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

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(45) **Date of Patent:** **May 8, 2018**

(54) **FOCUS SCANNING APPARATUS  
RECORDING COLOR**  
(71) Applicant: **3SHAPE A/S, Copenhagen K (DK)**  
(72) Inventors: **Bo Esbech, Gentofte (DK); Christian Romer Rosberg, Bronshoj (DK); Mike Van Der Poel, Rodovre (DK); Rasmus Kjaer, Copenhagen (DK); Michael Vinther, Copenhagen (DK); Karl-Josef Hollenbeck, Copenhagen (DK)**  
(73) Assignee: **3SHAPE A/S, Copenhagen K (DK)**  
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(52) **U.S. Cl.**  
CPC ..... **A61C 9/0073** (2013.01); **A61C 9/006** (2013.01); **A61C 9/0066** (2013.01); **G01B 11/24** (2013.01);

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(58) **Field of Classification Search**  
CPC .. **G01B 11/24; G01B 11/2509; G01B 11/2518**  
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§ 371 (c)(1),  
(2) Date: **Jul. 28, 2015**

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(60) Provisional application No. 61/764,178, filed on Feb. 13, 2013.

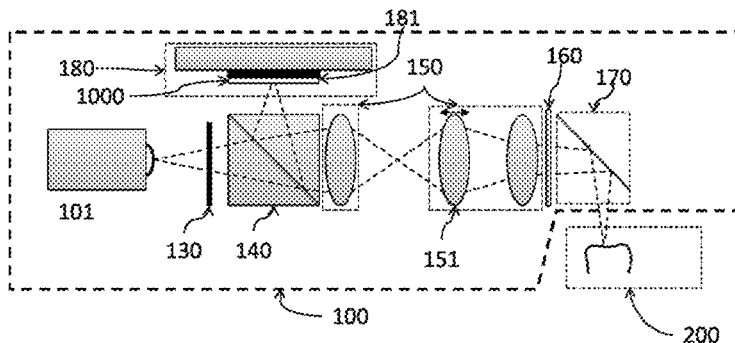
*Primary Examiner* — Kevin Pyo  
(74) *Attorney, Agent, or Firm* — Buchanan Ingersoll & Rooney P.C.

(30) **Foreign Application Priority Data**  
Feb. 13, 2013 (DK) ..... 2013 70077

(57) **ABSTRACT**  
Disclosed are a scanner system and a method for recording surface geometry and surface color of an object where both surface geometry information and surface color information for a block of said image sensor pixels at least partly from one 2D image recorded by said color image sensor.

(51) **Int. Cl.**  
**H01J 40/14** (2006.01)  
**A61C 9/00** (2006.01)  
(Continued)

**35 Claims, 4 Drawing Sheets**



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- (58) **Field of Classification Search**  
 USPC ..... 250/226, 234; 348/47  
 See application file for complete search history.

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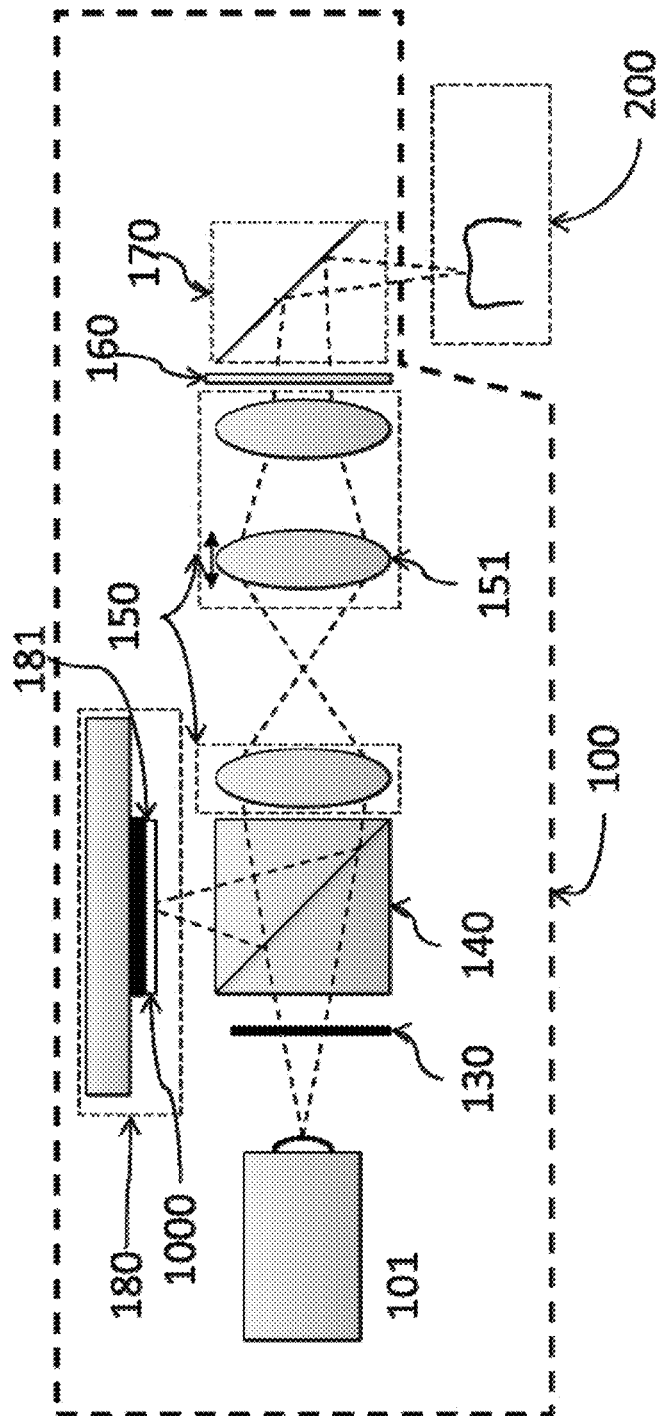


