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# United States Patent [19] Hutchings

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- [54] **SYSTEM AND METHOD FOR MEASURING MOVEMENT OF OBJECTS**
- [76] Inventor: **Lawrence J. Hutchings**, 18729 Brickell Way, Castro Valley, Calif. 94546
- [21] Appl. No.: **570,759**
- [22] Filed: **Dec. 12, 1995**
- [51] Int. Cl.<sup>6</sup> ..... **G01C 22/00**
- [52] U.S. Cl. .... **364/565; 364/410; 364/561; 340/323 R; 235/105**
- [58] **Field of Search** ..... **364/410, 449, 364/450, 561, 565, 569, 556, 559, 143, 443, 460; 128/670, 779; 482/8, 3, 74, 902; 342/52; 324/171; 340/384.71, 323 R; 377/24, 24.2; 73/490; 235/105**

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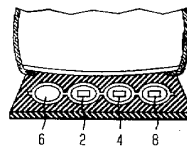
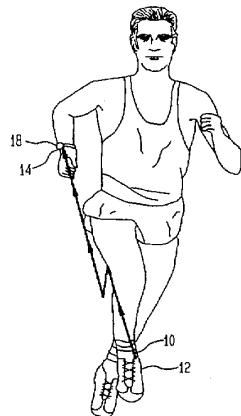
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### [57] ABSTRACT

A device that measures the distance traveled, speed, and height jumped of a person while running or walking. Accelerometers and rotational sensors are placed in the sole of one shoe along with an electronic circuit that performs mathematical calculations to determine the distance and height of each step. A radio frequency transmitter sends the distance and height information to a wristwatch or other central receiving unit. A radio frequency receiver in the wristwatch or other unit is coupled to a microprocessor that calculates an output speed based upon step-distance and elapsed time, and the distance traveled of the runner from the sum of all previous step distances. The output of the microprocessor is coupled to a display that shows the distance traveled, speed, or height jumped of the runner or walker.

