

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

(10) **Patent No.:** **US 10,324,273 B2**
(45) **Date of Patent:** **Jun. 18, 2019**

(54) **OPTICAL LENS SET**

(71) Applicant: **Genius Electronic Optical Co., Ltd.**,
Taichung (TW)

(72) Inventors: **Feng Chen**, Fujian (CN); **Baina Chen**,
Fujian (CN); **Yanxuan Yin**, Fujian
(CN)

(73) Assignee: **Genius Electronic Optical (Xiamen)
Co., Ltd.**, Xiamen, Fujian (TW)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 127 days.

(21) Appl. No.: **15/286,575**

(22) Filed: **Oct. 6, 2016**

(65) **Prior Publication Data**

US 2018/0059371 A1 Mar. 1, 2018

(30) **Foreign Application Priority Data**

Aug. 29, 2016 (CN) 2016 1 0755720

(51) **Int. Cl.**

G02B 9/60 (2006.01)
G02B 13/00 (2006.01)
G02B 5/00 (2006.01)
G02B 5/20 (2006.01)
G02B 27/00 (2006.01)

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

CPC **G02B 13/0045** (2013.01); **G02B 5/005**
(2013.01); **G02B 5/20** (2013.01); **G02B 9/60**
(2013.01); **G02B 27/0025** (2013.01)

(58) **Field of Classification Search**

CPC .. G02B 13/02; G02B 13/009; G02B 13/0045;
G02B 5/005; G02B 5/20; G02B 27/0025;
G02B 27/646; H04N 5/2254; H04N
5/2257; H04N 5/2258; H04N 5/23296
USPC 359/659, 714, 753, 763
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,437,092 B2 5/2013 Baba
9,864,171 B2 * 1/2018 Hsieh G02B 9/60
2015/0029601 A1 * 1/2015 Dror G02B 9/60
359/764
2015/0205069 A1 7/2015 Jung

FOREIGN PATENT DOCUMENTS

CN 102959448 A 3/2013
CN 205049806 U 2/2016
JP 2013156457 8/2013
TW 1522646 2/2016
TW 1565966 B 1/2017

* cited by examiner

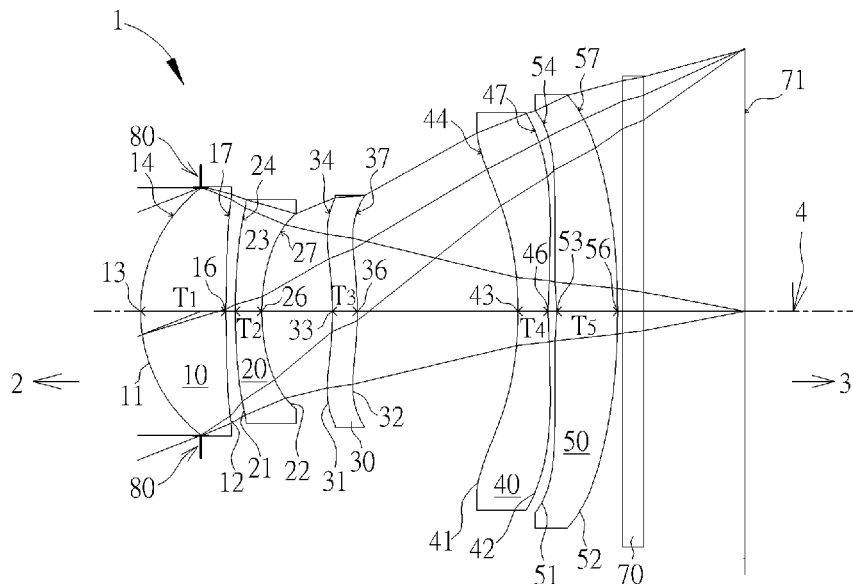
Primary Examiner — Mustak Choudhury

(74) *Attorney, Agent, or Firm* — Winston Hsu

(57) **ABSTRACT**

An optical lens assembly includes a first lens of a concave image surface near its periphery, a second lens of a plastic material, a third lens of a concave object surface near the optical-axis and a concave image surface near its periphery, a fourth lens of a concave object surface near the optical-axis, a fifth lens of a concave object surface near its periphery and a convex image surface near the optical-axis.

