



(43) International Publication Date
14 August 2014 (14.08.2014)

- (51) International Patent Classification:
G02F 1/1333 (2006.01) *G02F 1/13357* (2006.01)
- (21) International Application Number:
PCT/US2014/013338
- (22) International Filing Date:
28 January 2014 (28.01.2014)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
61/762,681 8 February 2013 (08.02.2013) US
- (71) Applicant: **3M INNOVATIVE PROPERTIES COMPANY** [US/US]; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).
- (72) Inventors: **BENOIT, Gilles J.**; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).
WHEATLEY, John A.; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).
THIELEN, James A.; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).

(74) Agents: **FULTON, Lisa P.** et al.; 3M Center Office of Intellectual Property Counsel, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: HIGH COLOR GAMUT QUANTUM DOT DISPLAY

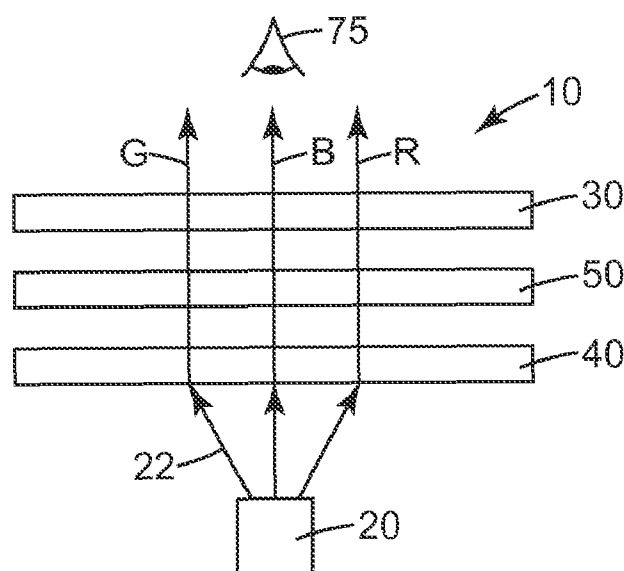


Fig. 1

(57) Abstract: An optical construction is described that includes a blue light source, a liquid crystal display panel, and a quantum dot film element optically between the blue light source and the liquid crystal display panel. In some embodiments, the blue light source can emit blue light that has a wavelength in a range from 440 to 460 nm and an FWHM of less than 25 nm. Also, in some embodiments, the quantum dot film element includes a plurality of quantum dots emitting a peak red wavelength in a range from 600 to 640 nm, an FWHM of less than 50 nm, a peak green wavelength in a range from 515 to 555 nm, and an FWHM of less than 40 nm. The quantum dot film element can be optically between the blue light source and the LCD panel.

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

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