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United States Patent [19]

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Hutchings

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[54] **SYSTEM AND METHOD FOR MEASURING MOVEMENT OF OBJECTS**

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[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/877,342**

[22] Filed: **Jun. 17, 1997**

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Related U.S. Application Data

[63] Continuation-in-part of application No. 08/570,759, Dec. 12, 1995, Pat. No. 5,724,265.

[51] **Int. Cl.⁶** **G01C 22/00**

[52] **U.S. Cl.** **702/145; 702/141; 702/142; 702/149; 702/146; 364/143**

[58] **Field of Search** 340/323 R, 384.71; 235/105; 364/143, 410.1; 128/779; 482/3, 8, 74, 902; 342/52; 324/171; 377/24.5, 24.2; 73/490; 702/101, 149, 141-142, 146, 147, 166

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Primary Examiner—James P. Trammell

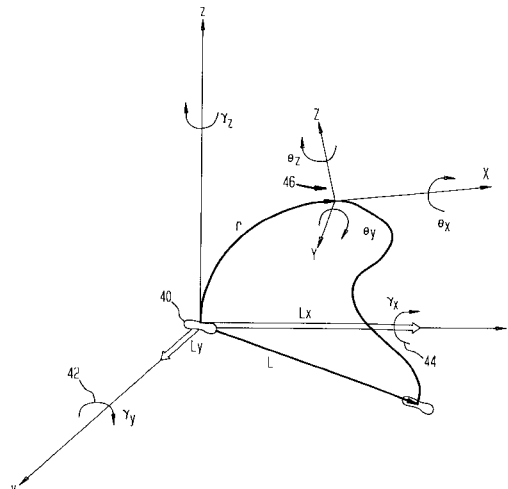
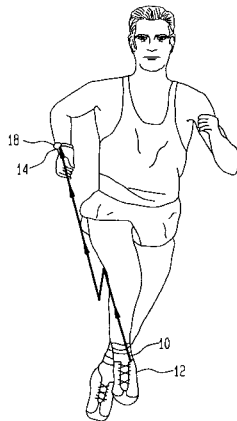
Assistant Examiner—Cuong H Nguyen

Attorney, Agent, or Firm—Sofer & Haroun, LLP

[57] ABSTRACT

A device that measures the distance traveled, speed, and height jumped of a moving object or a person while running or walking. Accelerometers and rotational sensors are placed in the object or in the sole of one shoe, or in a wrist watch or the waist of the user, along with an electronic circuit that performs mathematical calculations to determine the distance and height. A microprocessor calculates an output speed based upon step-distance and elapsed time, and the distance traveled from the sum of all previous steps. The output of the microprocessor is coupled to a display that shows the distance traveled, speed, or height jumped.

