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**Bachar et al.**

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(54) **INDUCTANCE-BASED POSITION SENSING IN A DIGITAL CAMERA ACTUATOR**

(58) **Field of Classification Search**  
CPC ..... G03B 7/10; G03B 2205/0053; G03B 2205/0069; G03B 2205/0084;  
(Continued)

(71) Applicant: **Corephotonics Ltd.**, Tel-Aviv (IL)

(72) Inventors: **Gil Bachar**, Tel-Aviv (IL); **Ephraim Goldenberg**, Ashdod (IL); **Gal Shabtay**, Tel-Aviv (IL)

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(73) Assignee: **Corephotonics Ltd**, Tel Aviv (IL)

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*Primary Examiner* — Kelly L Jerabek  
(74) *Attorney, Agent, or Firm* — Nathan & Associates Patent Agents Ltd; Menachem Nathan

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(57) **ABSTRACT**

**Related U.S. Application Data**

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Inductance-based sensing in a digital camera in which actuation of at least one electromagnetic (EM) actuator that includes at least one stationary ferromagnetic member associated with a large air gap causes a moving ferromagnetic member mechanically coupled to an optical element to by-pass or bridge the large air gap through at least one smaller air gap. The stationary member includes at least one ferromagnetic core surrounded at least partially by a coil. An inductance value correlated with a position of the optical element may be measured using the same coil as the one used for the actuation. In some embodiments, a single EM actuator includes two coils and the actuator is driven using both coils, while a regular or a mutual inductance is measured. In some camera embodiments that include two oppo-

(Continued)

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CPC ..... **G01B 7/003** (2013.01); **G01D 5/2013** (2013.01); **H04N 5/2254** (2013.01); **H04N 5/23287** (2013.01); **G03B 2205/0053** (2013.01)

