US 20240251644A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2024/0251644 A1**

PARK et al. (43) **Pub. Date: Jul. 25, 2024**

(54) **DISPLAY APPARATUS**

(71) Applicant: **LG Display Co., Ltd.**, Seoul (KR)

(72) Inventors: **SeHong PARK**, Paju-si (KR); **Wonrae KIM**, Paju-si (KR); **Inae CHOI**, Paju-si (KR); **Sejong SEONG**, Paju-si (KR); **SeoHyun NAM**, Paju-si (KR)

(21) Appl. No.: **18/510,170**

(22) Filed: **Nov. 15, 2023**

(30) **Foreign Application Priority Data**

Jan. 20, 2023 (KR) 10-2023-0008715

Publication Classification

(51) **Int. Cl.**

H10K 59/80	(2006.01)
H10K 59/122	(2006.01)
H10K 59/35	(2006.01)

(52) **U.S. Cl.**

CPC ***H10K 59/879*** (2023.02); ***H10K 59/122*** (2023.02); ***H10K 59/351*** (2023.02); ***H10K 59/80518*** (2023.02); ***H10K 59/878*** (2023.02)

(57) **ABSTRACT**

A display apparatus is provided, which may improve light extraction efficiency of light emitted from a light emitting element layer. The display apparatus comprises a substrate having a plurality of pixels having a plurality of subpixels, a pattern portion disposed on the substrate and formed to be concave between the plurality of subpixels, and a reflective portion on the pattern portion, wherein the plurality of subpixels include an overcoat layer having a first layer on the substrate and a light extraction portion adjacent to the reflective portion, having a plurality of concave portions formed on the first layer, an optimal radius R_{BEST} of the concave portion satisfies $R_{BEST}=0.15 \sin 4\pi(AR+0.05)+1.5n_{oc}+0.5m-0.59$, wherein '$\pi$' is a circumferential rate, AR is an aspect ratio of the concave portion, 'n_{oc}' is a refractive index of the first layer, and 'm' is a variable value according to a process of forming the plurality of concave portions.