

### (12) United States Patent Chen

# (10) Patent No.:

US 8,233,224 B2

(45) Date of Patent:

Jul. 31, 2012

### (54) IMAGING LENS SYSTEM

Inventor: Chun-Shan Chen, Taichung (TW)

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 288 days.

(21) Appl. No.: 12/654,912

(22)Filed: Jan. 8, 2010

(65)**Prior Publication Data** 

> US 2011/0013069 A1 Jan. 20, 2011

(30)Foreign Application Priority Data

Jul. 14, 2009 (TW) ...... 98123694 A

(51) Int. Cl. (2006.01)G02B 9/60 G02B 13/18 (2006.01)

(58) Field of Classification Search ........ 359/763-764, 359/754-757, 771-773, 776-778, 713-714 See application file for complete search history.

#### (56)References Cited

### U.S. PATENT DOCUMENTS

2001/0015856	A1*	8/2001	Yoneyama	359/687
2009/0122423	A1*	5/2009	Park et al	359/764
2010/0220229	A1*	9/2010	Sano	348/340

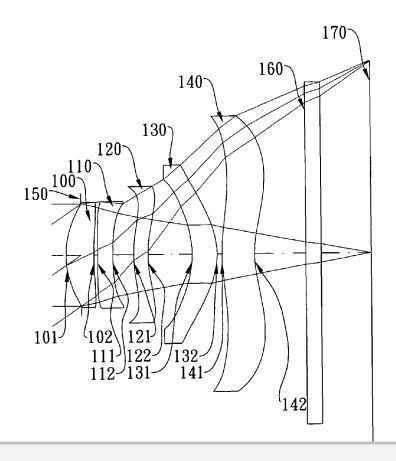
\* cited by examiner

Primary Examiner — Jordan Schwartz (74) Attorney, Agent, or Firm — Bacon & Thomas, PLLC

#### (57)ABSTRACT

This invention provides an imaging lens system including, in order from an object side to an image side: a first lens with positive refractive power having a convex object-side surface; a second lens with negative refractive power; a third lens having a concave image-side surface; a fourth lens with positive refractive power; a fifth lens with negative refractive power having a concave image-side surface, at least one surface thereof having at least one inflection point; and an aperture stop disposed between an imaged object and the third lens. The on-axis spacing between the first lens and second lens is T12, the focal length of the imaging lens system is f, and they satisfy the relation:  $0.5 < (T12/f) \times 100 < 15$ .

### 27 Claims, 13 Drawing Sheets





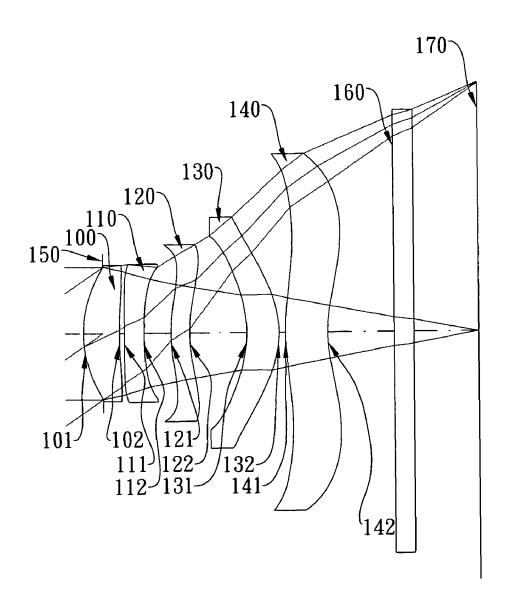
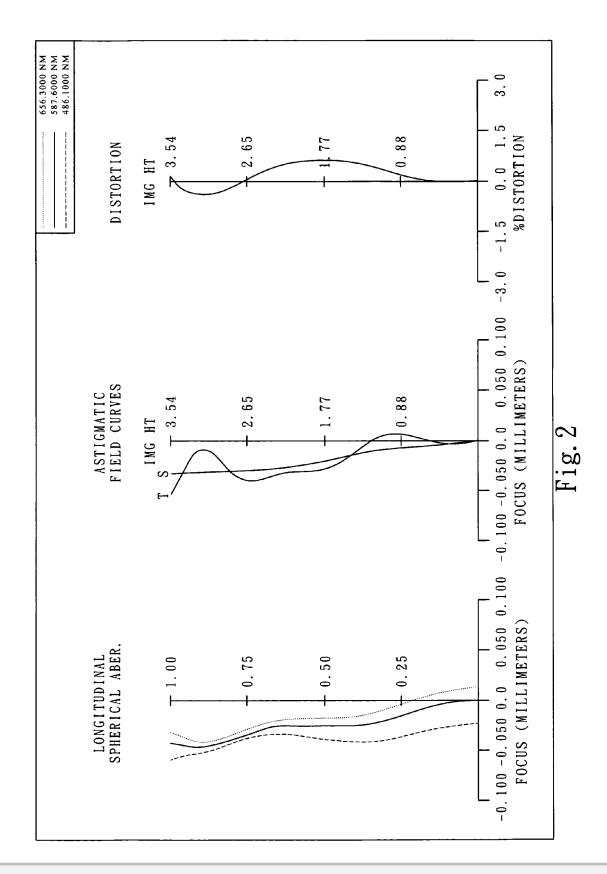


