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(12) **United States Patent**  
**Pasolini et al.**

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(54) **PEDOMETER DEVICE AND STEP  
DETECTION METHOD USING AN  
ALGORITHM FOR SELF-ADAPTIVE  
COMPUTATION OF ACCELERATION  
THRESHOLDS**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 3 days.

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(21) Appl. No.: **11/537,933**

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*Primary Examiner*—Michael P Nghiem

(65) **Prior Publication Data**

(74) *Attorney, Agent, or Firm*—Lisa K. Jorgenson; Dennis M. de Guzman; Seed IP Law Group PLLC

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(30) **Foreign Application Priority Data**

(57) **ABSTRACT**

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In a pedometer device for detecting and counting steps of a user on foot, an accelerometer sensor detects a vertical acceleration generated during the step. A processing unit, connected to the accelerometer sensor, processes an acceleration signal relating to the acceleration in order to detect the occurrence of a step, and in particular compares the acceleration signal with a first reference threshold. The processing unit automatically adapts the first reference threshold as a function of the acceleration signal. In particular, the processing unit modifies the first reference threshold as a function of an envelope of the amplitude of the acceleration signal.

(51) **Int. Cl.**  
**G01C 22/00** (2006.01)

(52) **U.S. Cl.** ..... **702/160**

(58) **Field of Classification Search** ..... 702/141,  
702/150–154, 158, 160; 600/595; 73/490,  
73/510

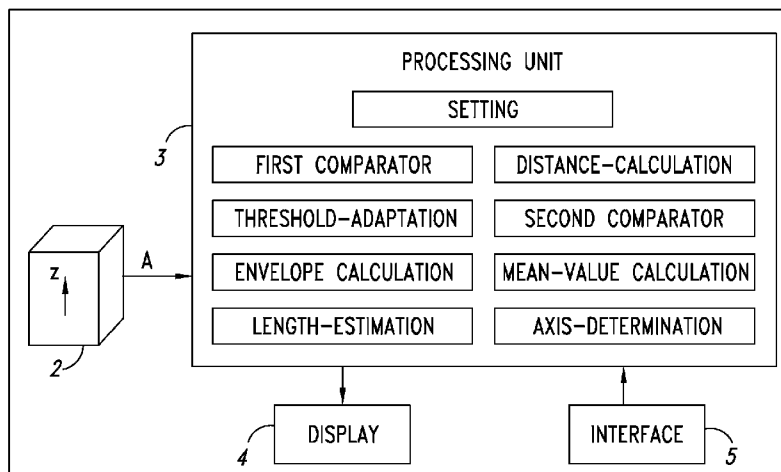
See application file for complete search history.

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**30 Claims, 5 Drawing Sheets**



