

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82B (07-13)

Approved for use through 01/31/2018, OMB 0651-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

OR

22913

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Sascha Connelly

- ☒ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Sascha Connelly

Date (Optional)

12/8/2017

Name

Sascha Connelly

235F810892EF4C4...

Title

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Lightricks Ltd.

EX1011

Page 1 of 254

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82B (07-13)

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POWER OF ATTORNEY BY APPLICANT

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Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

22913

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Troy Plota

- ☒ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Troy Plota

Date (Optional)

12/8/2017

Name

Troy Plota

Title

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	38218020
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John C. Stringham/Rebecca Reil
Filer Authorized By:	John C. Stringham
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	06-JAN-2020
Filing Date:	
Time Stamp:	19:49:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	20970-1-1-1-1_2020-01-06_AD S.pdf	1267291	no	9
			0bbc44e9750eab62acd781e50e5e43510275c03		

Warnings:

Information:					
2		20970-1-1-1-1_2020-01-06_Application.pdf	198323	yes	32
			54af30fc1ccdb07109bb0525aa292016c4186961		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Abstract		32	32	
	Claims		30	31	
	Specification		1	29	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	20970-1-1-1-1_2020-01-06_Figures.pdf	1478280	no	9
			fa591c98b9ec65acbc30b53f047a3073cedbb8f1		
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
4	Oath or Declaration filed	20970-1-1-1-1_2020-01-06_Declaration-Troy.pdf	104152	no	2
			d401e98d6adc8031b34d4d49e176bb9ea8fe03a9		
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
5	Oath or Declaration filed	20970-1-1-1-1_2020-01-06_Declaration-Sascha.pdf	101196	no	2
			39216bddde86bd19fc55b3fe9362cfc3697622ee		
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
6	Power of Attorney	20970-1-1-1-1_2020-01-06_POA-Sascha.pdf	665352	no	1
			f4f2bb0296d50598f4dd656aa25dc756dc574bf8		
Warnings:					

Page 4 of 254

Information:					
7	Power of Attorney	20970-1-1-1-1_2020-01-06_PO A-Troy.pdf	658250	no	1
			6d975c462a6cc7217be26f551c6da52adaa 559d2		
Warnings:					
Information:					
Total Files Size (in bytes):				4472844	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor	1				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Troy		Plota		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Kihei	State/Province	HI	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o PLOTAGRAPH, INC.				
Address 2	1215 S. Kihei Road, Suite O #1074				
City	Kihei	State/Province	HI		
Postal Code	96753	Country	US		

Inventor	2				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Sascha		Connelly		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Kihei	State/Province	HI	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o PLOTAGRAPH, INC.				
Address 2	1215 S. Kihei Road, Suite O #1074				
City	Kihei	State/Province	HI		
Postal Code	96753	Country	US		

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		

☐ An Address is being provided for the correspondence information of this application.

Customer Number	22913		
Email Address	docketing@wnlaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	Automated Pixel Shifting Within a Digital Image		
Attorney Docket Number	20970.1.1.1.1	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	22913		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15/660677	2017-07-26
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15/660677	Claims benefit of provisional	62/514703	2017-06-02
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15/660677	Claims benefit of provisional	62/368017	2016-07-28
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation in part of	16/162206	2018-10-16
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/162206	Claims benefit of provisional	62/574055	2017-10-18
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/162206	Continuation in part of	15/660677	2017-07-26
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15/660677	Claims benefit of provisional	62/514703	2017-06-02
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15/660677	Claims benefit of provisional	62/368017	2016-07-28

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.				
Applicant	1			Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.				
Clear				
Assignee	Legal Representative under 35 U.S.C. 117		Joint Inventor	
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest		
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:				
Name of the Deceased or Legally Incapacitated Inventor:				
If the Applicant is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Applicant:				
Address 1				
Address 2				
City		State/Province		
Country		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Applicant Data may be generated within this form by selecting the Add button. Add				

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		

Assignee	1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				Remove
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				Add

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/John C. Stringham/		Date (YYYY-MM-DD)	2020-01-06
First Name	John C.	Last Name	Stringham	Registration Number
				40831
Additional Signature may be generated within this form by selecting the Add button.				Add

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	20970.1.1.1.1
		Application Number	
Title of Invention	Automated Pixel Shifting Within a Digital Image		

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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ABSTRACT

Automating the shifting of pixels within a digital image comprises a processor receiving an indication of a starting point through a user interface. The starting point is received through a user selection of a particular portion of the digital image. Additionally, the processor receives, through the user interface, a direction associated with the starting point. The processor also selects a set of pixels extending in the direction away from the starting point. Further, the processor shifts the set of pixels in the first direction. Shifting the set of pixels comprises rendering and re-rendering in a loop the set of pixels being shifted.

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CLAIMS

What is claimed is:

1. A computer system for automating the shifting of pixels within a digital image, comprising:

one or more processors; and

one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following:

access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image;

identify a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask from being shifted;

receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of the digital image;

receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion of the user interface;

create a first link between the first starting point and the first ending point, wherein the first link comprises:

a non-linear pathway extending between the first starting point and the first ending point a first direction extending from the first starting point to the first ending point; and

a first length extending along the non-linear pathway between the first starting point and the first ending point;

identify a first set of pixels that lie along the link between the first starting point and the first ending point; and

shift the first set of pixels in the first direction along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering and re-rendering in a loop the first set of pixels being shifted.

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UNITED STATES PATENT APPLICATION

of

Troy Plota

and

Sascha Connelly

for

AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE

Automated Pixel Shifting Within a Digital Image

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. Patent Serial No. 15/660,677 entitled “Automated Pixel Shifting Within a Digital Image”, filed on July 26, 2017, which claims priority to and the benefit of U.S. Provisional Application 62/514,703 entitled “Automated Pixel Shifting Within A Digital Image”, filed on June 2, 2017, and U.S. Provisional Application Ser. No. 62/368,017 entitled “Automated Pixel Shifting Within A Digital Image”, filed on July 28, 2016. This application also claims priority to and is a continuation-in-part of U.S. Patent Serial No 16/162,206 entitled “Automated Pixel Shifting Within a Video File”, filed October 16, 2018, which claims priority to U.S. Provisional Application No. 62/574,055 entitled “Automated Pixel Shifting Within a Video File,” filed on October 18, 2017; and is also a continuation-in-part of U.S. Application No. 15/660,677 entitled “Automated Pixel Shifting Within A Digital Image”, filed on July 26, 2017, which claims priority to and the benefit of U.S. Provisional Application 62/514,703 entitled “Automated Pixel Shifting Within A Digital Image”, filed on June 2, 2017, and U.S. Provisional Application Ser. No. 62/368,017 entitled “Automated Pixel Shifting Within A Digital Image”, filed on July 28, 2016. The entire contents of each of the aforementioned applications and/or patents are incorporated by reference herein in their entirety.

BACKGROUND

[0001] Computers and computing systems have affected nearly every aspect of modern living. Computers are generally involved in work, recreation, healthcare, transportation, entertainment, household management, etc.

[0002] Computers, and in particular the fairly recent boom of digital photography, have changed the entire photography industry. For example, instead of taking pictures and then waiting for film to develop before viewing the images, with modern digital cameras, high quality photographs can be captured and immediately viewed. The increase in digital photography has been accompanied with a related increase in digital image software tools.

[0003] Digital image software tools include compression algorithms that dramatically reduce the size of digital images with little or no loss of image quality. Additional, digital image software tools also include tools to edit or otherwise manipulate digital images. For example, many digital image editing tools and digital image sharing tools include filters that can be applied to images to generate desired effects and appearances within an image.

[0004] While in some cases the use of digital image tools can appear seamless and quick to an end-user, many of these tools utilize extremely complex computer-based technological solutions. For example, properly applying a filter to an image can involve complex mathematical equations necessary to consistently adjust the color of individual pixels within a digital image.

[0005] Adjusting relatively simple aspects of a digital image, such as color, provides many users with highly desirable tools for editing their digital images. Additional, tools

are desirable for improving digital images, such as the ability to incorporate movement within a digital image.

[0006] The subject matter claimed herein is not limited to embodiments that solve any disadvantages or that operate only in environments such as those described above. Rather, this background is only provided to illustrate one exemplary technology area where some embodiments described herein may be practiced.

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BRIEF SUMMARY

[0007] Embodiments disclosed herein comprise a computer system for automating the shifting of pixels within a digital image. The system comprises one or more processors and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform various steps. For example, the system accesses, from memory, a digital image file. The digital image file comprises information that corresponds to individual pixels within the digital image. The system also identifies a particular portion of the digital image to mask. The mask prevents pixels covered by the mask from being shifted. The system also received a first starting point through a user interface. The first starting point is received through a user selection of a first beginning portion of the digital image. Additionally, the system receives a first ending point through the user interface. The first starting point is received through a user selection of a first ending portion of the user interface.

[0008] The system then creates a first link between the first starting point and the first ending point. The first link comprises a first direction extending from the first starting point to the first ending point. The first link also comprises a first length between the first starting point and the first ending point. In addition, the system identifies a first set of pixels that lie between the first starting point and the first ending point. The system shifts the first set of pixels in the first direction. Shifting the first set of pixels comprises rendering and re-rendering in a loop the first set of pixels being shifted.

[0009] Disclosed embodiments include automating the shifting of pixels within a digital image by using a processor to receive an indication of a starting point through a user interface. The starting point is received through a user selection of a particular

portion of the digital image. Additionally, the processor receives, through the user interface, a direction associated with the starting point. The processor also selects a set of pixels extending in the direction away from the starting point. Further, the processor shifts the set of pixels in the first direction. Shifting the set of pixels comprises rendering and re-rendering in a loop the set of pixels being shifted.

[0010] Additional disclosed embodiments comprise a method for automating the shifting of pixels within a digital image. The method comprises receiving a first indication of a first starting point through a user interface. The first starting point is received through a user selection of a portion of the digital image. The method also comprises receiving, through the user interface, a first direction associated with the first starting point. Additionally, the method comprises selecting a first set of pixels extending in the first direction away from the first starting point. The method also comprises shifting the first set of pixels in the first direction, wherein shifting the first set of pixels comprises rendering and re-rendering in a loop the first set of pixels being shifted.

[0011] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

[0012] Additional features and advantages will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by the practice of the teachings herein. Features and advantages of the invention may be realized and obtained by means of the instruments and combinations particularly pointed out in the appended claims. Features of the present invention will become more fully apparent from

the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In order to describe the manner in which the above-recited and other advantages and features can be obtained, a more particular description of the subject matter briefly described above will be rendered by reference to specific embodiments which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments and are not therefore to be considered to be limiting in scope, embodiments will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

[0014] Figure 1 illustrates a schematic of an embodiment of a computer system for automating the shifting of pixels within a digital image.

[0015] Figure 2 illustrates a schematic of an embodiment of a software architecture for automating the shifting of pixels within a digital image.

[0016] Figures 3A-3C illustrate embodiments of a photo that has received beginning and ending points.

[0017] Figure 4 illustrates an embodiment of a photo that has formed a mesh from received beginning and ending points.

[0018] Figures 5A-5D illustrates embodiments of individual pixels being shifted.

[0019] Figure 6A illustrates an embodiment of a mask.

[0020] Figure 6B illustrates another embodiment of a mask

[0021] Figure 7 illustrates a flow chart of an embodiment of a method for automating the shifting of pixels within a digital image.

[0022] Figure 8 illustrates a flow chart of another embodiment of a method for automating the shifting of pixels within a digital image.

DETAILED DESCRIPTION

[0023] Embodiments disclosed herein comprise systems, methods, and computer-readable media that automate the shifting of pixels within a digital image. Disclosed embodiments provide interfaces and tools for automating the shifting of pixels within a digital image. For example, disclosed embodiments automate the shifting of pixels within a digital photograph of water such that the water appears to be flowing.

[0024] In at least one embodiment, a user, through simple interface actions, selects portions of a digital image to automate the shifting of pixels. The user controls the speed of the pixel shifting, the magnitude of the pixel shifting, the direction of pixel shifting, and various other attributes of the pixel movement. Additionally, the user applies masks to the digital image to prevent pixels within specific portions of the digital image from moving. As such, disclosed embodiments provide technical solutions for automating the manipulation of pixels within a digital image.

[0025] For example, Figure 1 illustrates a schematic of an embodiment of a computer system 100 for automating the shifting of pixels within a digital image. The depicted computer system 100 comprises a variety of different components, including one or more client applications 120, load balancers 110, application servers 130(a-c), databases 140, and workers 150(a-b). In the depicted embodiment, the computer system 100 comprises a network-based or cloud-based system that allows a user to manipulate a digital photograph over a network connection. One will understand, however, that alternate or additional embodiments may be otherwise configured such that the system is otherwise distributed or localized. For instance, in at least one embodiment, the system 100 is executed by a single local computer.

[0026] In at least one embodiment, a client application 120 is executed within a web browser at a user's computer. The client application 120 comprises a user interface for uploading, or otherwise selecting, a digital image and issuing commands to cause one or more pixels within the digital image to shift. At least a portion of the processing and actual manipulation of the digital image occurs on an application server 130(a-c) within the cloud. A load balancer 110 balances the processing load of one or more users between multiple application servers 130(a-c). For example, the load balancer 110 may ensure that each application server 130(a-c) is, on average, under the same processing load.

[0027] The application servers 130(a-c) and the client application 120 are in communication with one or more web storage services 160, such as AMAZON™ S3 storage. Additionally, the application servers 1430(a-c) may be in communication with various backend databases 140. The various storage services 160 and databases 140 may store the digital images and software components used within the computer system 100.

[0028] Figure 2 illustrates a schematic of an embodiment of a software architecture 200 for automating the shifting of pixels within a digital image. In particular, Figure 2 depicts various screen interfaces 210, actions 220, and dialog/context dependent controls 230 that are present within the software architecture 200. In at least one embodiment, a user is presented with a Home/List Projects screen interface. 210a The Home/List Projects 210a provide the user with a selection of previously saved projects and/or the option to select a digital image and initiate a new project.

