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NOTICE OF ALLOWANCE AND FEE(S) DUE

26875 7590 10/05/2018

WOOD, HERRON & EVANS, LLP
2700 CAREW TOWER
441 VINE STREET
CINCINNATI, OH 45202

EXAMINER
LI, GRACE Q

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 10/05/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/892,139	11/18/2015	Csaba Benedek	GKMS-36	7499

TITLE OF INVENTION: METHOD AND SYSTEM FOR GENERATING A THREE-DIMENSIONAL MODEL

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	01/07/2019

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: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (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)

26875 7590 10/05/2018
WOOD, HERRON & EVANS, LLP
2700 CAREW TOWER
441 VINE STREET
CINCINNATI, OH 45202

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

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14/892,139	11/18/2015	Csaba Benedek	GKMS-36	7499

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nonprovisional	SMALL	$500	$0.00	$0.00	$500	01/07/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
LI, GRACE Q	2611	345-420000

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 03-02 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,
(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.

1 _____
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 has been filed for recordation as set forth in 37 CFR 3.11. 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 ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

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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.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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. 14/892,139	Applicant(s) Benedek et al.	
	Examiner GRACE Q LI	Art Unit 2611	AIA 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 9/20/2018.
   ☐ 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 See Continuation Sheet . 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 areply 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. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/GRACE Q LI/ Examiner, Art Unit 2611	/KEE M TUNG/ Supervisory Patent Examiner, Art Unit 2611

Continuation of 3. The allowed claim(s) is/are: 2,9-14,16-17,19 and 27

DETAILED ACTION

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.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

An extension of time under 37 CFR 1.136(a) is required in order to make an examiner's amendment which places this application in condition for allowance. During a conversation conducted on 9/25/2018, W. Scott Gaines requested an extension of time for ONE MONTH(S) and authorized the Director to charge Deposit Account No. 23-3000 the required fee of $ 200.00 for this extension and authorized the following examiner's amendment. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with W. Scott Gaines on 9/20/2018.

The application has been amended as follows:

1. (Cancelled)

2. (Currently Amended) [[The]] A method ~~according to claim 1 further~~ for generating a three-dimensional model, comprising:

generating a time series of scene point sets corresponding to a scene comprising an object shape;

dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to a background of the scene;

separating a time series of the respective object shape subsets from the time series of foreground point sets;

generating a background three-dimensional model on the basis of one or more of the background point sets;

generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets;

classifying one or more points of the scene point sets on the basis of height values of the points into one of a ground category, a tall object category, a short object category, and a rare regions category; and

removing the points classified in the rare regions category from the scene point sets, ~~; and~~

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along a trajectory of the object shape, and

each scene point set is divided into the foreground point set and the background point set by assigning the points classified in the ground category and the tall object category to the background point set, and by assigning the points classified in the short object category to the foreground point set.

3-8. (Cancelled)

9. (Currently Amended) [[The]] A method ~~according to claim 1 wherein the time series of scene point sets is generated by a scanning device in a given location, and further~~ for generating a three-dimensional model comprising:

generating a time series of scene point sets corresponding to a scene comprising an object shape using a scanning device in a given location;

dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to a background of the scene;

separating a time series of the respective object shape subsets from the time series of foreground point sets;

generating a background three-dimensional model on the basis of one or more of the background point sets;

generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets;

after the division of each scene point set into the foreground point set and the background point set, generating a topographic model by modelling topographic features of the scene;

generating a projected foreground point set by projecting the foreground point set onto the topographic model;

generating a projected object shape subset of points corresponding to the object shape by dividing the projected foreground point set using shape filtering or dimensional fitting;

determining the object shape subset on the basis of the projected object shape subset;

determining a time series of location points of the object shape on the topographic model on the basis of the projected object shape subset, and

determining [[the]] a trajectory of the object shape on the basis of the time series of location points

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along the trajectory of the object shape.

10. (Previously Presented) The method according to claim 9 wherein the trajectory of the object shape is determined using the Magyar method on the basis of the time series of location points.

