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**Kuri**

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(54) **SYSTEM AND METHOD FOR DETERMINING ARTERIAL COMPLIANCE AND STIFFNESS**

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(58) **Field of Classification Search**

None  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,830,131 A \* 11/1998 Caro et al. .... 600/300  
5,836,884 A \* 11/1998 Chio ..... 600/485  
6,511,436 B1 1/2003 Asmar  
6,554,774 B1 \* 4/2003 Miele ..... 600/485  
6,692,443 B2 \* 2/2004 Crutchfield et al. .... 600/504

6,796,168 B1 \* 9/2004 Goldstein et al. .... 73/54.01  
7,048,691 B2 \* 5/2006 Miele et al. .... 600/504  
8,197,414 B2 6/2012 Quinn et al.  
8,517,951 B2 8/2013 Fujii et al.  
8,574,161 B2 11/2013 Banet et al.  
8,657,755 B2 \* 2/2014 Parfenov et al. .... 600/507  
2003/0135124 A1 \* 7/2003 Russell ..... 600/500

(Continued)

OTHER PUBLICATIONS

Bude, Ronald O., and Jonathan M. Rubin. "Relationship between the Resistive Index and Vascular Compliance and Resistance." *Radiology* 211.2 (1999): 411-417.\*

(Continued)

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(57) **ABSTRACT**

A system and method for calculating the arterial compliance, stiffness, and arterial flow and resistance indices for any artery in issue of a subject having a blood pressure monitoring device configured to calculate systolic and diastolic blood pressure readings for an artery of the subject, a blood flow velocity monitoring device configured to calculate the velocity of blood flowing within the artery of the subject at a peak point of a systolic phase of contraction of the subject's heart muscle, peak-systolic velocity, and the velocity of blood flowing within the artery of the subject at an end point of a diastolic phase of the subject's heart muscle, end-diastolic velocity, and a central processing unit comprising a computer readable program embodied within the central processing unit configured to calculate the arterial compliance, stiffness, and arterial flow and resistance indices as a function of the area of the artery under initial systolic and end diastolic pressure, the area of the artery generating arterial elastic recoil pressure for continuous flow during the systolic and diastolic phases, peak-systolic and end-diastolic arterial flow velocities, and systolic and diastolic blood pressure.

**30 Claims, 4 Drawing Sheets**