[0029] Once a user selects a project of choice, the software architecture 200 accesses, from memory, a digital image file of interest. As used herein, a digital image file comprises information that corresponds to individual pixels within a digital image. A view/edit project screen interface 210b provides the user with various editing options,

both manual and automated. For example, the editing screen provides the user with actions for uploading a base image 220a, selecting a transformation mask 210c, generating points 210d, adjusting animation duration and FPS rate 220b, selecting a mask type 220c, generating a static preview 220d, and editing a point selection 230a.

[0030] In at least one embodiment, a user is presented with options to select between various different types of transformation mask operations. For example, the user can choose a select area option 220e that allows a user to draw boundaries around an area. A mask is then automatically generated within that area. Additionally, a user may select an automated mask by edge-detection option 220f that scans a digital image and automatically identifies distinct areas within the image based upon edge detection. A user may also select a manual mask painting option 220g that allows a user to manually draw a mask on the digital image.

[0031] A mask defines a static portion of the image with respect to shifting. In at least one embodiment, the mask is created by using a combination of two tools - automatic and manual. The automatic tool lets the user define masked and shifted areas by drawing lines in them. Any changes along those lines trigger an automatic edge detection using a watershed transformation on the image gradient. This generates a binary mask image that the user can later modify via a simple brush tool. The final mask image is then once again passed through edge detection so it can be saved in vector format.

[0032] In at least one embodiment, a mask is later applied in one of two ways. In the first application method, the mask is fixed and is applied by adding static (unmovable) point on all mask edges. In the second application method, the mask is an overlay that cuts-and-pastes the masked portions of the image on top of the animation.

[0033] For example, Figure 3A depicts a user utilizing the automated mask by edge-detection option 220f. In particular, the user has drawn two lines 300a, 300b across the house and mountain behind the house. The software architecture 200 interprets the lines as indicating the area that the user wishes to mask. In at least one embodiment, a user may only select a single pixel within the area that should be masked. Various different embodiments may accept a variety of different input interfaces. For example, a user may draw the lines using a computer mouse, a touch interface, a stylus interface, a keyboard interface, or any number of other user interfaces.

[0034] Upon receiving the selection, the software architecture 200 performs an edge detections method to identify edges that form boundaries around the selected area. After identifying a boundary, the software architecture 200 generates a mask to cover the area within the boundary. For instance, Figure 3B illustrates a mask 310 covering the house and the mountain behind the house, but excluding the sky and the grass in front of the house. As such, a user is provided with tools for identifying a particular portion of the digital image to mask. The mask prevents pixels covered by the mask from being shifted.

[0035] In at least one embodiments, methods other than generating a mask are used to prevent portions of a digital from moving. For example, in at least one embodiment, a user selects the manual mask painting option 220g and manually places stabilizer points around a portion of the digital image that should not move. The stabilizer points indicate to the architecture software that pixels associated with the stationary points should be not be shifted or otherwise moved. In at least one embodiment, the stabilizer points are useable for creating a fence around an area that should not be shifted. For example, placing the stabilizer points causes the architecture software to stop shifting pixels at a boundary that is made up of the stabilizer points.

[0036] The software architecture 200 also provides a user with a point generation display 210 that comprises options 220h, 220i for generating points. For example, the user may be provided with an automatic feature point detection option 220h that generate points through automatic feature point detection or a manual feature point addition/removal option 220i. When generating points through automatic feature point detection the software architecture 200 identifies areas outside the mask that are associated with directional texture, directional patterns, that otherwise comprise a visually detectable pattern of motion. For example, Figure 3C depicts the picture of the house and landscape with points drawn throughout the foreground grass 320a and points drawn throughout the clouds in the sky 320b.

[0037] In at least one embodiment, the software architecture 200 places the points within the grass based upon identified lines and edges within the grass that extend outward from the ground or from the user generated mask 310. Based upon the lines and textures associated with the grass extending upwards and away from the ground, the software architecture 200 determines that the grass is associated with movement away from the ground. As such, the software architecture 200 automatically places points through the grass.

[0038] In at least one embodiment, a user can alternatively or additionally manually add or remove points. For example, a user can manually add all of the points depicted in Figure 3C or a user can direct the software architecture 200 to automatically add a portion of the points and then the user can add additional points.

[0039] In at least one embodiment, points are added to a digital image in two different stages. During the first stage, the software architecture 200 receives a first starting point through a user interface. A starting point is received through a user selection of a

beginning portion of the digital image. The beginning portion of the digital image comprises a starting pixel, or area, from which the user wishes pixels to shift. For example, in Figure 3C, various beginning points (also referred to herein as “starting points”) comprise the points nearest to the base of the grass and represented by crosses comprise starting points. In at least one embodiment, a beginning point comprise a particular pixel that is selected by a user or automatically selected by the software architecture 200.

[0040] During the second stage of the point generation, the software architecture 200 receives an ending point through the user interface. The ending point is received through a user selection of an ending portion of the user interface. The ending portion of the digital image comprises an ending pixel, or area, to which the user wishes pixels to shift. For example, in Figure 3C various ending points are selected on the outer periphery of the grass and are represented by arrows. In at least one embodiment, each starting point is paired with a specific ending point and vice versa. Additionally, the software architecture creates a link between the starting point and first ending point. In at least one embodiment, a link is a vector extending from the starting point to the ending point. A link comprises a direction extending from the first starting point to the first ending point and a length between the first starting point and the first ending point.

[0041] A user is capable of choosing the direction of a link and length of a link at will. For example, upon placing a starting point, the user can place an associated ending point at any other location within the user interface – even outside the edges of the digital image. As such, in at least one embodiment, a single digital image can be associated with a multitude of different starting points, ending points, and associated links going in different directions and comprising different lengths. In the case the points are generated

automatically by the software architecture 200, a user is free to move and adjust the points in any way that is desirable.

[0042] In at least one embodiment, the software architecture 200 generates a starting mesh from the collective starting points. Similarly, the software architecture 200 generates an ending mesh from the collective ending points. For example, Figure 4 depicts a starting mesh and ending mesh overlaid on the digital image of the house and landscape. In at least one embodiment, the software architecture provides the user with the option of viewing one or both of the meshes. Visualizing the meshes may assist a user in viewing the inputs that cause the pixels to shift.

[0043] Once a user has established one or more starting and ending point pairs, the software architecture identifies sets of pixels that lie between the respective starting points and the respective ending points. In at least one embodiment, a first set of pixel may comprise a group of pixels that intersect with a link between a starting point and an ending point and that are not covered by a mask. The size of the group of pixels may be user selectable or automatically determined. For example, a user may increase the threshold distances that the set of pixels extend beyond the link. As such at one extreme, the set of pixels may comprise a line of individual pixels extending from the starting point to the ending point, or at another extreme the set of pixels may comprise a relatively wide swatch of pixels that are parallel to the link that extends between the starting point and the ending point.

[0044] After identifying the appropriate set of pixels associated with each starting point and ending point pair, the software architecture 200 shifts the respective sets of pixels in the direction determined by their relative links. In at least one embodiment, shifting the sets of pixels comprises rendering and re-rendering in a loop the sets of pixels

being shifted. Additionally, as described above, different sets of pixels may be associated with different directions. As such, sets of pixels may travel in different directions within the digital image.

[0045] In at least one embodiment once pixels begin to shift, the user may notice that a particular portion of the digital image that the user desired to not move is in fact being shifted. To correct this error, the user can edit the mask such that it covers the portion of interest. Additionally, in at least one embodiment, to correct the error, the user executes a feather tool that blurs the portion of interest such that the shifting pixels are no longer noticeable. In a further embodiment, the user places stabilizer points along the portion of interest. The stabilizer points may be placed with a simple click along the particular portion of the digital image. The stabilizer point cause pixels within the particular portion of the digital image to not be shifted.

[0046] By way of example, Figures 5A-5D depict embodiments of individual pixels being shifted. In particular, Figure 5A depicts a starting point 550, an ending point 530, and an associated link 540. Additionally, Figures 5A depicts exemplary pixels 500, 510, and 520. One will understand that the pixels 500, 510, 520 are provided only for the sake of clarity and explanation and that in various embodiments the pixels may comprise a variety of different colors.

[0047] Figure 5A depicts the pixels 500, 510, 520 in their original state within the digital image. Once the software architecture 200 begins shifting the set of pixels in the direction of the link (extending from the starting point to the ending point), the pixels 500, 510, 520 are moved. For example, Figure 5B depicts the pixels 500, 510, 520 after the initial movement. As compared to Figure 5A the set of pixels are shifted left, along the direction of the link, one space.

[0048] In various embodiments, a user is provided with an animation duration and FPS rate option 220b for determining the step size within the shift and/or the speed at which the shift occurs. For example, while the embodiment depicted in Figures 5A-5D have a step size of a single pixel space, in various embodiments, the pixels may shift multiple pixels at a time. Additionally, in at least one embodiment the step size is time constrained. For example, a user may indicate that each respective loop in the pixel shifting only take 2 seconds. In such a case, the step size may be determined by the length of the link and the frame rate of the shifting. In other words, one set of pixels may need to travel a link length of 20 pixels within the 2 seconds, while another set of pixels may only need to travel a link length of 6 pixels within two seconds. As such, based upon the frame rate at which the steps occur, the two sets of pixels would operate at different step sizes. In at least one embodiment, a user can set a particular desired framerate to be associated with a digital image. Additionally, in at least one embodiment, the magnitude of the shifting of a set of pixels is proportionally related to the length of an associated link.

[0049] In contrast in at least one embodiment, the step size of each set of pixels is consistent such that sets of pixels along longer links take more time to complete a loop than sets of pixels along shorter links. Accordingly, a user can create a particularly long link to indicate a long, or more extended, motion within a digital image. In contrast, the user can create a particular short link to indicate a short, or faster, motion within the digital image.

[0050] Figure 5C depicts pixels 500, 510, 520 another step along the shift. In Figure 5D the pixels 500, 510, 520 are shown at yet another step along the shift, but in this step the pixels 500, 510, 520 are beginning to loop around. For example, pixel 500a is at the

left of the shift, while corresponding pixel 500b is reappearing at the right of the shift to begin the shifting loop. In various additional or alternative embodiments, the set of pixels only begins to loop as pixels 500, 510, 520 leave the screen. For example, once pixel 500a reaches the end of the link (i.e., ending point 530), pixel 500a disappears on the next step. Upon disappearing, pixel 500b then reappears at the beginning of the link (i.e., starting point 550) to start the loop. Additionally, in at least one additional or alternative embodiment, the pixels 500, 510, 520 fade in and out at the beginning and ending of each loop. For example, upon reaching the end of the link, pixel 500a fades out of the image by slowly growing transparent, such that the disappearance of pixel 500a is not abrupt or jarring. Similarly, pixel 500b can fade in such that its appearance is not abrupt or jarring.

[0051] In various alternative or additional embodiments, different methods of pixel shifting and blending can be used to similar effect. For example, in at least one embodiment, the pixels immediately begin cycling as soon as the shifting begins. For example, instead of what is shown in Figures 5A-5D, as soon as pixel 500 shifted to its new position depicted in Figure 5B, pixel 500B would appear in the position depicted in Figure 5D. As such, the pixels begin looping and blending into each other immediately.

[0052] In at least one embodiment, the software architecture 200 uses alpha blending when shifting the pixels from the starting point to the ending point. For example, the software application 200 may utilize a sin, cosine, or linear alpha blend to shift the set of pixels. Additionally, in at least one embodiment, the software architecture uses a warping function, such as a Shepard's distortion. When using a mesh algorithm, the software architecture 200 triangulates the mesh using defined points and then calculates an affine transformation for every triangle. Further, the software architecture 200 supports

animation blending in order to achieve the seaming effect of a continuous motion. This is achieved by blending animated frames two by two using one of a few predefined blend functions.

[0053] Similarly, a user is provided with a mask type option 220c to select between different types of masks. Each different mask type may use different mask configurations. In at least one embodiments, mask types also vary by the color that is used to depict the mask within the image.

[0054] For example, Figures 6A and 6B illustrate an embodiment of a mask 600. In the depicted embodiment, a strip of points 610 on the edge of the mask (“edge strip”) is used to generate the flow of points simulating an animation. The dimensions and shape of the edge strip depend on properties of the mask and the user selected flow. In at least one embodiment, the width of the edge strip 610 is determined as a linear function of the dimensions of the target image. Further, the shape of the edge strip 610 may be a result of sliding the shape of the mask 600 in the direction of the vector flow. As such, a user is able to customize the mask.

[0055] When in use, the mask 600 assists in generating pixel flow. For example, as depicted in Figure 6B the points 632, 642, 652 on the edge strip 610 are being stretched in order to generate a flow of points in the desired direction. For example, the points 632, 642, 652 are shown as being stretched to strips 630, 640, 650 that are stretched from the edge 610 of the mask 600. The stretching motion is performed continuously such that the points 632, 642, 652 are continuously reset and stretched such that the pixel shifting is continuous and results in the impression of motion.

[0056] In various additional or alternative embodiments, a user has the ability to further manipulate a digital image. For example, instead of the straight links depicted in

Figures 5A-5D, the use can view an edit point selection dialog 230a as depicted in Figure 2. The edit point selection provides a user with the options of changing a movement direction and path 220j or selecting a predefined movement 220k. For example, instead of straight links extending between a starting point and ending point, the user can create a custom path between any two starting and ending points. In such a case, the associated set of pixels would travel along the path of the link. Similarly, the user may select a predefined path (i.e., movement) that is defined within the software architecture 200. For example, the predefined paths may include a curved path. Using the curved path option, the user can cause a set of pixels to travel along a curved path (i.e., link) between a starting and ending point.

