

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
23 January 2025 (23.01.2025)



(10) International Publication Number
WO 2025/018917 A1

(51) International Patent Classification:

A61B 3/113 (2006.01) *G02C 7/04* (2006.01)
G02B 27/00 (2006.01) *G06F 3/01* (2006.01)

(21) International Application Number:

PCT/RU2024/050090

(22) International Filing Date:

25 April 2024 (25.04.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2023118660 14 July 2023 (14.07.2023) RU

(71) Applicant: **XPANCEO RESEARCH ON NATURAL SCIENCE L.L.C.** [AE/AE]; Hor Al Anz East Area, SED-DIQ AL KAZEM BUILDING (133-251), office 203- A4;, P.O. Box: 393047 (AE).

(72) Inventors: **ARSENIN, Aleksey Vladimirovich**; ul. Saltykovskaya, d. 23, korp. 1, kv. 64, Moscow, 111672 (RU).

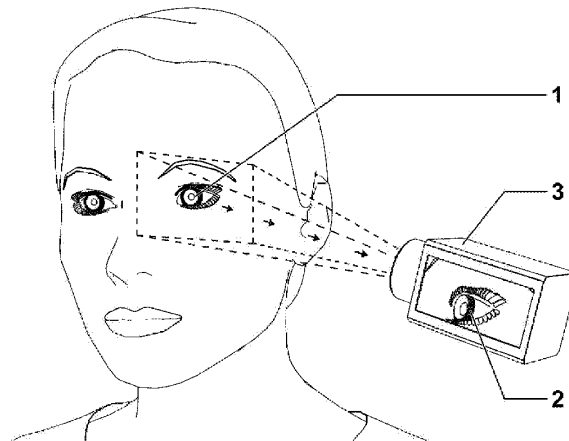
VOLKOV, Valentin Sergeevich; ul. Beregovaya, d. 4, kv. 19, Dolgoprudnyy, 141700 (RU). **SOLOVEI, Valentin Romanovich**; ul. Goncharova, d. 5, kv. 16, Moscow, 127254 (RU). **SYUY, Alexander Vyacheslavovich**; Dolgoprudnaya alleya, d. 15, korp. 5, kv. 49, Moscow, 127204 (RU). **FRADKIN, Ilia Markovich**; Altufievskoe shosse, dom 20B, kv. 164, Moscow, 127562 (RU).

(74) Agent: **CHUGUNOVA, Marina Mikhailovna**; ul. Nedelina, d. 34, korp. 3, kv. 20, Moscow, 121471 (RU).

(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, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, 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, ST, SV, SY, TH,

(54) Title: USER'S EYE TRACKING METHOD AND CONTACT LENS

[Fig. 1]



(57) Abstract: The group of inventions relates to the user's eye tracking methods and can be used in AR/VR/MR/XR forming systems. According to the user's eyes tracking method, a camera monitors the user's eyes, a contact lens containing an optical structure forming a stereoscopic image is placed on the user's eye, and the user's eyes position is determined from the linear dimension and angular position of this image relative to the camera. The optical structure could be implemented as an autostereogram and a decoding slit raster, wherein the autostereogram is formed by reflecting said slit raster in a mirror coating or by a shadow cast by said slit raster on a diffusely reflecting coating. The optical structure could be formed by real images or a hologram. The invention makes it possible to enhance the accuracy when measuring the position of the contact lens and, hence, of the user's eyes.

[Continued on next page]

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,
ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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).

Declarations under Rule 4.17:

- *as to the identity of the inventor (Rule 4.17(i))*
- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*

Published:

- *with international search report (Art. 21(3))*