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Schairer et al.

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(54) **PHOTOGRAMMETRIC RECESSION MEASUREMENTS OF AN ABLATING SURFACE**

(75) Inventors: **Edward T. Schairer**, Palo Alto, CA (US); **James T. Heineck**, San Jose, CA (US)

(73) Assignee: **The United States of America as Represented by the Administrator of the National Aeronautics & Space Administration (NASA)**, Washington, DC (US)

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(51) **Int. Cl.**
G06K 9/00 (2006.01)

(52) **U.S. Cl.** **382/154; 348/47; 356/601**

(58) **Field of Classification Search** **382/154; 348/47; 356/601, 603**

See application file for complete search history.

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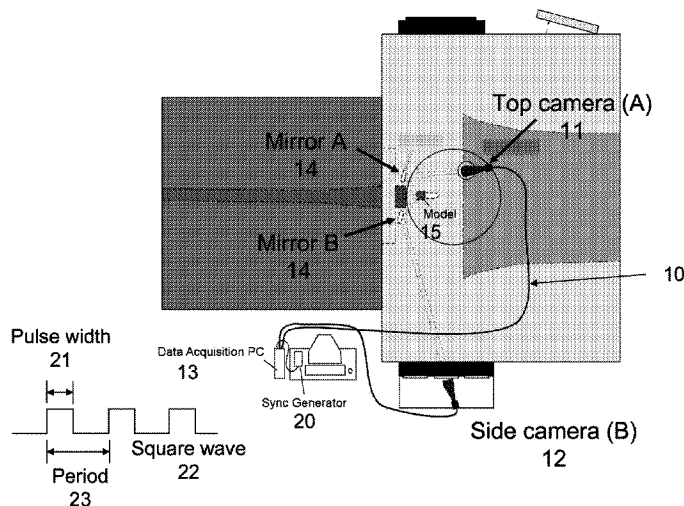
(Continued)

Primary Examiner — Gregory M Desire
(74) *Attorney, Agent, or Firm* — John F. Schipper; Robert M. Padilla

(57) **ABSTRACT**

An instrument and method for measuring the time history of recession of an ablating surface of a test article during testing in a high enthalpy thermal test facility, such as an arcjet. The method advances prior art by providing time-history data over the full ablating surface without targets and without any modifications to the test article. The method is non-intrusive, simple to implement, requires no external light source, and does not interfere with normal operations of the arcjet facility.

