



US007102505B2

(12) **United States Patent**
Kates

(10) **Patent No.:** **US 7,102,505 B2**
(45) **Date of Patent:** **Sep. 5, 2006**

(54) **WIRELESS SENSOR SYSTEM**

(76) Inventor: **Lawrence Kates**, 1111 Bayside Dr.,
Corona Del Mar, CA (US) 92625

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 49 days.

4,827,244 A 5/1989 Bellavia et al.
4,862,514 A 8/1989 Kedjierski
4,871,999 A 10/1989 Ishii et al.
4,901,316 A 2/1990 Igarashi et al.
4,916,432 A 4/1990 Tice et al.
4,977,527 A 12/1990 Shaw et al.
4,996,518 A 2/1991 Takahashi et al.

(Continued)

FOREIGN PATENT DOCUMENTS

EP 346 152 A2 12/1989

(Continued)

OTHER PUBLICATIONS

"Measuring and Controlling Indoor Humidity," <http://www.relative-humidity-sensor.com>, 3 pages.

(Continued)

Primary Examiner—Davetta W. Goins
(74) Attorney, Agent, or Firm—Knobbe, Martens, Olson &
Bear, LLP

(21) Appl. No.: **10/856,390**

(22) Filed: **May 27, 2004**

(65) **Prior Publication Data**

US 2005/0275530 A1 Dec. 15, 2005

(51) **Int. Cl.**
G08B 19/00 (2006.01)

(52) **U.S. Cl.** **340/521**; 340/539.1; 340/539.24;
340/3.1; 340/3.51; 340/286.01

(58) **Field of Classification Search** 340/521,
340/539.24, 502-506, 628, 632, 514, 3.1,
340/3.4, 3.51, 3.52, 286.01, 286.05, 825.71,
340/539.1

See application file for complete search history.

(56) **References Cited**

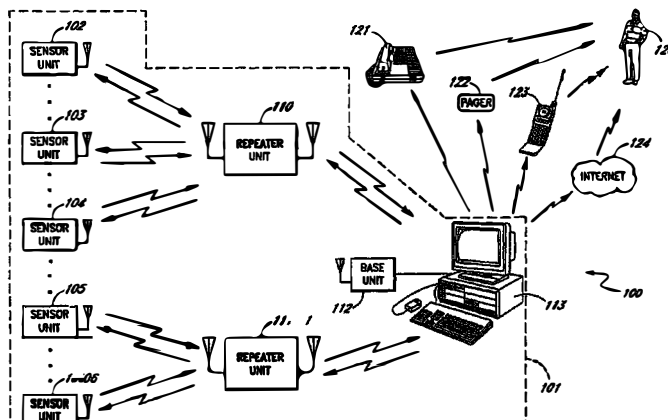
U.S. PATENT DOCUMENTS

4,099,168 A 7/1978 Kedjierski et al.
4,226,533 A 10/1980 Snowman
4,266,220 A 5/1981 Malinowski
4,400,694 A 8/1983 Wong et al.
4,420,746 A 12/1983 Malinowski
4,455,553 A 6/1984 Johnson
4,535,450 A 8/1985 Tan
4,543,570 A 9/1985 Bressert et al.
4,556,873 A 12/1985 Yamada et al.
4,652,859 A 3/1987 Van Wienen
4,661,804 A 4/1987 Abel
4,670,739 A 6/1987 Kelly, Jr.
4,675,661 A 6/1987 Ishii
4,692,742 A 9/1987 Raizen et al.
4,692,750 A 9/1987 Murakami et al.
4,727,359 A 2/1988 Yuchi et al.

