

[54] **DEAD RECKONING NAVIGATIONAL SYSTEM USING ACCELEROMETER TO MEASURE FOOT IMPACTS**

4,991,126 2/1991 Reiter 364/561
 5,117,301 5/1992 Tsumura 359/154
 5,117,444 5/1992 Sutton et al. 377/24.2
 5,367,458 11/1994 Roberts et al. 364/424.02
 5,485,402 1/1996 Smith et al. 354/566

[75] Inventors: **Robert W. Levi, Anaheim; Thomas Judd, Fountain Valley, both of Calif.**

OTHER PUBLICATIONS

Meijer, et al., *Methods to Assess Physical Activity with Special Reference to Motion Sensors and Accelerometers*, IEEE Transactions on Biomedical Engineering, Mar. 1991, vol. 38, No. 3, pp. 221-229.
 "American Practical Navigator", originally by N. Bowditch, L.L.D., 1966—Corrected Print, published by the U.S. Navy Hydrographic Office.

[73] Assignee: **Point Research Corporation, Santa Ana, Calif.**

Primary Examiner—Michael Zanelli
 Attorney, Agent, or Firm—Price, Gess & Ubell

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[51] Int. Cl.⁶ **G01C 22/00**

[52] U.S. Cl. **364/450; 364/443; 364/460**

[58] Field of Search 364/449, 450,
 364/452, 460, 454, 443; 235/105; 340/944;
 73/490

[57] **ABSTRACT**

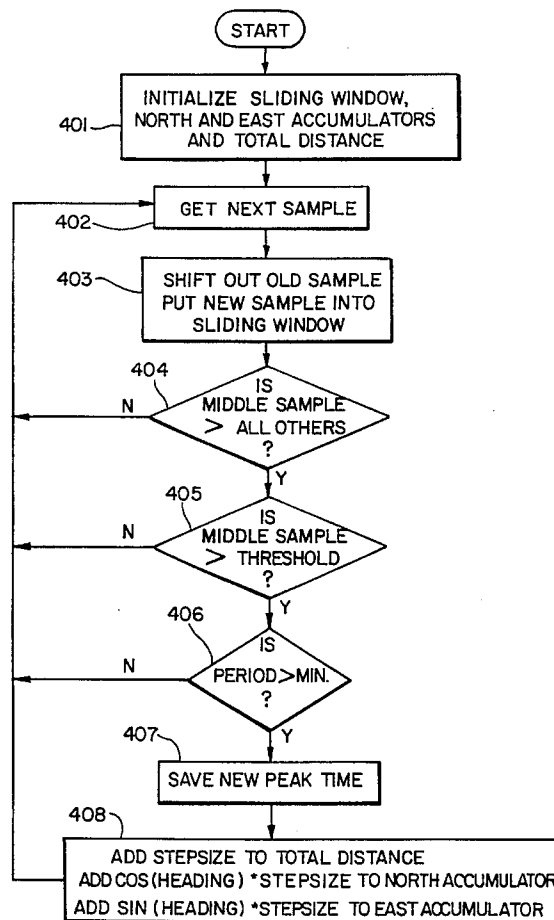
A microcomputer-assisted position finding system that integrates GPS data, dead reckoning sensors, and digital maps into a low-cost, self-contained navigation instrument is disclosed. A built-in radio frequency transponder allows individual positions to be monitored by a central coordinating facility. Unique dead reckoning sensors and features are disclosed for ground speed/distance measurement and computer-aided position fixes.