9 Claims, 8 Drawing Sheets



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FIG. 1

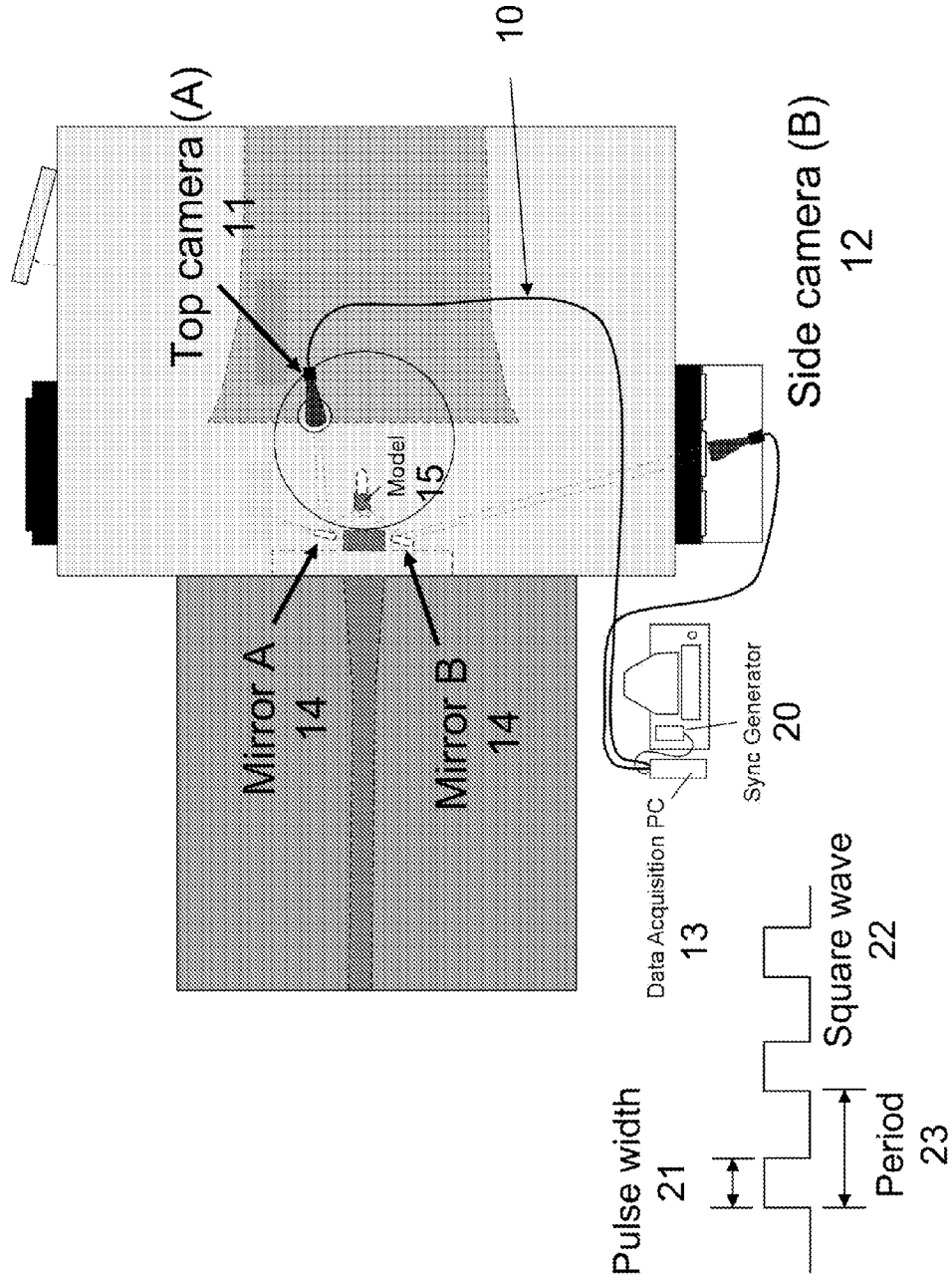


FIG. 2