35 Claims, 7 Drawing Sheets



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FIG. 1

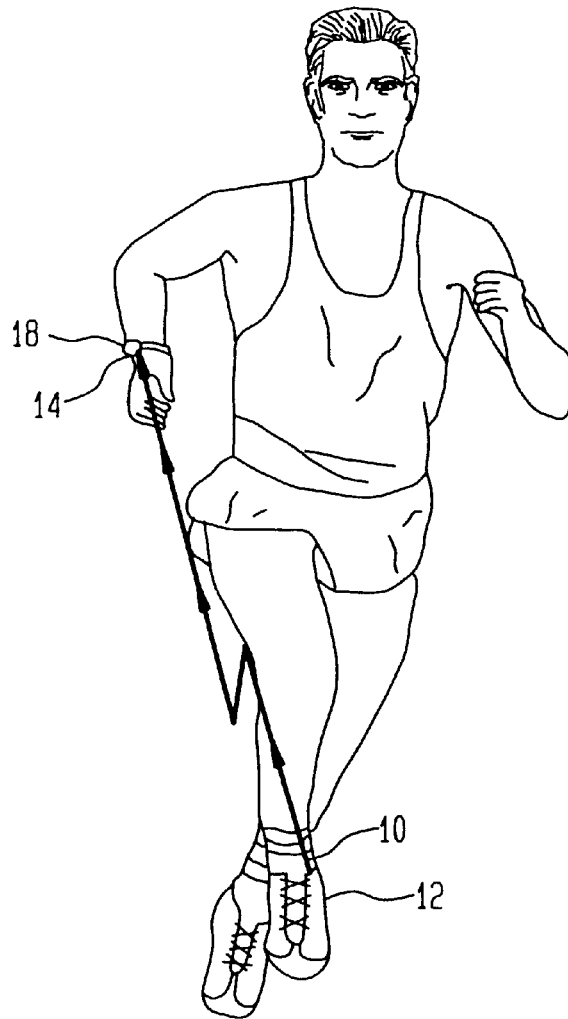


FIG. 2

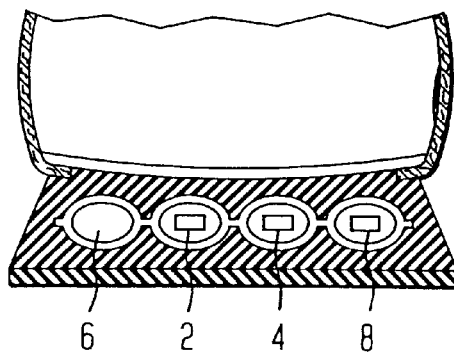