(57) **ABSTRACT**

A low cost, robust, wireless sensor system that provides an extended period of operability without maintenance is described. The system includes one or more intelligent sensor units and a base unit that can communicate with a large number of sensors. When one or more of the sensors detects an anomalous condition (e.g., smoke, fire, water, etc.) the sensor communicates with the base unit and provides data regarding the anomalous condition. The base unit can contact a supervisor or other responsible person by a plurality of techniques, such as, telephone, pager, cellular telephone, Internet, etc. In one embodiment, one or more wireless repeaters are used between the sensors and the base unit to extend the range of the system and to allow the base unit to communicate with a larger number of sensors.

29 Claims, 8 Drawing Sheets



Emerson Exhibit 1022

U.S. PATENT DOCUMENTS

5,134,644 A 7/1992 Garton et al.
 5,138,562 A 8/1992 Shaw et al.
 5,151,683 A 9/1992 Takahashi et al.
 5,159,315 A 10/1992 Schultz et al.
 5,168,262 A 12/1992 Okayama
 5,260,687 A 11/1993 Yamauchi et al.
 5,267,180 A 11/1993 Okayama
 5,281,951 A 1/1994 Okayama
 5,319,698 A 6/1994 Glidewell et al.
 5,400,246 A 3/1995 Wilson et al.
 5,430,433 A 7/1995 Shima
 5,432,500 A 7/1995 Scripps
 5,530,433 A 6/1996 Morita
 5,568,121 A 10/1996 Lamensdorf
 5,574,435 A 11/1996 Mochizuki
 5,627,515 A 5/1997 Anderson
 5,736,928 A 4/1998 Tice et al.
 5,889,468 A 3/1999 Banga
 5,907,491 A * 5/1999 Canada et al. 700/108
 5,949,332 A 9/1999 Kim
 6,049,273 A 4/2000 Hess
 6,060,994 A 5/2000 Chen
 6,075,451 A 6/2000 Lebowitz et al.
 6,078,050 A 6/2000 Castleman
 6,078,269 A 6/2000 Markwell et al.
 6,084,522 A 7/2000 Addy
 6,097,288 A 8/2000 Koeppel, Jr.
 6,215,404 B1 4/2001 Morales
 6,320,501 B1 11/2001 Tice et al.
 6,380,860 B1 4/2002 Goetz
 6,420,973 B1 7/2002 Acevedo

6,437,692 B1 * 8/2002 Petite et al. 340/540
 6,441,731 B1 8/2002 Hess
 6,445,292 B1 9/2002 Jen et al.
 6,515,283 B1 2/2003 Castleman et al.
 6,553,336 B1 4/2003 Johnson et al.
 6,583,720 B1 6/2003 Quigley
 6,759,956 B1 * 7/2004 Menard et al. 340/539.19
 2002/0011570 A1 1/2002 Castleman
 2002/0186141 A1 12/2002 Jen et al.
 2003/0058093 A1 3/2003 Dohi et al.
 2003/0199247 A1 10/2003 Striemer