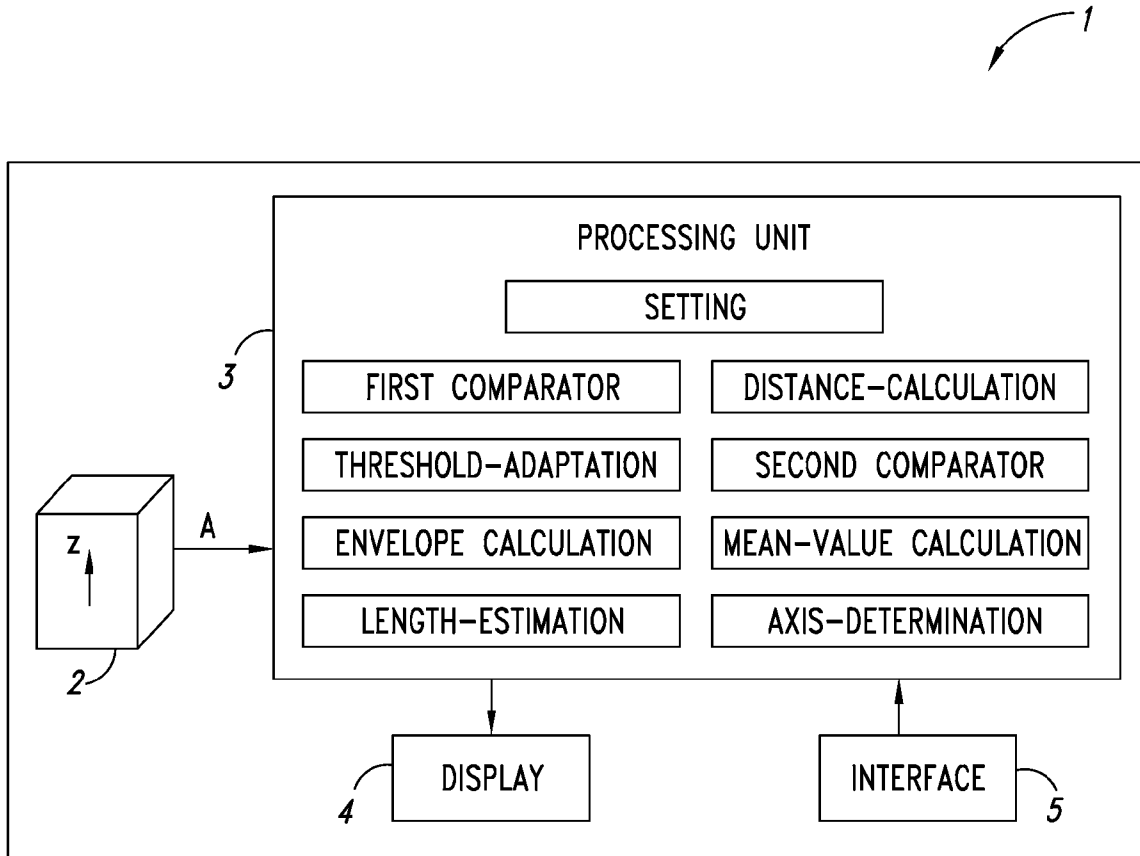


FIG. 1

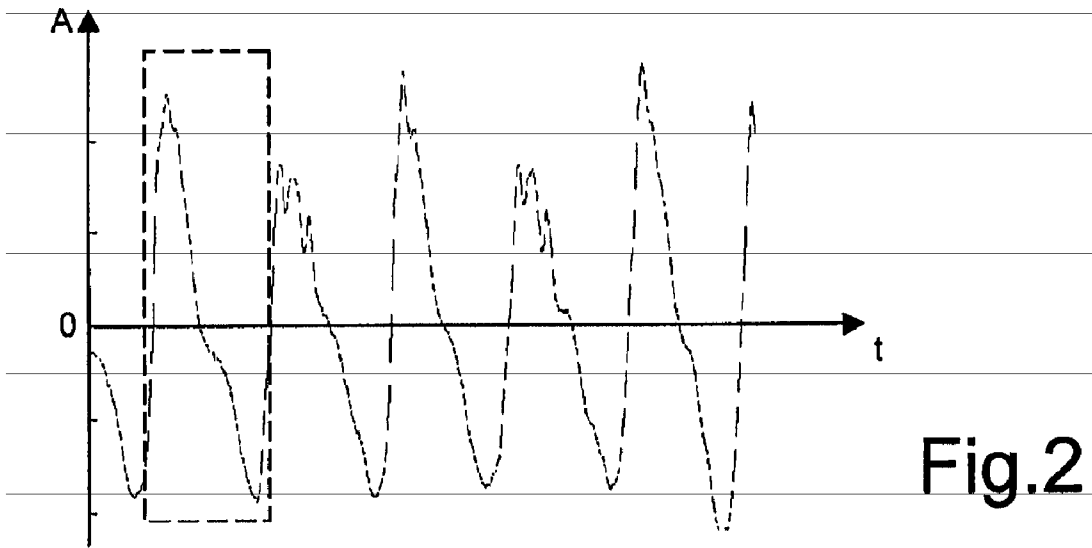


Fig.2

