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United States Patent [19] Hancock

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[54] **ELECTRONIC AUTOROUTING NAVIGATION SYSTEM FOR VISUALLY IMPAIRED PERSONS**

2 661 607 11/1991 France .
WO 95/04440 2/1995 WIPO .

OTHER PUBLICATIONS

[75] Inventor: **Michael B. Hancock**, Galveston, Tex.

Yewman, "The Seeing-Eye Box," *Biomedical Inquiry*, The University of Texas Medical Branch at Galveston, Spring 1996.

[73] Assignee: **Board of Regents The University of Texas System**, Austin, Tex.

[21] Appl. No.: **699,580**

Primary Examiner—Michael Zanelli
Assistant Examiner—Edward Pipala
Attorney, Agent, or Firm—Arnold, White & Durkee

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[51] **Int. Cl.⁶** **G01C 21/00; G06F 165/00**

[52] **U.S. Cl.** **701/209; 701/211**

[58] **Field of Search** 364/443, 444.1,
364/444.2, 448, 449.2, 449.3, 449.5; 701/200,
201, 202, 206, 208, 209, 211

[57] ABSTRACT

[56] References Cited

U.S. PATENT DOCUMENTS

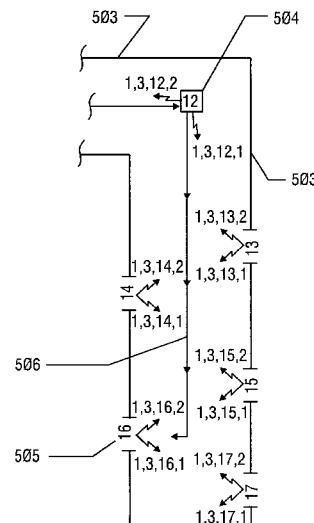
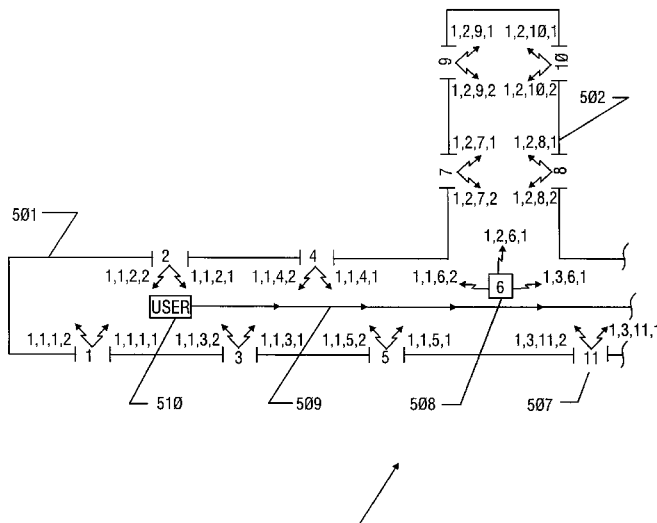
| | | | |
|-----------|---------|----------------|------------|
| 3,104,478 | 9/1963 | Strauss et al. | 35/25 |
| 3,718,896 | 2/1973 | Mowat | 340/1 R |
| 4,025,922 | 5/1977 | Trawick, III | 343/6.5 LC |
| 4,045,799 | 8/1977 | Dapiran | 343/113 PT |
| 4,119,811 | 10/1978 | Moricca et al. | 340/407 |
| 4,193,689 | 3/1980 | Reymond et al. | 356/152 |
| 4,648,710 | 3/1987 | Ban et al. | 356/4 |
| 4,660,022 | 4/1987 | Osaka | 340/407 |
| 4,904,993 | 2/1990 | Sato | 340/825.57 |
| 4,935,907 | 6/1990 | Friedman | 367/118 |
| 5,032,083 | 7/1991 | Friedman | 434/112 |
| 5,032,836 | 7/1991 | Ono et al. | 340/325.71 |
| 5,067,081 | 11/1991 | Person | 364/444 |
| 5,144,294 | 9/1992 | Alonzi et al. | 340/825.49 |
| 5,214,410 | 5/1993 | Verster | 340/572 |
| 5,406,491 | 4/1995 | Lima | 364/449 |
| 5,487,669 | 1/1996 | Kelk | 434/112 |
| 5,508,699 | 4/1996 | Silverman | 340/944 |
| 5,600,706 | 2/1997 | Dunn et al. | 379/59 |