[0057] Once a user is satisfied with their work on an image, a preview output screen 210e allows a user to view the image while the pixels are being shifted. Such a view may give the impression that at least a portion of the static image is animated. In contrast, a user is also give a static preview option 220d that allows the user to view the un-animated image. If the user is satisfied with the final product, the user is provided with a format selection and export action 220. This action generates a variety of different formats that are configured for viewing. For example, an animated GIF may be produced.

[0058] Additionally, in at least one embodiment, a user is able to save all of the masking work, point generation work, and animation duration and FPS rate work separate from the underlying image. For example, the user may perform the above discussed steps on a particular photo. The user may then decide to manipulate the photo within a photo editor application. In such a case, instead of having to restart the animation process with the modified photo, the user applies the previously saved animation work to the modified photo.

[0059] The following discussion now refers to a number of methods and method acts that may be performed. Although the method acts may be discussed in a certain order or illustrated in a flow chart as occurring in a particular order, no particular ordering is required unless specifically stated, or required because an act is dependent on another act being completed prior to the act being performed.

[0060] One will appreciate that embodiments disclosed herein can also be described in terms of flowcharts comprising one or more acts for accomplishing a particular result. For example, Figure 7 and the corresponding text describe acts in various methods and systems for automating the shifting of pixels within a digital image. The acts of Figure 7 are described below.

[0061] For example, Figure 7 illustrates that a flow chart of an exemplary method 700 for automating the shifting of pixels within a digital image includes an act 710 of receiving a starting point. Act 710 comprises receiving an indication of a starting point through a user interface, wherein the starting point is received through a user selection of a particular portion of the digital image. For example, as depicted and explained with respect to Figure 5A, a user selects a starting point 550. Similarly, Figure 3C depicts various user-selected starting points surrounding the grass in the digital image.

[0062] Additionally, Figure 7 illustrates that the method includes an act 720 of receiving a direction. Act 720 comprises receiving, through the user interface, a direction associated with the starting point. For example, as depicted and explained with respect to Figure 5A, the use can select an ending point 530. A link 540 is then formed between the starting point 550 and the ending point 530. The link 540 is associated with a direction extending from the starting point 550 to the ending point 530. As such, the software architecture 200 receives a direction from the link 540.

[0063] In contrast, in additional or alternative embodiments, the software architecture 200 can receive a direction without the use of an ending point 530 or a link 540. For example, the software architecture 200 may receive the direction from a default setting stored within memory or explicitly from the user. Further, in at least one embodiment, the software architecture 200 identifies a direction from line and edge detection. For example, the software architecture 200 may identify a direction that follow the blades of grass depicted in Figure 3A. In any case, in at least one embodiment, a user may only need to enter a starting point and the direction is identified either automatically or through user interaction other than the creation of an ending point.

[0064] Figure 7 also illustrates that the method includes an act 730 of selecting a set of pixels. Act 730 comprises selecting a set of pixels extending in the direction away from the starting point. For example, as depicted and explained with respect to Figure 5A, the software architecture 200 selects a set of pixels 500, 510, 520 that extend in the direction of the link 540 away from the starting point 550. The computer architecture 200 may define the set of pixels 500, 510, 520 as being every pixel that extends in the direction away from the starting point and that is within a user or computer-defined threshold distance from the link 540.

[0065] Further, Figure 7 illustrates that the method includes an act 740 of shifting the set of pixels. Act 740 comprises shifting the set of pixels in the first direction. Shifting the set of pixels comprises rendering and re-rendering in a loop the set of pixels being shifted. For example, as depicted and explained with respect to Figures 5A-5D, a shifting loop is described where pixels 500, 510, 520 are shifted upward and then re-looped.

[0066] Additionally, Figure 8 depicts an embodiment of a method 800 for shifting pixels comprises a step 810 of accessing a digital file. Act 810 includes accessing, from

memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image. For example, as depicted and described with respect to Figure 1, a user can upload a digital image through a client application 120. The computer system 100 then receives the digital image.

[0067] Figure 8 also illustrates that the method 800 includes an act 820 of identifying a portion of an image to mask 820. Act 820 comprises identifying a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask from being shifted. For example, as depicted and described with respect to Figures 3A-3C, a user is able to mask a particular portion of the digital image. The masked portion of the image is held static, such that the pixels do not shift.

[0068] Additionally, Figure 8 illustrates that the method 800 includes an act 830 of receiving a starting point. Act 830 comprises receiving a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of the digital image. For example, as depicted and explained with respect to Figure 5A, a user selects a starting point 550. Similarly, Figure 3C depicts various user-selected starting points surrounding the grass in the digital image.

[0069] Figure 8 also illustrates that the method 800 includes an act 840 of receiving an ending point. Act 840 comprises receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion of the user interface. For example, as depicted and explained with respect to Figure 5A, a user selects an ending point 530. Similarly, Figure 3C depicts various user-selected starting ending surrounding the grass in the digital image.

[0070] In addition, Figure 8 illustrates that the method 800 includes an act 850 of creating a link between the beginning and the ending points. Act 850 comprises create a

first link between the first starting point and the first ending point, wherein the first link comprises a first direction extending from the first starting point to the first ending point and a first length between the first starting point and the first ending point. For example, as depicted and explained with respect to Figure 5A, a link 540 is created between beginning points 550 and ending points 530. Similarly, Figure 3C depicts various links connecting beginning points and ending points.

[0071] Further, Figure 8 illustrates that the method 800 includes an act 860 of identifying a set of pixels. Act 860 comprises identifying a first set of pixels that lie between the first starting point and the first ending point. For example, as depicted and explained with respect to Figure 5A, the software architecture 200 identifies a set of pixels 500, 510, 520 that extend in the direction of the link 540 away from the starting point 550. The computer architecture 200 may define the set of pixels 500, 510, 520 as being every pixel that extends in the direction away from the starting point and that is within a user or computer-defined threshold distance from the link 540.

[0072] Further still, Figure 8 illustrates that the method 800 includes an act 870 of shifting the set of pixels 870. Act 870 comprises shifting the second set of pixels in the second direction, wherein shifting the second set of pixels comprises rendering and re-rendering in a loop the second set of pixels being shifted. For example, as depicted and explained with respect to Figures 5A-5D, a shifting loop is described where pixels 500, 510, 520 are shifted upward and then re-looped.

[0073] Accordingly, disclosed embodiments provide novel and innovative technical methods for automatically shifting pixels within a digital image. The shifted pixels may give a digital image the perception of movement. At least one disclosed embodiment requires only a single digital image to create a perception of movement within the digital

image. Disclosed embodiments also provide novel and innovative technical solutions for receiving user input through a computer interface to simply and efficiently manipulate a digital image by shifting pixels.

[0074] Further, the methods may be practiced by a computer system including one or more processors and computer-readable media such as computer memory. In particular, the computer memory may store computer-executable instructions that when executed by one or more processors cause various functions to be performed, such as the acts recited in the embodiments. In various embodiments, disclosed methods and systems may comprises software executed within the cloud. For example, a user may access the software through a web browser. In additional or alternative embodiments, the software is executed locally at a device. For example, the software may be executed on a mobile computing device such as a smart phone or tablet.

[0075] Embodiments of the present invention may comprise or utilize a special purpose or general-purpose computer including computer hardware, as discussed in greater detail below. Embodiments within the scope of the present invention also include physical and other computer-readable media for carrying or storing computer-executable instructions and/or data structures. Such computer-readable media can be any available media that can be accessed by a general purpose or special purpose computer system. Computer-readable media that store computer-executable instructions are physical storage media. Computer-readable media that carry computer-executable instructions are transmission media. Thus, by way of example, and not limitation, embodiments of the invention can comprise at least two distinctly different kinds of computer-readable media: physical computer-readable storage media and transmission computer-readable media.

[0076] Further, computing system functionality can be enhanced by a computing system's ability to be interconnected to other computing systems via network connections. Network connections may include, but are not limited to, connections via wired or wireless Ethernet, cellular connections, or even computer to computer connections through serial, parallel, USB, or other connections. The connections allow a computing system to access services at other computing systems and to quickly and efficiently receive application data from other computing systems.

[0077] Interconnection of computing systems has facilitated distributed computing systems, such as so-called "cloud" computing systems. In this description, "cloud computing" may be systems or resources for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, services, etc.) that can be provisioned and released with reduced management effort or service provider interaction. A cloud model can be composed of various characteristics (e.g., on-demand self-service, broad network access, resource pooling, rapid elasticity, measured service, etc.), service models (e.g., Software as a Service ("SaaS"), Platform as a Service ("PaaS"), Infrastructure as a Service ("IaaS"), and deployment models (e.g., private cloud, community cloud, public cloud, hybrid cloud, etc.).

[0078] Cloud and remote based service applications are prevalent. Such applications are hosted on public and private remote systems such as clouds and usually offer a set of web based services for communicating back and forth with clients.

[0079] Many computers are intended to be used by direct user interaction with the computer. As such, computers have input hardware and software user interfaces to facilitate user interaction. For example, a modern general-purpose computer may include

a keyboard, mouse, touchpad, camera, etc. for allowing a user to input data into the computer. In addition, various software user interfaces may be available.

[0080] Examples of software user interfaces include graphical user interfaces, text command line based user interface, function key or hot key user interfaces, and the like.

[0081] Physical computer-readable storage media includes RAM, ROM, EEPROM, CD-ROM or other optical disk storage (such as CDs, DVDs, etc.), magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store desired program code means in the form of computer-executable instructions or data structures and which can be accessed by a general purpose or special purpose computer.

[0082] A “network” is defined as one or more data links that enable the transport of electronic data between computer systems and/or modules and/or other electronic devices. When information is transferred or provided over a network or another communications connection (either hardwired, wireless, or a combination of hardwired or wireless) to a computer, the computer properly views the connection as a transmission medium. Transmissions media can include a network and/or data links which can be used to carry or desired program code means in the form of computer-executable instructions or data structures and which can be accessed by a general purpose or special purpose computer. Combinations of the above are also included within the scope of computer-readable media.

[0083] Further, upon reaching various computer system components, program code means in the form of computer-executable instructions or data structures can be transferred automatically from transmission computer-readable media to physical computer-readable storage media (or vice versa). For example, computer-executable instructions or data structures received over a network or data link can be buffered in

RAM within a network interface module (e.g., a “NIC”), and then eventually transferred to computer system RAM and/or to less volatile computer-readable physical storage media at a computer system. Thus, computer-readable physical storage media can be included in computer system components that also (or even primarily) utilize transmission media.

[0084] Computer-executable instructions comprise, for example, instructions and data which cause a general-purpose computer, special purpose computer, or special purpose processing device to perform a certain function or group of functions. The computer-executable instructions may be, for example, binaries, intermediate format instructions such as assembly language, or even source code. Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the described features or acts described above. Rather, the described features and acts are disclosed as example forms of implementing the claims.

[0085] Those skilled in the art will appreciate that the invention may be practiced in network computing environments with many types of computer system configurations, including, personal computers, desktop computers, laptop computers, message processors, hand-held devices, multi-processor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers, mobile telephones, PDAs, pagers, routers, switches, and the like. The invention may also be practiced in distributed system environments where local and remote computer systems, which are linked (either by hardwired data links, wireless data links, or by a combination of hardwired and wireless data links) through a network, both

perform tasks. In a distributed system environment, program modules may be located in both local and remote memory storage devices.

[0086] Alternatively, or in addition, the functionality described herein can be performed, at least in part, by one or more hardware logic components. For example, and without limitation, illustrative types of hardware logic components that can be used include Field-programmable Gate Arrays (FPGAs), Program-specific Integrated Circuits (ASICs), Program-specific Standard Products (ASSPs), System-on-a-chip systems (SOCs), Complex Programmable Logic Devices (CPLDs), etc.

[0087] The present invention may be embodied in other specific forms without departing from its spirit or characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

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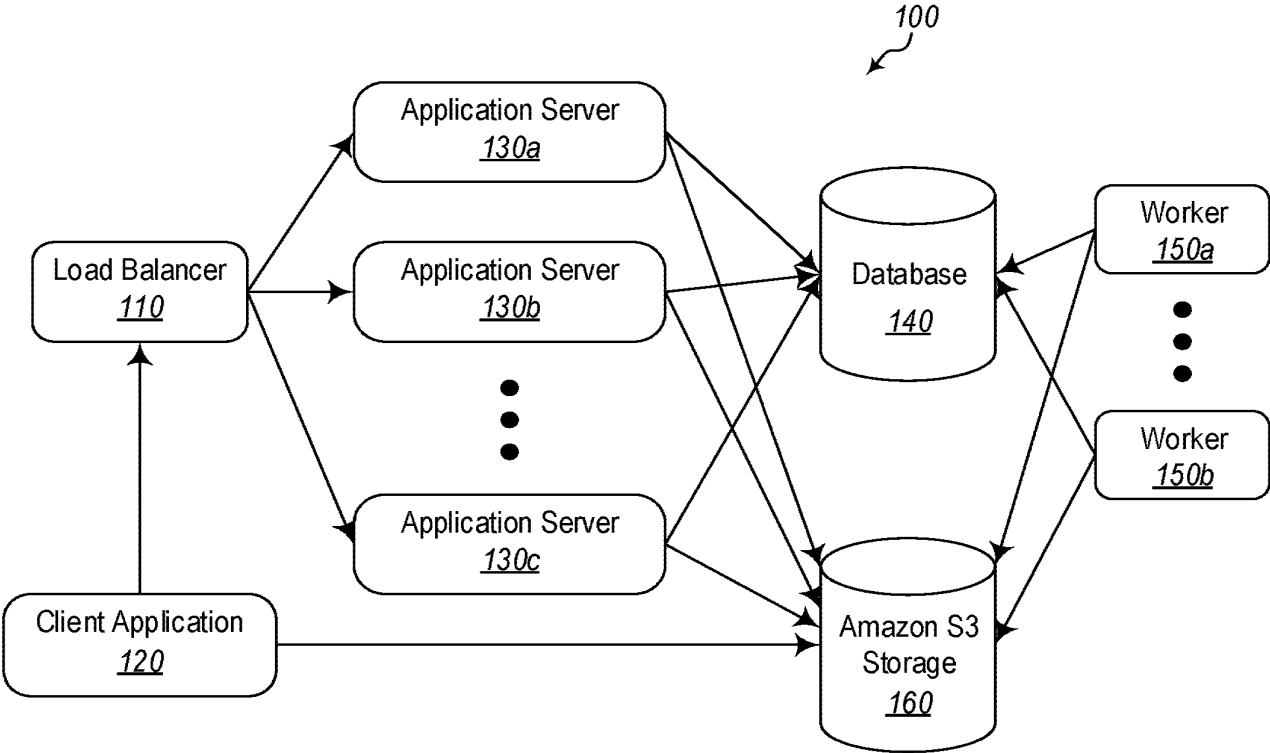