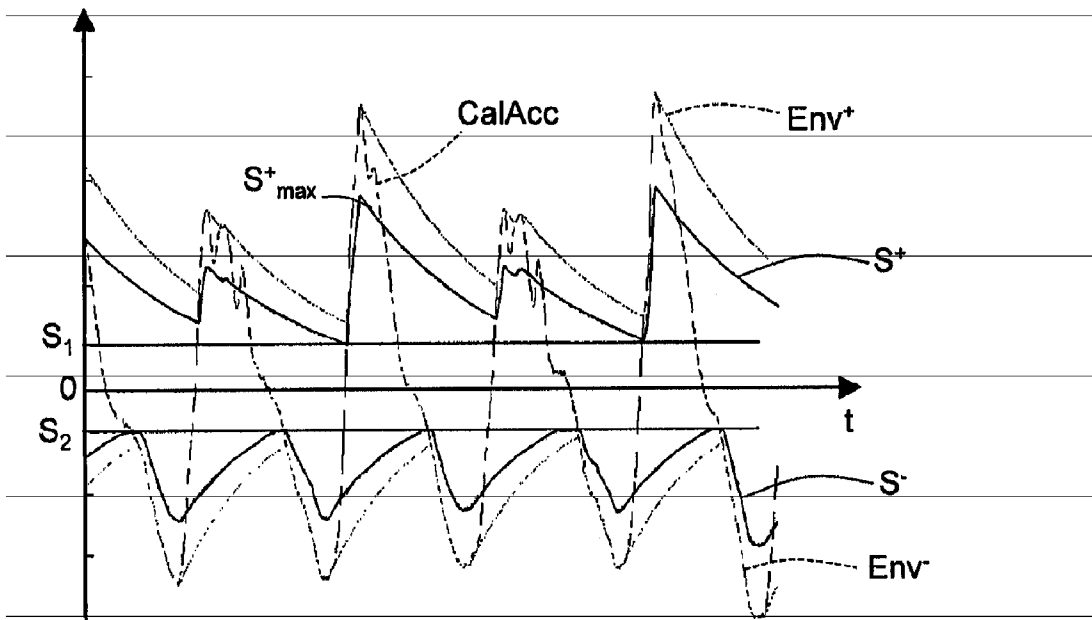


Fig.5

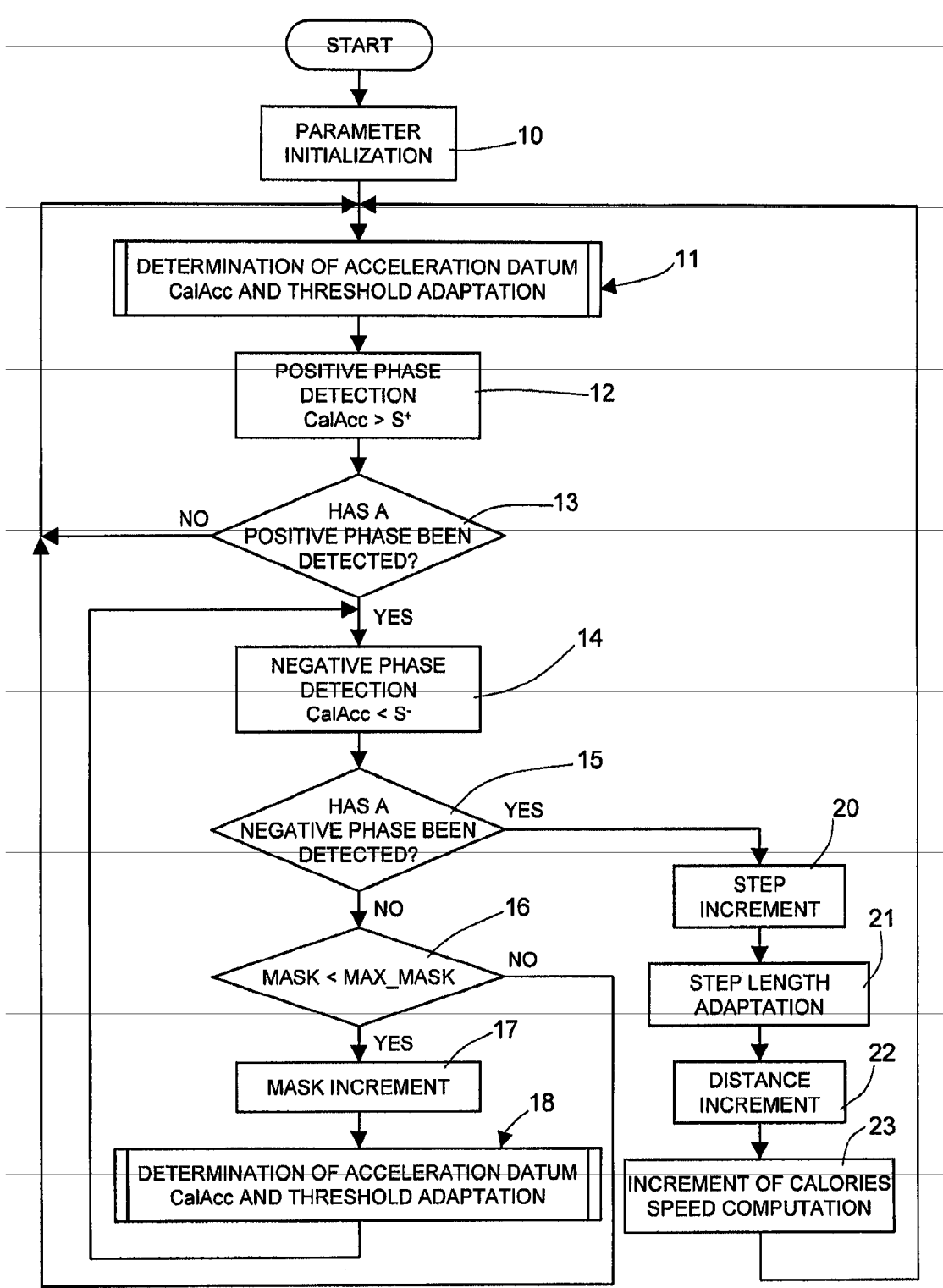


Fig.3