18 Claims, 30 Drawing Sheets



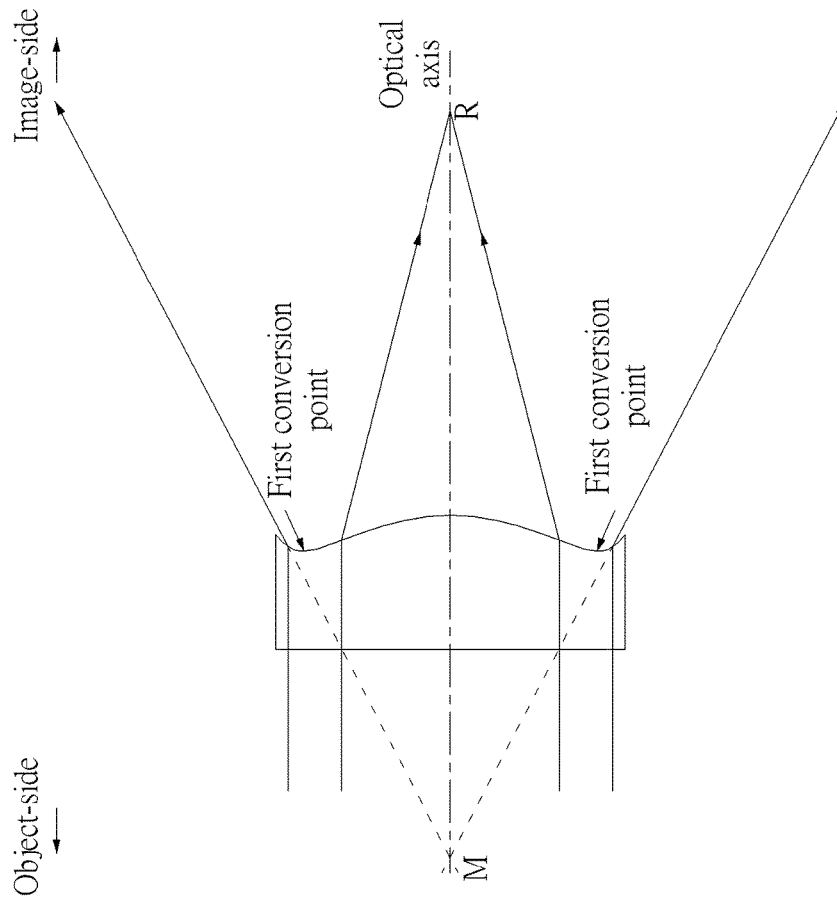


FIG. 2

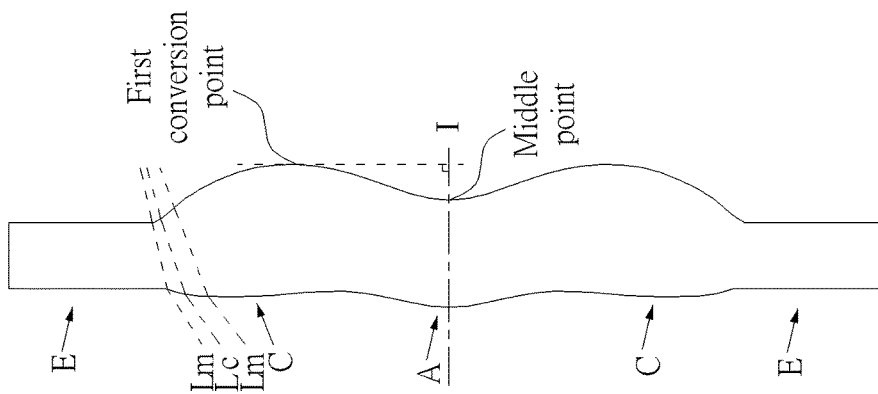


FIG. 1

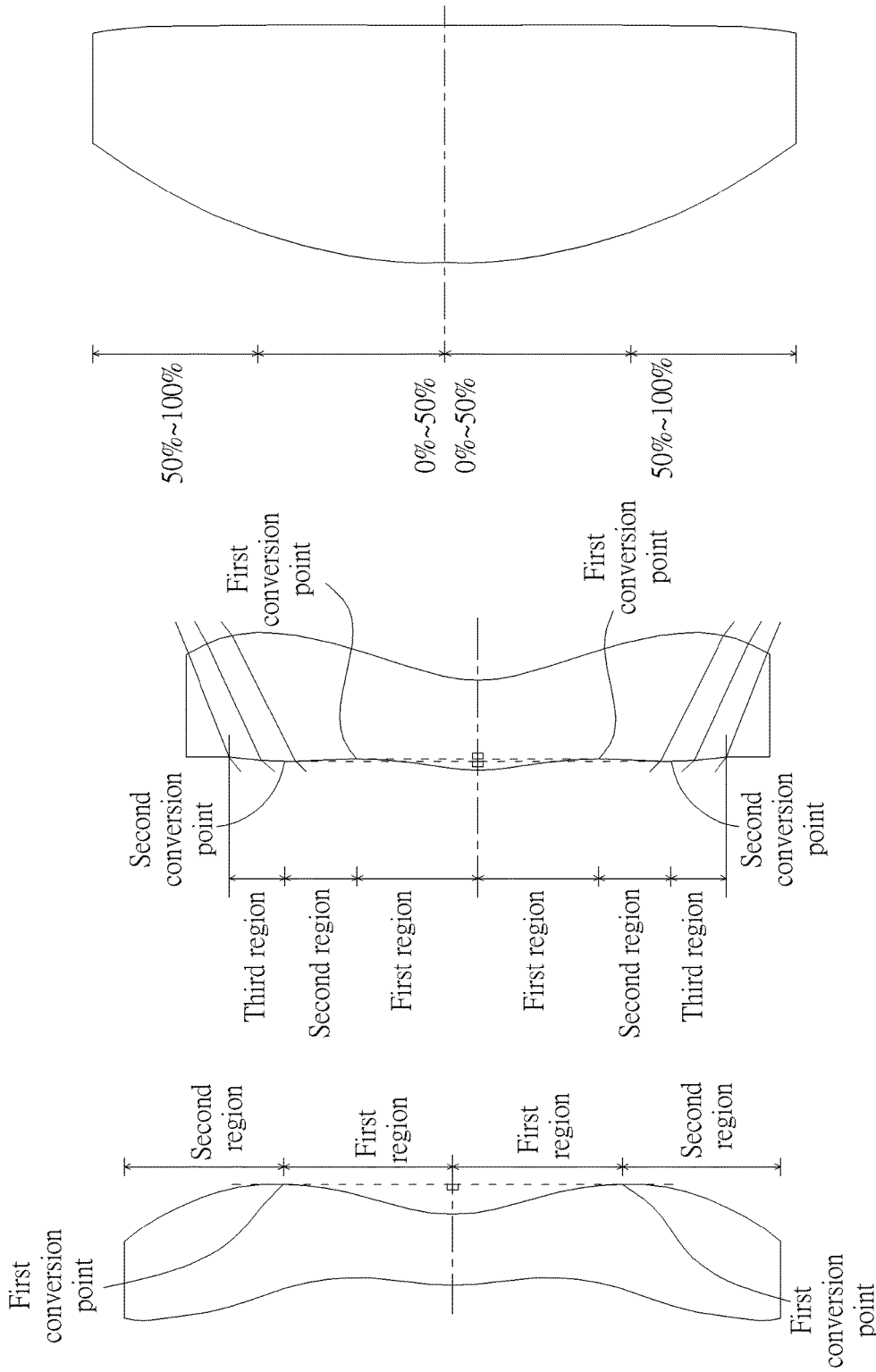


FIG. 5

FIG. 4

FIG. 3