Fig. 1





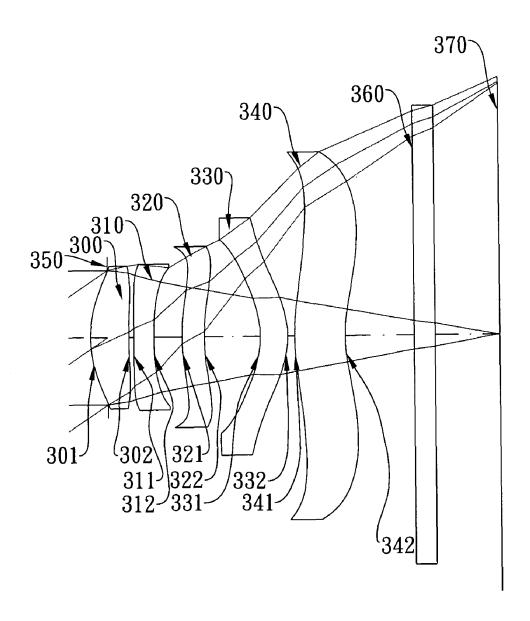
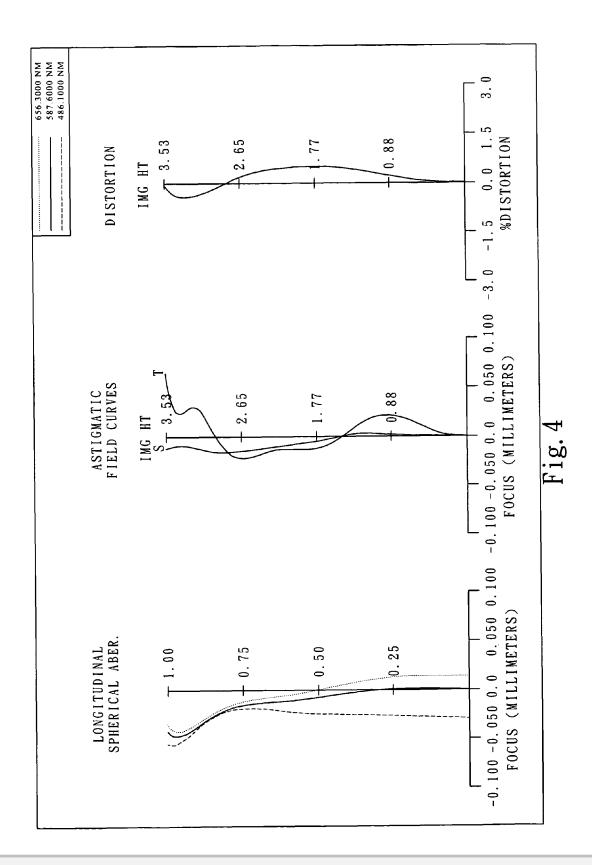


Fig. 3







# DOCKET A L A R M

# 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.

