



(86) Date de dépôt PCT/PCT Filing Date: 2003/07/26
(87) Date publication PCT/PCT Publication Date: 2004/02/05
(45) Date de délivrance/Issue Date: 2013/01/08
(85) Entrée phase nationale/National Entry: 2005/02/07
(86) N° demande PCT/PCT Application No.: US 2003/023585
(87) N° publication PCT/PCT Publication No.: 2004/011885
(30) Priorité/Priority: 2002/07/27 (US10/206,459)

(51) Cl.Int./Int.Cl. *G01D 11/28* (2006.01),
F21V 8/00 (2006.01), *G02B 5/02* (2006.01),
G02F 1/13357 (2006.01)

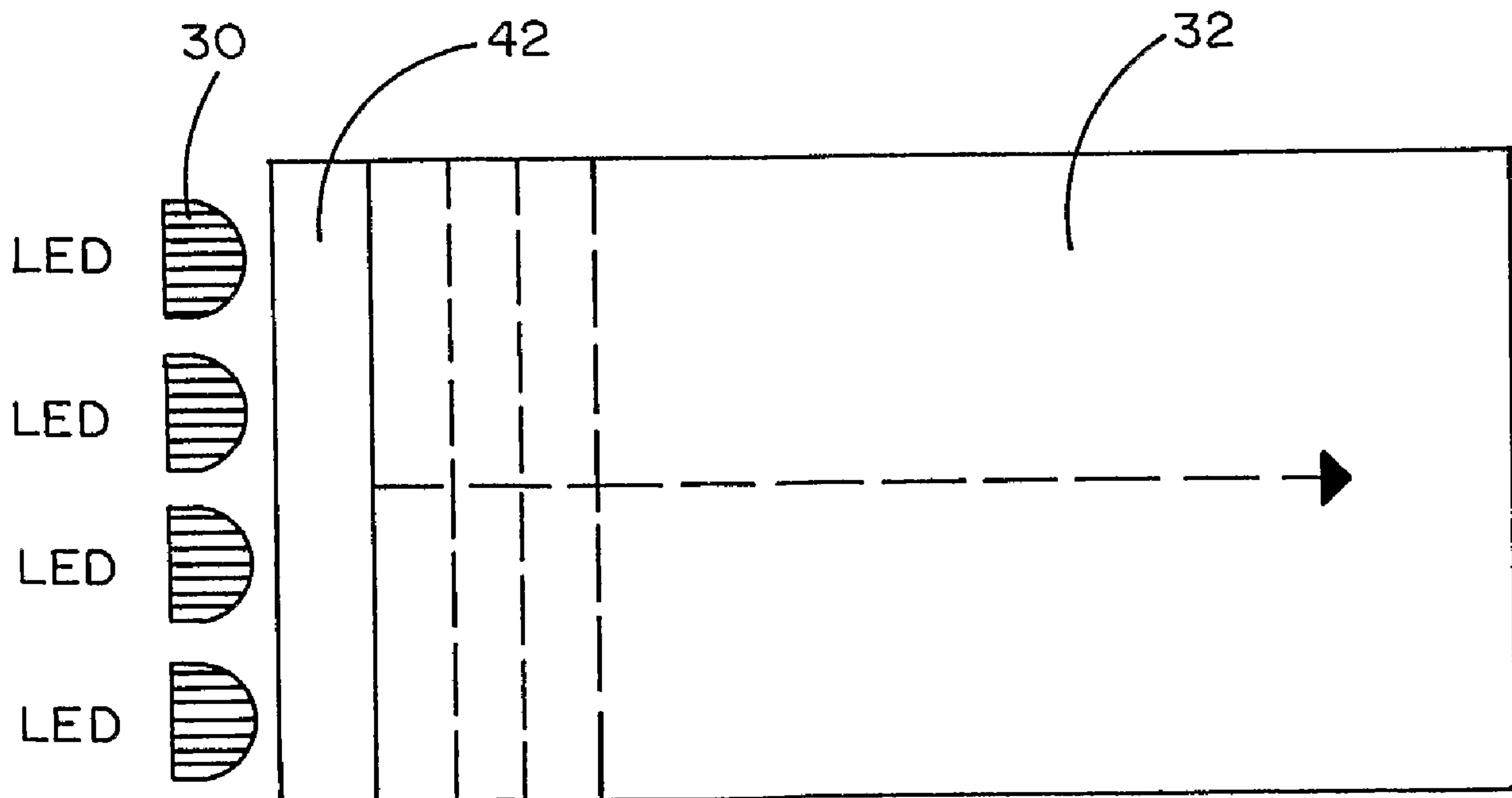
(72) Inventeurs/Inventors:
WANG, SAN ZHUANG, US;
SAVANT, GAJENDRA D., US;
LAINE, JEFFREY A., US;
BENNAHMIA, MARK, US;
SHIE, RICK L., US

(73) Propriétaire/Owner:
ASAHI KASEI KABUSHIKI KAISHA, JP

(74) Agent: HEENAN BLAIKIE LLP

(54) Titre : SYSTÈME EN CONTRE-JOUR POUR DISPOSITIFS D'AFFICHAGE

(54) Title: BACKLIGHTING SYSTEM FOR DISPLAYS



(57) Abrégé/Abstract:

An LED-based backlighting system that provides excellent brightness and homogeneity suitable for high performance multicolor and high resolution portable displays such as for PDAs and cell phones. Several different but similar embodiments are disclosed. Some are suitable for use with multiple LEDs (30) and some for use with a single LED (12). In a first such embodiment, multiple LEDs are located adjacent the input edge of a light pipe (14). The input edge contains fixed pitch grooves to propagate the LED light in a direction that is substantially angled toward the bottom surface of the light pipe along its entire area. The light pipe (32) bottom surface also has grooves for altering the direction of the LED light toward the upper surface of the light pipe where it exits the light pipe toward a viewer. The exterior of the exit surface of the light pipe receives a light shaping diffuser (LSD) and an optical film (48). The diffuser (42) acts to diffuse and distribute the exiting light at selected horizontal and vertical angles and the optical film shapes. In a second embodiment, a second LSD is positioned above the optical film. In a third embodiment, an LSD strip comprising a foreshortened LSD is positioned below the light pipe adjacent the input edge to better reduce hot spots near the LEDs.