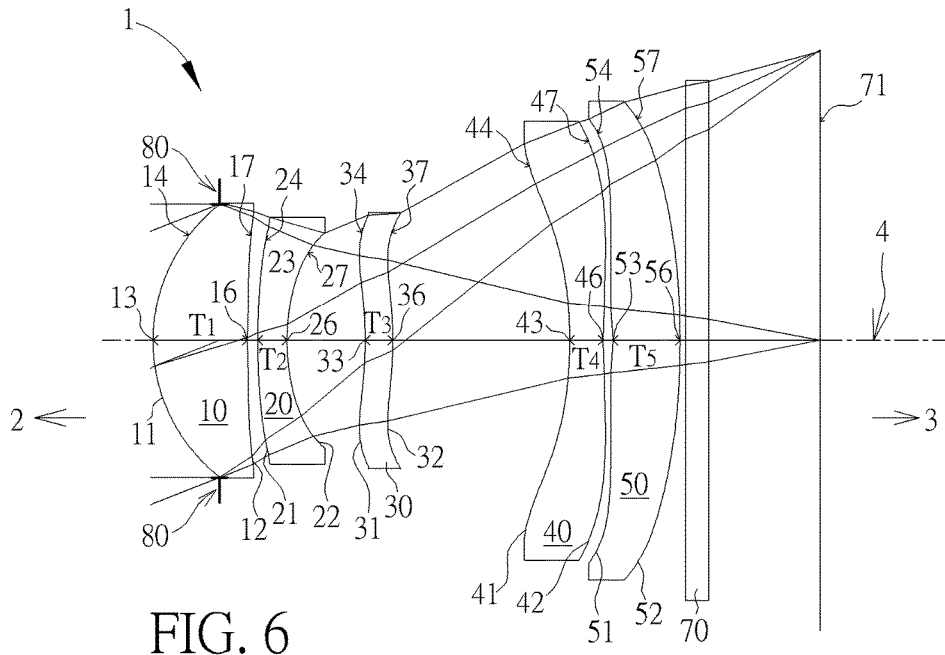


FIG. 6

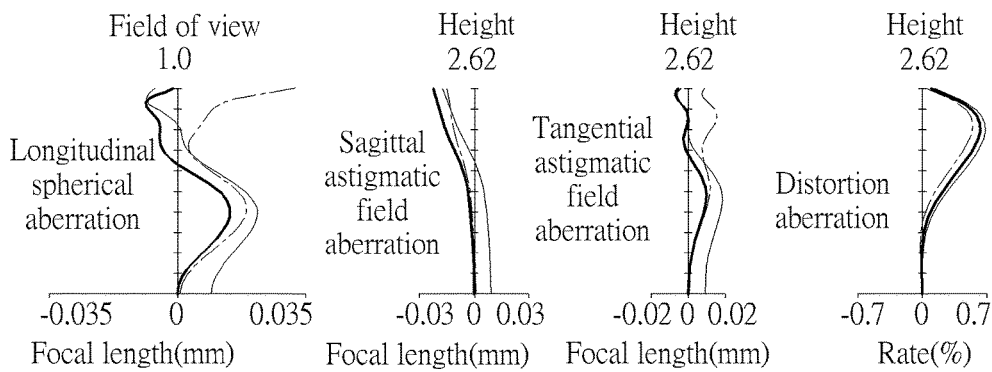
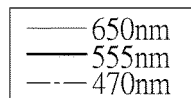


FIG. 7A

FIG. 7B

FIG. 7C

FIG. 7D

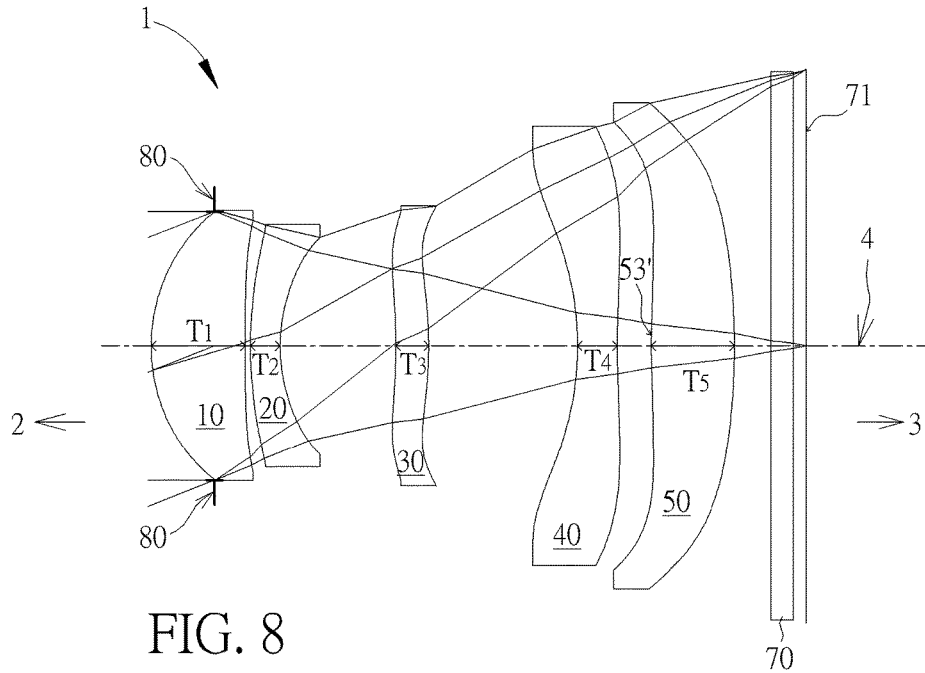