Fig. 1

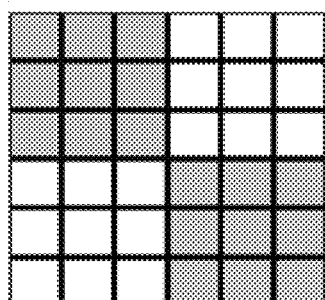


Fig. 2A

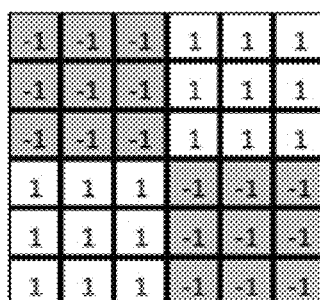


Fig. 2B

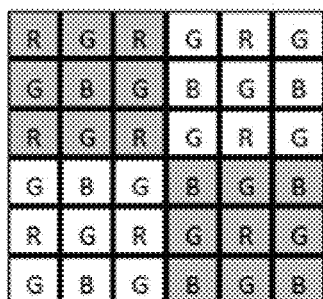


Fig. 3A

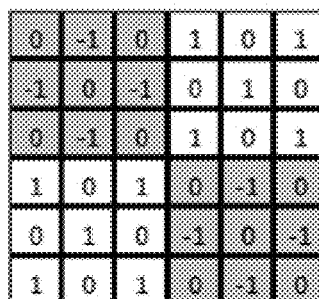


Fig. 3B

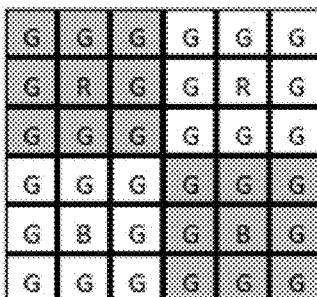


Fig. 4

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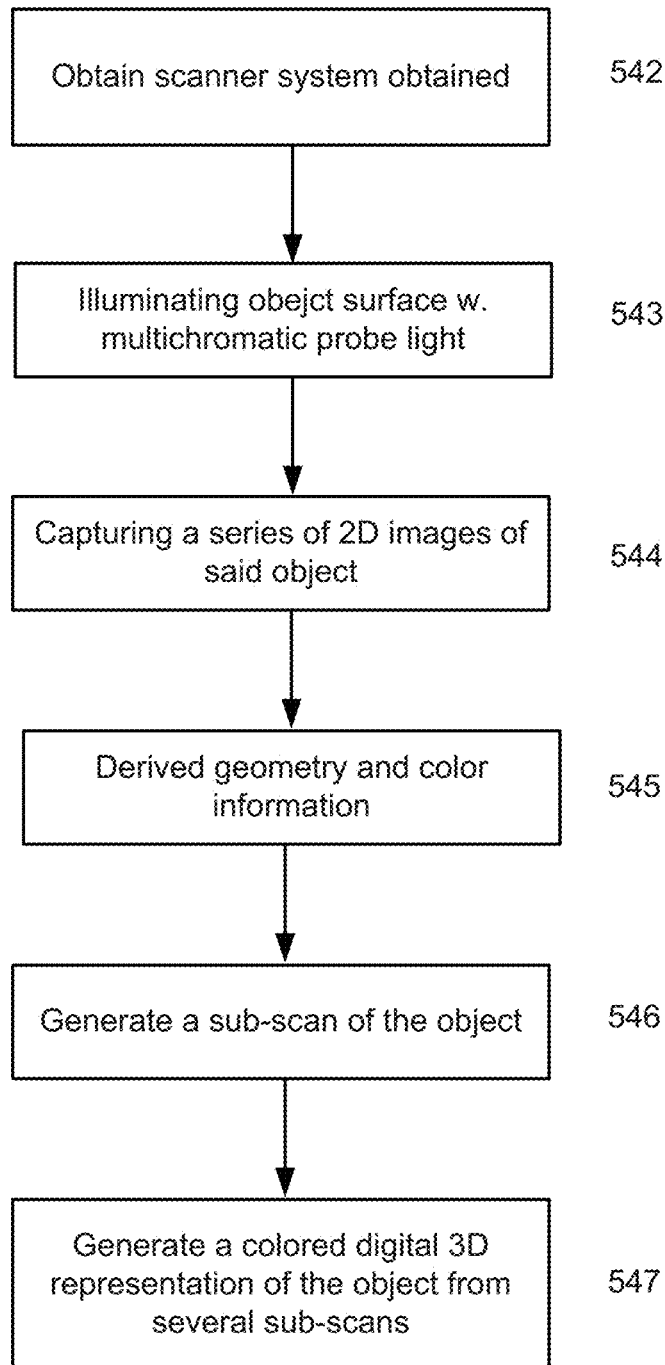


Fig. 5

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