

(51) International Patent Classification:
G02F 1/1347 (2006.01)(21) International Application Number:
PCT/US2011/047531(22) International Filing Date:
12 August 2011 (12.08.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/858,349 17 August 2010 (17.08.2010) US
13/073,764 28 March 2011 (28.03.2011) US(71) Applicant (for all designated States except US): **LC-TEC DISPLAYS AB** [SE/SE]; Tunälvagen 281, S-781 73 Borlänge (SE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **OSTERMAN, Jesper** [SE/SE]; Stenslundsvägen 39, S-791 74 Falun (SE).
SCHEFFER, Terry, J. [US/US]; 189 Paukaa Drive, Hilo, Hawaii 96720 (US).(74) Agent: **ANGELLO, Paul, S.**; Steel Rives LLP, 900 SW Fifth Ave, Suite 2600, Portland, Oregon 97204 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: HIGH-SPEED LIQUID CRYSTAL POLARIZATION MODULATOR

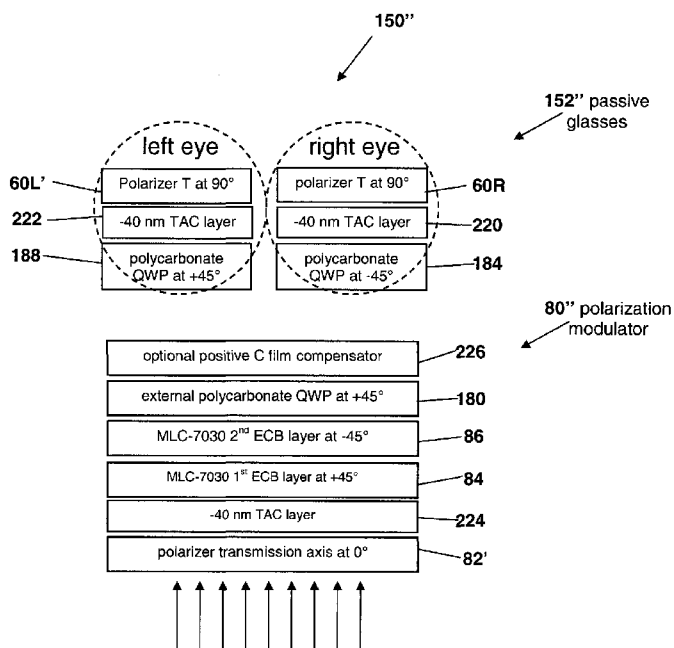


Fig. 19

(57) Abstract: A polarization modulator (20) for time-multiplexed stereoscopic 3D applications rapidly switches between two polarization states in alternate subframes. The polarization modulator uses two liquid crystal devices (26, 28) arranged in optical series and driven (52) such that the second device compensates a change the first device makes to an input polarization state of incident light during alternate subframes. The compensating liquid crystal devices are characterized in that, if the same voltage is applied to both of them, the second device compensates the change that the first device makes to the input polarization state, regardless of the applied voltage level. If the applied voltage is changed from one level to another and the liquid crystal material (34_e, 34_n) in the liquid crystal devices relaxes to the new voltage level, polarization state compensation will take place throughout the duration of the relaxation so that the slow, unpowered transition does not manifest itself as a change in polarization state.