

Bibliographic Data

Application No: 16/811,330

Foreign Priority claimed: ☒ Yes ☐ No

35 USC 119 (a-d) conditions met: ☒ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /CHARLES L BEARD/

Examiner's Signature

Initials

Title:

MIXED REALITY BASED 3D SKETCHING DEVICE AND METHOD

| FILING or 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|-----------------------|-------|----------------|---------------------|
| 03/06/2020 | 345 | 2616 | SJ00150IW |
| RULE | | | |

APPLICANTS

INDUSTRY ACADEMY COOPERATION FOUNDATION OF SEJONG UNIVERSITY, Seoul, KOREA,
REPUBLIC OF

INVENTORS

Soo Mi CHOI, Seoul, KOREA, REPUBLIC OF

Jun Han KIM, Anyang-si, KOREA, REPUBLIC OF

Je Wan HAN, Seoul, KOREA, REPUBLIC OF

CONTINUING DATA

FOREIGN APPLICATIONS

KOREA, REPUBLIC OF KR10-2019-0114815 09/18/2019

IF REQUIRED, FOREIGN LICENSE GRANTED**

03/19/2020

**** SMALL ENTITY ****

STATE OR COUNTRY


KOREA, REPUBLIC OF

ADDRESS

AGORA LAW, LLC
21732 38th DR SE
BOTHELL, WA 98021
UNITED STATES

FILING FEE RECEIVED


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| <i>Issue Classification</i>  | Application/Control No. 16/811,330 | Applicant(s)/Patent Under Reexamination CHOI et al. |
| | Examiner Charles L Beard | Art Unit 2616 |

| CPC | | | | | | |
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| Symbol | | | | | Type | Version |
| G06T | / | 19 | / | 006 | F | 2013-01-01 |
| G06F | / | 3 | / | 011 | I | 2013-01-01 |
| G06T | / | 17 | / | 10 | I | 2013-01-01 |
| G06T | / | 3 | / | 0031 | I | 2013-01-01 |

| CPC Combination Sets | | | | | |
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| NONE (Assistant Examiner) _____ (Date) _____ | | Total Claims Allowed: 5 | |
| /CHARLES L BEARD/ Examiner, Art Unit 2616 (Primary Examiner) _____ (Date) _____ | | 28 November 2020 O.G. Print Claim(s) 1 | O.G. Print Figure Fig. 5 |


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| | Examiner Charles L Beard | Art Unit 2616 |

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| INTERNATIONAL CLASSIFICATION | | | |
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| US ORIGINAL CLASSIFICATION | |
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| CROSS REFERENCES(S) | | | | | | |
| CLASS | SUBCLASS (ONE SUBCLASS PER BLOCK) | | | | | |
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| NONE | | Total Claims Allowed: | |
| (Assistant Examiner) | (Date) | 5 | |
| /CHARLES L BEARD/ Examiner, Art Unit 2616 | 28 November 2020 | O.G. Print Claim(s) | O.G. Print Figure |
| (Primary Examiner) | (Date) | 1 | Fig. 5 |

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| | Examiner Charles L Beard | Art Unit 2616 |

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| <input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47 | | | | | | | | | | | | | | | |
| CLAIMS | | | | | | | | | | | | | | | |
| Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
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| NONE (Assistant Examiner) _____ (Date) _____ | | Total Claims Allowed: 5 | |
| /CHARLES L BEARD/ Examiner, Art Unit 2616 (Primary Examiner) _____ (Date) _____ | | 28 November 2020 O.G. Print Claim(s) 1 | O.G. Print Figure Fig. 5 |

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| <i>Search Notes</i>  | Application/Control No. 16/811,330 | Applicant(s)/Patent Under Reexamination CHOI et al. |
| | Examiner Charles L Beard | Art Unit 2616 |


| CPC - Searched* | | |
|---|------------|----------|
| Symbol | Date | Examiner |
| G06T (19/006 3/0031 17/10) | 09/25/2020 | CLB |
| G06F (3/011 3/03542 3/033 3/03545 3/03546 3/037 3/0383 3/0386 3/0354 3/03541 3/04883) | 09/25/2020 | CLB |
| G06K (9/00402) | 09/25/2020 | CLB |
| G06T (19/006 3/0031 17/10) | 11/27/2020 | CLB |
| G06F (3/011) | 11/27/2020 | CLB |

| CPC Combination Sets - Searched* | | |
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| Symbol | Date | Examiner |
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| US Classification - Searched* | | | |
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| Class | Subclass | Date | Examiner |
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* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

