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

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(54) **MONITORING DEVICE, METHOD AND SYSTEM**

(56) **References Cited**

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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 37 days.

This patent is subject to a terminal disclaimer.

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**Related U.S. Application Data**

(63) Continuation-in-part of application No. 11/566,229, filed on Dec. 3, 2006, which is a continuation-in-part of application No. 11/388,707, filed on Mar. 24, 2006, which is a continuation-in-part of application No. 11/085,778, filed on Mar. 21, 2005.

(60) Provisional application No. 60/829,679, filed on Oct. 17, 2006, provisional application No. 60/843,967, filed on Sep. 12, 2006, provisional application No. 60/665,116, filed on Mar. 25, 2005, provisional application No. 60/613,785, filed on Sep. 28, 2004.

(51) **Int. Cl.**  
**A61B 5/00** (2006.01)

(52) **U.S. Cl.** ..... **600/485**; 600/500; 600/503

(58) **Field of Classification Search** ..... None  
See application file for complete search history.

(Continued)

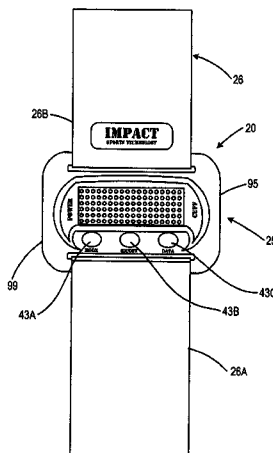
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(57) **ABSTRACT**

A monitoring device (20) for monitoring the vital signs of a user is disclosed herein. The monitoring device (20) is preferably an article (25) having an optical sensor (30) and a circuitry assembly (35). The optical sensor (30) preferably comprises a photodetector (130) and a plurality of light emitting diodes (135). The monitoring device (20) preferably provides for the display of the following information about the user: pulse rate; blood oxygenation levels; calories expended by the user of a pre-set time period; target zones of activity; time; distance traveled; and/or dynamic blood pressure.

**6 Claims, 13 Drawing Sheets**



# US 7,468,036 B1

Page 2

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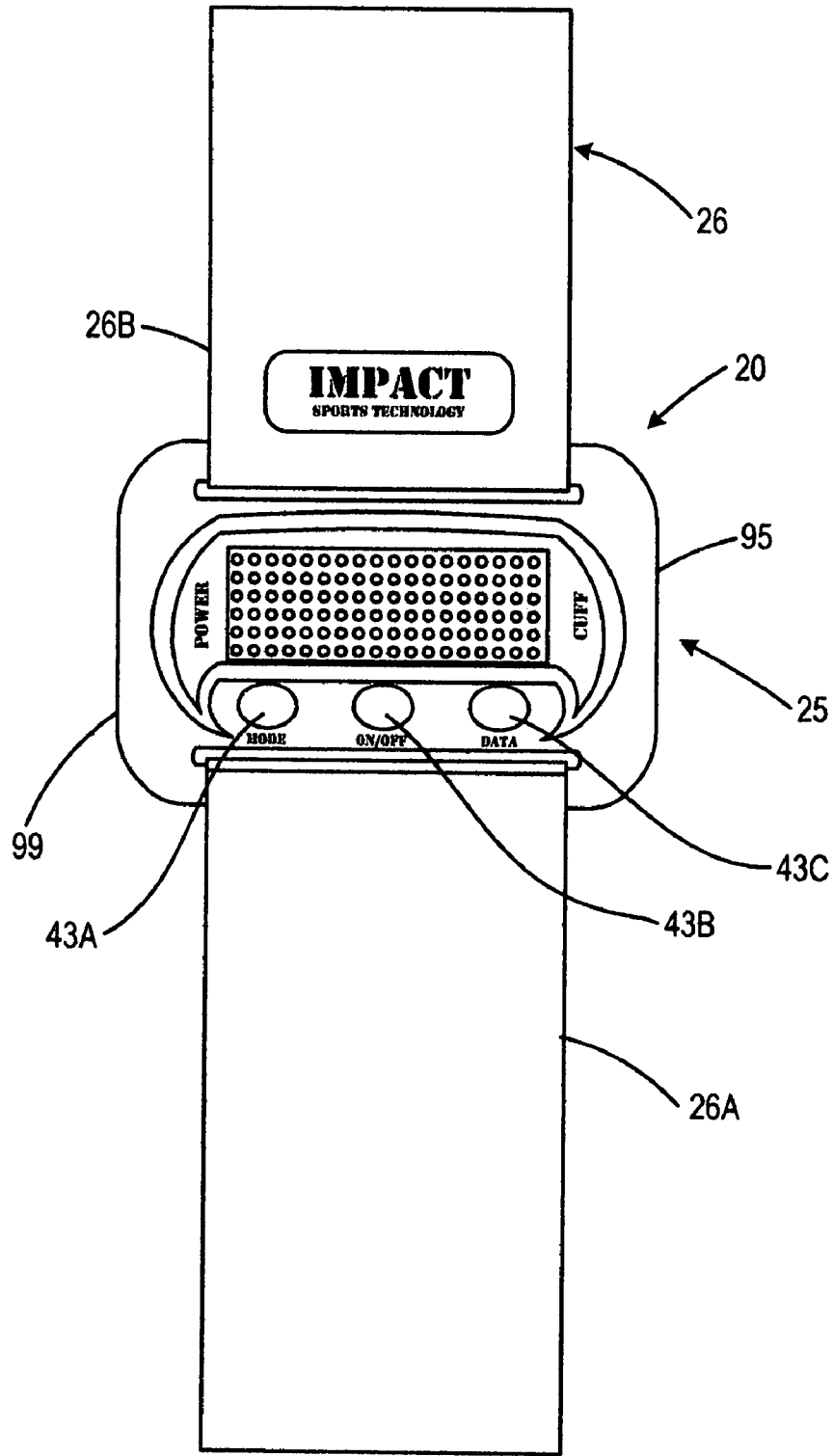


