



US006864780B2

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

(10) **Patent No.:** **US 6,864,780 B2**
(45) **Date of Patent:** **Mar. 8, 2005**

(54) **DATA TRANSMISSION SYSTEM USING A HUMAN BODY AS A SIGNAL TRANSMISSION PATH**

5,811,897 A 9/1998 Spaude et al.
6,223,018 B1 * 4/2001 Fukumoto et al. 455/41.1
6,324,053 B1 * 11/2001 Kamijo 361/683
6,350,129 B1 * 2/2002 Gorlick 439/37

(75) Inventors: **Kenji Doi**, Nara (JP); **Masaru Hashimoto**, Osaka (JP); **Masaki Koyama**, Osaka (JP); **Yoshiko Suzuki**, Moriguchi (JP); **Tokuhisa Nishimura**, Shijonawate (JP)

FOREIGN PATENT DOCUMENTS

EP 0 843 425 5/1998
JP 61-46639 3/1986
JP 10-229357 8/1998
JP 2001-77735 3/2001
WO WO 87/03119 5/1987
WO WO 96/36134 11/1996

(73) Assignee: **Matsushita Electric Works, Ltd.**, Kadoma (JP)

* cited by examiner

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 390 days.

Primary Examiner—Michael Horabik
Assistant Examiner—Scott Au
(74) *Attorney, Agent, or Firm*—Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

(21) Appl. No.: **09/948,638**

(22) Filed: **Sep. 10, 2001**

(65) **Prior Publication Data**

US 2002/0030585 A1 Mar. 14, 2002

(30) **Foreign Application Priority Data**

Sep. 8, 2000 (JP) 2000-272984

(51) **Int. Cl.**⁷ **G08B 29/00**; H04B 1/00; G08C 19/00

(52) **U.S. Cl.** **340/5.64**; 340/825.72

(58) **Field of Search** 340/565, 5; 341/176

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,591,854 A 5/1986 Robinson
5,062,232 A * 11/1991 Eppler 42/70.11
5,796,827 A 8/1998 Coppersmith et al.

(57) **ABSTRACT**

A data transmission system using a human body as a signal transmission path includes a transmitter and a receiver. The transmitter uses a pair of electrodes which are held in close proximity to the skin of the human body. The transmitter transmits data to the receiver through the signal transmission path partly extending through the human body when a user carrying the transmitter touches a touch electrode of the receiver. The electrodes are integrated into a garment worn by the user in such a manner that the electrodes are kept in a closely facing relation to the skin of the user, thereby establishing the electrical path extending through the human body. With the integration of the two electrodes into the garment, the user wearing the garment as an everyday clothes or uniform can be easy and convenient to carry the transmitter for successful transmission of the data.

7 Claims, 6 Drawing Sheets