Fig. 1

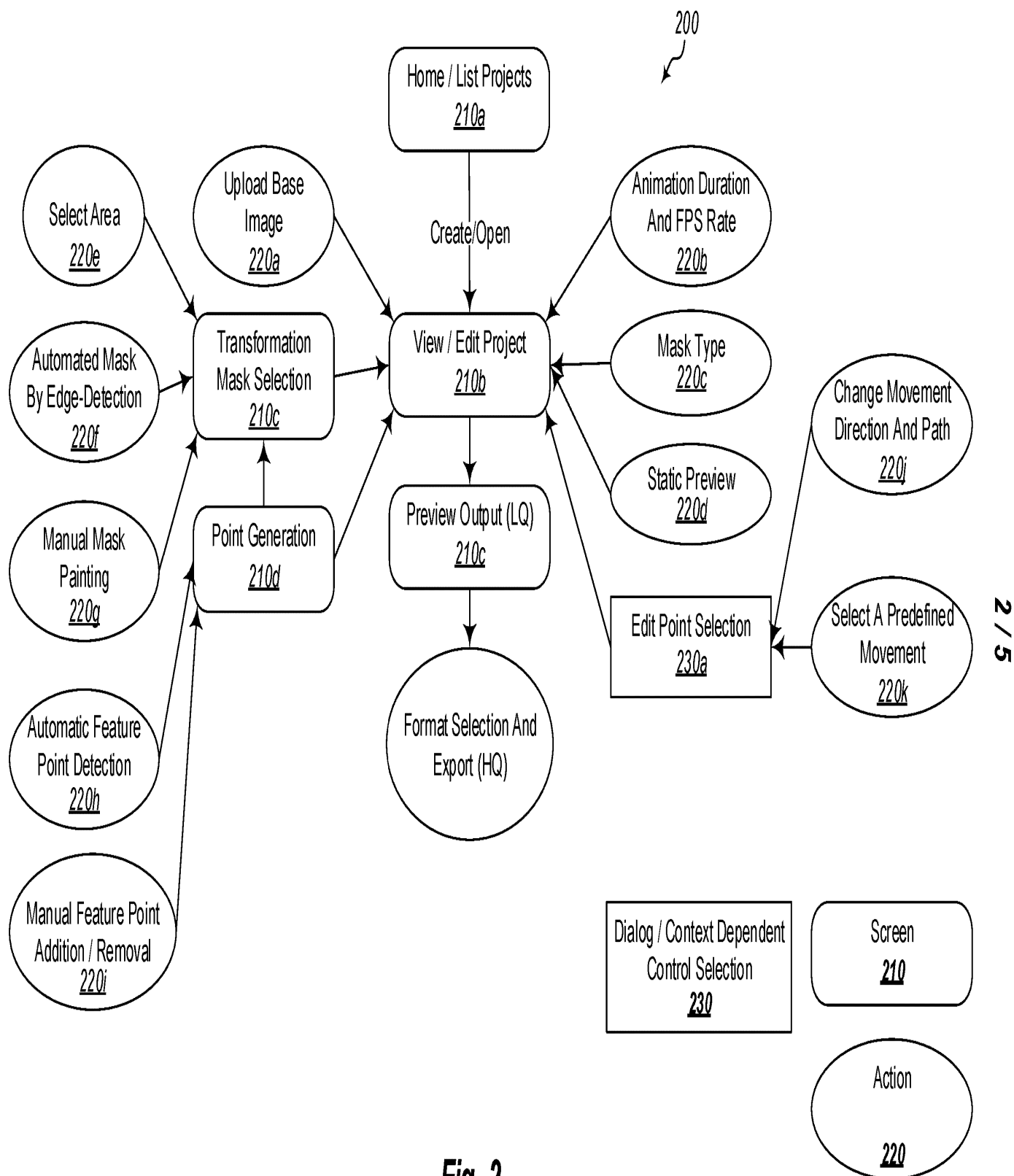


Fig. 2

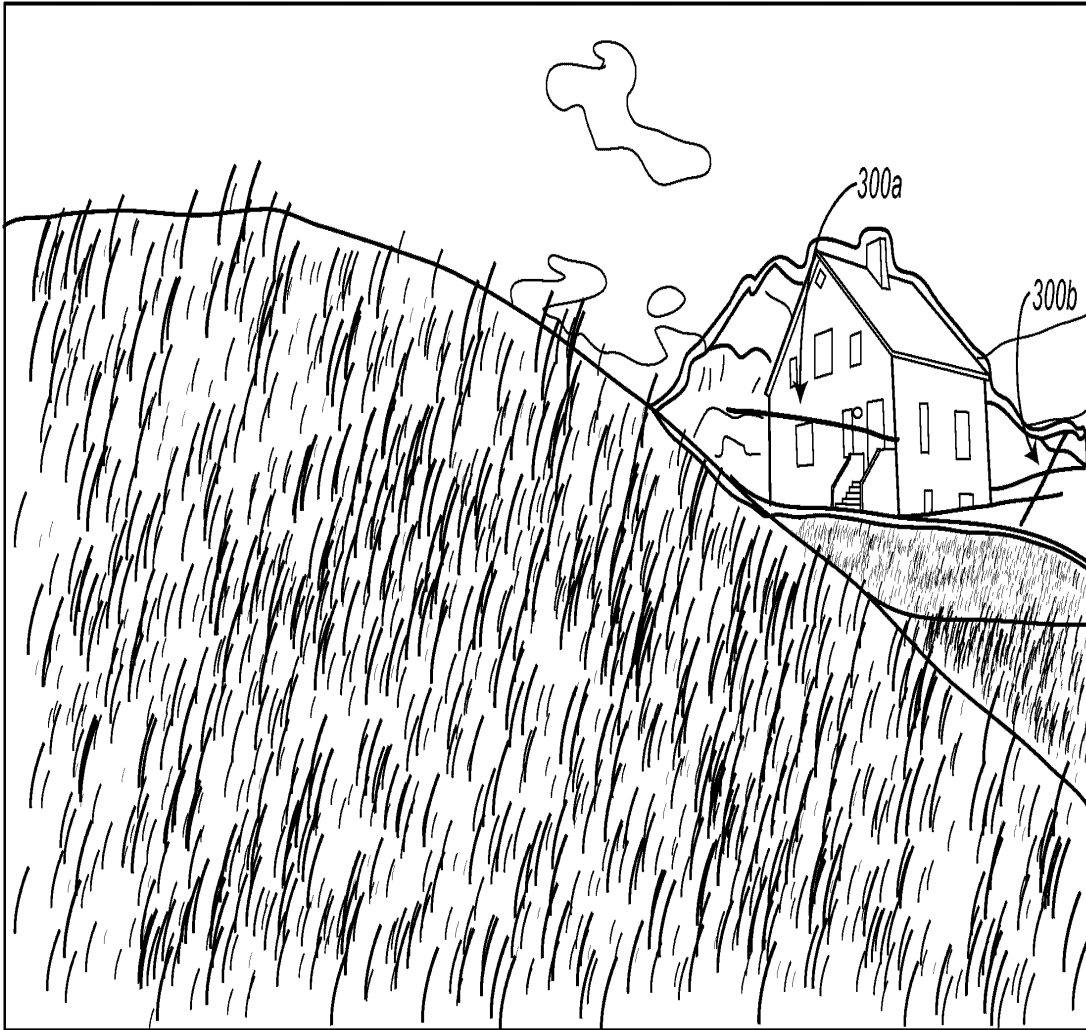


Fig. 3A

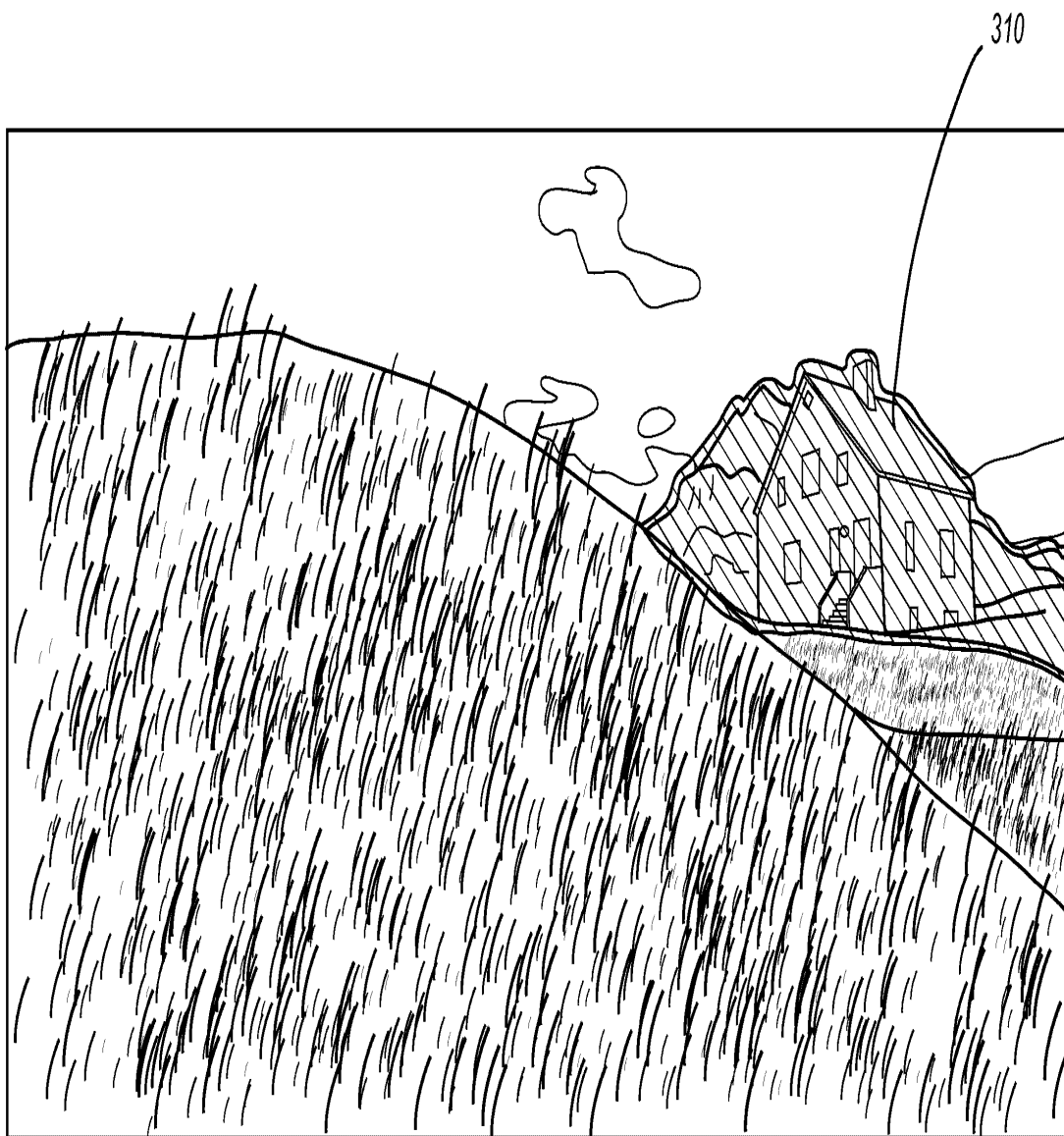
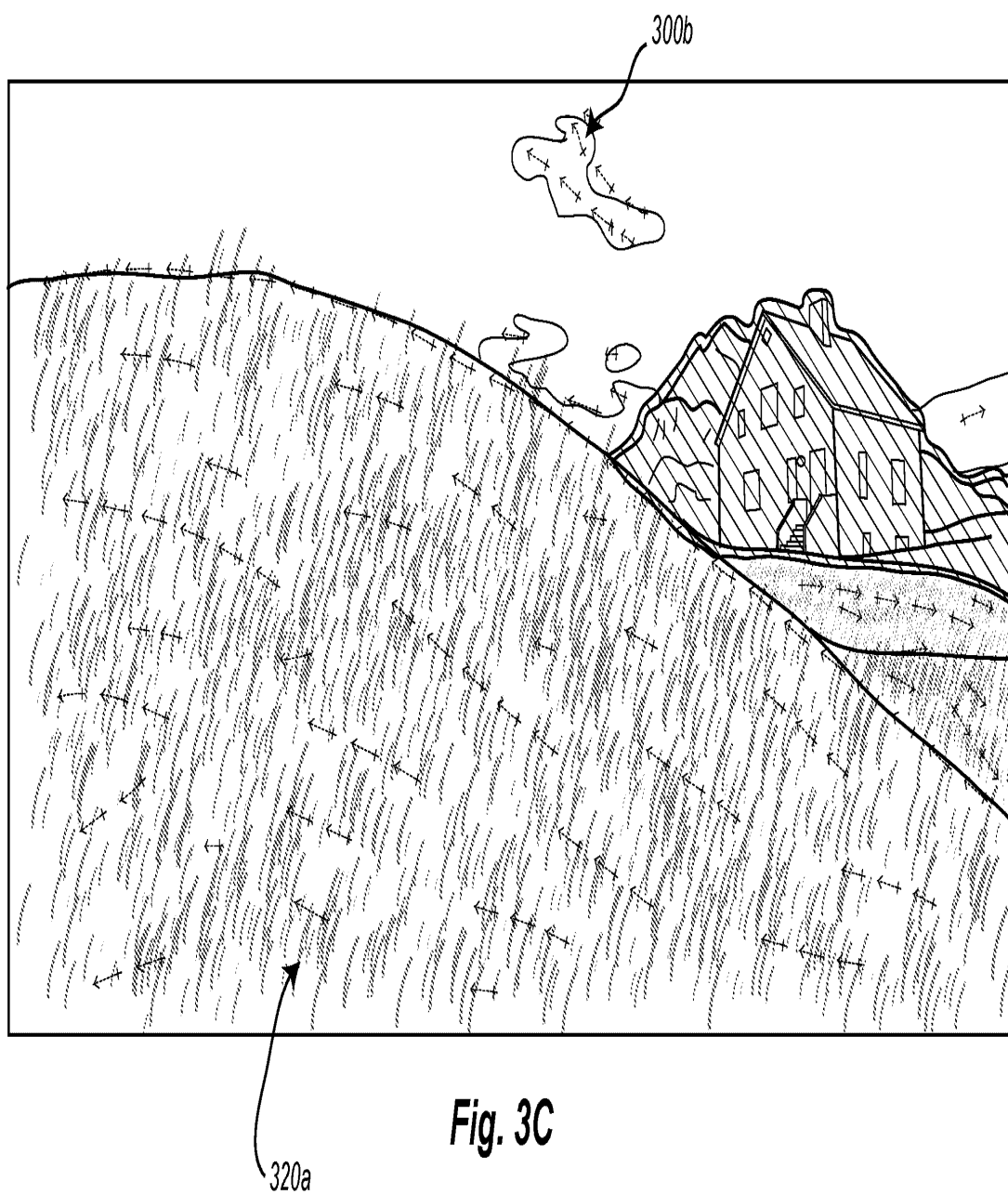


