



US 20240244963A1

(19) **United States**(12) **Patent Application Publication**  
**HWANG et al.**(10) **Pub. No.: US 2024/0244963 A1**(43) **Pub. Date: Jul. 18, 2024**(54) **PHENYL CARBAZOLE-BASED COMPOUNDS  
AND FLUORENE-BASED COMPOUNDS AND  
ORGANIC LIGHT EMITTING DEVICE AND  
FLAT PANEL DISPLAY DEVICE  
COMPRISING THE SAME***H10K 50/81* (2006.01)  
*H10K 50/818* (2006.01)  
*H10K 50/82* (2006.01)  
*H10K 50/828* (2006.01)  
*H10K 59/123* (2006.01)  
*H10K 59/32* (2006.01)(71) Applicant: **Samsung Display Co., Ltd.**, Yongin-si  
(KR)

(Continued)

(72) Inventors: **Seok-Hwan HWANG**, Yongin-si (KR);  
**Young-Kook KIM**, Yongin-si (KR);  
**Yoon-Hyun KWAK**, Yongin-si (KR);  
**Jong-Hyuk LEE**, Yongin-si (KR);  
**Kwan-Hee LEE**, Yongin-si (KR);  
**Min-Seung CHUN**, Yongin-si (KR)(52) **U.S. Cl.**CPC ..... *H10K 85/636* (2023.02); *C07D 209/88*  
(2013.01); *C09K 11/06* (2013.01); *H05B 33/14*  
(2013.01); *H10K 50/81* (2023.02); *H10K*  
*50/818* (2023.02); *H10K 50/82* (2023.02);  
*H10K 50/828* (2023.02); *H10K 59/123*  
(2023.02); *H10K 59/35* (2023.02); *H10K*  
*85/633* (2023.02); *C09K 2211/1011* (2013.01);  
*C09K 2211/1014* (2013.01); *C09K 2211/1022*  
(2013.01); *C09K 2211/1029* (2013.01); *C09K*  
*2211/185* (2013.01); *C09K 2323/00* (2020.08);  
*H10K 50/11* (2023.02); *H10K 50/15* (2023.02);  
*H10K 50/16* (2023.02); *H10K 50/17*  
(2023.02); *H10K 50/171* (2023.02); *H10K*  
*50/18* (2023.02); *H10K 59/32* (2023.02);  
*H10K 85/615* (2023.02); *H10K 85/626*  
(2023.02); *H10K 85/6572* (2023.02); *H10K*  
*2101/10* (2023.02); *H10K 2102/00* (2023.02);  
*H10K 2102/103* (2023.02); *H10K 2102/351*  
(2023.02); *Y10S 428/917* (2013.01); *Y10T*  
*428/31504* (2015.04)(21) Appl. No.: **18/582,600**(22) Filed: **Feb. 20, 2024****Related U.S. Application Data**(63) Continuation of application No. 17/968,388, filed on  
Oct. 18, 2022, now Pat. No. 11,950,501, which is a  
(Continued)(30) **Foreign Application Priority Data**Apr. 2, 2004 (KR) ..... 10-2004-0022877  
Jul. 14, 2004 (KR) ..... 10-2004-0054700  
Nov. 29, 2004 (KR) ..... 10-2004-0098747  
May 29, 2006 (KR) ..... 10-2006-0048306**Publication Classification**(51) **Int. Cl.***H10K 85/60* (2006.01)  
*C07D 209/88* (2006.01)  
*C09K 11/06* (2006.01)  
*H05B 33/14* (2006.01)  
*H10K 50/11* (2006.01)  
*H10K 50/15* (2006.01)  
*H10K 50/16* (2006.01)  
*H10K 50/17* (2006.01)  
*H10K 50/18* (2006.01)

(57)

**ABSTRACT**

An organic light emitting device including: a substrate; a first electrode; a second electrode; and an organic layer interposed between the first electrode and the second electrode and including an emission layer, wherein one of the first electrode and the second electrode is a reflective electrode and the other is a semitransparent or transparent electrode, and wherein the organic layer includes a layer having at least one of the compounds having at least one carbazole group, and a flat panel display device including the organic light emitting device. The organic light emitting device has low driving voltage, excellent current density, high brightness, excellent color purity, high efficiency, and long lifetime.