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| /CHARLES L BEARD/ Examiner, Art Unit 2616 | |
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| | Examiner Charles L Beard | Art Unit 2616 |

| Search Notes | | |
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| Search Notes | Date | Examiner |
| EAST search notes attached | 09/25/2020 | CLB |
| Inventor search (performed in EAST) | 09/25/2020 | CLB |
| Assignee search (performed in EAST) | 09/25/2020 | CLB |
| G06T (19/006 3/0031 17/10) (modified by text search, performed in EAST) | 09/25/2020 | CLB |
| G06F (3/011 3/03542 3/033 3/03545 3/03546 3/037 3/0383 3/0386 3/0354 3/03541 3/04883) (modified by text search, performed in EAST) | 09/25/2020 | CLB |
| G06K (9/00402) (modified by text search, performed in EAST) | 09/25/2020 | CLB |
| EAST search notes attached | 11/27/2020 | CLB |
| G06T (19/006 3/0031 17/10) (modified by text search, performed in EAST) | 11/27/2020 | CLB |
| G06F (3/011) (modified by text search, performed in EAST) | 11/27/2020 | CLB |
| EAST search notes attached | 11/28/2020 | CLB |
| Assignee search (performed in EAST) | 11/28/2020 | CLB |
| Inventor search (performed in EAST) | 11/28/2020 | CLB |

| Interference Search | | | |
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| US Class/CPC Symbol | US Subclass/CPC Group | Date | Examiner |
| G06T | (19/006 3/0031 17/10) | 11/27/2020 | CLB |
| G06F | (3/011) | 11/27/2020 | CLB |

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| | Examiner Charles L Beard | | Art Unit 2616 | Page 1 of 2 |

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| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | CPC Classification | US Classification |
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| * | A | US-20180104106-A1 | 04-2018 | LEE; Beng Hai | G06T1/0007 | 1/1 |
| * | B | US-20200367970-A1 | 11-2020 | Qiu; Zigang Jimmy | A61B34/10 | 1/1 |
| * | C | US-20160055681-A1 | 02-2016 | Koyrakh; Lev A. | G06T19/00 | 345/427 |
| * | D | US-5740273-A | 04-1998 | Parthasarathy; Kannan | G06K9/00416 | 382/187 |
| * | E | US-5583542-A | 12-1996 | Capps; Stephen P. | G06F40/166 | 345/173 |
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| * | G | US-20140180465-A1 | 06-2014 | NAKANO; Takahiro | G05B19/4097 | 700/160 |
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| * | K | US-20200372723-A1 | 11-2020 | KOMISSAROV; Andrei Valerievich | G06T19/006 | 1/1 |
| * | L | US-20170205224-A1 | 07-2017 | TANIGUCHI; Atsushi | G01B21/04 | 1/1 |
| * | M | US-20160071327-A1 | 03-2016 | WU; XIN-YUAN | G06T5/002 | 382/154 |

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| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Country | Name | CPC Classification |
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NON-PATENT DOCUMENTS

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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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| Notice of References Cited | Application/Control No. 16/811,330 | | Applicant(s)/Patent Under Reexamination CHOI et al. | |
| | Examiner Charles L Beard | | Art Unit 2616 | Page 2 of 2 |

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| * | A | US-8478006-B2 | 07-2013 | Arakita; Kazumasa | G06T3/0037 | 382/128 |
| * | B | US-8467596-B2 | 06-2013 | Abadpour; Arash | G06T7/12 | 382/151 |
| * | C | US-5602570-A | 02-1997 | Capps; Stephen P. | G06F40/166 | 345/173 |
| * | D | US-20190164338-A1 | 05-2019 | CHOI; Soo Mi | G06T19/20 | 1/1 |
| * | E | US-20140327667-A1 | 11-2014 | KIM; Han Jun | G06T15/08 | 345/419 |
| * | F | US-10805607-B2 | 10-2020 | Moon; Joo Hee | H04N19/176 | 1/1 |
| * | G | US-10681353-B2 | 06-2020 | Moon; Joo Hee | H04N19/11 | 1/1 |
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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NOTICE OF ALLOWANCE AND FEE(S) DUE

