



US010670827B2

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

(10) **Patent No.: US 10,670,827 B2**  
(45) **Date of Patent: \*Jun. 2, 2020**

(54) **FOLDED CAMERA LENS DESIGNS**

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

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/392,754**

(22) Filed: **Apr. 24, 2019**

(65) **Prior Publication Data**

US 2019/0250362 A1 Aug. 15, 2019

**Related U.S. Application Data**

(63) Continuation of application No. 16/252,608, filed on Jan. 19, 2019, which is a continuation of application (Continued)

(51) **Int. Cl.**  
**G02B 7/02** (2006.01)  
**H04N 5/225** (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **G02B 7/021** (2013.01); **G02B 7/08** (2013.01); **G02B 13/004** (2013.01);  
(Continued)

(58) **Field of Classification Search**  
CPC .. **G02B 13/0065**; **G02B 7/021**; **G02B 13/004**;  
**H04N 5/2259**

See application file for complete search history.

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(57) **ABSTRACT**

Digital cameras, optical lens modules for such digital cameras and methods for assembling lens elements in such lens modules. In various embodiments, the digital cameras comprise an optical lens module including  $N \geq 3$  lens elements  $L_i$ , each lens element comprising a respective front surface  $S_{2i-1}$  and a respective rear surface  $S_{2i}$ . In various embodiments the first lens element toward the object side,  $L_1$  and its respective front surfaces  $S_1$  have optical and/or mechanical properties, such as a clear aperture, a clear height and a mechanical height that are larger than respective properties of following lens elements and surfaces. This is done to achieve a camera with large aperture stop, given a lens and/or camera height.

**27 Claims, 28 Drawing Sheets**