22 Claims, 5 Drawing Sheets



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FIG. 1

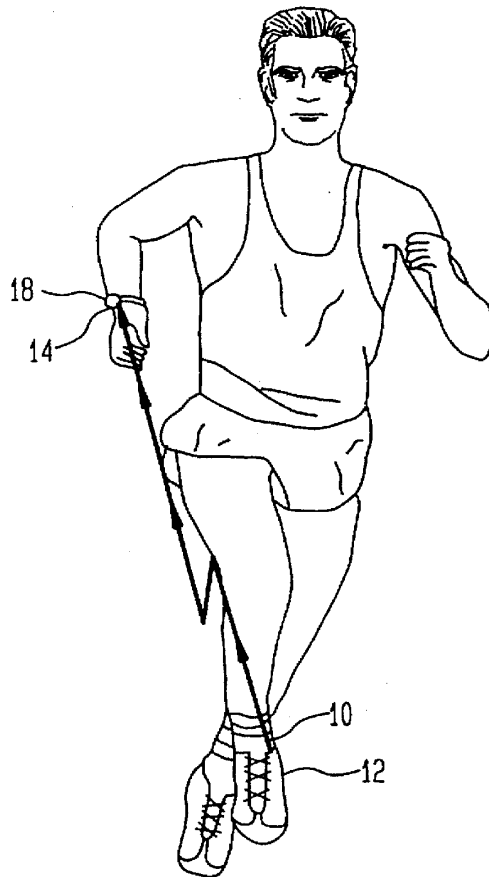


FIG. 2

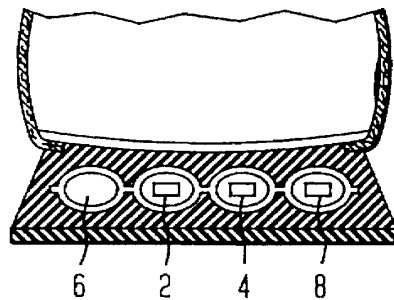


FIG. 3

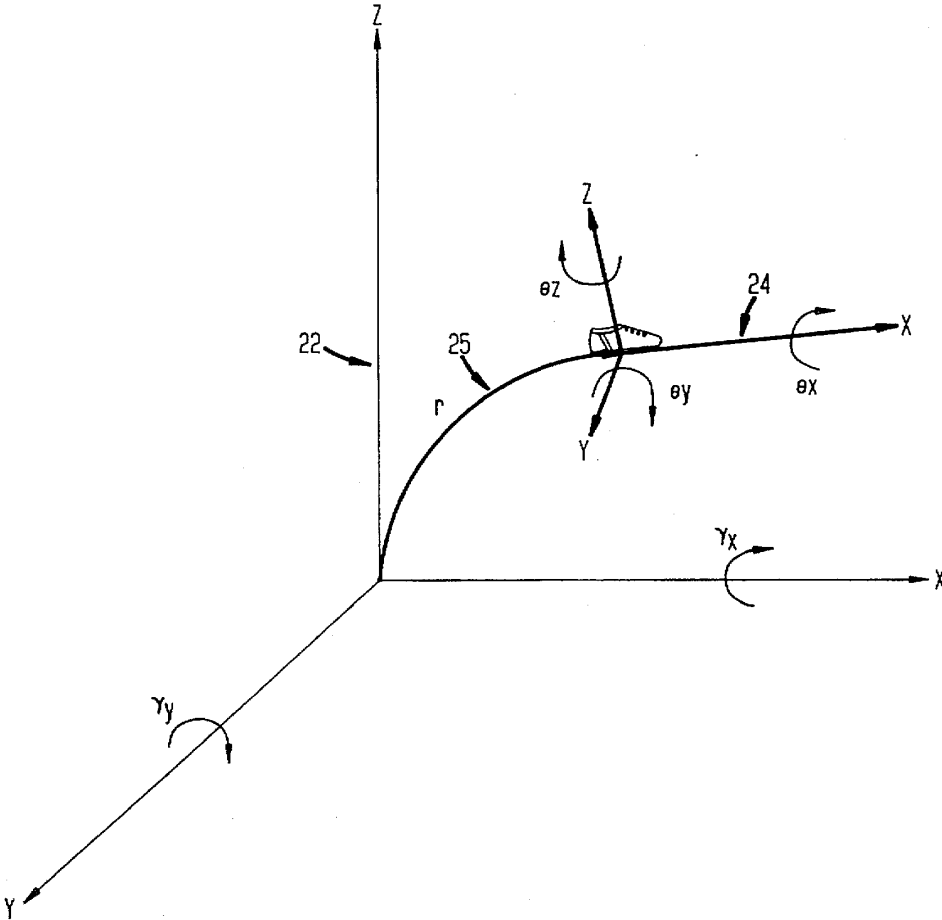
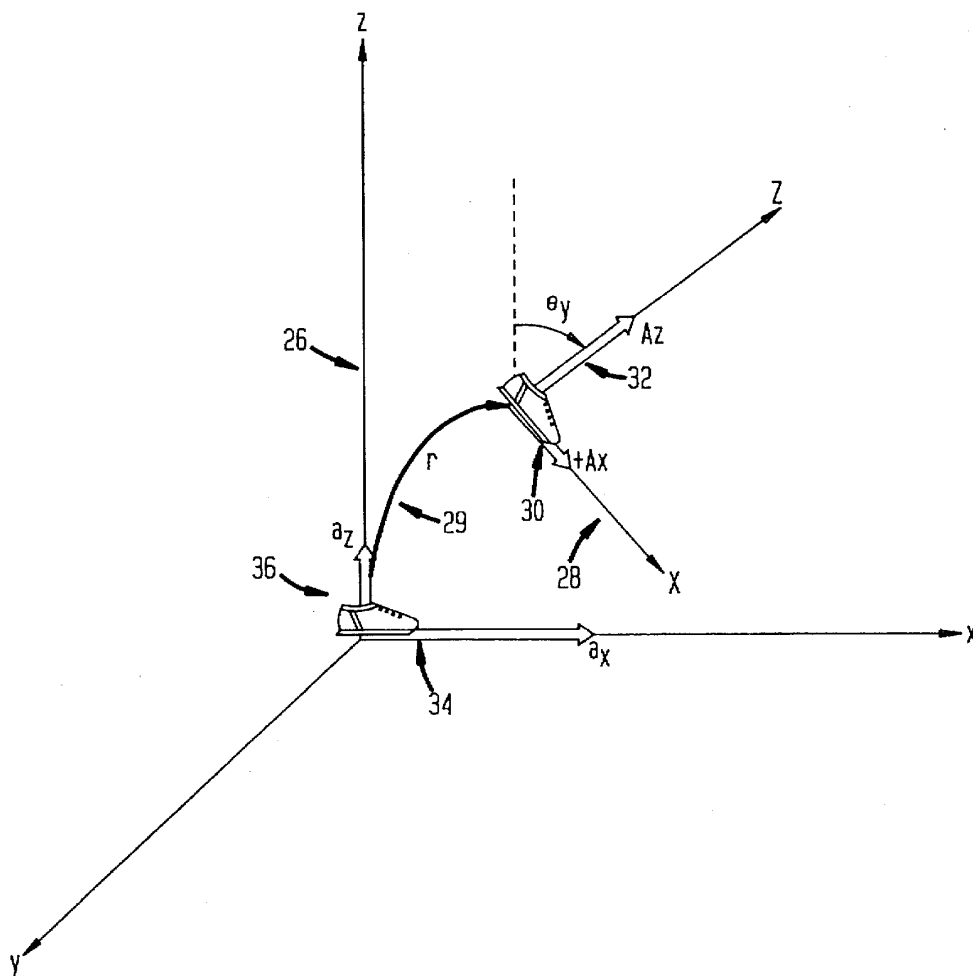


FIG. 4



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