146269 7590 12/04/2020
AGORA LAW, LLC
21732 38th DR SE
BOTHELL, WA 98021

EXAMINER

BEARD, CHARLES LLOYD

ART UNIT

PAPER NUMBER

2616

DATE MAILED: 12/04/2020

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 16/811,330 | 03/06/2020 | Soo Mi CHOI | SJ00150IW | 6192 |

TITLE OF INVENTION: MIXED REALITY BASED 3D SKETCHING DEVICE AND METHOD

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL | \$600 | \$0.00 | \$0.00 | \$600 | 03/04/2021 |

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

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P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

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| (Typed or printed name) |
| (Signature) |
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 16/811,330 | 03/06/2020 | Soo Mi CHOI | SJ00150IW | 6192 |

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| nonprovisional | SMALL | \$600 | \$0.00 | \$0.00 | \$600 | 03/04/2021 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|----------------------|----------|----------------|
| BEARD, CHARLES LLOYD | 2616 | 345-633000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

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5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29☐ Applicant asserting small entity status. See 37 CFR 1.27☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

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| 146269 | 7590 | 12/04/2020 | EXAMINER | |
| AGORA LAW, LLC | | | BEARD, CHARLES LLOYD | |
| 21732 38th DR SE | | | ART UNIT | |
| BOTHHELL, WA 98021 | | | PAPER NUMBER | |
| | | | 2616 | |
| DATE MAILED: 12/04/2020 | | | | |

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

| | | | |
|-------------------------------|--------------------------------------|------------------------------------|---------------------------------|
| Notice of Allowability | Application No. 16/811,330 | Applicant(s) CHOI et al. | |
| | Examiner Charles L Beard | Art Unit 2616 | AIA (FITF) Status Yes |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/09/2020.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-2 and 4-6. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

| | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____. 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date. _____. | 5. <input type="checkbox"/> Examiner's Amendment/Comment 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____. |
|--|--|

/CHARLES L BEARD/
Examiner, Art Unit 2616

DETAILED CORRESPONDENCE

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Amendment

Received 11/09/2020

Claims 1, 2, and 4-6 are pending.

Claim 3 has been canceled.

Claims 1, 5, and 6 are amended.

The Specification rejection of the Abstract has been withdrawn in view of the amendments received 11/09/2020.

The 35 USC § 101 rejection of claim 6 has been withdrawn in view of the amendments received 11/09/2020.

The 35 USC § 112(b) rejection of claim 3 has been withdrawn in view of the amendments received 11/09/2020.

Response to Arguments

Received 11/09/2020

Regarding independent claim(s) 1, 5, and 6:

Applicant's arguments (Remarks, Page 6: ¶ 3-4), filed 11/09/2020, with respect to the rejection(s) of claim(s) 1, 5, and 6 under 35 U.S.C § 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn, necessitated by Applicant's amendments.

Allowable Subject Matter

Claims 1, 2, and 4-6 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The following is an Examiner's statement of reasons for allowance:

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Independent claims 1, 5, and 6 are distinguished from the closest know prior art alone or reasonable combination, in consideration of the claim as a whole, particularly the limitations:

(Claim 1)

wherein the memory stores program commands that are executable by the processor to periodically track a marker pen photographed through a camera, to determine whether to remove a third point using a distance between a first point corresponding to a reference point, among points that are sequentially tracked, and a second point at a current time, a preset constant, and an angle between the first point, the second point, and the previously identified third point, to search an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and to display the searched object model on a screen, wherein the removal of the third point is determined by the following Equation: [Equation]

if $\theta(x, p) < a/dist(o, p)$ then Remove(x)

wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $dist(o, p)$ represents distance between o and p .

(Claim 5)

A mixed reality based 3D sketching method of performing a mixed reality based 3D sketch in a device including a processor and a memory, the method comprising:

periodically tracking a marker pen photographed through a camera;

determining whether to remove a third point using a distance between a first point corresponding to a reference point, among points that are sequentially tracked, and a second point at a current time, a preset constant, and an angle between the first point, the second point, and the previously identified third point, searching an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and displaying the searched object model on a screen, wherein the removal of the third point is determined by the following Equation: [Equation]

if $\theta(x, p) < a/dist(o, p)$ then Remove(x)

wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $dist(o, p)$ represents distance between o and p .

