## United States Patent [19]

### Bernard et al.

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Nov. 28, 1989

# [54] PERSONAL MONITOR AND PROCESS FOR HEAT AND WORK STRESS

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[21] Appl. No.: 338,374

[22] Filed: Apr. 13, 1989

### Related U.S. Application Data

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	doned.							

[51]	Int. Cl.4	A61B 5/02
[52]	U.S. Cl	128/670; 128/706;
		128/736
[58]	Field of Search	128/670-671,
	128/687-69	90, 736, 696, 706–708

### [56] References Cited

#### U.S. PATENT DOCUMENTS

3,675,640 7/1972	Gatts 128/671
3,978,849 9/1976	Geneen .
4,090,504 5/1978	Nathan .
4,117,834 10/1978	McPartland et al
4,129,125 12/1978	Lester et al
4,308,870 1/1982	Arkans 128/736 X
4,312,358 1/1982	Barney 128/670
4,367,752 1/1983	Jimenez et al 128/707 X
4,463,764 8/1984	Anderson et al 128/671 X
4,595,020 6/1986	Palti 128/736
4,679,566 7/1987	Tamm 128/671

### FOREIGN PATENT DOCUMENTS

117330 9/1984 European Pat. Off. .

### OTHER PUBLICATIONS

Journal A, vol. 24, No. 4, Oct. 1983, (Antwerpen, BE), M. Woerlee: "Measurements of Human Work and Work Environment", pp. 195–204, see pp. 196–198: 2. Measurements in the Blood Circulation During Work; FIGS. 2, 4; pp. 200–203; 5. Measuring the Thermal Loading During Work and 6. Measurement in the Work Environment.

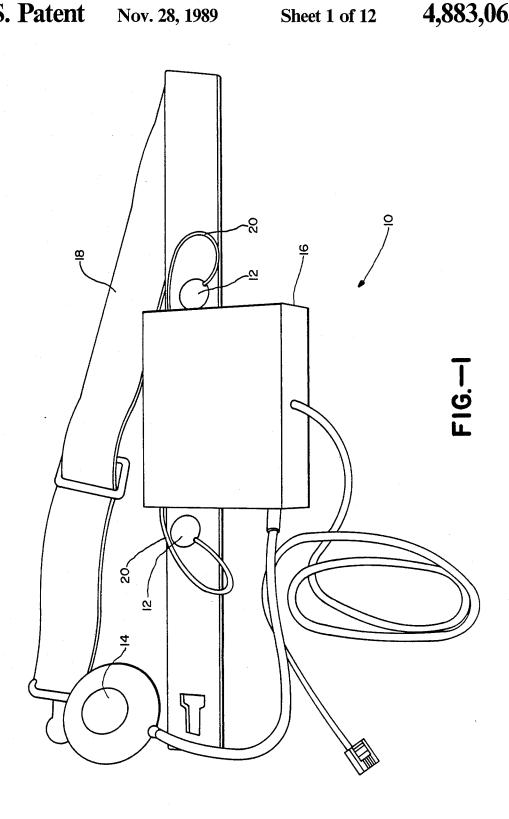
Primary Examiner—Angela D. Sykes Attorney, Agent, or Firm—Flehr, Hohbach, Test, Albritton & Herbert

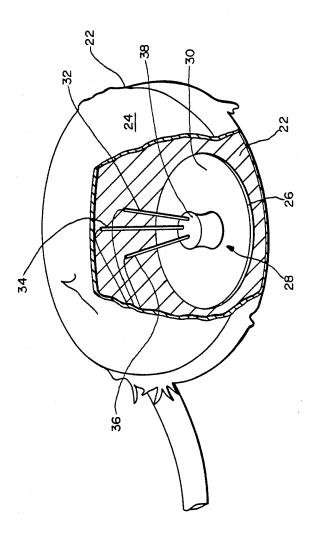
### [57] ABSTRACT

A personal monitor (10, 100, 200) for work and heat stress has a heart beat sensor (12) producing output electrical signals indicating a user's heart beats. A memory (127) stores heart beat information corresponding to the heart beat signals produced over predetermined time intervals. A microprocess (126) is connected to receive the heart beat information from the memory (127). The microprocessor (126) analyzes the heart beat information incrementally over the predetermined time intervals under program control to obtain a physiological demand during the predetermined time intervals and compares the obtained physiological demand against a stored physiological demand limit. Light emitting diodes (208) and a sound producing diaphragm (186) provide indications to the user when the stored physiological demand limit has been exceeded. The microprocessor (126) controls operation of the LEDs (208) and the diaphragm (186).

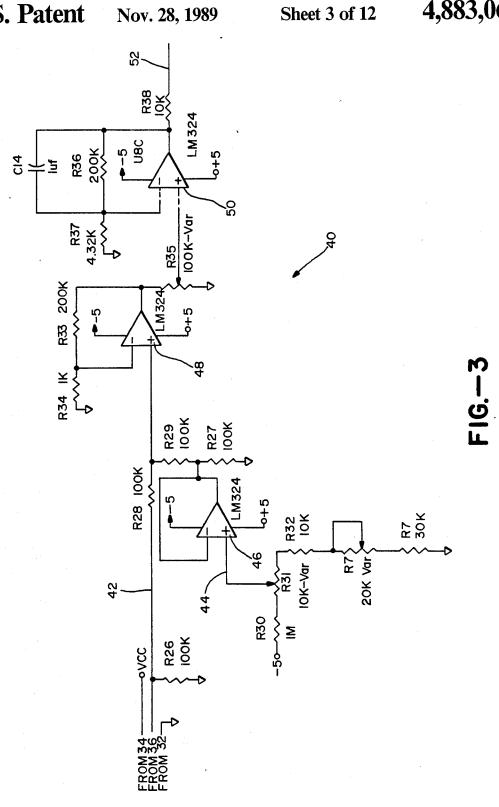
19 Claims, 12 Drawing Sheets



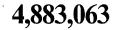


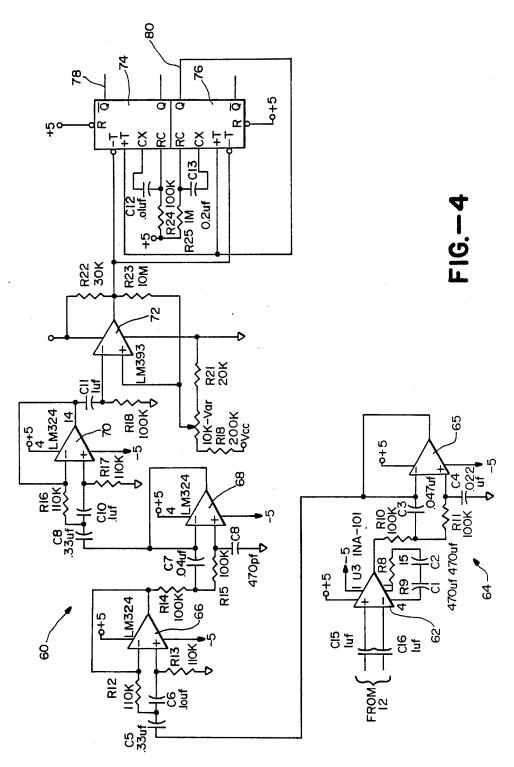


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