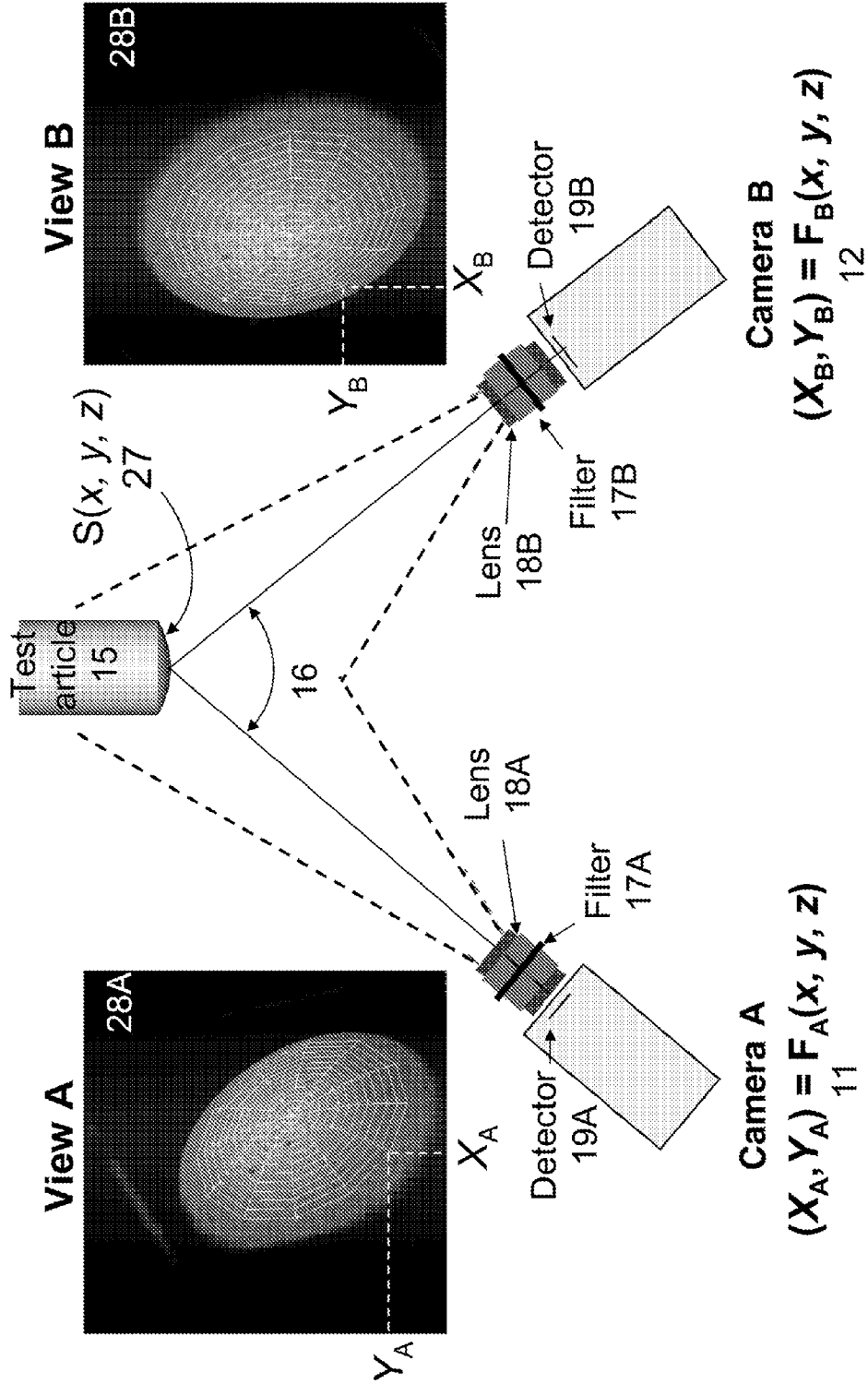


FIG. 3

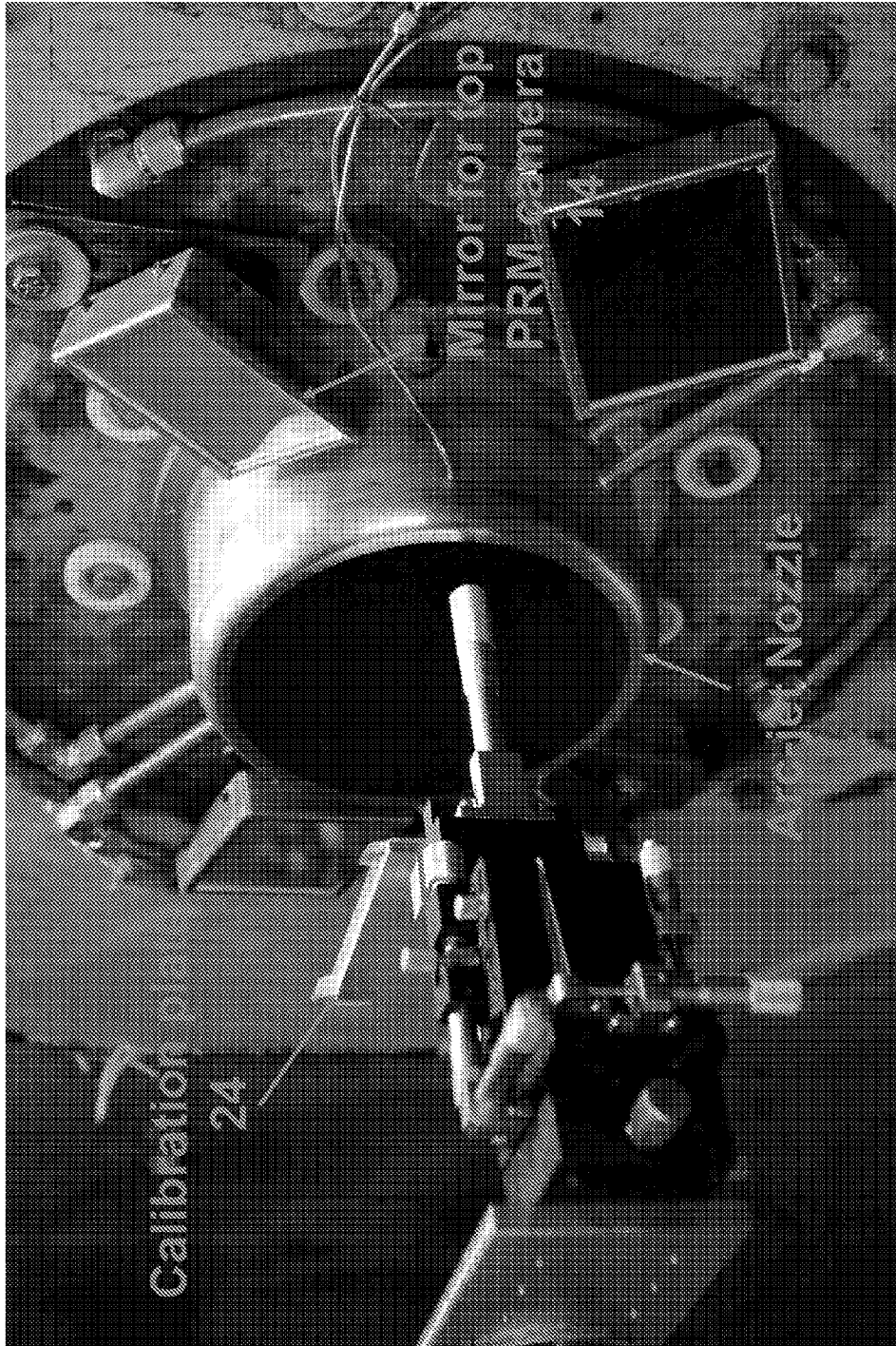
