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Parulski et al.

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(54) **METHOD AND APPARATUS FOR OPERATING A DUAL LENS CAMERA TO AUGMENT AN IMAGE**

6,611,289	B1	8/2003	Yu et al.
6,864,474	B2	3/2005	Misawa
7,676,146	B2*	3/2010	Border et al. 396/80
2003/0020814	A1	1/2003	Ono
2003/0160886	A1	8/2003	Misawa et al.
2005/0046738	A1	3/2005	Sato
2005/0275747	A1	12/2005	Nayar et al.
2006/0187312	A1	8/2006	Labaziewicz et al.

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(Continued)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 882 days.

FOREIGN PATENT DOCUMENTS

EP 0 858 208 8/1998

This patent is subject to a terminal disclaimer.

(Continued)

(21) Appl. No.: **11/684,025**

Primary Examiner—Kelly L. Jerabek

(22) Filed: **Mar. 9, 2007**

(74) Attorney, Agent, or Firm—Thomas J. Strouse; Peyton C. Watkins

(65) **Prior Publication Data**

(57) **ABSTRACT**

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(51) **Int. Cl.**
H04N 5/232 (2006.01)
G03B 13/00 (2006.01)
G03B 17/00 (2006.01)

(52) **U.S. Cl.** **348/349**; 396/79

(58) **Field of Classification Search** 348/349;
396/72, 79, 100

See application file for complete search history.

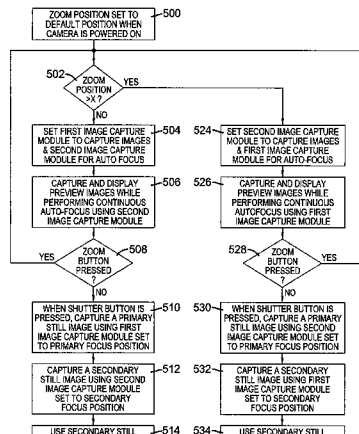
(56) **References Cited**

U.S. PATENT DOCUMENTS

4,606,630	A	8/1986	Haruki et al.
5,668,597	A	9/1997	Parulski et al.
5,874,994	A	2/1999	Xie et al.
6,441,855	B1	8/2002	Omata et al.

An electronic camera for producing an output image of a scene from a captured image signal includes a first imaging stage comprising a first image sensor for generating a first sensor output and a first lens for forming a first image of the scene on the first image sensor, and a second imaging stage comprising a second image sensor for generating a second sensor output and a second lens for forming a second image of the scene on the second image sensor. The sensor output from the first imaging stage is used as a primary output image for forming the captured image signal and the sensor output from the second imaging stage is used as a secondary output image for modifying the primary output image, thereby generating an enhanced, captured image signal.

22 Claims, 29 Drawing Sheets



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U.S. PATENT DOCUMENTS

2006/0193509	A1	8/2006	Criminisi et al.	
2008/0013941	A1*	1/2008	Daley	396/121
2008/0218612	A1*	9/2008	Border et al.	348/262
2008/0218613	A1*	9/2008	Janson et al.	348/262