Fig. 3B



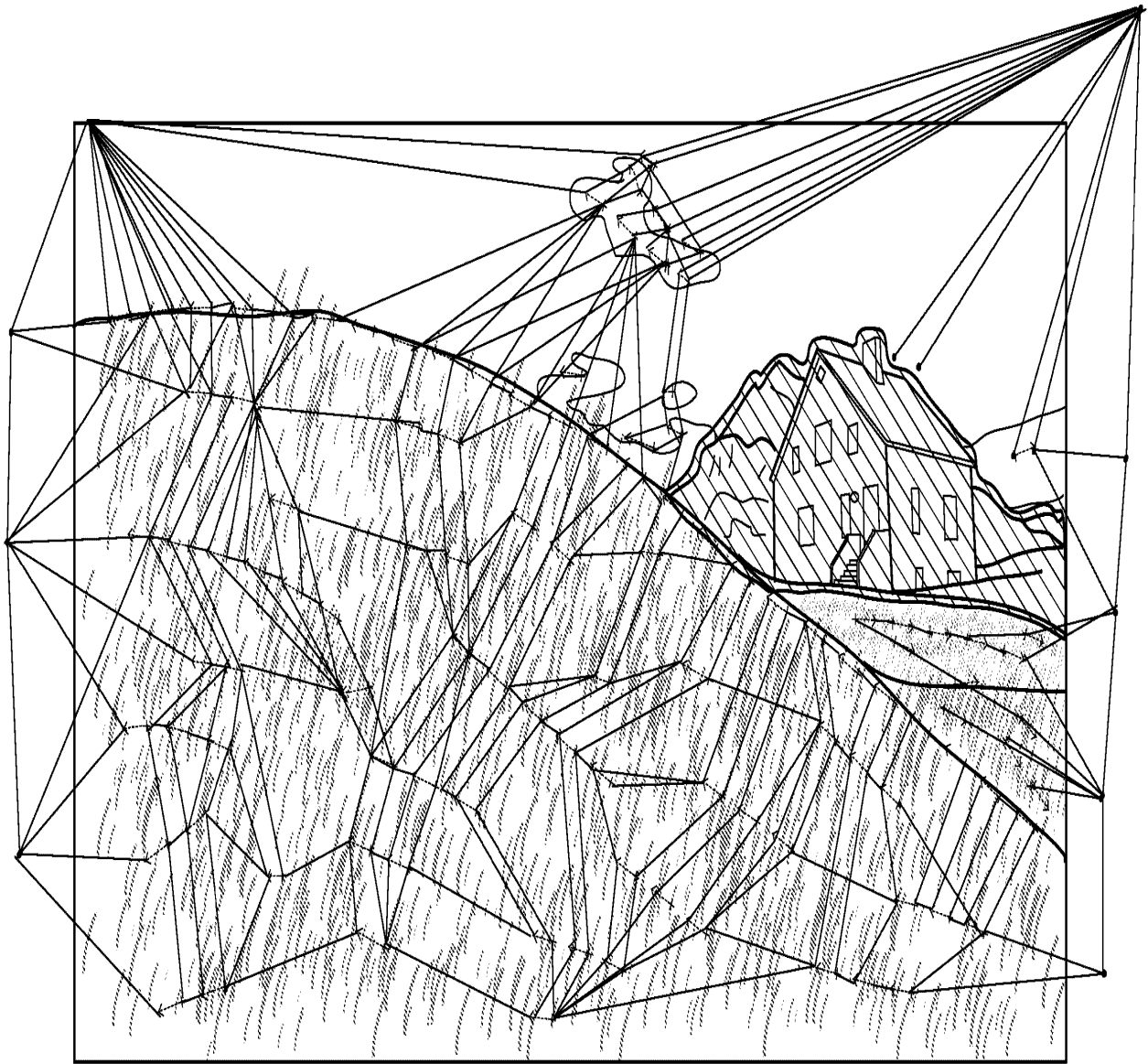


Fig. 4

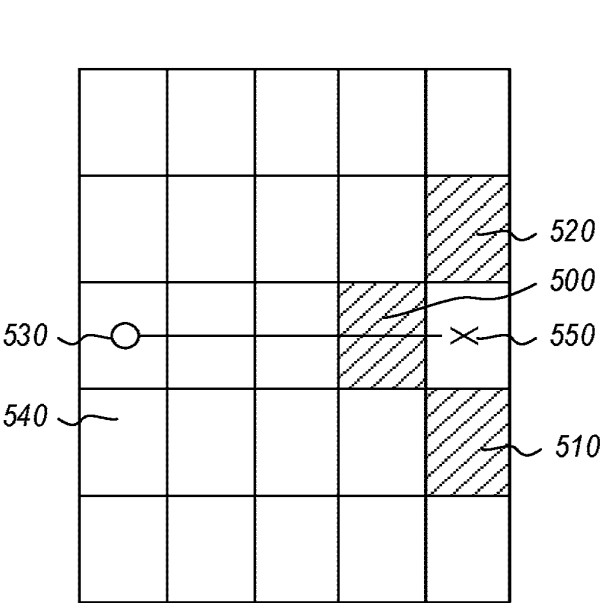


Fig. 5A

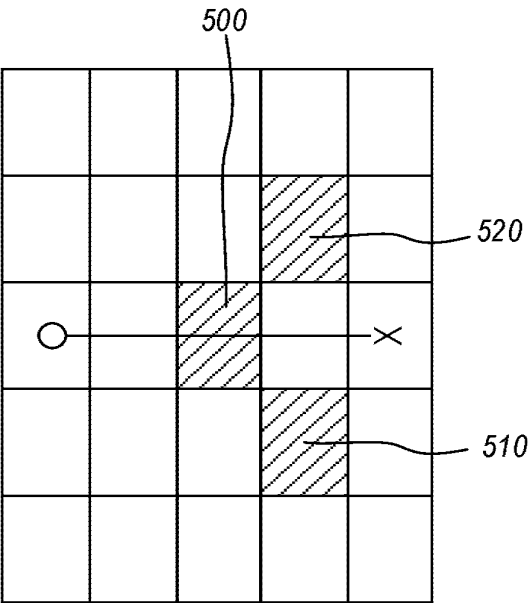


Fig. 5B

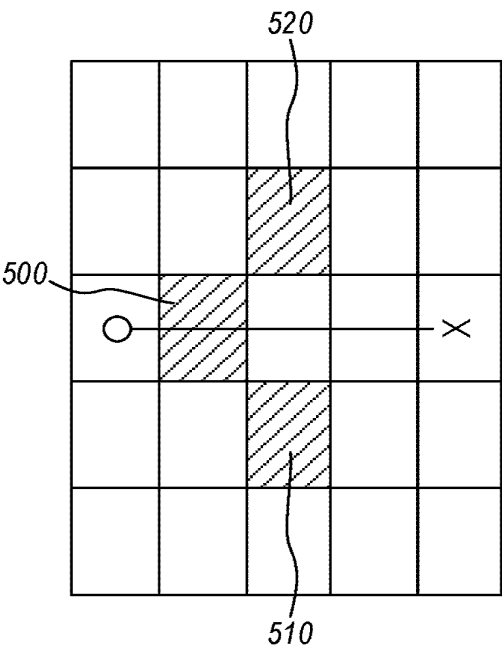


Fig. 5C

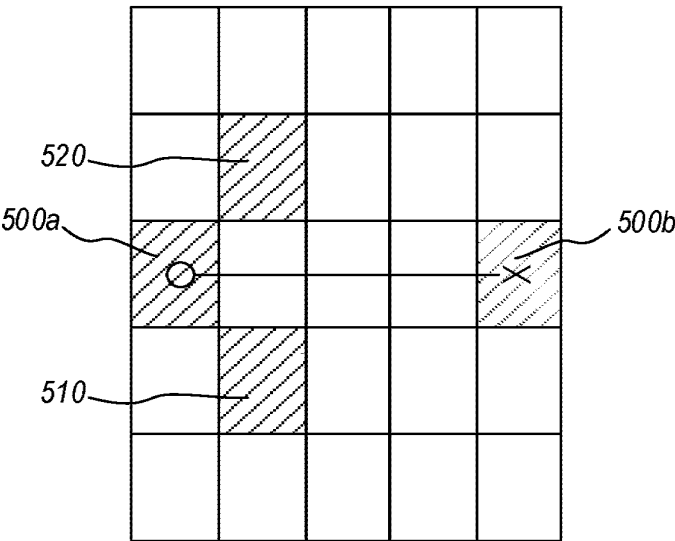


Fig. 5D

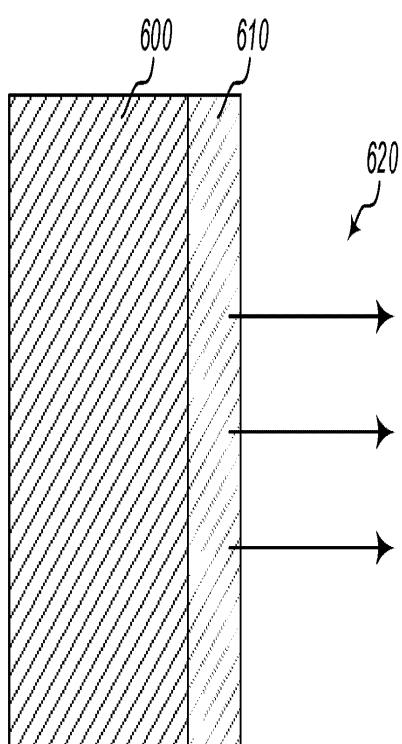


Fig. 6A

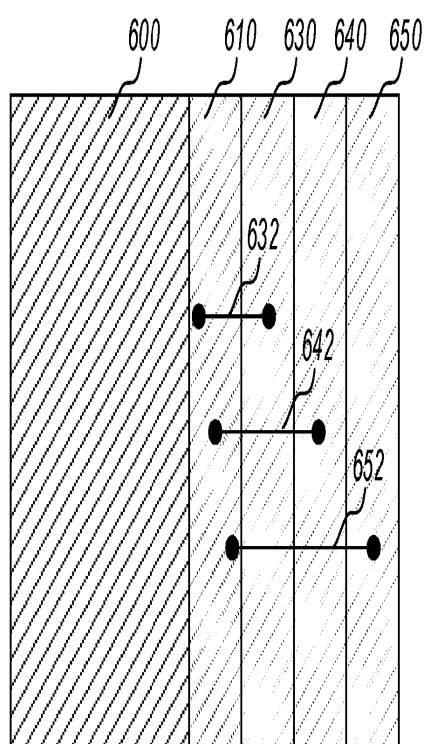
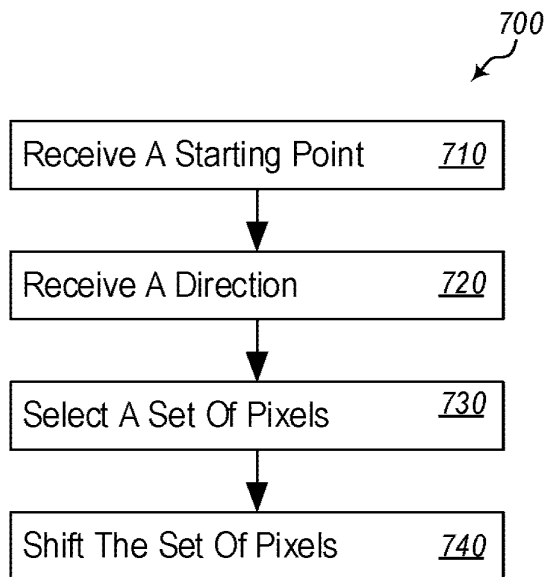
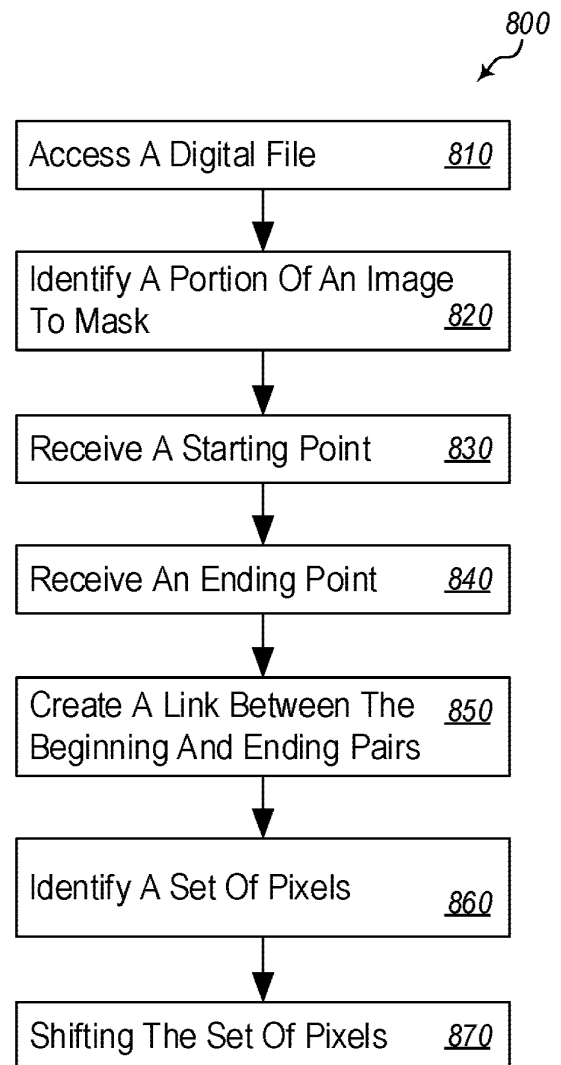