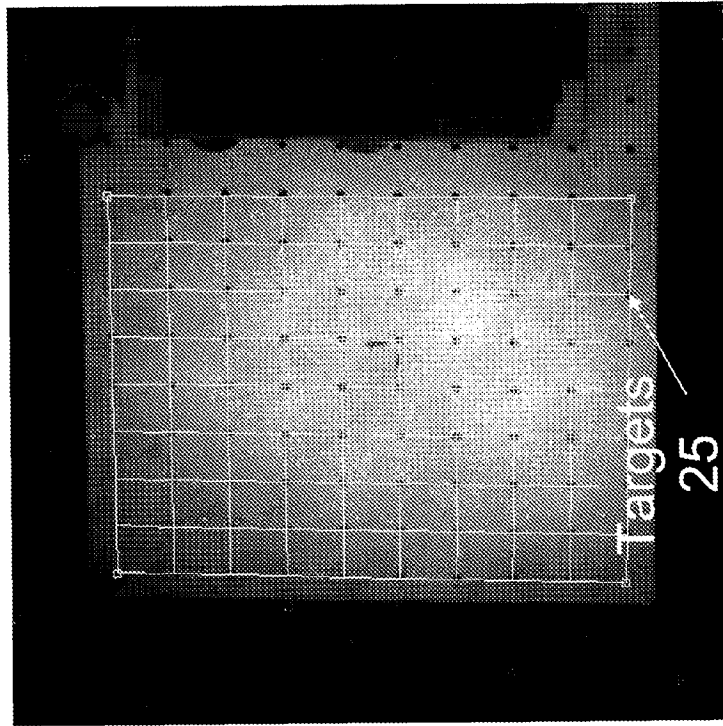
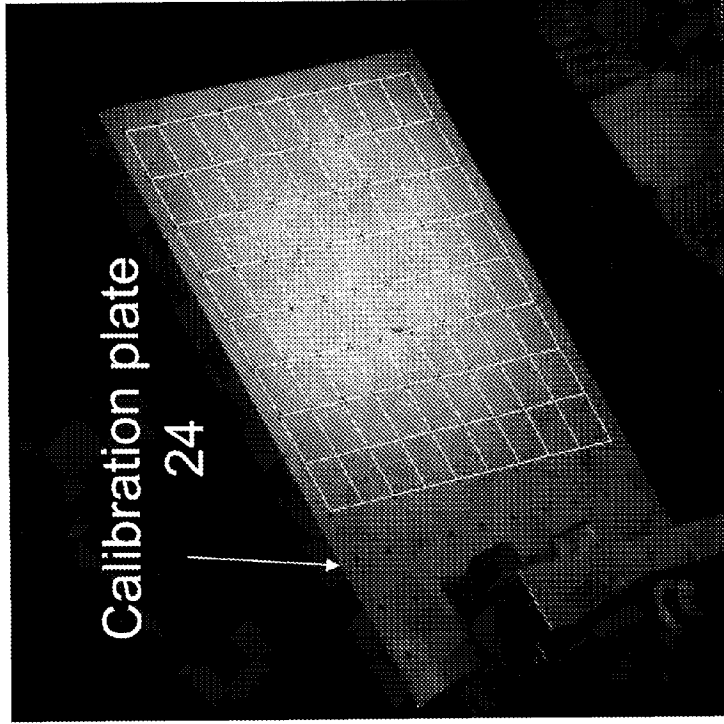


