US008934045B2

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

(10) **Patent No.: US 8,934,045 B2**
(45) **Date of Patent: Jan. 13, 2015**

(54) **DIGITAL CAMERA SYSTEM HAVING REMOTE CONTROL**

(75) Inventors: **Keith Stoll Karn**, Avon, NY (US); **Marc Krolczyk**, Spencerport, NY (US); **Kazuhiro Joza**, Saitama (JP)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 296 days.

(21) Appl. No.: **13/417,565**

(22) Filed: **Mar. 12, 2012**

(65) **Prior Publication Data**

US 2013/0235222 A1 Sep. 12, 2013

(51) **Int. Cl.**
H04N 5/222 (2006.01)
H04N 5/232 (2006.01)

(52) **U.S. Cl.**
USPC **348/333.13**; 348/333.02; 348/211.99

(58) **Field of Classification Search**
CPC H04N 5/2259; H04N 5/23206; H04N 5/2628; H04N 2101/00; H04N 5/772
USPC 348/211.99, 211.2, 211.3, 207.11
See application file for complete search history.

(56) **References Cited**

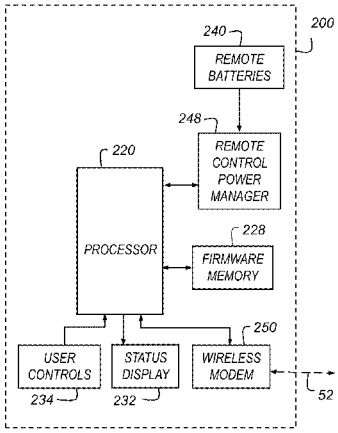
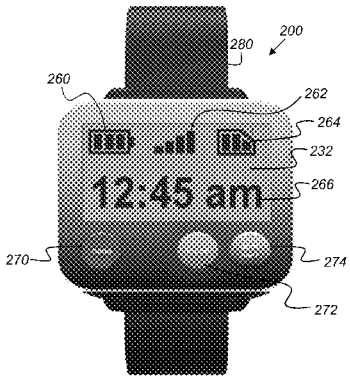
U.S. PATENT DOCUMENTS

1,258,437	A	3/1918	Nord
2,326,657	A	8/1943	Johnston
3,971,065	A	7/1976	Bayer
4,068,248	A	1/1978	Pizzuti et al.
4,314,452	A	2/1982	Waters
4,642,678	A	2/1987	Cok
4,774,574	A	9/1988	Daley et al.
5,189,511	A	2/1993	Parulski et al.
5,198,849	A	3/1993	Hurai
5,469,211	A	11/1995	Maruichi
5,493,335	A	2/1996	Parulski et al.
5,652,621	A	7/1997	Adams, Jr. et al.
5,652,935	A	7/1997	Kusaka
5,666,582	A	9/1997	Nakai et al.
5,668,597	A	9/1997	Parulski et al.
5,799,221	A	8/1998	Yamamoto et al.
5,983,035	A	11/1999	Funaki
6,192,162	B1	2/2001	Hamilton, Jr. et al.
6,288,742	B1	9/2001	Ansari et al.
6,292,218	B1	9/2001	Parulski et al.
6,545,587	B1	4/2003	Hatakeyama et al.
6,710,809	B1	3/2004	Niikawa
6,934,056	B2	8/2005	Gindele et al.
7,023,478	B2	4/2006	MalloyDesormeaux
7,046,275	B1	5/2006	Yamada
7,090,415	B2	8/2006	Griga
7,450,835	B2	11/2008	Lackey et al.
7,494,290	B2	2/2009	Kim

(Continued)

Primary Examiner — Tuan Ho
Assistant Examiner — Selam Gebriel
(74) *Attorney, Agent, or Firm* — Wong, Cabello, Lutsch, Rutherford & Brucculeri, LLP

(57) **ABSTRACT**

A digital camera system includes an image capture module and a remote control module. The image capture module includes an image capture system and a first wireless communication system. The remote control module includes a status display with one or more status display elements for displaying status information pertaining to the image capture module, a battery-operated power supply, one or more user controls, a second wireless communication, and a power management system providing a normal-power state and a low-power state. The system is configured such that when a user activates one of the user controls while the remote control module is in the low-power state the remote control module is set to operate in the normal-power state, a status inquiry is sent to the image capture module, and returned status information is displayed on the status display.

14 Claims, 8 Drawing Sheets