Fig. 6B

**Fig. 7****Fig. 8**

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)	Attorney Docket Number	20970.1.1.1
	First Named Inventor	Troy Plota
	COMPLETE IF KNOWN	
	Application Number	15/660,677
	Filing Date	July 26, 2017
	Art Unit	2422
☐ Declaration Submitted With Initial Filing	OR	☐ Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f)) required)
Examiner Name		UNKNOWN

AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE		
(Title of the invention)		
As a below named inventor, I hereby declare that:		
This declaration is directed to:		
☐ The attached application,		
OR		
☒ United States Application Number or PCT International application number <u>15/660,677</u>		
filed on <u>July 26, 2017</u>		
The above-identified application was made or authorized to be made by me.		
I believe I am the original inventor or an original joint inventor of a claimed invention in the application.		
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.		
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City	State	Zip
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☐ Declaration Submitted With Initial Filing OR ☐ Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f)) required)

AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE

(Title of the Invention)

As a below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application,

OR

☒ United States Application Number or PCT International application number 15/660,677

filed on July 26, 2017

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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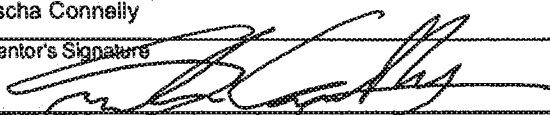
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Sascha Connelly

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Application Number	16/735,550
Filing Date	January 6, 2020
First Named Inventor	Troy Plota
Title	AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE
Art Unit	
Examiner Name	
Attorney Docket Number	

SIGNATURE of Applicant or Patent Practitioner

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Name	John A. Powell	Registration Number	71,533
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PTO/AIA/82B (07-13)

Approved for use through 03/31/2011. OMB 0351-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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POWER OF ATTORNEY BY APPLICANTI hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

134962

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number:

OR

Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Sascha Connelly

Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is specified below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Sascha Connelly

Date (Optional)

Name

Sascha Connelly

Title

CEO - Co-founder

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Document Description: Power of Attorney

PTO/AIA/82A (07-13)

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REGISTERED PRACTITIONERS**

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	16/735,550
Filing Date	January 6, 2020
First Named Inventor	Troy Plota
Title	AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE
Art Unit	
Examiner Name	
Attorney Docket Number	

SIGNATURE of Applicant or Patent Practitioner

Signature	/John A. Powell/	Date (Optional)	
Name	John A. Powell	Registration Number	71,533
Title (if Applicant is a juristic entity)			

Applicant Name (if Applicant is a juristic entity)

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9198 and select option 2.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

134962

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

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The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number:

OR



Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Troy Plota

Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is specified below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Troy Plota

Date (Optional)

Name

Troy Plota

Title

President - Co-founder

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.



Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. This 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 and 1.14. This collection is estimated to take 3 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 1480, Alexandria, VA 22313-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1480, Alexandria, VA 22313-1480.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	38339872
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John Andrew Powell
Filer Authorized By:	
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	20-JAN-2020
Filing Date:	
Time Stamp:	13:06:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	SaschaPOA.pdf	1146945	no	2
			e0d621ab9e8da93a074fc53c350cae9f1914b8ea		

Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

2	Power of Attorney	TroyPOA.pdf	1134425	no	2
			4d4e322de052376bb931f3361fc08a87b0f7e5fc		

Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

Total Files Size (in bytes):			2281370
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1

CONFIRMATION NO. 2797

FORMALITIES LETTER



OC000000114252107

22913
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

Date Mailed: 01/29/2020

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.

The surcharge is due for any one of:

- late submission of the basic filing fee, search fee, or examination fee,
- late submission of inventor's oath or declaration,
- filing an application that does not contain at least one claim on filing, or
- submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ 75 basic filing fee.
- \$ 80 surcharge.
- \$ 330 search fee.
- \$ 380 examination fee.
- \$(0) previous unapplied payment amount.
- \$ 865 TOTAL FEE BALANCE DUE.

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/fasrat/



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
16/735,550	01/06/2020	2845	0.00	20970.1.1.1.1	1	1

CONFIRMATION NO. 2797

FILING RECEIPT



0000000114232106

22913
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

Date Mailed: 01/29/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Troy Plota, Kihei, HI;
Sascha Connelly, Kihei, HI;

Applicant(s)

Troy Plota, Kihei, HI;
Sascha Connelly, Kihei, HI;

Power of Attorney: The patent practitioners associated with Customer Number 134962

Domestic Priority data as claimed by applicant

This application is a CON of 15/660,677 07/26/2017 PAT 10558342
which claims benefit of 62/514,703 06/02/2017
and claims benefit of 62/368,017 07/28/2016
This application 16/735,550
is a CIP of 16/162,206 10/16/2018
which claims benefit of 62/574,055 10/18/2017
and is a CIP of 15/660,677 07/26/2017 PAT 10558342
which claims benefit of 62/514,703 06/02/2017
and claims benefit of 62/368,017 07/28/2016

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 01/27/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/735,550**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Automated Pixel Shifting Within a Digital Image

Preliminary Class

341

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor

community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 16/735,550	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	1	minus 20 = *	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *	x 230 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
			TOTAL	785		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	16/735,550
Filing Date	January 6, 2020
First Named Inventor	Troy Plota
Title	Automated Pixel Shifting Within a Digital Image
Art Unit	2845
Examiner Name	Not assigned
Attorney Docket Number	20970.1.1.1.1

SIGNATURE of Applicant or Patent Practitioner

Signature	/John C. Stringham/	Date (Optional)	2/10/2020
Name	John C. Stringham	Registration Number	40831
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐

*Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82B (07-13)

Approved for use through 01/31/2018, OMB 0651-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

22913

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Sascha Connelly

- ☒ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Sascha Connelly

Date (Optional)

12/8/2017

Name

Sascha Connelly

Title

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82B (07-13)

Approved for use through 01/31/2018, OMB 0651-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

22913

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Troy Plota

- ☒ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Troy Plota

Date (Optional)

12/8/2017

Name

Troy Plota

Title

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	38538426
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John C. Stringham/Rebecca Reil
Filer Authorized By:	John C. Stringham
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	10-FEB-2020
Filing Date:	06-JAN-2020
Time Stamp:	13:24:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	20970-1-1-1-1_2020-02-10_Powers-of-Attorney.pdf	1424024	no	3
			bda32c71134566ec69760ca70477027da6049ad9		

Warnings:

Information:	
Total Files Size (in bytes):	1424024
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	16/735550
				Filing Date	01-06-2020
				First Named Inventor	Troy Plota
				Art Unit	2845
				Examiner Name	Not Assigned
Sheet	1	Of	3	Attorney Docket Number	20970.1.1.1.1

U.S. PATENT APPLICATION PUBLICATIONS					
Examiner Initials*	Cite No.	Publication Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	20070019007	25-Jan-2007	JUNG	
	2	20090189912	30-Jul-2009	Holtman	
	3	20100134505	3-Jun-2010	ANDERSON	
	4	20110273583	10-Nov-2011	YOSHINO	
	5	20150022518	22-Jan-2015	JVC KENWOOD CORPORATION	
	6	20150262327	17-Sep-2015	OMRON CORPORATION	
	7	20150095882	2-Apr-2015	Jaeger et al.	
	8	20170140514	18-May-2017	Amirghodsi et al.	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published	T 1
	9	International Search Report and Written Opinion for application no. PCT/US2017/044256 mailed on October 6, 2017	
	10	SCICompanion, "Palette Cycling", 6 March 2016 [Online], Retrieved on 21 September 2018 from <URL: http://scicompanion.com/Documentation/palettecycling.html >.	

OFFICE ACTION / NOTICE OF ALLOWANCE / ISSUE NOTIFICATION DOCUMENTS				
Examiner Initials*	Cite No.	Application Number	Mail Date	Document
	11	15/660677	26-Sep-2018	Office Action
	12	15/660677	6-May-2019	Final Office Action
	13	16/102055	2-Oct-2018	Office Action
	14	16/102055	18-Jan-2019	Final Office Action
	15	16/102055	17-Apr-2019	Notice of Allowance
	16	16/162206	26-Dec-2018	Office Action
	17	16/162206	3-May-2019	Final Office Action

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	16/735550
				Filing Date	01-06-2020
				First Named Inventor	Troy Plota
				Art Unit	2845
				Examiner Name	Not Assigned
Sheet	2	Of	3	Attorney Docket Number	20970.1.1.1.1

OFFICE ACTION / NOTICE OF ALLOWANCE / ISSUE NOTIFICATION DOCUMENTS				
Examiner Initials*	Cite No.	Application Number	Mail Date	Document
	18	15/660677	2-Oct-2019	Notice of Allowance
	19	16/162206	27-Nov-2019	Notice of Allowance

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			
¹ Applicant is to place a check mark here if the reference is accompanied by a translation into English or if a concise explanation of the relevance, as presently understood by the undersigned attorney of record, of each listed reference that is not in the English language and is unaccompanied by a translation into English is provided with the reference.			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	16/735550
				Filing Date	01-06-2020
				First Named Inventor	Troy Plota
				Art Unit	2845
				Examiner Name	Not Assigned
Sheet	3	Of	3	Attorney Docket Number	20970.1.1.1.1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments to Deposit Account No. 23-3178 regarding this Information Disclosure Statement

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John C. Stringham/	Date	2020-06-19
Name/Print	John C. Stringham	Registration Number	40831

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 20970-1-1-1A	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2017/044256	International filing date (<i>day/month/year</i>) 27 July 2017	(Earliest) Priority Date (<i>day/month/year</i>) 28 July 2016
Applicant PLOTA, TROY		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (see Box No. II).

3. ☐ Unity of invention is lacking (see Box No. III).

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 1
☐ as suggested by the applicant.
☒ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2017/044256

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06K 9/00; G06T 1/00; G09G 3/20; G09G 3/36; G09G 5/00 (2017.01)

CPC - G06T 15/20; H04N-001/60/77; H04N-009/73/5; H04N-013/02/6 (2017.08)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 345/419.000; 345/473.000; 348/223.100; 382/154.000 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	US 20150262327 A1 (OMRON CORPORATION) 17 September 2015 (17.09.2015) entire document	1-3, 7-17 --- 4-6, 18-20
Y --- A	US 20150022518 A1 (JVC KENWOOD CORPORATION) 22 January 2015 (22.01.2015) entire document	1-3, 10-12, 15-17 --- 4-6, 18-20
Y --- A	US 20100134505 A1 (ANDERSON) 03 June 2010 (03.06.2010) entire document	1-3, 7-17 --- 4-6, 18-20
A	US 20070019007 A1 (JUNG) 25 January 2007 (25.01.2007) entire document	1-20
A	US 20110273583 A1 (YOSHINO et al) 10 November 2011 (10.11.2011) entire document	1-20

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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

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

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

25 September 2017

Date of mailing of the international search report

06 OCT 2017

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

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

Facsimile No. 571-273-8300

Authorized officer

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: JOHN C. STRINGHAM 60 EAST SOUTH TEMPLE SUITE 1000 SALT LAKE CITY, UT 84111		Date of mailing (day/month/year) 06 OCT 2017	
Applicant's or agent's file reference 20970-1-1-1A		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/US2017/044256	International filing date (day/month/year) 27 July 2017	Priority date (day/month/year) 28 July 2016	
International Patent Classification (IPC) or both national classification and IPC IPC(8) - G06K 9/00; G06T 1/00; G09G 3/20; G09G 3/36; G09G 5/00 (2017.01) CPC - G06T 15/20; H04N-001/60/77; H04N-009/73/5; H04N-013/02/6 (2017.08)			
Applicant PLOTA, TROY			

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	Date of completion of this opinion 25 September 2017	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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Form PCT/ISA/237 (cover sheet) (January 2015)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2017/044256

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2017/044256

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-20	YES
	Claims	None	NO
Inventive step (IS)	Claims	4-6, 18-20	YES
	Claims	1-3, 7-17	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-3 and 15-17 lack an inventive step under PCT Article 33(3) as being obvious over OMRON CORPORATION (hereinafter OMRON) in view of JVC KENWOOD CORPORATION (hereinafter JVC) and ANDERSON.