FIG. 4A FIG. 4B

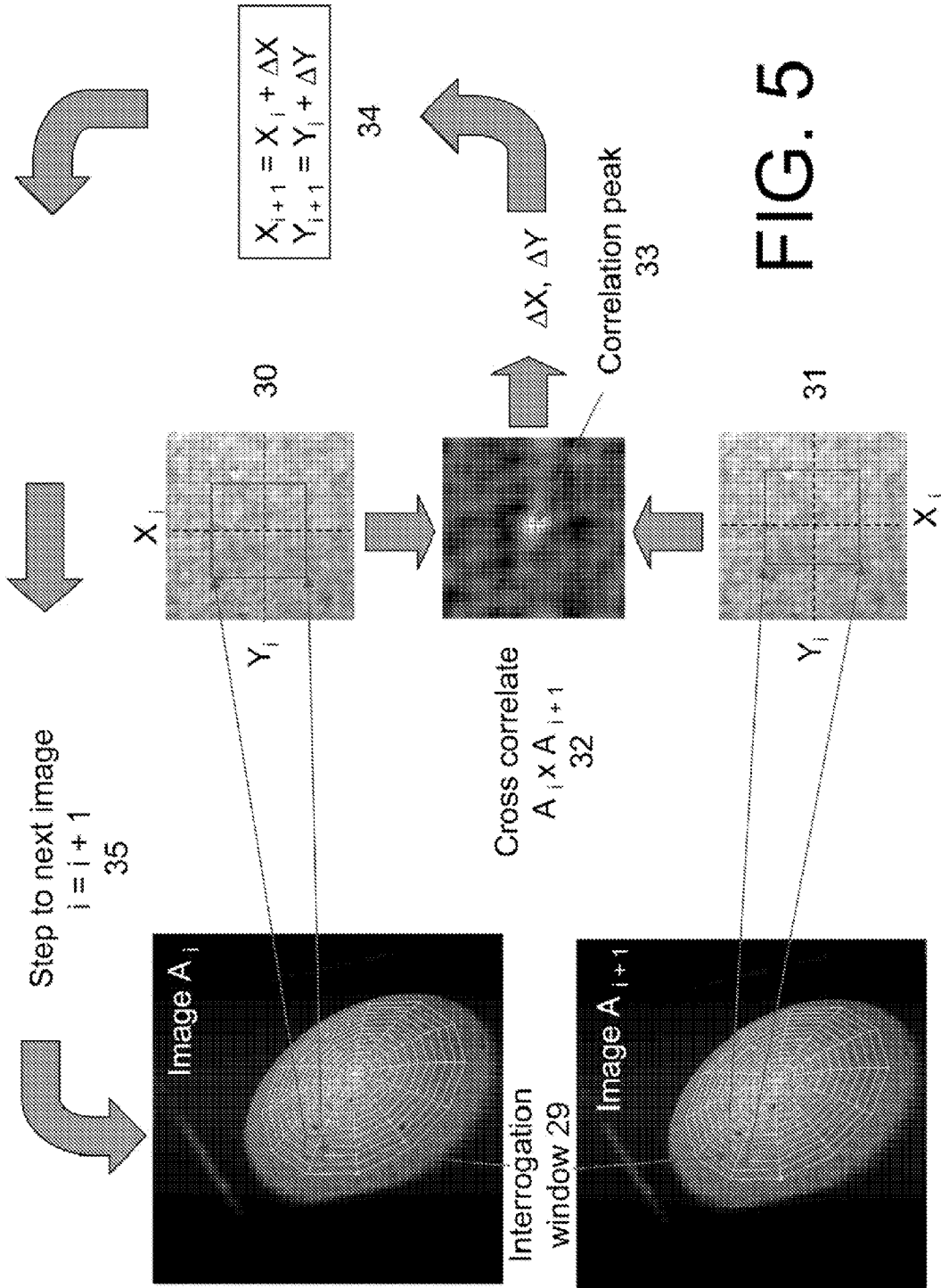
Calibration images
26



Side camera



Top camera



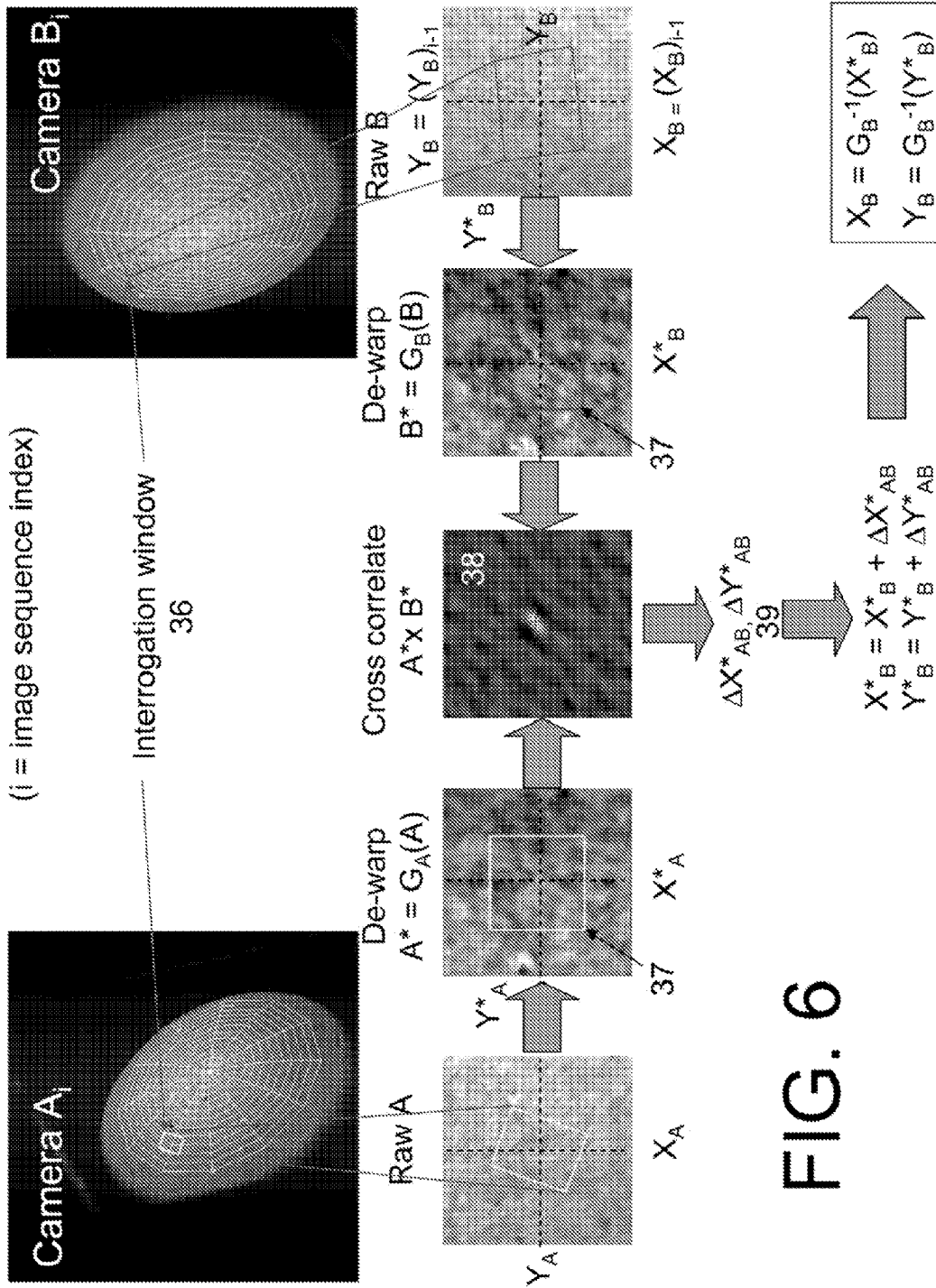


