# United States Patent [19]

## Levi et al.

[11] **Patent Number:** 5,583,776

[45] **Date of Patent:** 

Dec. 10, 1996

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

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

[21] Appl. No.: 405,087

[22] Filed: Mar. 16, 1995

[56]

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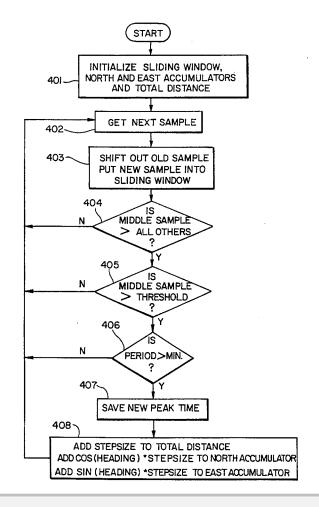
"American Practical Navigator", originally by N. Bowditch, LL.D., 1966—Corrected Print, published by the U.S. Navy Hydrographic Office.

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

### 7] ABSTRACT

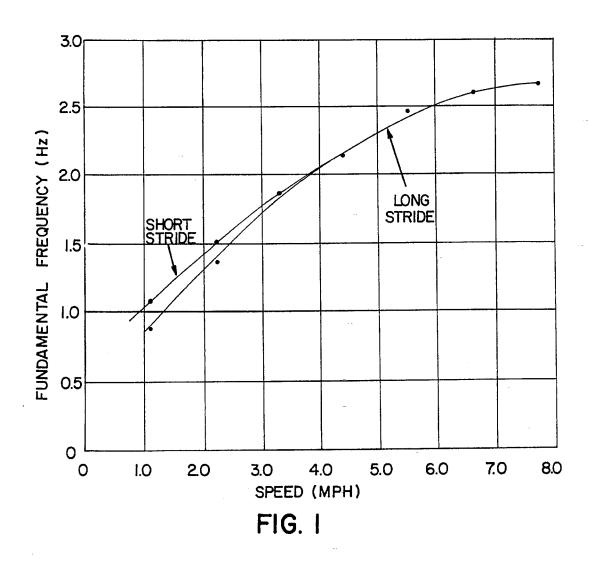
A microcomputer-assisted position finding system that integrates GPS data, dead reckoning sensors, and digital maps into a low-cost, self-contained navigation instrument is disclosed. A built-in radio frequency transponder allows individual positions to be monitored by a central coordinating facility.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

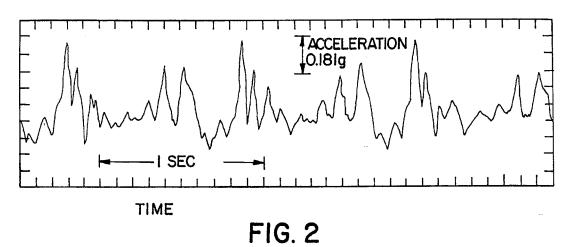
## 15 Claims, 8 Drawing Sheets



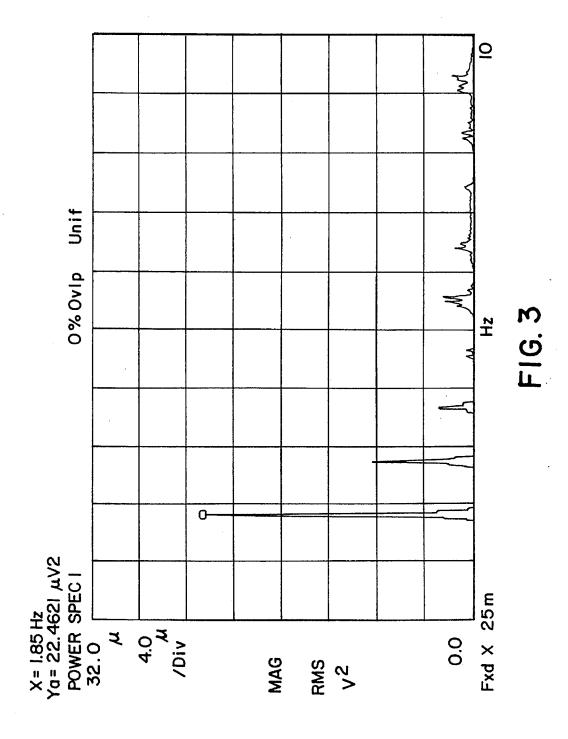


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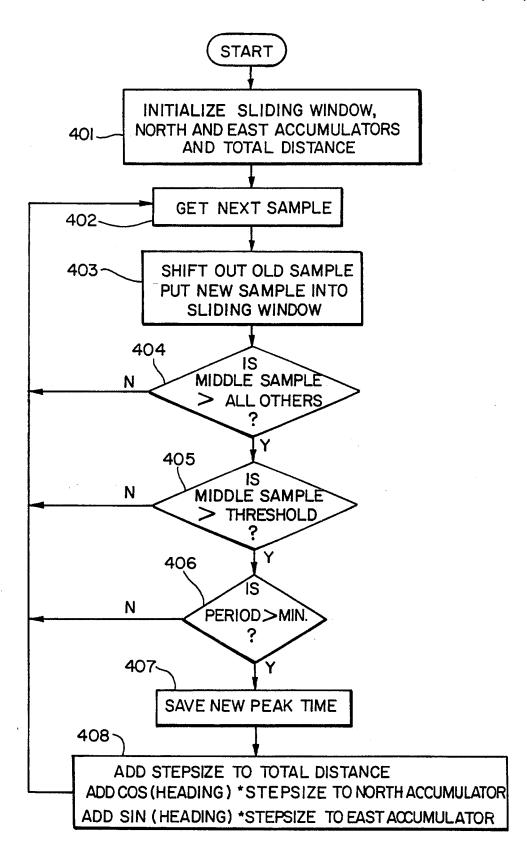


FIG. 4



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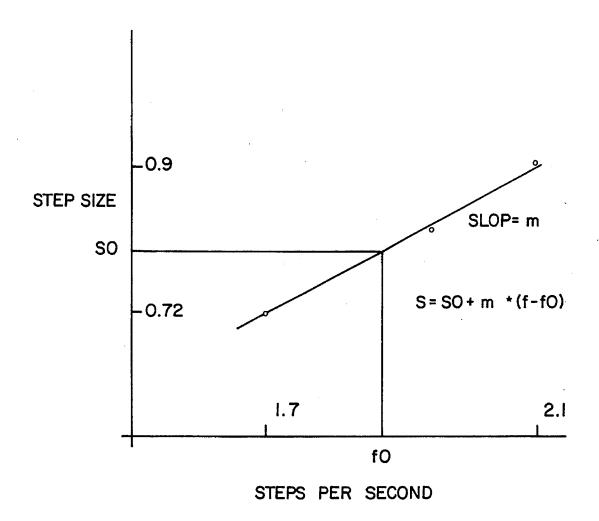


FIG. 5

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