FIG. 3

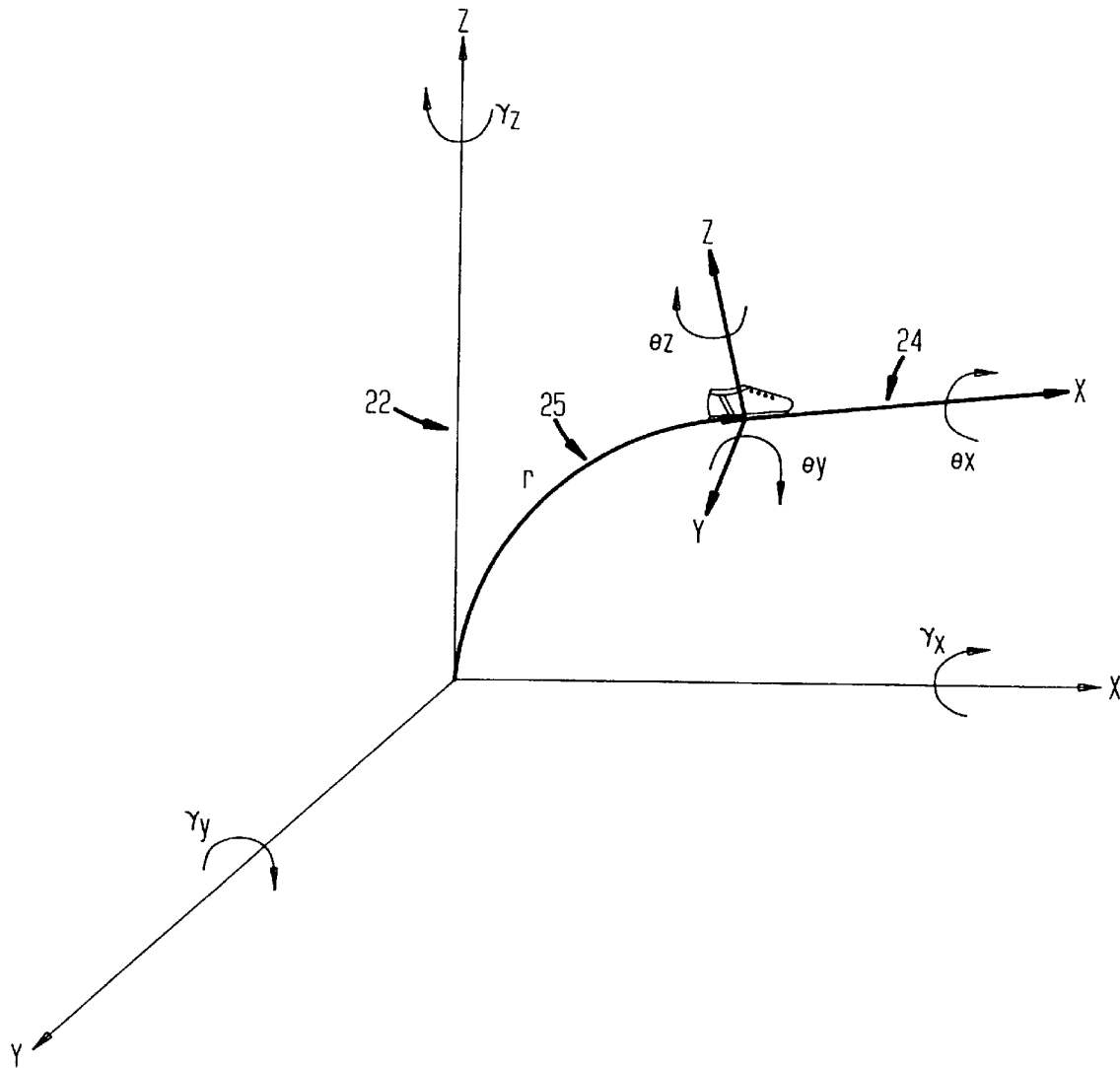
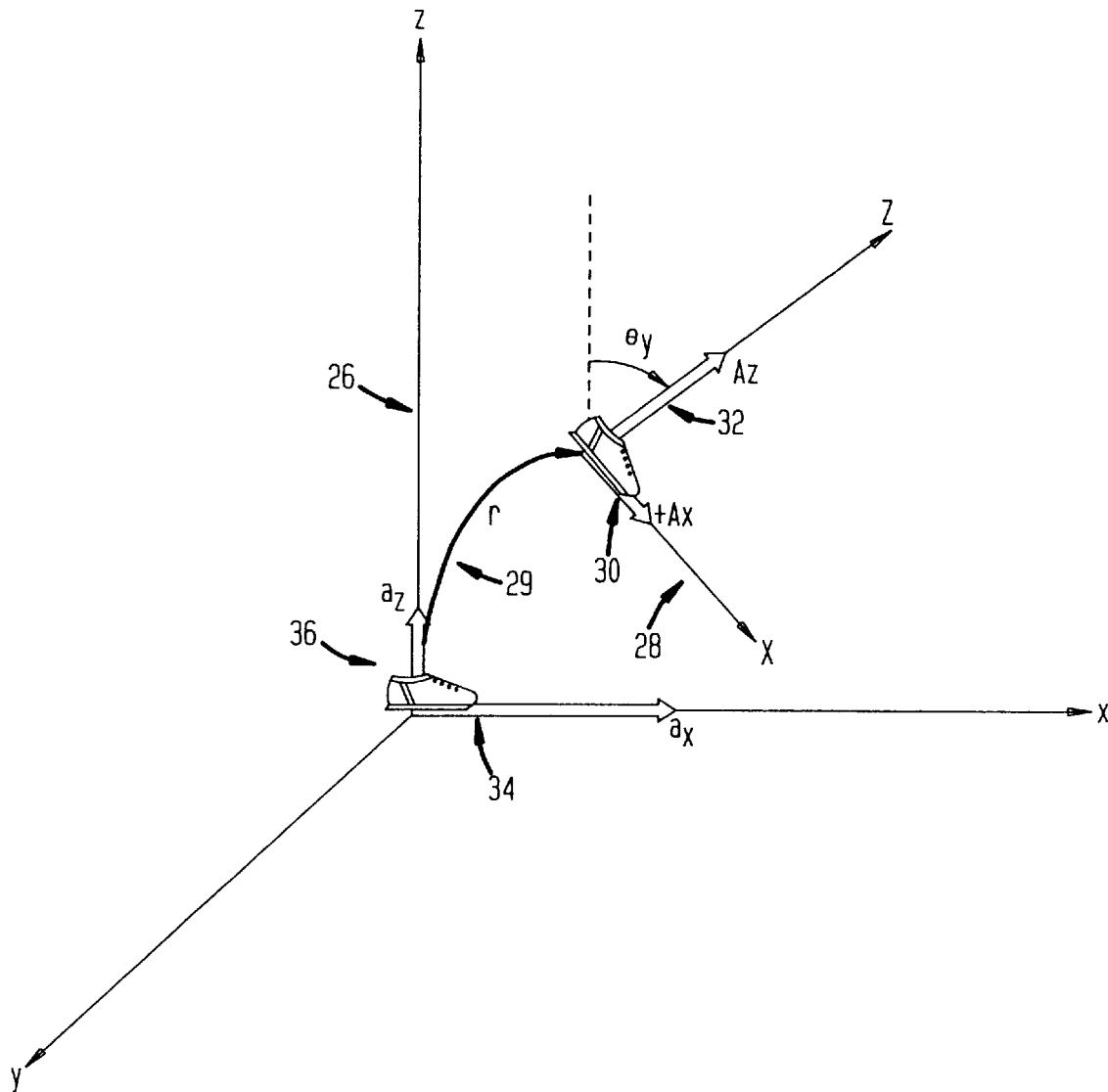


FIG. 4



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