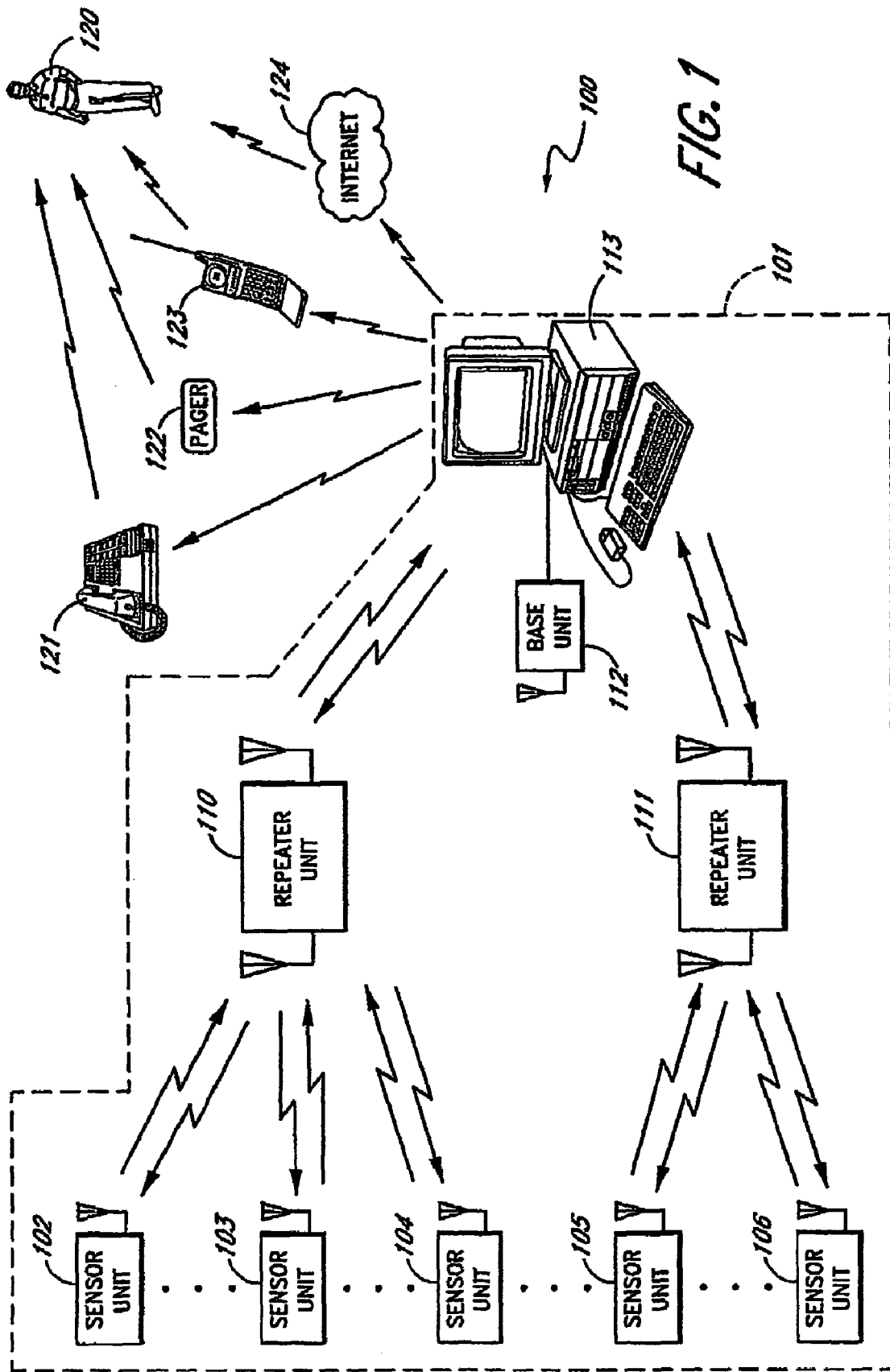
FOREIGN PATENT DOCUMENTS

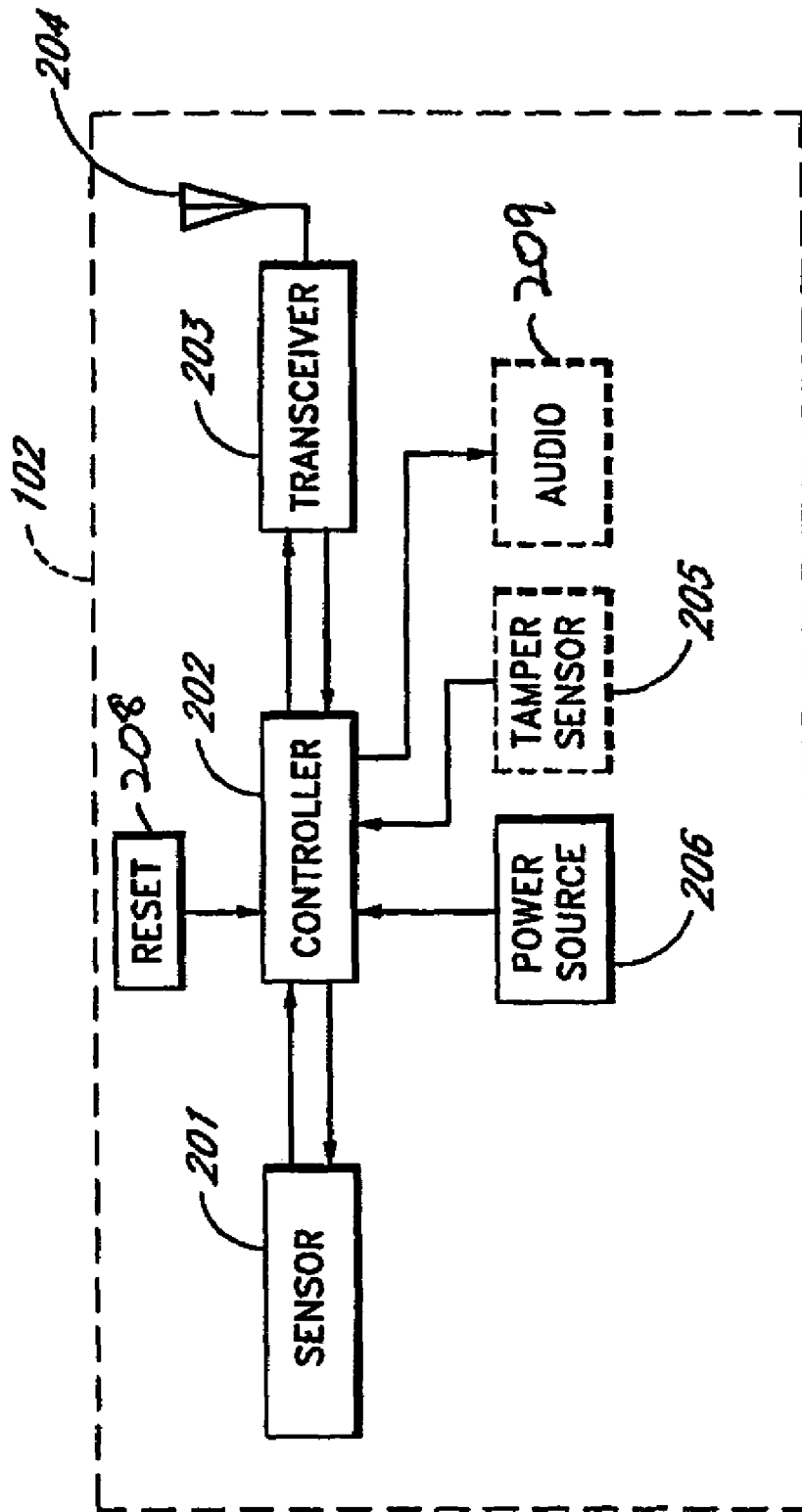
EP 0 346 152 A3 12/1989
 WO WO 00/21047 A1 4/2000

OTHER PUBLICATIONS

"Impedance Moisture Sensor Technology," <http://www.sensorland.com/HowPage029.html>, 2 pages.
 "Relative Humidity Information," www.relative-humidity-sensor.com/relative-humidity.html, 6 pages.
 "Ways to Prevent Mold Problems," <http://www.toxic-black-mold-info.com/prevent.html>, 12 pages.
 "G-Cap™ 2 Relative Humidity Sensor," <http://www.globalspec.com/FeaturedProducts/Detail?ExhibitID=1454>, 2 pages.
 Texas Instruments, Inc., Product catalog for "TRF6901 Single-Chip RF Transceiver," Copyright 2001-2003, 27 pages.
 Texas Instruments, Inc., Mechanical Data for "PT (SPQFP-G48) Plastic Quad Flatpack," 2 pages.