FOREIGN PATENT DOCUMENTS

JP	2005045511	2/2005
WO	01/06449	1/2001
WO	2005/057278	6/2005

* cited by examiner

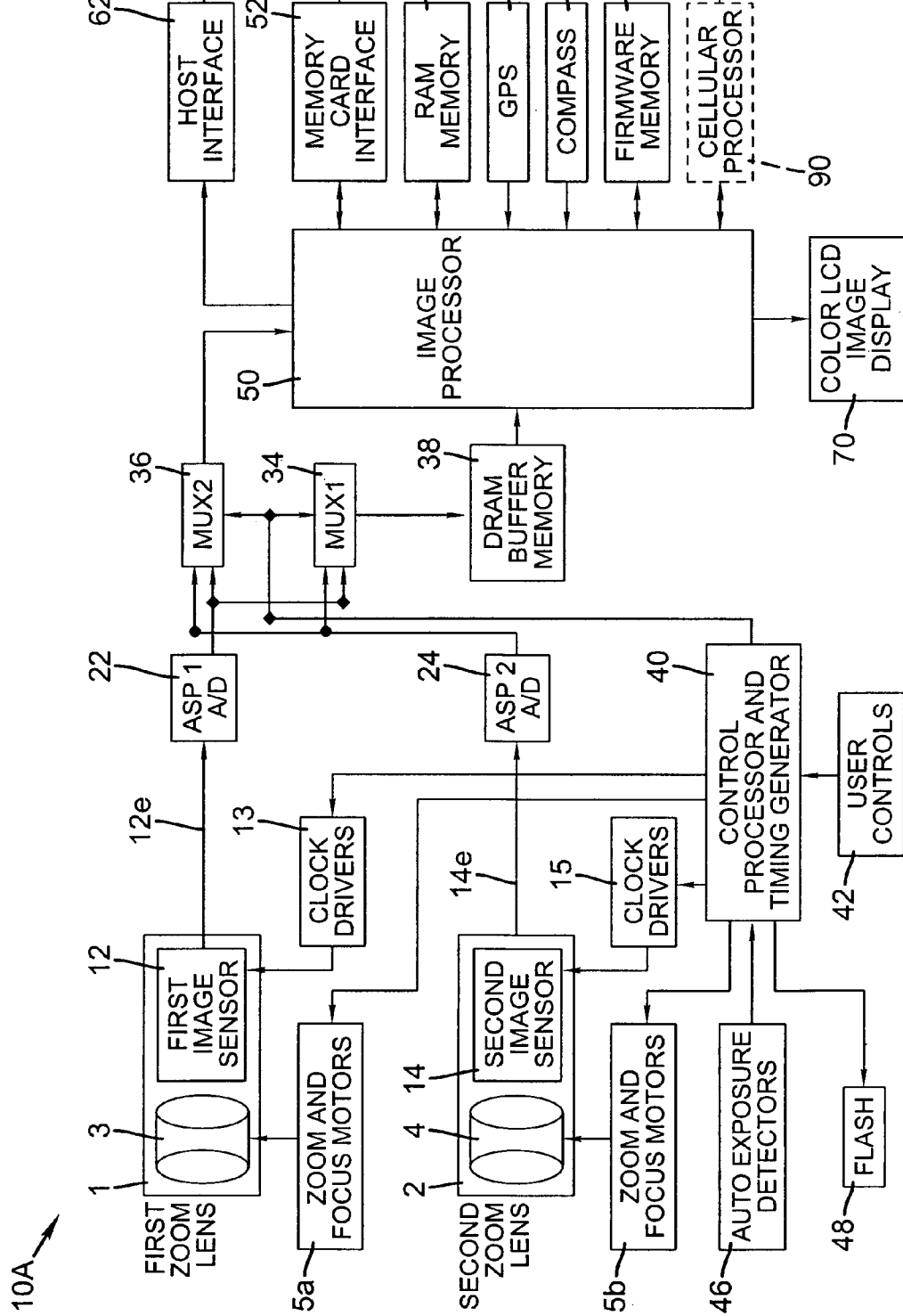


FIG. 1

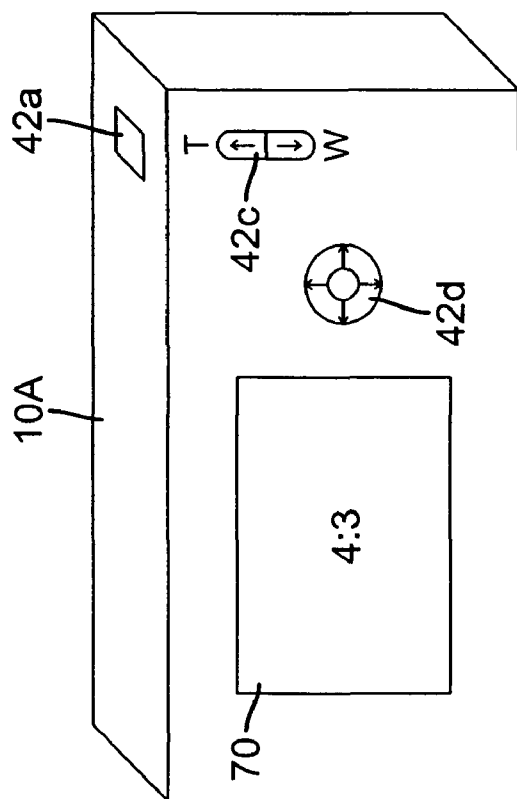