11. (Previously Presented) The method according to claim 9 wherein the trajectory is smoothed.

12. (Previously Presented) The method according to claim 9 wherein the trajectory of the object shape is one of a plurality of trajectories of object shapes, and further comprising:

recording along each of the trajectories at least one of height values or intensity values of the respective object shapes measured by the scanning device; and

assigning and linking one of the trajectories to another trajectory on the basis of the matching at least one of the height values or the intensity values.

13. (Previously Presented) The method according to claim 9, characterised by selecting as a location point of the object shape a weighted centre of the projected object shape subset corresponding to the object shape.

14. (Previously Presented) The method according to claim 9 further comprising:

determining the trajectory on the basis of the time series of location points by iteratively:

assigning a next location point in sequence for the object shape,

correcting the assigned location point after examination with a Kalman-filter,

finalising the corrected location point, and

making a proposal by means of the Kalman-filter, for the next location point in sequence, for the at least one object shape.

15. (Cancelled)

16. (Currently Amended) [[The]] A method ~~according to claim 1 further~~ for generating a three-dimensional model comprising:

generating a time series of scene point sets corresponding to a scene comprising an object shape using a scanning device in a given location;

dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to a background of the scene;

separating a time series of the respective object shape subsets from the time series of foreground point sets;

generating a background three-dimensional model on the basis of one or more of the background point sets;

generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets;

generating, by the scanning device, a time series of the scene point sets by moving the scanning device,

generating a registered point set by subjecting at least one part of the members of the time series of the scene point sets to point set registration;

assigning time stamps to the members of the time series of scene point sets; and

on the basis of the time stamps, separating, in the registered point set, at least one of a static combined object shape subset or a dynamic object shape subset

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along a trajectory of the object shape.

17. (Previously Presented) The method according to claim 16 further comprising:

generating, on the basis of the time stamps, a time series of object shape subsets from the dynamic object shape subset; and

assigning the trajectory to the object shape in the time series of object shape subsets on the basis of weighted centres of the object shape subsets.

18. (Cancelled)

19. (Previously Presented) The method according to claim 12 further comprising:

separating a vegetation subset corresponding to vegetation of the scene point set on the basis of a distance of a given point from at least one of an approximating plane fitted onto topographic features of the scene, an irregular location of the given point, or the intensity value of the given point, and removing the vegetation subset from the scene point set.

20-26. (Cancelled)

27. (Currently Amended) A system for generating a three-dimensional model, comprising:

a scanning device adapted for generating a time series of scene point sets corresponding to a scene comprising an object shape,

a point set dividing module adapted for dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to the background of the scene; and

an assignment module adapted for:

classifying one or more points of the scene point sets on the basis of height values of the points into one of a ground category, a tall object category, a short object category, and a rare regions category, and

removing the points classified in the rare regions category from the scene point sets;

an object shape subset dividing module adapted for separating a time series of the respective object shape subset from each foreground point set;

a background modelling module adapted for generating a background three-dimensional model on the basis of one or more of the background point sets;

an optical model-generating module adapted for generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

a model combining module adapted for generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets,

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along a trajectory of the object shape, and

each scene point set is divided into the foreground point set and the background point set by assigning the points classified in the ground category and the tall object category to the background point set, and by assigning the points classified in the short object category to the foreground point set.

28-31. (Cancelled)

Allowable Subject Matter

Claim(s) 2, 9-14, 16, 17, 19, 27 are allowed.

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

Regarding claim 2, as amended, it recites, inter alia, **each scene point set is divided into the foreground point set and the background point set by assigning the points classified in the ground category and the tall object category to the background point set, and by assigning the points classified in the short object category to the foreground point set.**

None of the prior art on the record, alone or in combination, discloses the combination of all the limitations of claim 2, in particular, the above limitation. Therefore, claim 2 is allowable over prior art.

Claim 27 recites similar limitations as claim 2, thus is allowed under similar rational.