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,635,399 1/1972 Dahlquist et al. 235/105
 3,797,010 3/1974 Adler et al. 340/323
 3,901,086 8/1975 Griffiths et al. 73/490
 4,053,755 10/1977 Sherrill 364/561
 4,149,417 4/1979 Griffiths et al. 73/490
 4,409,992 10/1983 Sidorenko et al. 128/782

15 Claims, 8 Drawing Sheets



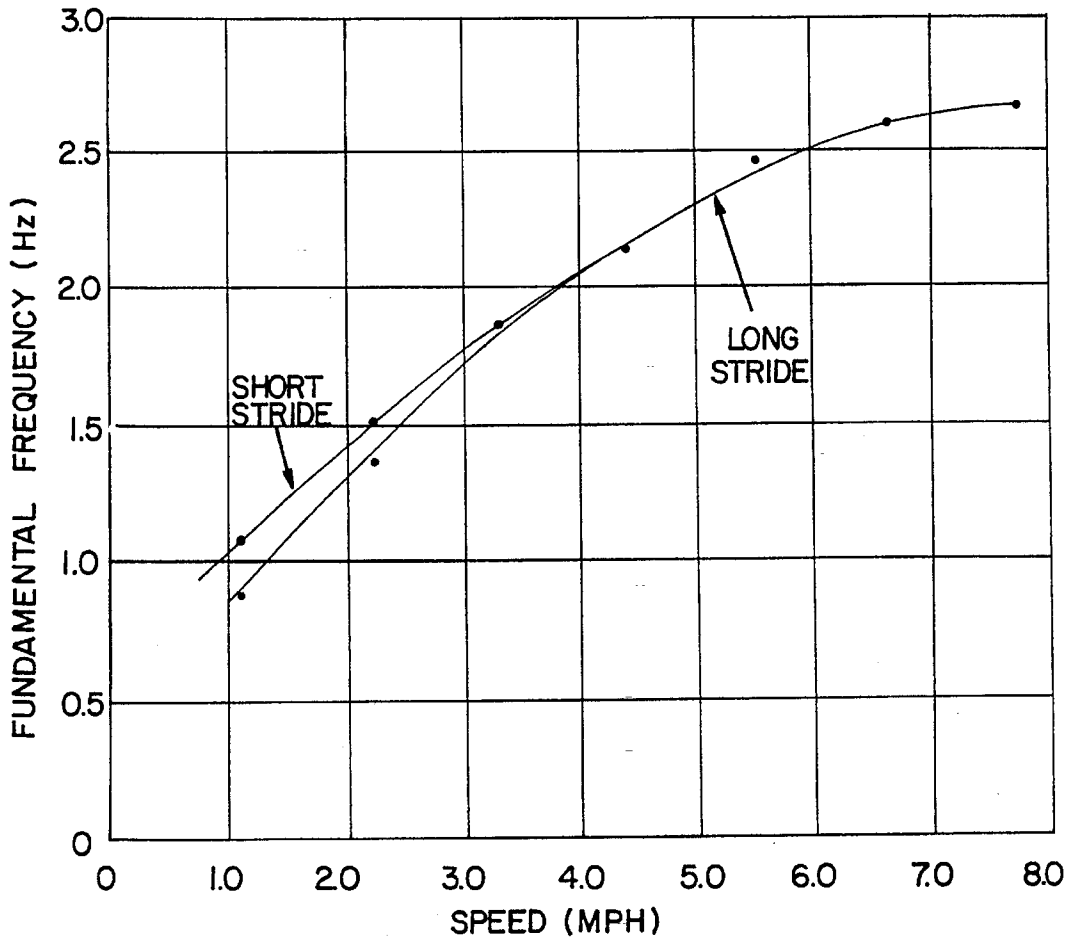


FIG. 1

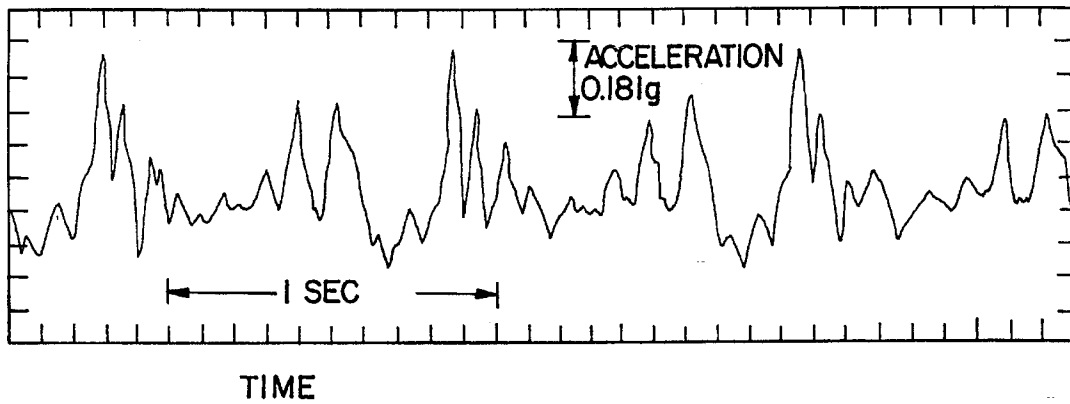


FIG. 2

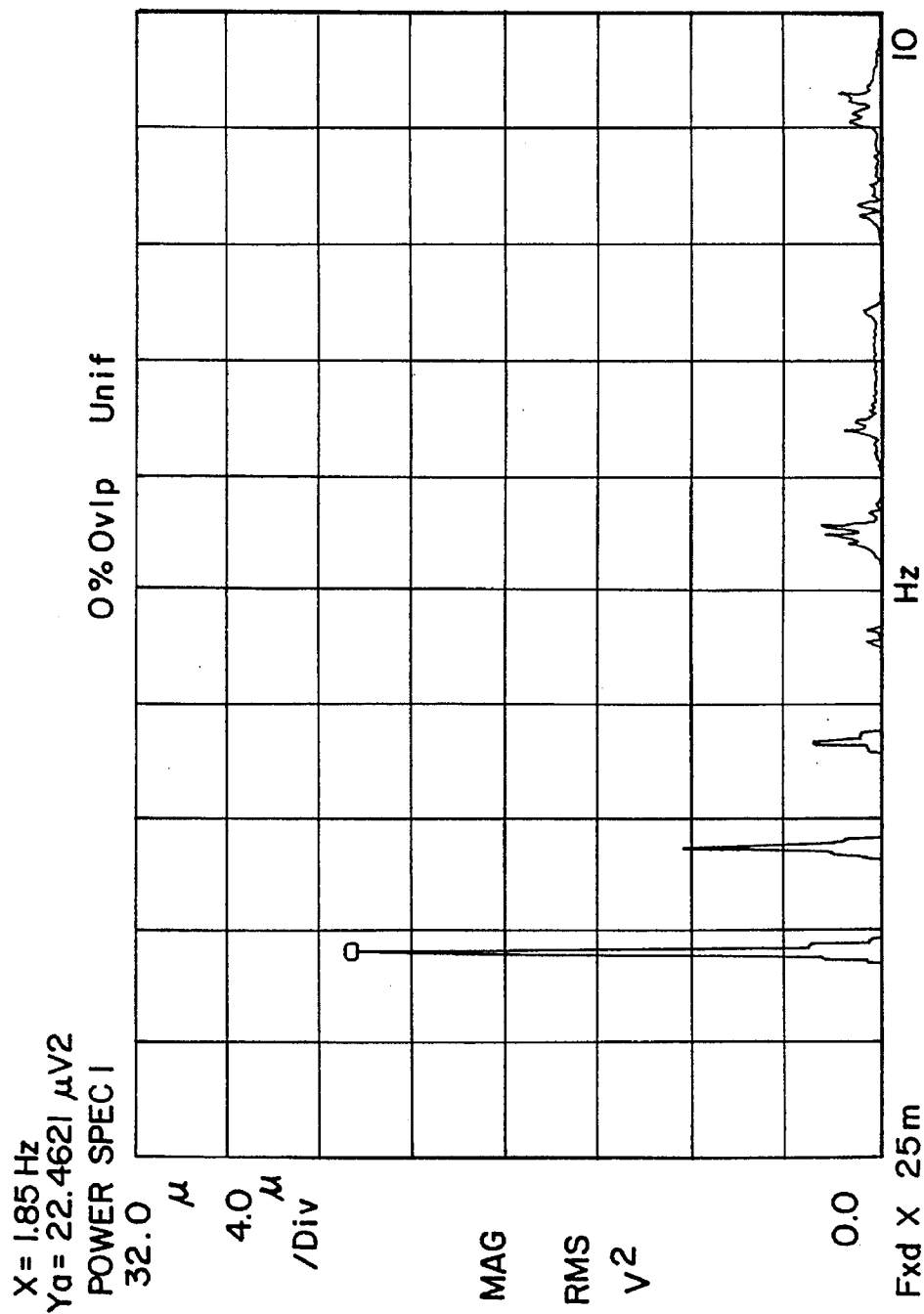