FIGURE 1

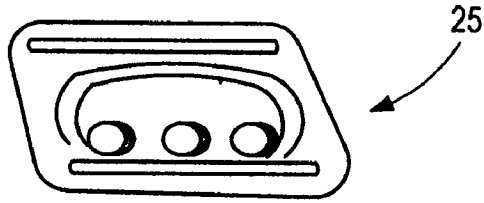


FIGURE 2

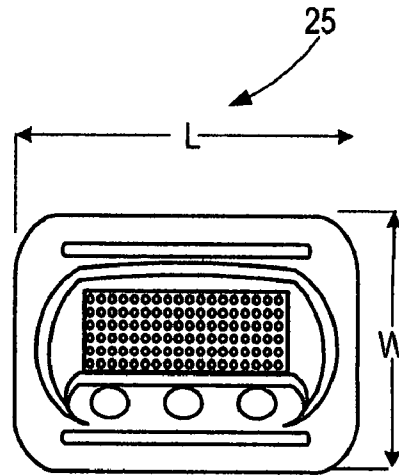


FIGURE 2A

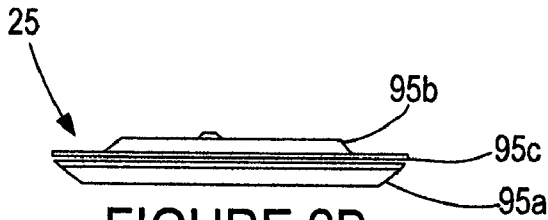


FIGURE 2B



FIGURE 2D



FIGURE 2C

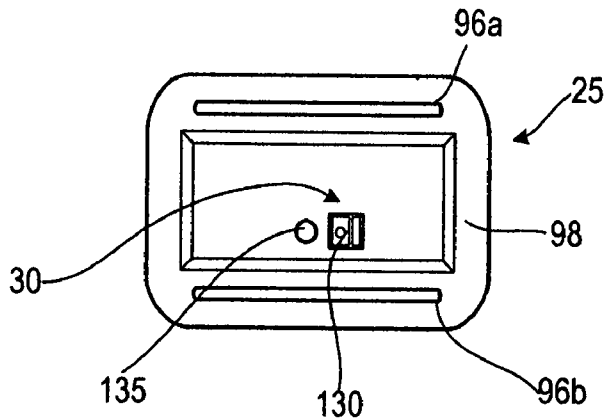


FIGURE 2E

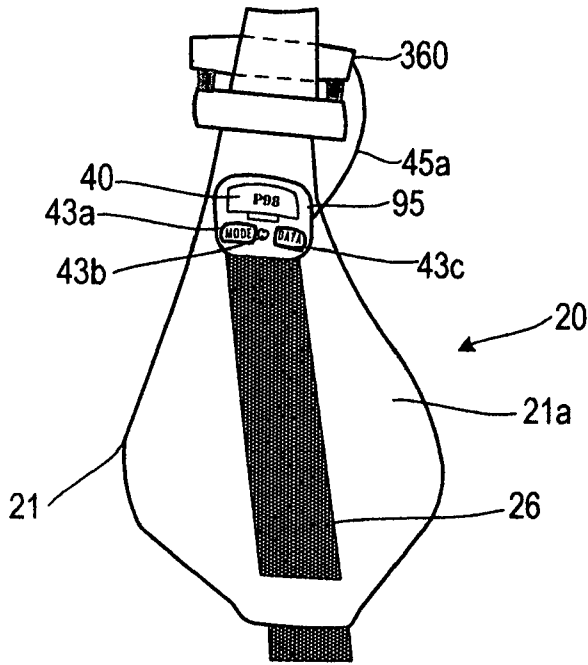


FIGURE 3

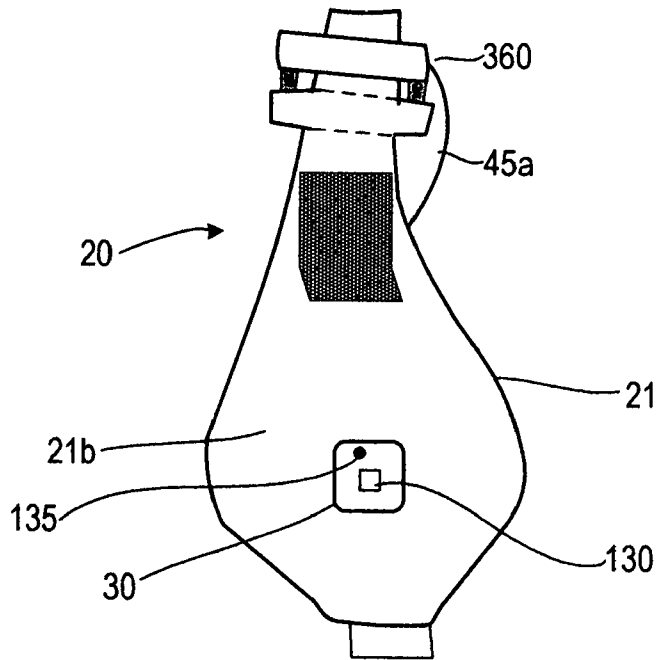


FIGURE 3A

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