Regarding claim 9, as amended, it recites, inter alia, **after the division of each scene point set into the foreground point set and the background point set, generating a topographic model by modelling topographic features of the scene;**

generating a projected foreground point set by projecting the foreground point set onto the topographic model;

generating a projected object shape subset of points corresponding to the object shape by dividing the projected foreground point set using shape filtering or dimensional fitting;

determining the object shape subset on the basis of the projected object shape subset;

determining a time series of location points of the object shape on the topographic model on the basis of the projected object shape subset, and

determining a trajectory of the object shape on the basis of the time series of location points.

None of the prior art on the record, alone or in combination, discloses the combination of all the limitations of claim 9, in particular, the above limitation. Therefore, claim 9 is allowable over prior art.

Regarding claim 16, it recites, inter alia, **on the basis of the time stamps, separating, in the registered point set, at least one of a static combined object shape subset or a dynamic object shape subset.**

None of the prior art on the record, alone or in combination, discloses the combination of all the limitations of claim 16, in particular, the above limitation. Therefore, claim 16 is allowable over prior art.

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."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GRACE Q LI whose telephone number is (571)270-0497. The examiner can normally be reached on Monday - Friday, 8:00 am-5:00 pm.

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, Kee Tung can be reached on (571)-272-7794. 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 http://pair-direct.uspto.gov. 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.

/GRACE Q LI/
Examiner, Art Unit 2611
9/25/2018

/KEE M TUNG/
Supervisory Patent Examiner, Art Unit 2611

Applicant-Initiated Interview Summary	**Application No.** 14/892,139	**Applicant(s)** Benedek et al.	
	Examiner GRACE Q LI	**Art Unit** 2611	**AIA Status** Yes

All participants (applicant, applicants representative, PTO personnel):

(1) GRACE Q. LI. (3) _____.

(2) W. Scott Gaines. (4) _____.

Date of Interview: 20 September 2018.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☑Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1-2,9,16 and 27.

Identification of prior art discussed: none.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The proposed amendment is discussed. The examiner notes that the amendment as attached pdf places the application under allowance condition..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/GRACE Q LI/ Examiner, Art Unit 2611	/KEE M TUNG/ Supervisory Patent Examiner, Art Unit 2611

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

Inventors:	Csaba Benedek et al.
Serial No.:	14/892,139
Filed:	November 18, 2015
Title:	METHOD AND SYSTEM FOR GENERATING A THREE-DIMENSIONAL MODEL
Attorney Docket:	GKMS-36

1. (Cancelled)

2. (Currently Amended) [[The]] A method ~~according to claim 1 further~~ for generating a three-dimensional model, comprising:

generating a time series of scene point sets corresponding to a scene comprising an object shape;

dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to a background of the scene;

separating a time series of the respective object shape subsets from the time series of foreground point sets;

generating a background three-dimensional model on the basis of one or more of the background point sets;

generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets;

classifying one or more points of the scene point sets on the basis of height values of the points into one of a ground category, a tall object category, a short object category, and a rare regions category; and

removing the points classified in the rare regions category from the scene point sets, ~~; and~~

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along a trajectory of the object shape, and

each scene point set is divided into the foreground point set and the background point set by assigning the points classified in the ground category and the tall object category to the

background point set, and by assigning the points classified in the short object category to the foreground point set.

3-8. (Canceled)

9. (Currently Amended) [[The]] A method ~~according to claim 1 wherein the time series of scene point sets is generated by a scanning device in a given location, and further~~ for generating a three-dimensional model comprising:

generating a time series of scene point sets corresponding to a scene comprising an object shape using a scanning device in a given location;

dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to a background of the scene;

separating a time series of the respective object shape subsets from the time series of foreground point sets;

generating a background three-dimensional model on the basis of one or more of the background point sets;

generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets;

after the division of each scene point set into the foreground point set and the background point set, generating a topographic model by modelling topographic features of the scene;

generating a projected foreground point set by projecting the foreground point set onto the topographic model;

generating a projected object shape subset of points corresponding to the object shape by dividing the projected foreground point set using shape filtering or dimensional fitting;

determining the object shape subset on the basis of the projected object shape subset;

determining a time series of location points of the object shape on the topographic model on the basis of the projected object shape subset, and

determining [[the]] a trajectory of the object shape on the basis of the time series of location points

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along the trajectory of the object shape.