Regarding Claim 1, OMRON teaches computer system (para [0037], system configuration of an image capturing apparatus) for automating the shifting of pixels within a digital image (para [0038] discloses image capture apparatus includes shift amount map, where, as further disclosed in para [0041]-[0044], pixels of an image are shifted), comprising: one or more processors; and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following (para [0047] discloses processing device such as a CPU executing control programs. Also see para [0024], program for causing a computer to execute the image processing method): access, from memory, a digital image file (para [0038] discloses images are captured [thus, the images will be stored in associated memory/storage for processing]). Also see para [0048]), wherein the digital image file comprises information that corresponds to individual pixels within the digital image (para [0041] discloses obtaining pixel shift amount map from storage [claimed information corresponding to pixels]); receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of the digital image; receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion of the user interface (para [0046] discloses input/output unit 15 is a unit that receives an input operation by a user. Further, para [0096] discloses user inputs shift amount. Further as disclosed in Fig. 8, a shift amount begins at a starting pixel and shifts a determined distance to an ending point pixel); create a first link between the first starting point and the first ending point, wherein the first link comprises: a first direction extending from the first starting point to the first ending point (para [0091] discloses user inputs shift direction. Further, as disclosed in Fig. 8, a pixel distance from a starting point to an end/target point is determined with an associated direction for shifting the associated pixels. Also, see para [0061], user selects target point); and a first length between the first starting point and the first ending point (Fig. 8, pixel shift distance. Also see para [0096], pixel shift amount); identify a first set of pixels that lie between the first starting point and the first ending point (Fig. 8 discloses determining a pixel distance which is the amount of pixels to shift from a starting pixel to a target pixel); and shift the first set of pixels in the first direction (para [0091] and [0093] pixels are shifted based on pixel shift direction) and rendering the first set of pixels being shifted (para [0086], morphed image is generated and provided to user).

OMRON fails to disclose identify a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask from being shifted; and wherein the first set of pixels comprises rendering and re-rendering in a loop.

However, JVC, in analogous art, teaches image processing (abstract). JVC further teaches identify a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask from being shifted (para [0086] discloses pixels of only the person region are shifted without shifting the pixels of the peripheral background region of the person region, where, as further disclosed in para [0071], masks are used to indicate the respective regions [thus, the mask will specific which regions to omit from the shifting procedure]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

Furthermore, ANDERSON, in analogous art, teaches image processing (abstract). ANDERSON further teaches rendering and re-rendering in a loop (para [0025] discloses a rendering module which iteratively renders images on the display device [claimed rendering and re-rendering in a loop]. Also see para [0048]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of ANDERSON to incorporate rendering and re-rendering in the invention of OMRON in order to progressively monitor the quality of images as they are processed iteratively (para [0004], ANDERSON).

Regarding Claim 2, modified OMRON teaches wherein receiving an indication of a particular portion of the digital image comprises receiving through a user interface a selection of a particular pixel within the digital image (para [0061] discloses user can designate pixels directed to desired regions/portions of an image such as an organ).

OMRON fails to disclose generating a mask. However, JVC, in analogous art, teaches a mask (para [0071], masks are used to indicate the respective regions).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2017/044256

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Regarding Claim 3, modified OMRON teaches the computer system of claim 2, wherein the executable instructions include instructions that are executable to configure the computer system (para [0047] discloses processing device such as a CPU executing control programs. Also see para [0024], program for causing a computer to execute the image processing method). OMRON fails to disclose generate the mask by: identifying one or more edges that form a boundary around the particular pixel; and generating the mask to cover area within the boundary.

However, JVC, in analogous art, teaches generate the mask by: identifying one or more edges that form a boundary around the particular pixel (para [0096] discloses edge region of the mask); and generating the mask to cover area within the boundary (para [0071], masks are used to indicate the respective regions. Further, para [0141] discloses object boundary part of a mask).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

Regarding Claim 15, OMRON discloses a method (method for morphing a captured image) for automating the shifting of pixels within a digital image (para [0038] discloses image capture apparatus includes shift amount map, where, as further disclosed in para [0041]-[0044], pixels of an image are shifted),

comprising: accessing, from memory, a digital image file (para [0038] discloses images are captured [thus, the images will be stored in associated memory/storage for processing]. Also see para [0048]), wherein the digital image file comprises information that corresponds to individual pixels

within the digital image (para [0041] discloses obtaining pixel shift amount map from storage [claimed information corresponding to pixels]); receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of the digital image; receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion of the user interface (para [0046] discloses input/output unit 15 is a unit that receives an input operation by a user. Further, para [0096] discloses user inputs shift amount. Further as disclosed in Fig. 8, a shift amount begins at a starting pixel and shifts a determined distance to an ending point pixel); create a first link between the first starting point and the first ending point, wherein the first link comprises: a first direction extending from the first starting point to the first ending point (para [0091] discloses user inputs shift direction. Further, as disclosed in Fig. 8, a pixel distance from a starting point to an end/target point is determined with an associated direction for shifting the associated pixels. Also, see para [0061], user selects target point); and a first length between the first starting point and the first ending point (Fig. 8, pixel shift distance. Also see para [0096], pixel shift amount); identifying a first set of pixels that lie between the first starting point and the first ending point (Fig. 8 discloses determining a pixel distance which is the amount of pixels to shift from a starting pixel to a target pixel); and shift the first set of pixels in the first direction (para [0091] and [0093] pixels are shifted based on pixel shift direction) and rendering the first set of pixels being shifted (para [0086], morphed image is generated and provided to user).

OMRON fails to disclose identifying a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask from being shifted; and wherein the first set of pixels comprises rendering and re-rendering in a loop.

However, JVC, in analogous art, teaches image processing (abstract). JVC further teaches identifying a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask from being shifted (para [0086] discloses pixels of only the person region are shifted without shifting the pixels of the peripheral background region of the person region, where, as further disclosed in para [0071], masks are used to indicate the respective regions [thus, the mask will specify which regions to omit from the shifting procedure]).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

Furthermore, ANDERSON, in analogous art, teaches image processing (abstract). ANDERSON further teaches rendering and re-rendering in a loop (para [0025] discloses a rendering module which iteratively renders images on the display device [claimed rendering and re-rendering in a loop]. Also see para [0048]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of ANDERSON to incorporate rendering and re-rendering in the invention of OMRON in order to progressively monitor the quality of images as they are processed iteratively (para [0004], ANDERSON).

Regarding Claim 16, modified OMRON teaches wherein receiving an indication of a particular portion of the digital image comprises receiving through a user interface a selection of a particular pixel within the digital image (para [0061] discloses user can designate pixels directed to desired regions/portions of an image such as an organ).

OMRON fails to disclose generating a mask. However, JVC, in analogous art, teaches a mask (para [0071], masks are used to indicate the respective regions).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

Regarding Claim 17, modified OMRON fails to disclose generate the mask by: identifying one or more edges that form a boundary around the particular pixel; and generating the mask to cover area within the boundary.

However, JVC, in analogous art, teaches generate the mask by: identifying one or more edges that form a boundary around the particular pixel (para [0096] discloses edge region of the mask); and generating the mask to cover area within the boundary (para [0071], masks are used to indicate the respective regions. Further, para [0141] discloses object boundary part of a mask).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2017/044256

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Claims 7-9, 13, and 14 lack an inventive step under PCT Article 33(3) as being obvious over OMRON CORPORATION (hereinafter OMRON) in view of ANDERSON.

Regarding Claim 7, OMRON teaches method (method for morphing a captured image) for automating the shifting of pixels within a digital image (para [0038] discloses image capture apparatus includes shift amount map, where, as further disclosed in para [0041]-[0044], pixels of an image are shifted), comprising: receiving a first indication of a first starting point through a user interface (para [0046] discloses input/output unit 15 is a unit that receives an input operation by a user. Further, para [0096] discloses user inputs shift amount. Further as disclosed in Fig. 8, a shift amount begins at a starting pixel and shifts a determined distance to an ending point pixel), wherein the first starting point is received through a user selection of a portion of the digital image (para [0061] discloses user can designate pixels directed to desired regions/portions of an image such as an organ); receiving, through the user interface, a first direction associated with the first starting point (para [0091] discloses user inputs shift direction. Further, as disclosed in Fig. 8, a pixel distance from a starting point to an end/target point is determined with an associated direction for shifting the associated pixels. Also, see para [0061], user selects target point); selecting a first set of pixels extending in the first direction away from the first starting point (Fig. 8 discloses determining a pixel distance which is the amount of pixels to shift from a starting pixel to a target pixel); and shifting the first set of pixels in the first direction (para [0091] and [0093] pixels are shifted based on pixel shift direction), wherein shifting the first set of pixels comprises rendering the first set of pixels being shifted (para [0086], morphed image is generated and provided to user). OMRON fails to disclose wherein the first set of pixels comprises rendering and re-rendering in a loop. However, ANDERSON, in analogous art, teaches rendering and re-rendering in a loop (para [0025] discloses a rendering module which iteratively renders images on the display device [claimed rendering and re-rendering in a loop]. Also see para [0048]). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of ANDERSON to incorporate rendering and re-rendering in the invention of OMRON in order to progressively monitor the quality of images as they are processed iteratively (para [0004], ANDERSON).

Regarding Claim 8, modified OMRON teaches the method as recited in claim 7, further comprising receiving an indication of an ending point through a user interface (para [0061] discloses target points are set by the user. Further, Fig. 8 discloses pixel are shifted from a starting point to the target point by a determined shift amount), wherein the ending point is received through a user selection of a different portion of the digital image (para [0061] discloses a user can designate only a desired organ, and control points and a target point are arranged only with respect to the designated organ).

Regarding Claim 9, modified OMRON teaches the method as recited in claim 8, further comprising when a pixel selected from the first set of pixels reaches the ending point (Fig. 8, pixels are shifted from a starting point to a target point and are shifted by a determined amount of pixels) and rendering the pixels being shifted from the first starting point to the ending point (para [0086], morphed image is generated and provided to user). OMRON fails to disclose wherein the first set of pixels comprises rendering and re-rendering in a loop. However, ANDERSON, in analogous art, teaches rendering and re-rendering in a loop (para [0025] discloses a rendering module which iteratively renders images on the display device [claimed rendering and re-rendering in a loop]. Also see para [0048]). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of ANDERSON to incorporate rendering and re-rendering in the invention of OMRON in order to progressively monitor the quality of images as they are processed iteratively (para [0004], ANDERSON).

Regarding Claim 13, modified OMRON teaches the method as recited in claim 7, further comprising: receiving a second indication of a second starting point through a user interface, wherein the second starting point is received through a user selection of a portion of the digital image; receiving, through the user interface, a second direction associated with the second starting point; selecting a second set of pixels extending in the second direction away from the second starting point; and shifting the second set of pixels in the second direction (para [0046] discloses input/output unit 15 is a unit that receives an input operation by a user. Further, para [0096] discloses user inputs shift amount. Further as disclosed in Fig. 8, a first and second shift amounts are designated where a respective shift amount begins at a starting pixel and shifts a determined distance to an target/ending point pixel), and rendering the first set of pixels being shifted (para [0086], morphed image is generated and provided to user). OMRON fails to disclose rendering and re-rendering in a loop the second set of pixels being shifted. OMRON fails to disclose wherein the first set of pixels comprises rendering and re-rendering in a loop. However, ANDERSON, in analogous art, teaches rendering and re-rendering in a loop (para [0025] discloses a rendering module which iteratively renders images on the display device [claimed rendering and re-rendering in a loop]. Also see para [0048]). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of ANDERSON to incorporate rendering and re-rendering in the invention of OMRON in order to progressively monitor the quality of images as they are processed iteratively (para [0004], ANDERSON).

Regarding Claim 14, modified OMRON teaches the method as recited in claim 13, wherein the first direction is different from the second direction (Fig. 8 discloses a first and second direction for shifting pixels by a respective shift amount to a target point).

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International application No.

PCT/US2017/044256

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Claims 10-12 lack an inventive step under PCT Article 33(3) as being obvious over OMRON CORPORATION (hereinafter OMRON) in view of ANDERSON and JVC KENWOOD CORPORATION (hereinafter JVC).

Regarding Claim 10, modified OMRON fail to disclose comprising receiving an indication to generate a mask over a portion of the digital image, wherein pixels under the mask are prevented from shifting.

However, JVC, in analogous art, teaches receiving an indication to generate a mask over a portion of the digital image, wherein pixels under the mask are prevented from shifting (para [0086] discloses pixels of only the person region are shifted without shifting the pixels of the peripheral background region of the person region, where, as further disclosed in para [0071], masks are used to indicate the respective regions [thus, the mask will specify which regions to omit from the shifting procedure]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

Regarding Claim 11, modified OMRON teaches the method as recited in claim 10, further comprising receiving through a user interface a selection of a particular pixel within the digital image (para [0061] discloses user can designate pixels directed to desired regions/portions of an image such as an organ).

OMRON fails to disclose selecting a mask. However, JVC, in analogous art, teaches generating a mask (para [0071], masks are used to indicate the respective regions). Furthermore, configuring processing of images is a practice well known in the art and the specifics (selecting a mask to generate) is a matter of design choice. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate generating desired masks to omit specified pixels from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

Regarding Claim 12, modified OMRON fails to disclose identifying one or more edges that form a boundary around the particular pixel; and generating the mask to cover area within the boundary.

However, JVC, in analogous art, teaches generate the mask by: identifying one or more edges that form a boundary around the particular pixel (para [0096] discloses edge region of the mask); and generating the mask to cover area within the boundary (para [0071], masks are used to indicate the respective regions. Further, para [0141] discloses object boundary part of a mask).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of JVC to incorporate masking pixels to omit from a shifting procedure in the invention of OMRON in order to enhance flexibility in processing images by selecting predefined regions to perform analysis and processing (para [0086], JVC).

Claims 4-6 and 18-20 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest:

Regarding claim 4, the prior art of record, individually or in combination, does not teach or fairly suggest the computer system of claim 1, wherein the executable instructions include instructions that are executable to configure the computer system to: receive a second starting point through the user interface, wherein the 10 second starting point is received through a user selection of a second beginning portion of the digital image; receive a second ending point through the user interface, wherein the second ending point is received through a user selection of a second beginning portion of the user interface; 15 create a second link between the second starting point and the second ending point, wherein the second link comprises: a second direction extending from the second starting point to the second ending point; and a second length between the second starting point and the second 20 ending point; identify a second set of pixels that lie between the second starting point and the second ending point; and shift the second set of pixels in the second direction, wherein shifting the second set of pixels comprises rendering and re-rendering in a loop the 25 second set of pixels being shifted.

