from the light sources that is totally internally reflected at an optical interface between the prism and a sample outside the structure proximate the second face is reflected at the third face and incident on a portion of the photo detector array that depends on a refractive index of the sample. The light sources are positioned with respect to the structure and photodetector array such that the totally internally reflected light from each light source corresponds to a different range of refractive index of the sample and maps to a corresponding portion of the photodetector array.



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