* cited by examiner





SENSOR UNIT

FIG. 2

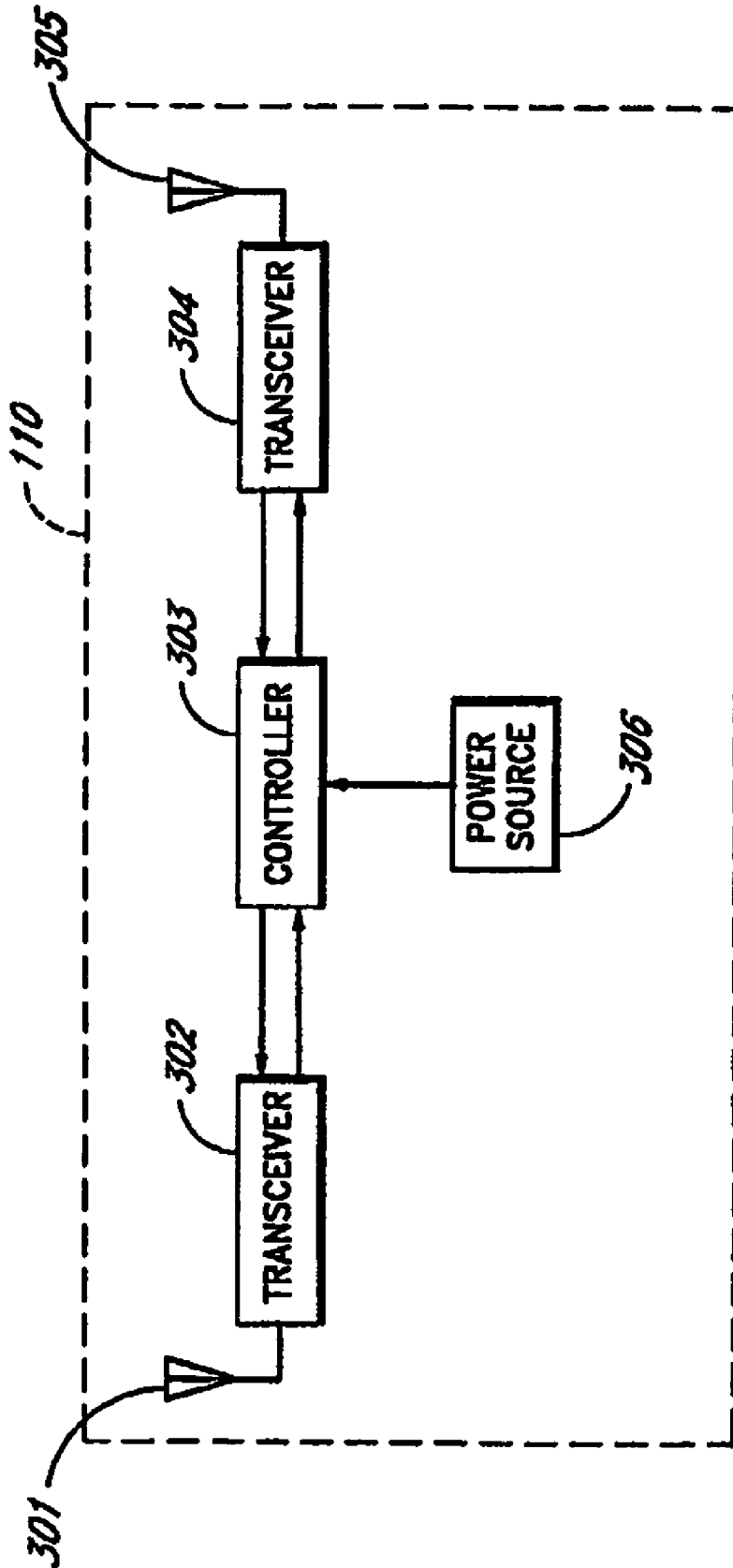


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