(Claim 6)

the method comprising:

periodically tracking a marker pen photographed through a camera;

determining whether to remove a third point using a distance between a first point corresponding to a reference point, among points that are sequentially tracked, and a second point at a current time, a preset constant, and an angle between the first point, the second point, and the previously identified third point, searching an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and displaying the searched object model on a screen, wherein the removal of the third point is determined by the following Equation: [Equation]

if $\theta(x, p) < a/dist(o, p)$ then Remove(x)

wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $dist(o, p)$ represents distance between o and p .

Wherein:

Claim 1, claim 5, and claim 6 are similar however are not identical, although the subject matter of claim 1 is addressed below in view of the prior art, the same is similarly apply to the subject matter of claim 5 and claim 6.

Parthasarathy et al. (US Patent No. 5740273) teaches to periodically track a marker pen photographed through a camera, to determine whether to remove a third point using a distance between a first point corresponding to a reference point, among points that are sequentially tracked, and a second point at a current time, a preset constant, and an angle between the first point, the second point, and the previously identified third point. However, Parthasarathy et al. fails to disclose to search an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and to display the searched object model on a screen, wherein the removal of the third point is determined by the following Equation: [Equation] if $\theta(x, p) < a / \text{dist}(o, p)$ then $\text{Remove}(x)$ wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $\text{dist}(o, p)$ represents distance between o and p .

Capps et al. (US Patent No. 5583542) teaches to periodically track a marker pen photographed through a camera, to determine whether to remove a third point using a distance between a first point corresponding to a reference point, among points that are sequentially tracked, and a second point at a current time, a preset constant, and an angle between the first point, the second point, and the previously identified third point. However, Capps et al. fails to disclose to search an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and to display the searched object model on a screen, wherein the removal of the third point is determined by the following

Equation: [Equation] if $\theta(x, p) < a/dist(o, p)$ then Remove(x) wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $dist(o, p)$ represents distance between o and p .

Mitaka et al. (US Patent No. 5546476) teaches to determine whether to remove a third point using a distance between a first point corresponding to a reference point, among points that are sequentially tracked, and a second point at a current time, a preset constant, and an angle between the first point, the second point, and the previously identified third point, to search an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and to display the searched object model on a screen. However, Mitaka et al. fails to disclose to search an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and to display the searched object model on a screen, wherein the removal of the third point is determined by the following Equation: [Equation] if $\theta(x, p) < a/dist(o, p)$ then Remove(x) wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $dist(o, p)$ represents distance between o and p .

Taniguchi et al. (US PGPUB No. 20170205224 A1) teaches to determine whether to remove a third point using a distance between a first point corresponding to a reference point, among points that are sequentially tracked, and a second point at a current time, a preset constant, and an angle between the first point, the second point, and the previously identified third point. However, Taniguchi et al. fails to disclose to

search an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and to display the searched object model on a screen, wherein the removal of the third point is determined by the following Equation: [Equation] if $\theta(x, p) < a/dist(o, p)$ then Remove(x) wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $dist(o, p)$ represents distance between o and p .

Lu et al. (US PGPUB No. 20180239434 A1) teaches wherein the memory stores program commands that are executable by the processor to periodically track a marker pen photographed through a camera, to determine whether to modify a point using a distance. However, Lu et al. fails to disclose to search an object model corresponding to a 3D sketch that has been corrected, after correction is completed depending on the removal of the third point, and to display the searched object model on a screen, wherein the removal of the third point is determined by the following Equation: [Equation] if $\theta(x, p) < a/dist(o, p)$ then Remove(x) wherein o represents a reference point, p represents a second point, x represents a third point, a represents a preset constant, $\theta(x, p)$ represents angle between point x and p , and $dist(o, p)$ represents distance between o and p .

As a result of the limitations of independent claims 1, 5, and 6 as well as dependent claims 2, 4 are also considered as being distinguished from the closest known prior art alone or reasonable combination.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to PTO-892, Notice of Reference Cited for a listing of analogous art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Lloyd Beard whose telephone number is (571)272-5735. The examiner can normally be reached on Monday - Friday, 8:00 AM - 5: 00 PM, alternate Fridays EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Devona Faulk can be reached on (571) 272-7515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair->

Art Unit: 2616

my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CHARLES LLOYD. BEARD
Examiner
Art Unit 2616

/CHARLES L BEARD/
Examiner, Art Unit 2616