FIG. 3

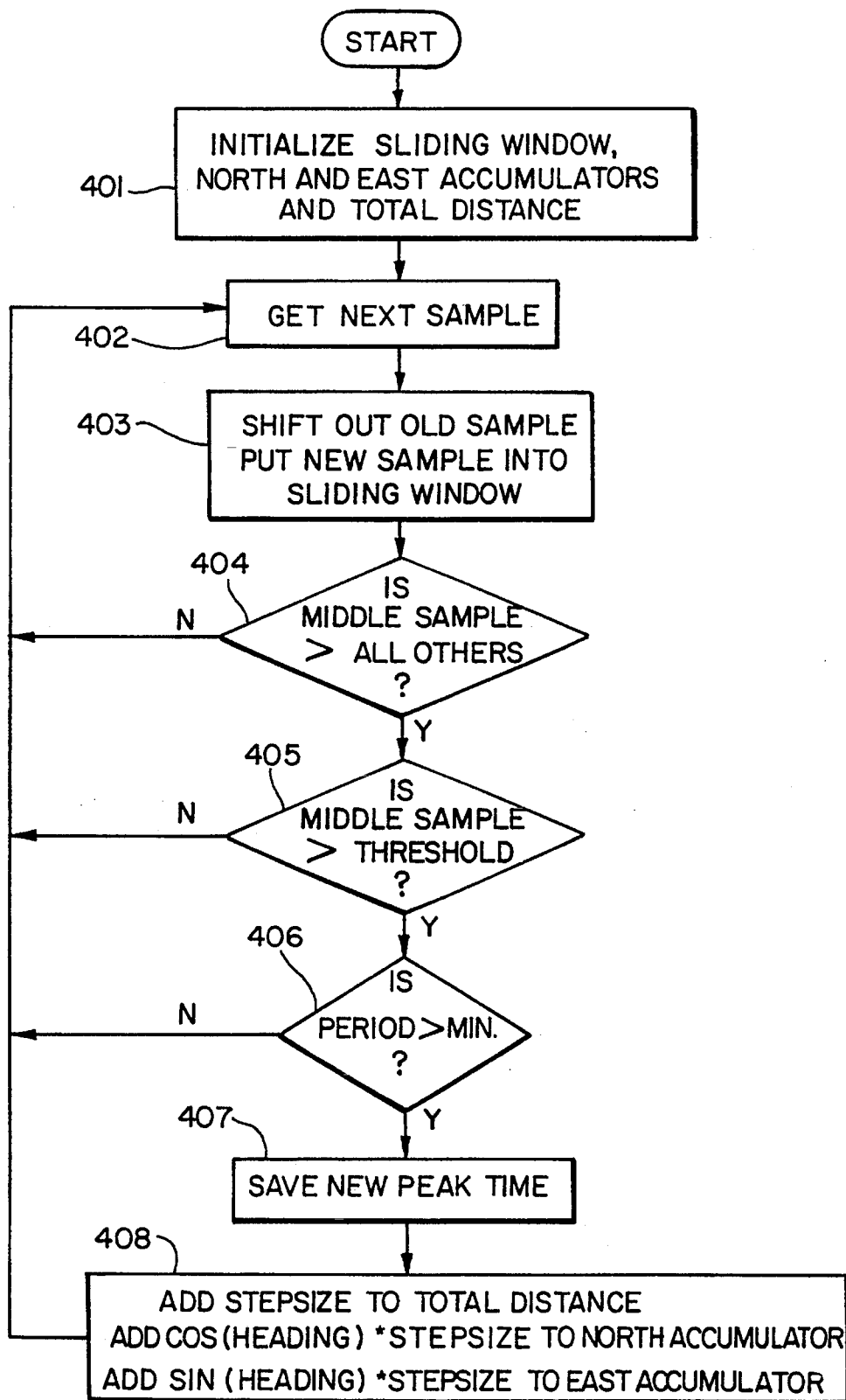


FIG. 4

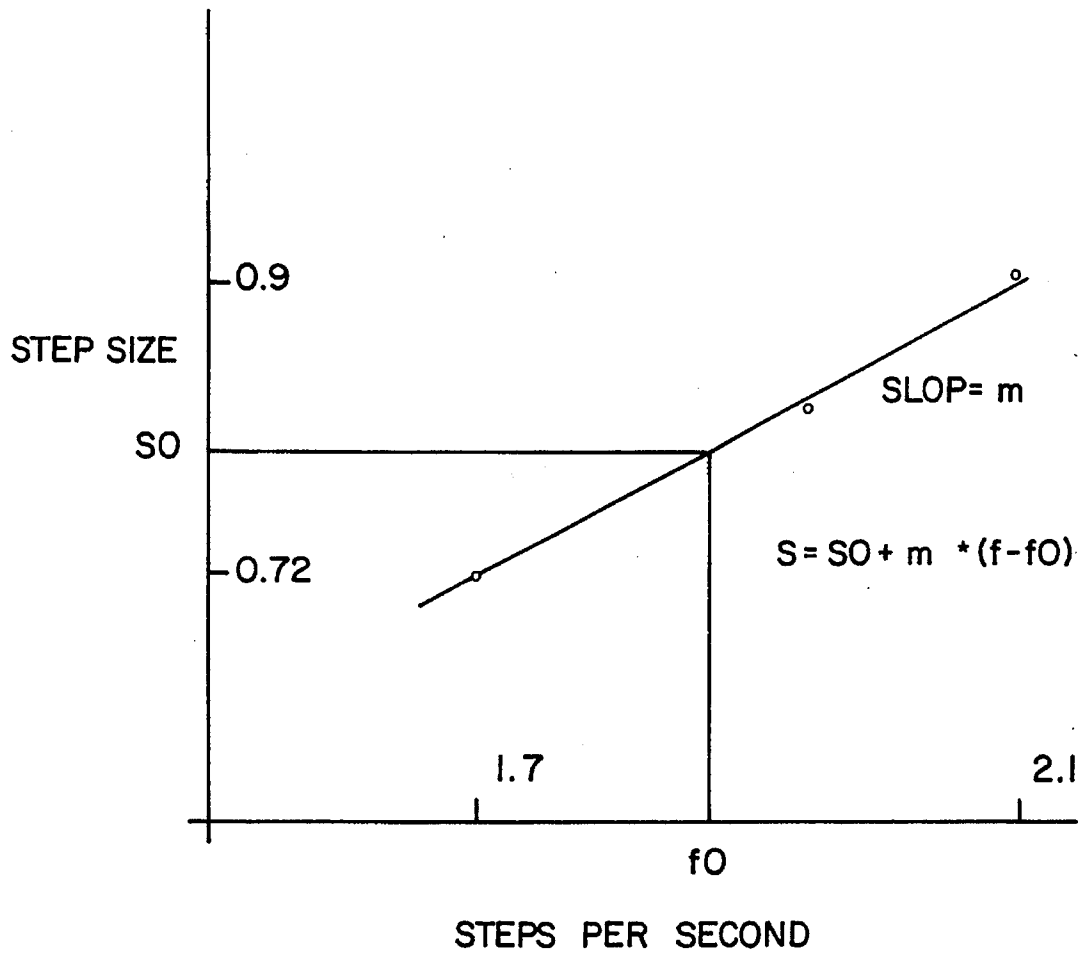


FIG. 5

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