(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 April 2004 (22.04.2004)

PCT

(10) International Publication Number
WO 2004/032748 A1

(51) International Patent Classification[7]: A61B 05/00

(21) International Application Number:
PCT/US2003/032132

(22) International Filing Date: 10 October 2003 (10.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/269,801 11 October 2002 (11.10.2002) US

(71) Applicant *(for all designated States except US)*: **TENSYS MEDICAL, INC.** [US/US]; 5825 Oberlin Drive, Suite 100, San Diego, CA 92121 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HESSEL, Stephen, R.** [US/US]; 9869 Caminito Pudregal, San Diego, CA 92131 (US). **FINBURGH, Simon, E.** [US/US]; 6375 Wellesly Court, San Diego, CA 92122 (US). **HEMPSTEAD, Russell, D.** [US/US]; 11849 Timaru Way, San Diego, CA 92128 (US). **PERONA, Mark, W.** [US/US]; 8558 Galway Place, San Diego, CA 92129 (US). **VIDISCHAK, Ronald, J.** [US/US]; 1837 Jeffrey Avenue, Escondido, CA 92027 (US). **VOSS, Gregory, I.** [US/US]; 405 Glenmont Drive, Solana Beach, CA 92075 (US). **CONERO, Ronald, S.** [US/US]; 11202 Gatemoore Way, San Diego, CA 92131 (US). **MARKLE, William, H.** [US/US]; 2 Cameo Crest, Laguna Niguel, CA 92677 (US).

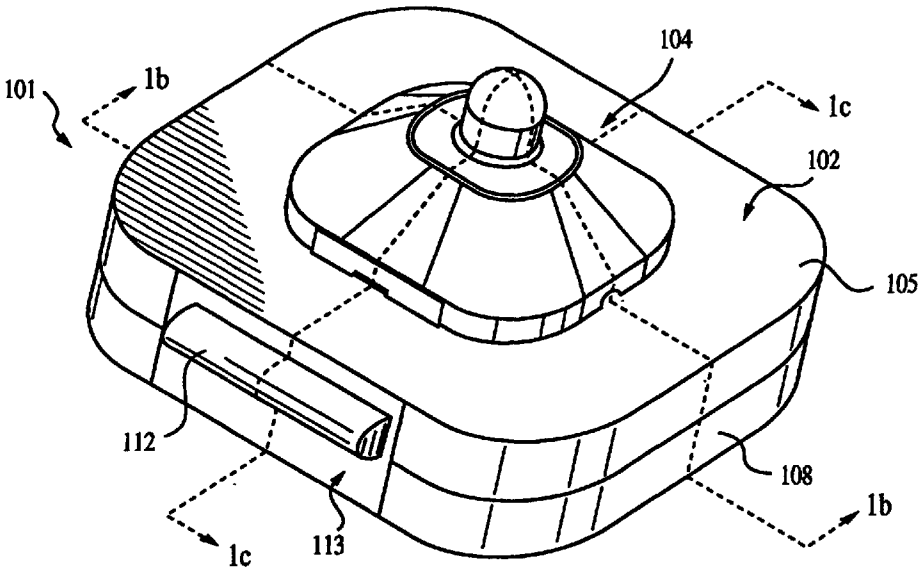
(74) Agent: **GAZDZINSKI, Robert, F.**; Gazdzinski & Associates, 11440 West Bernardo Court, Suite 375, San Diego, CA 92127 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: NON-INVASIVELY MEASURING HEMODYNAMIC PARAMETERS



(57) Abstract: Improved apparatus (100) and methods for non-invasively assessing one or more hemodynamic parameters associated with the circulatory system of a living organism. In one aspect, the invention comprises apparatus (100) adapted to accurately place and maintain a sensor (101) (e.g., tonometric pressure sensor) with respect to the anatomy of the subject, including an alignment apparatus (230) which is separable from an adjustable fixture (257). The alignment apparatus (230) moveably captures the sensor (101) to, *inter alia*, facilitate coupling thereof to an actuator (106) used to position the sensor (101) during measurements. The alignment apparatus (230) also advantageously allows the sensor (101) position to be maintained when the fixture (100) is removed from the subject, such as during patient transport. Methods for positioning the alignment apparatus (230) and sensor (101), correcting for hydrostatic pressure effects, and providing treatment to the subject are also disclosed.

WO 2004/032748 A1

ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

Published:

— *with international search report*

— *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.