The present invention is an autorouting navigation system for directing one or more visually impaired persons to a physical location. The present invention includes a portable autorouting navigation unit that includes an input device for selecting a target location corresponding to a physical location of a plurality of location beacons, a receiver configured to receive signals from the location beacons, a memory storing information correlating the locations of the location beacons, and an output device for communicating with the user. A microcontroller or microprocessor under program control processes the signals received from the location beacons, analyzes those signals and correlation data, and determines a routing path from the user's present position to the target location. The microcontroller may also provide an indication, such as an audible sound, to the user of whether or not the user is following the routing path to the target location. Significantly, the present invention relies upon beacons that send out location and direction information without being polled by the portable unit determines a routing path that allows for autorouting. Beacons may also be organized in groups of beacons that can correlate to geographical landmarks such as hallways in a building to reduce the size of the correlating data stored in the memory of the portable unit and thereby reduce processing time.

FOREIGN PATENT DOCUMENTS

0 338 997 10/1989 European Pat. Off. .

15 Claims, 10 Drawing Sheets



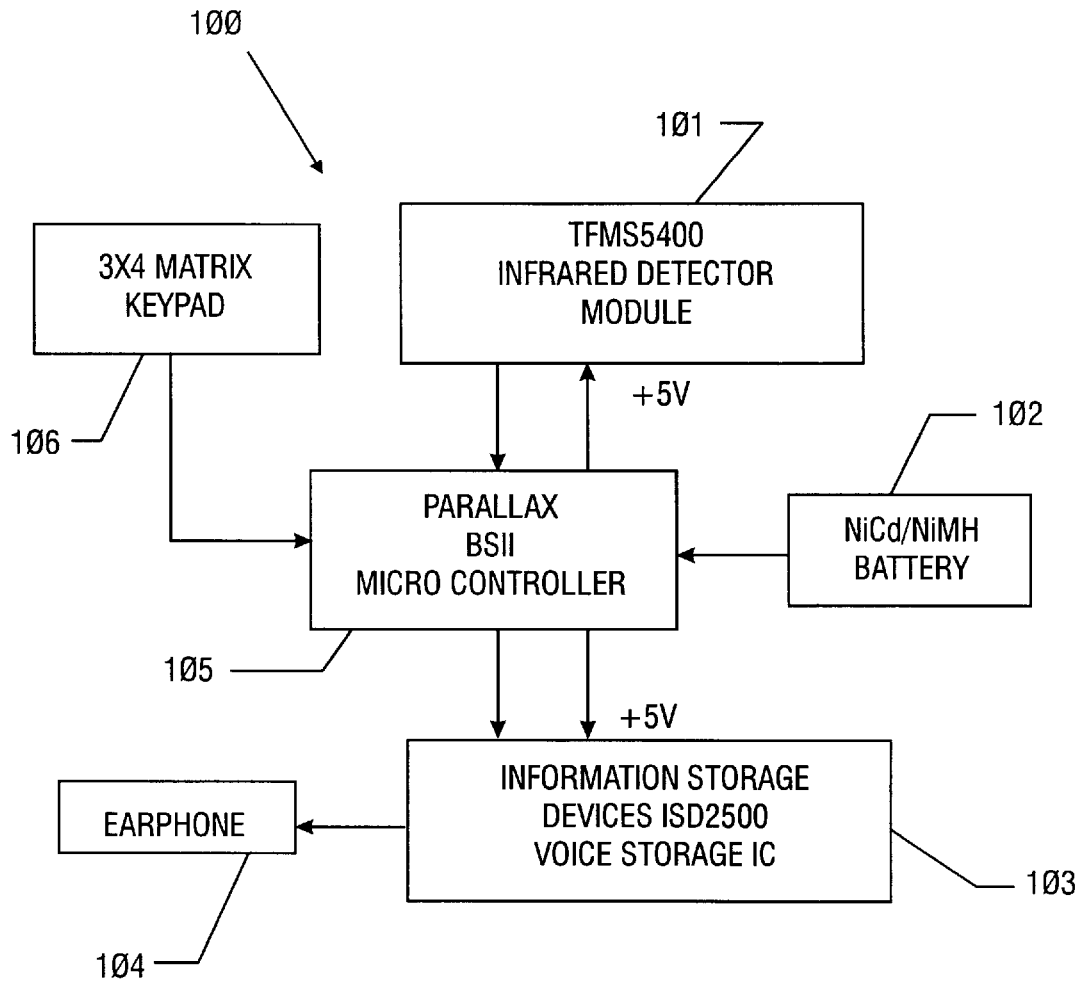


FIG. 1A

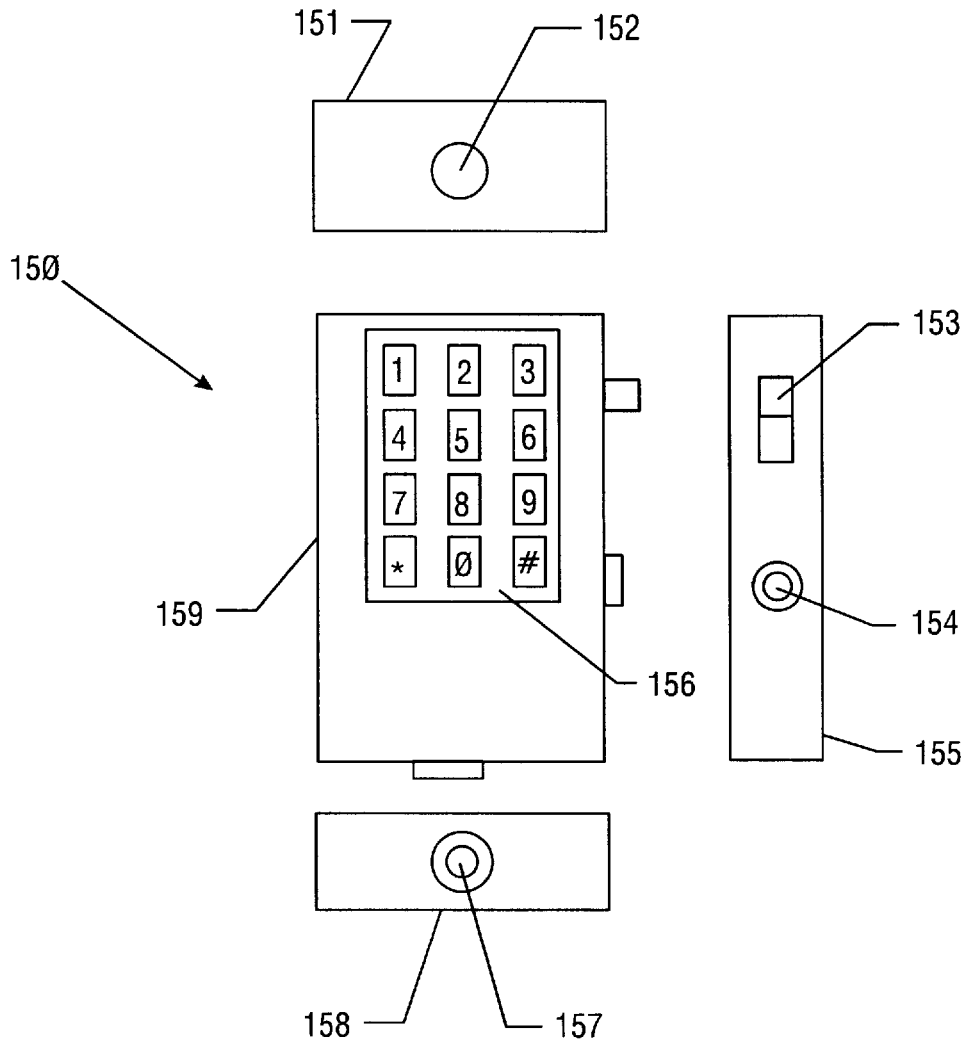


FIG. 1B

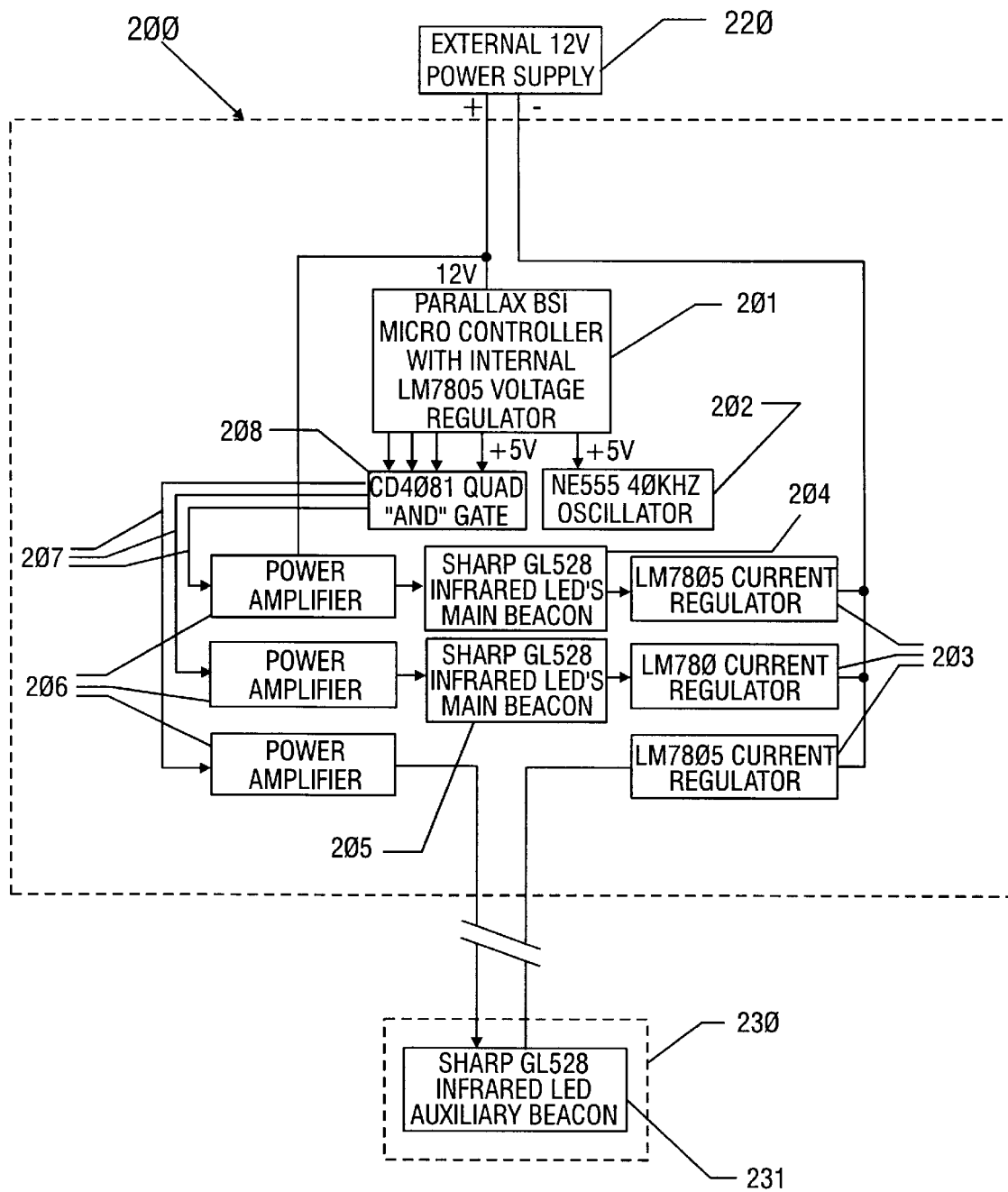


FIG. 2A

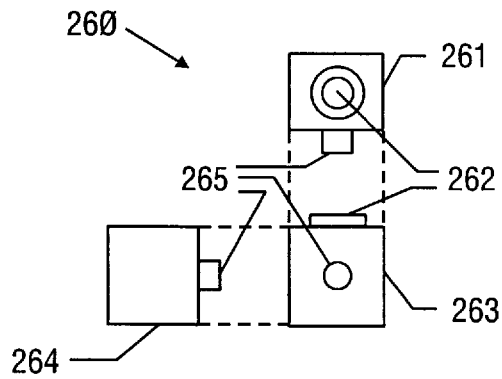
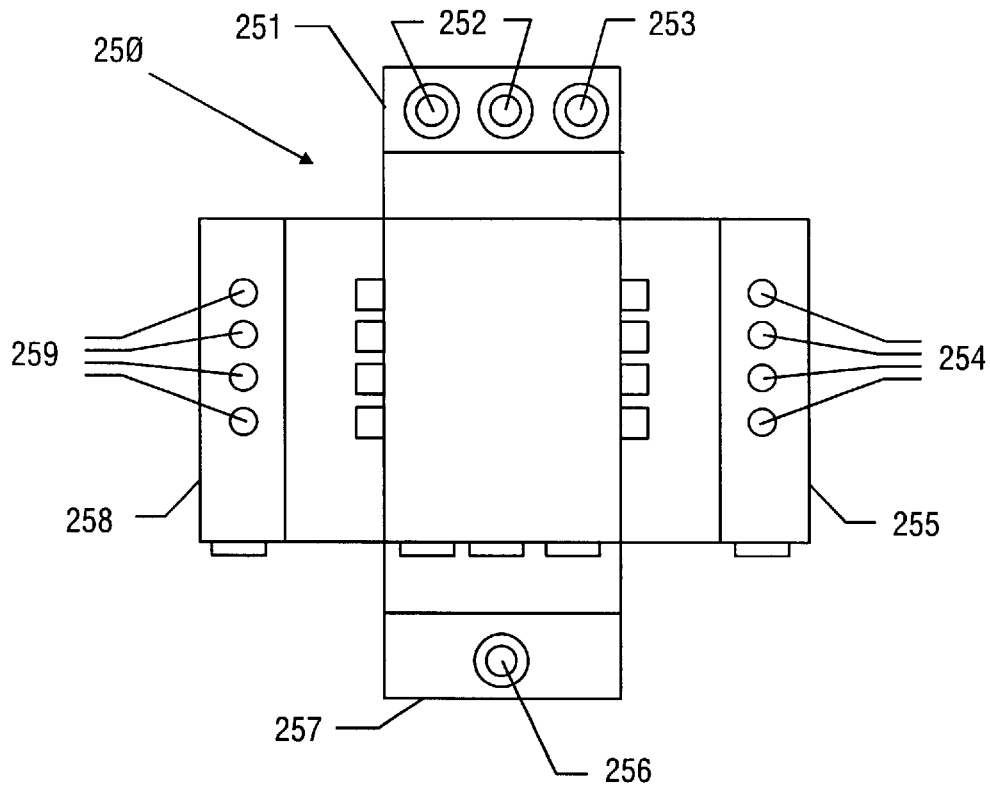


FIG. 2B

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