FIG. 8

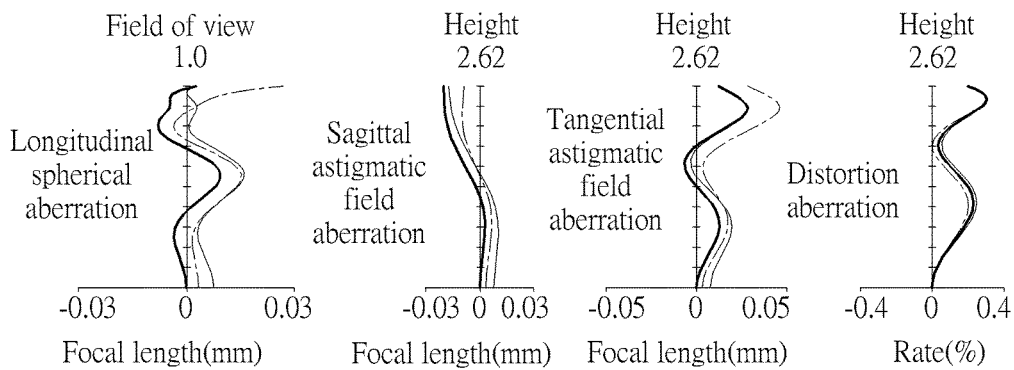
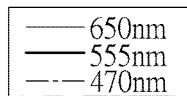


FIG. 9A

FIG. 9B

FIG. 9C

FIG. 9D

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.