US009411133B1

(12) **United States Patent**
Hsieh et al.

(10) **Patent No.: US 9,411,133 B1**
(45) **Date of Patent: Aug. 9, 2016**

(54) **IMAGING LENS SYSTEM, IMAGE CAPTURING DEVICE AND ELECTRONIC DEVICE**

(71) Applicant: **LARGAN PRECISION CO., LTD.**, Taichung (TW)

(72) Inventors: **Dung-Yi Hsieh**, Taichung (TW); **Hsin-Hsuan Huang**, Taichung (TW)

(73) Assignee: **LARGAN PRECISION CO., LTD.**, Taichung (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/742,463**

(22) Filed: **Jun. 17, 2015**

(30) **Foreign Application Priority Data**

Feb. 2, 2015 (TW) ..... 104103389 A

(51) **Int. Cl.**

G02B 13/18	(2006.01)
G02B 9/08	(2006.01)
G02B 9/60	(2006.01)
G02B 13/00	(2006.01)
H04N 5/232	(2006.01)
G02B 27/00	(2006.01)
G02B 3/04	(2006.01)
G02B 5/00	(2006.01)

(52) **U.S. Cl.**
CPC ***G02B 13/0045*** (2013.01); ***H04N 5/232*** (2013.01); *G02B 3/04* (2013.01); *G02B 5/005* (2013.01); *G02B 9/60* (2013.01); *G02B 13/002* (2013.01); *G02B 13/0015* (2013.01); *G02B 13/18* (2013.01); *G02B 27/0025* (2013.01)

(58) **Field of Classification Search**
CPC G02B 13/0045; G02B 9/60; G02B 13/18; G02B 27/0025; G02B 5/005; G02B 13/0015; G02B 3/04; G02B 13/002
USPC 359/714, 739, 740, 764–766
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,864,454	B1	1/2011	Tang et al.	
8,233,224	B2 *	7/2012	Chen	G02B 9/60 359/714
2013/0265650	A1 *	10/2013	Chen	G02B 13/008 359/714
2014/0063596	A1 *	3/2014	Jung	G02B 13/0045 359/714
2014/0104709	A1 *	4/2014	You	G02B 13/0045 359/764

(Continued)

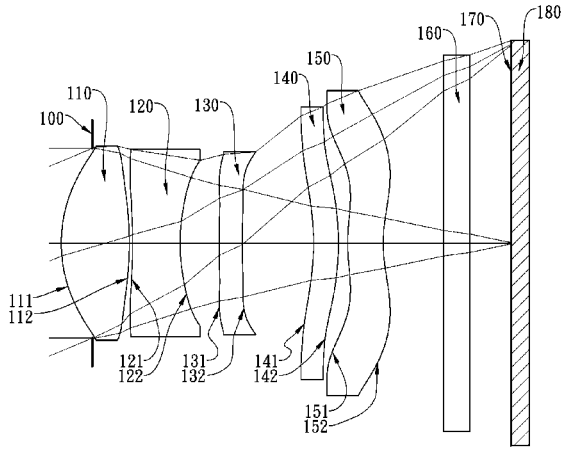
FOREIGN PATENT DOCUMENTS

CN	203773145	8/2014
JP	59083121	5/1984

(Continued)

Primary Examiner — Evelyn A Lester
(74) *Attorney, Agent, or Firm* — Locke Lord LLP; Tim Tingkang Xia, Esq.

(57) **ABSTRACT**

This disclosure provides an imaging lens system, including, in order from an object side to an image side: a first lens element with positive refractive power having a convex object-side surface; a second lens element with negative refractive power; a third lens element with refractive power; a fourth lens element with refractive power having an object-side surface and an image-side surface thereof being aspheric; a fifth lens element with refractive power having a convex object-side surface, the object-side surface and an image-side surface thereof being aspheric, and at least one of the object-side surface and the image-side surface being provided with at least one inflection point. The imaging lens system is further provided with a stop, and no lens element with refractive power is disposed between the stop and first lens element.

30 Claims, 24 Drawing Sheets