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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 May 2018 (31.05.2018)

WIPO | PCT

(10) International Publication Number
WO 2018/094479 A3

(51) International Patent Classification:
A61B 3/00 (2006.01) *G06N 5/00* (2006.01)
G06F 19/00 (2018.01)

(21) International Application Number:
PCT/AU2017/051313

(22) International Filing Date:
28 November 2017 (28.11.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2016265973 28 November 2016 (28.11.2016) AU

(71) Applicant: **BIG PICTURE VISION PROPRIETARY LIMITED** [AU/AU]; c/- Eagar & Martin Pty Ltd, Suite 2, 35-39 Scarborough Street, Southport, Queensland 4215 (AU).

(72) Inventor: **MCKINNON, Tom Clarence**; c/- Eagar & Martin Pty Ltd, Suite 2, 35-39 Scarborough Street, Southport, Queensland 4215 (AU).

(74) Agent: **MARTIN IP PTY LTD**; Level 6, 360 Queen Street, Brisbane QLD 4000 (AU).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH,

WO 2018/094479 A3

(54) Title: SYSTEM AND METHOD FOR MEDICAL CONDITION DIAGNOSIS, TREATMENT AND PROGNOSIS DETERMINATION

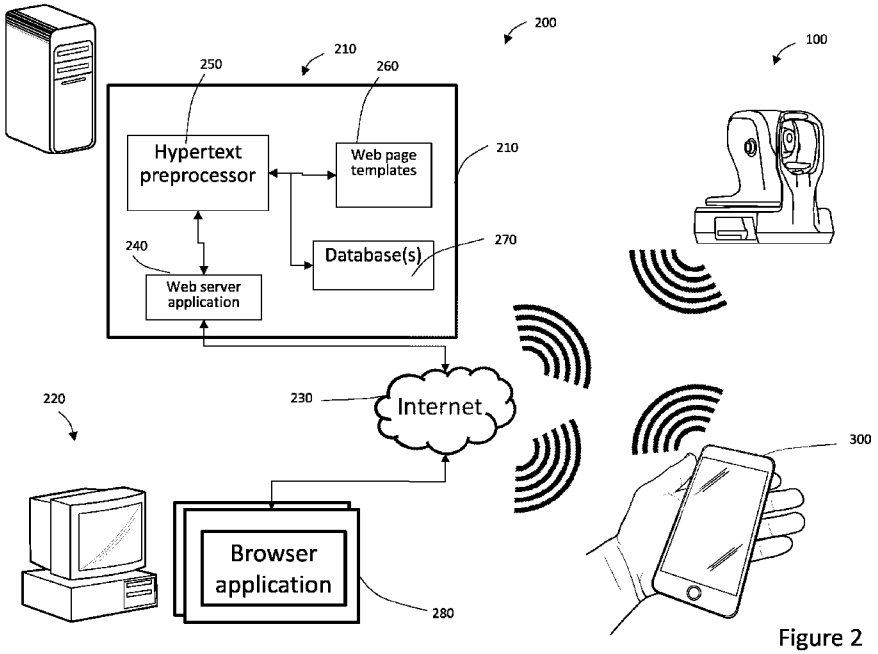

Figure 2

(57) Abstract: The apparatus and method disclosed relates to a system and method for identifying a medical condition in a patient. The system and method makes use of a remote terminal where tests and scans may be carried out and sent to a central server that receives patient medial data and detects anomalous characteristics in the tests and scans, and determines a diagnosis and probability of the diagnosis based on scans, tests presenting complaint and risk factors in the client medial history, lifestyle, or family medical history. Treatment and prognosis may also be determined in similar fashion. There is also provide an apparatus that simulates the effect of an ophthalmological condition on a virtual reality headset.

[Continued on next page]

GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
05 July 2018 (05.07.2018)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2017/051313

A. CLASSIFICATION OF SUBJECT MATTER

A61B 3/00 (2006.01) G06F 19/00 (2018.01) G06N 5/00 (2006.01)

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)

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)

EPOQUE database PATENW with classification marks IPC/CPC(s) (low) classification marks A61B3/10, A61B3/14, A61B5/02014,A61B3/0025, A61B5/0013, G06F19/321, G06F19/3418, A61B5/7267, G06Q50/22, G16H10/60, G16H40/63, G06F19, G16H15/00, G16H50/20, G16H80/00 and keywords such as abnormal, anomaly, symptom, OCT, visual field tests; retinal scan; search, database, condition, characteristics, detect anomaly, complaint, retinitis, macula degeneration, diabetic retinopathy, camera, camcorder, image and the like.

EPOQUE search (2) in PATENTW database with classification marks IPC/CPC(s) and keywords such as: visual defects; head gear, simulation, head set, virtual reality and the like. ESPACENET (or esp@cenet) with inventor and applicant and eye in abstract in title.
Applicant(s)/Inventor(s) name searched in internal databases provided by IP Australia.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C [X] 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

"E" earlier application or patent but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 May 2018	22 May 2018
Name and mailing address of the ISA/AU	**Authorised officer**
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	Viara Van Raad AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61262832676