10. (Previously Presented) The method according to claim 9 wherein the trajectory of the object shape is determined using the Magyar method on the basis of the time series of location points.

11. (Previously Presented) The method according to claim 9 wherein the trajectory is smoothed.

12. (Previously Presented) The method according to claim 9 wherein the trajectory of the object shape is one of a plurality of trajectories of object shapes, and further comprising:

recording along each of the trajectories at least one of height values or intensity values of the respective object shapes measured by the scanning device; and

assigning and linking one of the trajectories to another trajectory on the basis of the matching at least one of the height values or the intensity values.

13. (Previously Presented) The method according to claim 9, characterised by selecting as a location point of the object shape a weighted centre of the projected object shape subset corresponding to the object shape.

14. (Previously Presented) The method according to claim 9 further comprising:

determining the trajectory on the basis of the time series of location points by iteratively:

assigning a next location point in sequence for the object shape,

correcting the assigned location point after examination with a Kalman-filter,

finalising the corrected location point, and

making a proposal by means of the Kalman-filter, for the next location point in sequence, for the at least one object shape.

15. (Canceled)

16. (Currently Amended) [[The]] A method ~~according to claim 1 further~~ for generating a three-dimensional model comprising:

generating a time series of scene point sets corresponding to a scene comprising an object shape using a scanning device in a given location;

dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to a background of the scene;

separating a time series of the respective object shape subsets from the time series of foreground point sets;

generating a background three-dimensional model on the basis of one or more of the background point sets;

generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets;

generating, by the scanning device, a time series of the scene point sets by moving the scanning device,

generating a registered point set by subjecting at least one part of the members of the time series of the scene point sets to point set registration;

assigning time stamps to the members of the time series of scene point sets; and

on the basis of the time stamps, separating, in the registered point set, at least one of a static combined object shape subset or a dynamic object shape subset

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along a trajectory of the object shape.

17. (Previously Presented) The method according to claim 16 further comprising:

generating, on the basis of the time stamps, a time series of object shape subsets from the dynamic object shape subset; and

assigning the trajectory to the object shape in the time series of object shape subsets on the basis of weighted centres of the object shape subsets.

18. (Canceled)

19. (Previously Presented) The method according to claim 12 further comprising:

separating a vegetation subset corresponding to vegetation of the scene point set on the basis of a distance of a given point from at least one of an approximating plane fitted onto topographic features of the scene, an irregular location of the given point, or the intensity value of the given point, and removing the vegetation subset from the scene point set.

20-26. (Canceled)

27. (Currently Amended) A system for generating a three-dimensional model, comprising:

a scanning device adapted for generating a time series of scene point sets corresponding to a scene comprising an object shape,

a point set dividing module adapted for dividing each scene point set of the time series of scene point sets into:

a foreground point set corresponding to a foreground of the scene and comprising an object shape subset of points corresponding to the object shape, and

a background point set corresponding to the background of the scene; and

an assignment module adapted for:

classifying one or more points of the scene point sets on the basis of height values of the points into one of a ground category, a tall object category, a short object category, and a rare regions category, and

removing the points classified in the rare regions category from the scene point sets;

an object shape subset dividing module adapted for separating a time series of the respective object shape subset from each foreground point set;

a background modelling module adapted for generating a background three-dimensional model on the basis of one or more of the background point sets;

an optical model-generating module adapted for generating, from optical recordings, a dynamic three-dimensional model of a substituting object shape assignable to the object shape;

a model combining module adapted for generating a combined three-dimensional model on the basis of the background three-dimensional model and the dynamic three-dimensional model substituting each member of the time series of object shape subsets,

wherein the dynamic three-dimensional model is multiplied to a length corresponding to a movement of the object shape along a trajectory of the object shape, and

each scene point set is divided into the foreground point set and the background point set by assigning the points classified in the ground category and the tall object category to the background point set, and by assigning the points classified in the short object category to the foreground point set.

28-31. (Canceled)