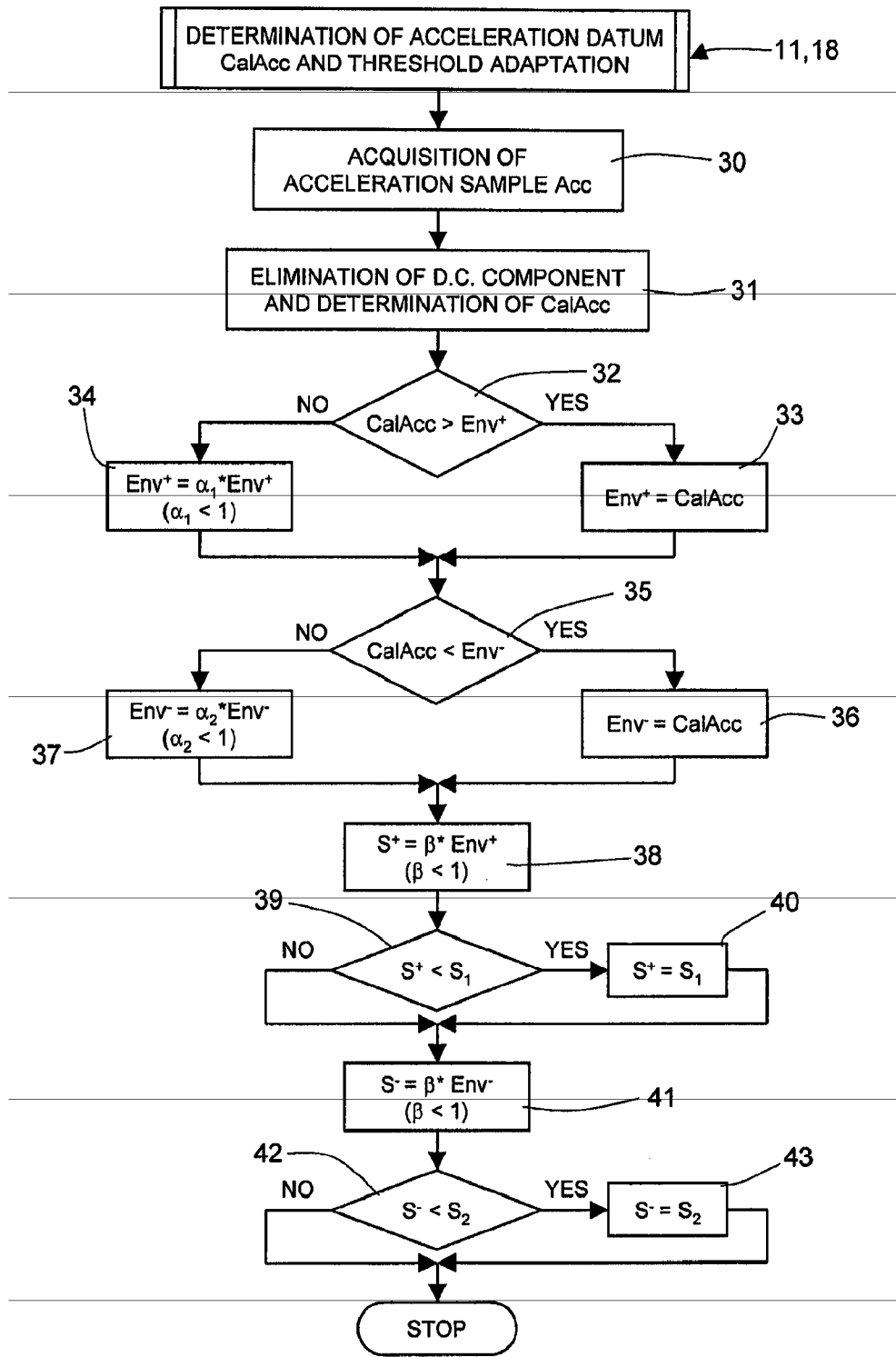


Fig.4

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