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(71) Applicant and

(72) Inventor: **ABREU, Marcio, Marc** [US/US]; 72 Highland
Park Road, New Haven, CT 06473 (US).

(74) Agents: **SCHERER, Jonathan, L.** et al.; Jacobson Hol-
man, PLLC, 400 Seventh Street, NW, Washington, DC
20004 (US).

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(54) Title: APPARATUS AND METHOD FOR MEASURING BIOLOGIC PARAMETERS



(57) Abstract: Support structures for positioning sensors on a physiologic tunnel for measuring physical, chemical and biological parameters of the body and to produce an action according to the measured value of the parameters. The support structure includes a sensor fitted on the support structures using a special geometry for acquiring continuous and undisturbed data on the physiology of the body. Signals are transmitted to a remote station by wireless transmission such as by electromagnetic waves, radio waves, infrared, sound and the like or by being reported locally by audio or visual transmission. The physical and chemical parameters include brain function, metabolic function, hydrodynamic function, hydration status, levels of chemical compounds in the blood, and the like. The support structure includes patches, clips, eyeglasses, head mounted gear and the like, containing passive or active sensors positioned at the end of the tunnel with sensing systems positioned on and accessing a physiologic tunnel.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/12382

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61B 5/00

US CL : 600/310, 474, 549

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 600/310, 474, 549, 322; 128/903, 904

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,292,685 B1 (POMPEI) 18 September 2001 (18.09.2001), column 3, line 63 - column 8, line 17.	1, 3-5, 8-13, 16, 17, 23-30, 47, 50, 51, 53
X	US 5,817,008 A (RAFERT et al) 06 October 1998 (06.10.1998), column 3, line 43 - column 6, line 37.	1, 3-7, 18-22, 28, 29, 31, 47, 48, 50-54

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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Eric F Winakur

Telephone No. 571/272-2975

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/12382

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-32 and 47-54

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1 - 34, 37 - 43, and 47 - 54, drawn to a sensor for measuring from a brain tunnel.

Group II, claim(s) 35 and 36, drawn to a head worn sweat sensor.

Group III, claim(s) 44 - 46, drawn to eyeglasses with an electromagnetic source and sensor.

Group IV, claim(s) 55, drawn to a method for fitting eyeglasses.

Group V, claim(s) 56, drawn to a method for warning of thermal damage.

Group VI, claim(s) 57, drawn to a method for enhancing safety while performing physical activity.

Group VII, claim(s) 58, drawn to a method of physical activity management.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

With regard to Group I, two distinct species are claimed. In particular, the species are directed to A) a sensing arrangement that includes placement on the skin at the end of a brain tunnel, and B) a sensing arrangement in the form of eyeglasses which may include an integrated sensor.

The claims are deemed to correspond to the species listed above in the following manner:

A) Claims 1 - 32 and 47 - 54.

B) Claims 33, 34, and 37 - 43.

The following claim(s) are generic: none.

The inventions listed as Groups I - VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The inventions of Group I perform measurements from a brain tunnel. Group II analyzes components of sweat. Group III uses an electromagnetic source and detector to perform measurements; the measurements do not need to be performed on a brain tunnel. Group IV is a method for fitting eyeglasses, and does not relate to a measurement of a physiological parameter. Group V is for monitoring for warning for thermal damage; the measurements do not need to be performed at a brain tunnel; the measurement configuration of Group III, also is not utilized. Group VI is for enhancing safety during physical activity and relates to monitoring fluid intake. Group VII is a physical activity management device; thermal state of the body is determined from brain temperature measurements; it does not require the features of the other groups. As such, each of the groups includes a unique special technical feature, as detailed above.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: Species A requires the device to be placed at the end of the brain tunnel while Species B is configured in an eyeglass arrangement and performs its measurement from a location separate from the brain tunnel. Thus, different technical features are required by each species.