FIG. 6

FIG. 7

FIG. 7A
Raw
images

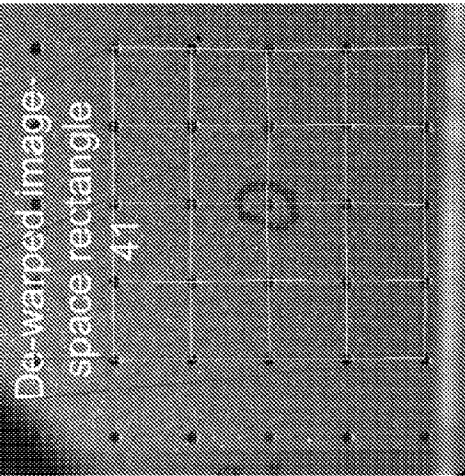
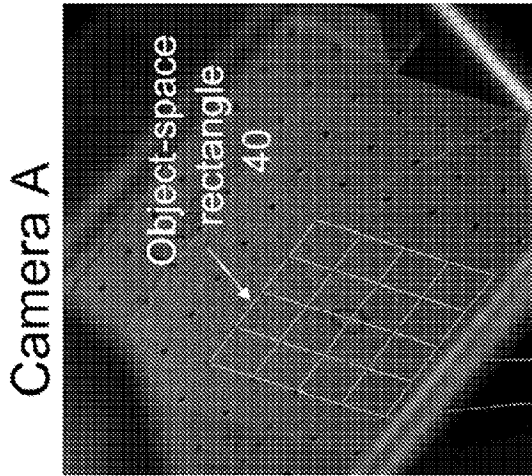