FIG. 2B

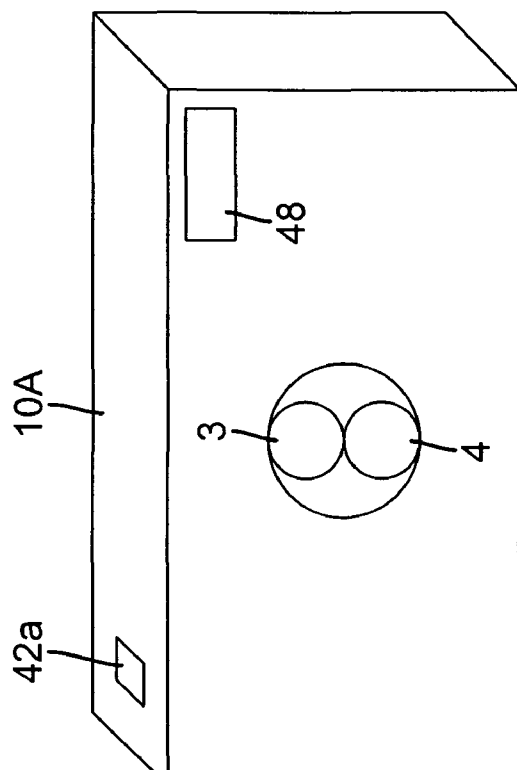


FIG. 2A

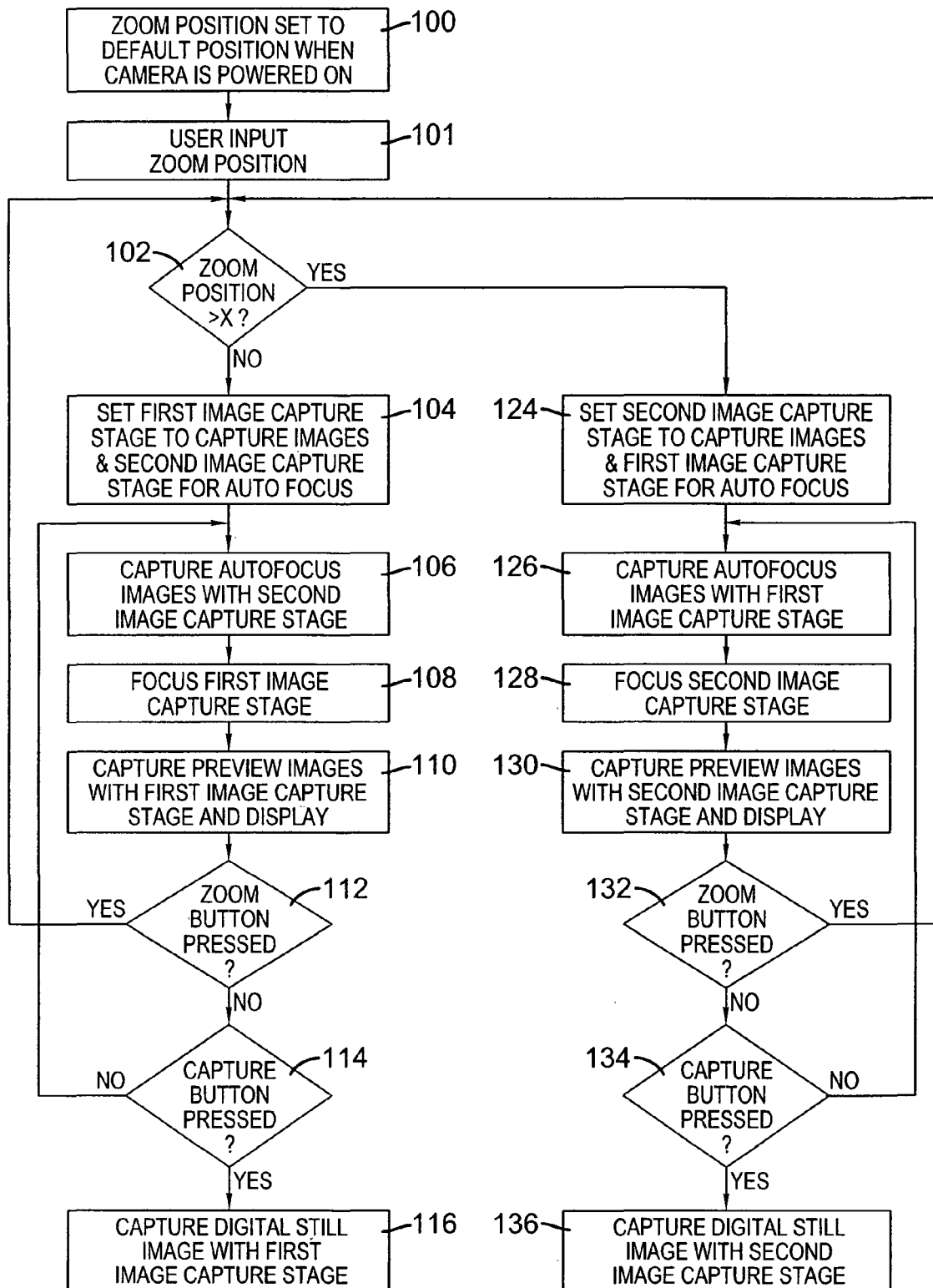


FIG. 3

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