US 20240244920A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2024/0244920 A1**

(43) **Pub. Date: Jul. 18, 2024**

SHIH

(54) **IN-CELL OPTICAL FINGERPRINT DISPLAY DEVICE**

(71) Applicant: **FocalTech Systems Co., Ltd.**, Hsinchu City (TW)

(72) Inventor: **Po-Sheng SHIH**, Hsinchu City (TW)

(21) Appl. No.: **18/588,360**

(22) Filed: **Feb. 27, 2024**

Related U.S. Application Data

(62) Division of application No. 17/376,368, filed on Jul. 15, 2021, now Pat. No. 11,963,427.

(60) Provisional application No. 63/057,486, filed on Jul. 28, 2020.

(30) **Foreign Application Priority Data**

Dec. 23, 2020 (TW) 109145691

Publication Classification

(51) **Int. Cl.**

H10K 59/65	(2006.01)
G02F 1/1333	(2006.01)
G02F 1/1335	(2006.01)
G02F 1/1343	(2006.01)
G06V 40/12	(2006.01)
G06V 40/13	(2006.01)
H10K 59/35	(2006.01)

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

CPC ***H10K 59/65*** (2023.02); ***G02F 1/13338*** (2013.01); ***G02F 1/133514*** (2013.01); ***G06V 40/13*** (2022.01); ***G06V 40/1318*** (2022.01); ***G06V 40/1359*** (2022.01); ***G06V 40/1394*** (2022.01); ***H10K 59/35*** (2023.02); *G02F 1/134309* (2013.01)

(57) **ABSTRACT**

An in-cell optical fingerprint display device has a substrate, a plurality of pixel units disposed on the substrate and arranged in a matrix, and a transparent cover disposed on the plurality of pixel units. At least one pixel unit includes: a display pixel unit at least has a red sub-pixel unit, a green sub-pixel unit, and a blue sub-pixel unit disposed on the substrate; and a fingerprint pixel unit having an optical fingerprint sensor disposed on the substrate, and a specific-color color resin arranged above the optical fingerprint sensor, wherein the specific-color color resin is a blue color resin or a green color resin.