FIG. 7C
Globally
de-warped
Images
42

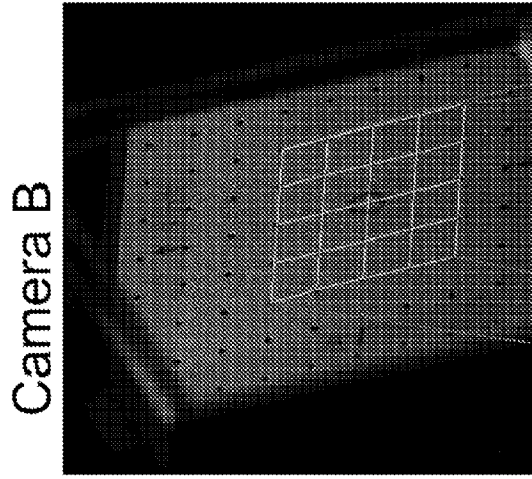


FIG. 7B

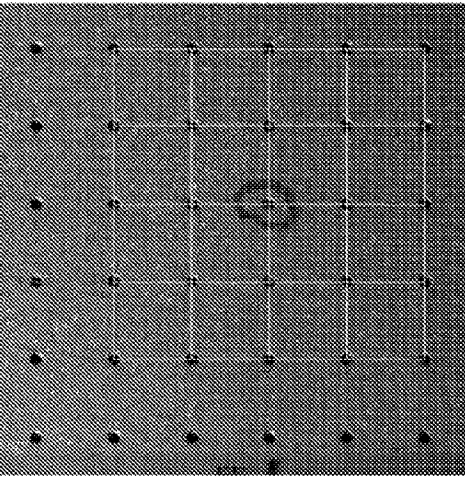


FIG. 7D

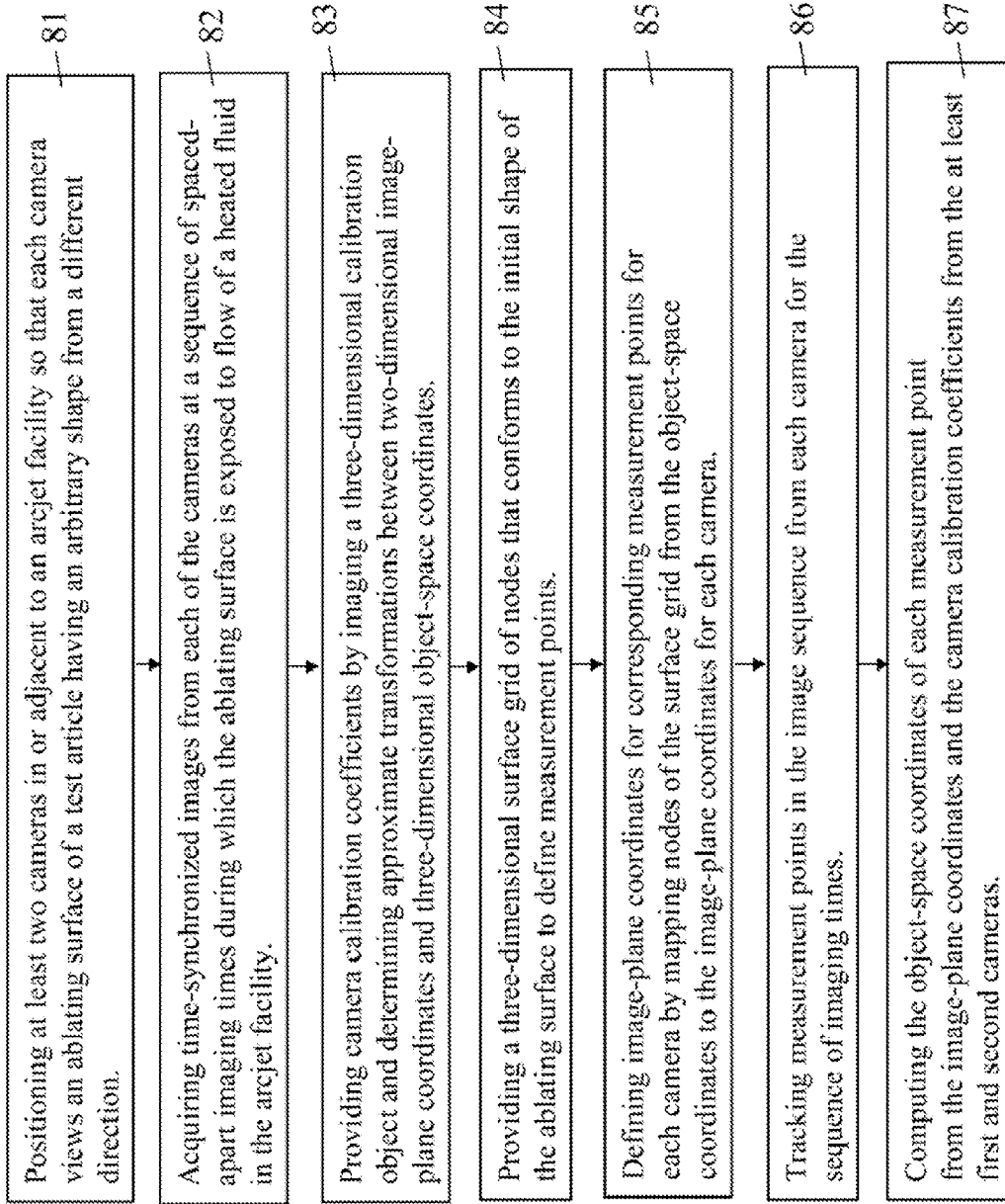


FIG. 8