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/AU2017/051313**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/0307933 A1 (CARL ZEISS MEDITEC, INC.) 16 October 2014 Abstract; Fig. 3 and 4-8, para[0003]-[0065]; esp. para[0003], para[0004], para[0028]-[0046], para [0047]-[0065]; Figs. 9-14C: esp. Fig. 9; Figs. 14A vs Figs. 14B, 14C	1-75
X	WO 2016/149536 A1 (OCUTRX VISION TECHNOLOGIES, LLC.) 22 September 2016 Abstract; para[00045]-[00047]; para[00050]; para[00075]; elements (14), (12), (16), (20); a Head Mounted Device (50); Figs. 1, 4A-11, 12, 13, 18-20; para[00079]; S90-S160	76-88
X	WO 2004/036378 A2 (MCINTYRE) 29 April 2004 Abstract, Elements (114)/(118)/(106) Figs. 1-9, page 7, ln. 24-28; "wearable headpiece" - Example 1, Example 2, "Macular De-generation, "Table 2, page 18-24	76-88
X	US 2015/0032468 A1 (NANT HOLDINGS IP, LLC) 29 January 2015 Figs. 1-5; modules (145)/(175)/(170)/(110)/(120)/(130) and para[0032]; [0055];[0058]; and para[0032]-[0036]; para[0037]-[0095]	1, 3-17, 21-25, 27-29, 45-49, 51, 52, 57, 58
A	US 2011/0129133 A1 (RAMOS et al.) 02 June 2011 Entire document	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2017/051313

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

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

1. ☐ Claims Nos.:

because they relate to subject matter not required to be searched by this Authority, namely:

the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including

2. ☐ Claims 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. ☐ Claims Nos:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box for Details

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 additional fees, this Authority did not invite payment of additional fees.
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.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Supplemental Box

Continuation of: **Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-58 are drawn to a method (or a system) for identification of abnormal medical condition in a patient carried out on an electronic device and the processor to carry out a software instructions and either a network/receiver/transmitter/communication module that is operatively connected with the processor to detect anomalous characteristics/symptoms in a medical data stored in a data storage medium and determining a medical condition from the detection of the anomalous characterises/symptoms. The feature of the detection of *the medical condition from the determination of the anomalous characteristics by comparing the anomalous characteristics is specific* for this group of claims.

- Claims 59-75 are drawn to a method (or a system) for identification of ophthalmological condition, comprising: a digital ophthalmological data collection device configured for capturing data relating to a patient's eye a database of ophthalmological conditions including a plurality of condition profiles, each condition profile including at least two identifying characteristics of the condition; and a processor configured to: run a digital image taken with said digital ophthalmological data collection device through a filter to detect abnormal ophthalmological characteristics; assign a weighting to each abnormal ophthalmological characteristic detected; and compare the weighted abnormal ophthalmological characteristics to the identifying characteristics in each condition profile in said database to identify an abnormal condition present in the digital image. The feature of *the detection of the ophthalmological condition by using the digital image and the filter with weights for the abnormal characteristics to identify the abnormal condition presented in the image* is specific for this group of claims.

- Claims 76-88 are drawn to a simulation system for simulating an ophthalmological condition, the system including: a camera for receiving an input and converting it into a visual image; a processor configured for processing data and instructions; digital storage media configured with instructions for directing a processor operationally; and a headset configured for displaying the processed image on a headset display to a user on which the headset is mounted, the instructions being configured for interrogating a condition database of one or more ophthalmological conditions, each ophthalmological condition being associated with one or more image processing filters, the image processing filters being adapted to convert a visual image to a processed image, wherein the processed image simulates the effect of the ophthalmological condition on a person's vision when viewing that visual image. The feature of the *said simulation system having the headset configured to display the processed image on a headset display to a user on the which the headset is mounted and each ophthalmological condition is associated with the said filters to simulate the specific ophthalmological condition* is specific for this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features.

PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. The only feature common to all of the claimed inventions and which provides a technical relationship among them is detection of an abnormal condition that affects a person and it is considered to be a medical condition that is detectable by an abnormal characteristics that is different from characteristics within a databases with characteristics that are normal.

However this feature does not make a contribution over the prior art because it is disclosed in: each one of the prior art documents US 2014/0307933 A1 (CARL ZEISS MEDITEC, INC.) 16 OCT 2014, WO 2016/149536 A1 (OCUTRX VISION TECHNOLOGIES, LLC.) 22 SEP 2016, WO 2004/036378 A2 (MCINTYRE) 29 APR 2004 . See part Novelty and Inventive step of this report for detailed disclosures in each one of these prior art documents of that common feature.

Therefore in the light of these documents this common feature cannot be a special technical feature. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a posteriori*.

This document reports on all claims (claims 1-88).

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/AU2017/051313**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
US 2014/0307933 A1	16 October 2014	US 2014307933 A1	16 Oct 2014
		US 9775510 B2	03 Oct 2017
		US 8801187 B1	12 Aug 2014
WO 2016/149536 A1	22 September 2016	WO 2016149536 A1	22 Sep 2016
		US 2016270648 A1	22 Sep 2016
		US 9955862 B2	01 May 2018
WO 2004/036378 A2	29 April 2004	WO 2004036378 A2	29 Apr 2004
		AU 2003286453 A1	04 May 2004
		US 2004156554 A1	12 Aug 2004
US 2015/0032468 A1	29 January 2015	US 2015032468 A1	29 Jan 2015
		AU 2014340629 A1	28 Jan 2016
		AU 2014340629 B2	23 Mar 2017
		AU 2017200578 A1	16 Feb 2017
		CA 2917606 A1	30 Apr 2015
		CN 105474220 A	06 Apr 2016
		EP 3195167 A2	26 Jul 2017
		JP 2016531351 A	06 Oct 2016
		KR 20170026319 A	08 Mar 2017
		WO 2015060994 A2	30 Apr 2015
US 2011/0129133 A1	02 June 2011	US 2011129133 A1	02 Jun 2011
		US 2011160562 A1	30 Jun 2011
		US 8041091 B2	18 Oct 2011
		US 2011129134 A1	02 Jun 2011

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.