Claims 5 and 6 depend from claim 4, and therefore meet the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 4.

Regarding claim 5, the prior art of record, individually or in combination, does not teach or fairly suggest the computer system of claim 4, wherein the first direction is different from the second direction.

Regarding claim 6, the prior art of record, individually or in combination, does not teach or fairly suggest the computer system of claim 4, wherein the magnitude of the shifting of the first set of pixels is proportionally related to the first length and the magnitude of the 30 shifting of the second set of pixels is proportionally related to the second length.

Regarding claim 18, the prior art of record, individually or in combination, does not teach or fairly suggest the method of claim 15, further comprising: receiving a second starting point through the user interface, wherein the second starting point is received through a user selection of a second beginning portion of the digital image; 10 receiving a second ending point through the user interface, wherein the second ending point is received through a user selection of a second beginning portion of the user interface; creating a second link between the second starting point and the second ending point, wherein the second link comprises: 15 a second direction extending from the second starting point to the second ending point; and a second length between the second starting point and the second ending point; identifying a second set of pixels that lie between the second starting 20 point and the second ending point; and shifting the second set of pixels in the second direction, wherein shifting the second set of pixels comprises rendering and re-rendering in a loop the second set of pixels being shifted.

Claims 19 and 20 depend from claim 18, and therefore meet the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 18.

Regarding claim 19, the prior art of record, individually or in combination, does not teach or fairly suggest the method of claim 18, wherein the first direction is different from the second 25 direction.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2017/044256

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Regarding claim 20, the prior art of record, individually or in combination, does not teach or fairly suggest the method of claim 18, wherein the magnitude of the shifting of the first set of pixels is proportionally related to the first length and the magnitude of the shifting of the second set of pixels is proportionally related to the second length

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Electronic Acknowledgement Receipt

EFS ID:	39777167
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John C. Stringham/Anastasiia Matkovska
Filer Authorized By:	John C. Stringham
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Receipt Date:	19-JUN-2020
Filing Date:	06-JAN-2020
Time Stamp:	16:49:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20970-1-1-1-1_2020-06-19_IDS.pdf	164774 83ad72df3af530d0a00e8b9460f60e07ec460d76	no	3

Warnings:

Information:					
This is not an USPTO supplied IDS fillable form					
2	Non Patent Literature	ISR_WO_PCTUS2017044256.pdf	906196 6eca60c64ec228d456cb4617a5337df300859cb4	no	9
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	15660677_OA_09-26-2018.pdf	2176259 e9568ac7986e251d9fd4f1b181f13c818a02f483	no	59
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	15660677_OA_05-06-2019.pdf	674196 c291f50ebbe86c24fd9f275b579e5a8ae2e78f2f	no	24
Warnings:					
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5	Other Reference-Patent/App/Search documents	15660677_NOA.pdf	519422 24137ac975a871dd3c6e8dd2daaf34abd88ced46	no	11
Warnings:					
Information:					
6	Other Reference-Patent/App/Search documents	16102055_OA_10-02-2018.pdf	2123967 ba91fdb29b827ae49d8c152bd352fcfd49e9a061	no	58
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Information:					
7	Other Reference-Patent/App/Search documents	16102055_OA_01-18-2019.pdf	1266397 779b686bf04a0ab3a371a8249a780370e24e66e0	no	35
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8	Other Reference-Patent/App/Search documents	16102055_NOA.pdf	604888 0744a33583d9619ef04131f26a683d4539f7b01c	no	14
Warnings:					
Information:					

9	Other Reference-Patent/App/Search documents	16162206_OA_12-26-2018.pdf	1638336	no	49
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Information:					
10	Other Reference-Patent/App/Search documents	16162206_OA_05-03-2019.pdf	488041	no	17
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Information:					
11	Other Reference-Patent/App/Search documents	16162206_NOA.pdf	468411	no	9
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Information:					
12	Non Patent Literature	Palette_cycling_.pdf	1534970	no	8
			3a3a976137ea2904946b392d5aef87ca639fc141		
Warnings:					
Information:					
Total Files Size (in bytes):			12565857		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1

22913
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

CONFIRMATION NO. 2797
POA ACCEPTANCE LETTER



Date Mailed: 09/29/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/10/2020.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/mnguyen/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1

22913
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

CONFIRMATION NO. 2797
POWER OF ATTORNEY NOTICE



Date Mailed: 09/29/2020

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/10/2020.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/mnguyen/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1

CONFIRMATION NO. 2797

ABANDONMENT/TERMINATION LETTER



22913
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

Date Mailed: 09/29/2020

NOTICE OF ABANDONMENT UNDER 37 CFR 1.53 (f) OR (g)

The above-identified application is abandoned for failure to timely or properly reply to the Notice to File Missing Parts (Notice) mailed on 01/29/2020.

- No reply was received.

If a complete reply to the notice was previously filed by applicant within the time period set forth in the notice, applicant may request for reconsideration of the holding of abandonment within 2 months from the mailing of this notice of abandonment by filing a petition to withdraw the holding of abandonment under 37 CFR 1.181(a). No petition fee is required. The petition must be accompanied by a true copy of the originally filed reply and the item(s) identified in one of the following:

1. A properly itemized date-stamped postcard receipt (see MPEP § 503);
2. If the originally filed reply included a certificate of mailing or transmission in compliance with 37 CFR 1.8(a), a copy of the certificate of mailing or transmission and a statement in compliance with 37 CFR 1.8(b) (see MPEP § 512); or
3. If the reply was filed via "Express Mail", (now "Priority Mail Express"), a submission satisfying the requirements of 37 CFR 1.10(e) including, for example, a copy of the mailing label showing the "date-in" (or "date accepted") (see MPEP § 513).

If applicant did not previously file complete reply within the the time period set forth in the notice, applicant may file a petition to revive the application under 37 CFR 1.137.

Under 37 CFR 1.137, a petition requesting that the application be revived on the grounds of UNINTENTIONAL DELAY must be filed promptly after applicant becomes aware of the abandonment and such petition must be accompanied by: (1) the reply required to the outstanding Office action or notice, unless previously filed; (2) the petition fee set forth in 37 CFR 1.17(m); (3) a terminal disclaimer (and fee set forth in 37 CFR 1.20(d)) if required by 37 CFR 1.137(d); and (4) a statement that the entire delay in filing the required reply from the due date for the reply until the filing of a grantable petition was unintentional. See MPEP 711.03(c) and Form PTO/SB/64.

Any questions concerning petitions to revive should be directed to the Office of Petitions at (571) 272-3282. Petitions should be mailed to Mail Stop Petitions, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

A copy of this notice MUST be returned with the reply.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/mnguyen/

**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT
ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(a)**

Page 1 of 2

Docket Number (Optional)
20970.1.1.1.1First named inventor: Troy PlotaApplication No.: 16/735,550

Art Unit: _____

Filed: January 6, 2020

Examiner: _____

Title: Automated Pixel Shifting Within a Digital Image

Attention: Office of Petitions

Mail Stop Petition

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

FAX (571) 273-8300

NOTE: If information or assistance is needed in completing this form, please contact the Office of Petitions at (571) 272-3282.

The above-identified application became abandoned for failure to file a timely and proper reply to a notice or action by the United States Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the Office notice or action plus any extensions of time actually obtained.

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION.

NOTE: A grantable petition requires the following items:

- (1) Petition fee;
- (2) Reply and/or issue fee;
- (3) Terminal disclaimer with disclaimer fee – required for all utility and plant applications filed before June 8, 1995, and for all design applications; and
- (4) Statement that the entire delay was unintentional.

1. Petition fee
☒ Small entity fee \$ 1050.00 (37 CFR 1.17(m)). Applicant asserts small entity status. See 37 CFR 1.27.

☐ Micro entity fee \$ _____ (37 CFR 1.17(m)). Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ Undiscounted fee \$ _____ (37 CFR 1.17(m)).
2. Reply and/or fee

A The reply and/or fee to the above-noted Office notice or action in the form of

Filing, Search, Exam, and surcharge fees (identify the type of reply):

☐ has been filed previously on _____.

☒ is enclosed herewith.

B The issue fee and publication fee (if applicable) of \$ _____

☐ has been paid previously on _____.

☐ is enclosed herewith.

This collection of information is required by 37 CFR 1.137(b). 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 1.11, 1.14 and 41.6. This collection is estimated to take 1 hour 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(a)

Page 2 of 2

3. Terminal disclaimer with disclaimer fee

- ☒ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.
- ☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of \$ _____) disclaiming the required period of time is enclosed herewith (see PTO/SB/63).

4. STATEMENT: The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(a) was unintentional. [NOTE: The United States Patent and Trademark Office may require additional information if there is a question as to whether either the abandonment or the delay in filing a petition under 37 CFR 1.137(a) was unintentional (MPEP 711.03(c), subsections (III)(C) and (D)).]

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

/John C. Stringham/

Signature

John C. Stringham

Typed or Printed Name

Workman Nydegger

Address

60 East So. Temple #1000, Salt Lake City, UT 84111

Address

December 8, 2020

Date

40831

Registration Number, if applicable

801-533-9800

Telephone Number

Enclosures:

- ☒ Fee Payment
- ☐ Reply
- ☐ Terminal Disclaimer Form
- ☐ Additional sheet(s) containing statements establishing unintentional delay
- ☐ Other: _____

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

I hereby certify that this correspondence is being:

- ☐ Deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.
- ☐ Transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (571) 273-8300.

Date

Signature

Typed or printed name of person signing certificate

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.

Electronic Patent Application Fee Transmittal

Application Number:	16735550			
Filing Date:	06-Jan-2020			
Title of Invention:	Automated Pixel Shifting Within a Digital Image			
First Named Inventor/Applicant Name:	Troy Plota			
Filer:	John C. Stringham/Ralene Eller			
Attorney Docket Number:	20970.1.1.1.1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	80	80
UTILITY SEARCH FEE	2111	1	350	350
UTILITY EXAMINATION FEE	2311	1	400	400
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	80	80
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
PET. REVIVE ABANDON APP, DELAY PYMT-RESP	2453	1	1050	1050
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1960

Electronic Acknowledgement Receipt

EFS ID:	41332998
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John C. Stringham/Ralene Eller
Filer Authorized By:	John C. Stringham
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	09-DEC-2020
Filing Date:	06-JAN-2020
Time Stamp:	10:39:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1960
RAM confirmation Number	E2020B9A40171321
Deposit Account	233178
Authorized User	Ralene Eller

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition for review by the Office of Petitions	20970-1-1-1-1_2020-12-09_Petition-to-Revive.pdf	219744	no	3
			613a1cdcffaa41bc1fe2631bbd120973e3fae0d3		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	39242	no	2
			5f2925332c2d5f2ec7850d85f3de8bf75507a256		
Warnings:					
Information:					
Total Files Size (in bytes):			258986		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1	2797
22913	7590	02/18/2021	EXAMINER	
Workman Nydegger 1000 Eagle Gate Tower 60 East South Temple Suite 1000 Salt Lake City, UT 84111			ART UNIT	PAPER NUMBER
			2845	
			NOTIFICATION DATE	DELIVERY MODE
			02/18/2021	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@wnlaw.com



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Application of :
Plota et al. :
Application No. 16/735,550 : **DECISION ON PETITION**
Filed: 6 Jan 2020 :
For: Automated Pixel Shifting Within a :
Digital Image :
:

This is a decision on the petition under the unintentional provisions of 37 CFR 1.137(a), filed December 9, 2020, to revive the above-identified application

The petition is **GRANTED**.

The application became abandoned for failure to reply in a timely manner to the Notice to File Missing Parts of Provisional Application (Notice), mailed January 29, 2020. The Notice set a period for reply of two (2) months from the mail date of the Notice. No extensions of time under the provisions of 37 CFR 1.136(a) were obtained. Accordingly, the application became abandoned on March 30, 2020. The Notice of Abandonment was mailed September 29, 2000.

The petition satisfies the requirements of 37 CFR 1.137(a) in that petitioner has supplied (1) the basic filing fee, surcharge, search fee and examination fee; (2) the petition fee of \$1,050; and (3) a proper statement of unintentional delay.

Telephone inquiries concerning this decision should be directed to Terri Johnson at (571) 272-2991.

This application is being referred to the Office of Patent Application Processing for appropriate action in the normal course of business on the reply received.

/TERRI S JOHNSON/
Paralegal Specialist, OPET



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
16/735,550	01/06/2020	2845	910	20970.1.1.1.1	1	1

CONFIRMATION NO. 2797
UPDATED FILING RECEIPT

22913
Workman Nydegger
1000 Eagle Gate Tower 60 East South Temple
Suite 1000
Salt Lake City, UT 84111



Date Mailed: 02/22/2021

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Troy Plota, Kihei, HI;
Sascha Connelly, Kihei, HI;

Applicant(s)

Troy Plota, Kihei, HI;
Sascha Connelly, Kihei, HI;

Power of Attorney: The patent practitioners associated with Customer Number 22913

Domestic Priority data as claimed by applicant

This application is a CON of 15/660,677 07/26/2017 PAT 10558342
which claims benefit of 62/514,703 06/02/2017
and claims benefit of 62/368,017 07/28/2016
This application 16/735,550
is a CIP of 16/162,206 10/16/2018 PAT 10621469
which claims benefit of 62/574,055 10/18/2017
and is a CIP of 15/660,677 07/26/2017 PAT 10558342
which claims benefit of 62/514,703 06/02/2017
and claims benefit of 62/368,017 07/28/2016

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 01/27/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/735,550**

Projected Publication Date: 06/03/2021

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Automated Pixel Shifting Within a Digital Image

Preliminary Class

341

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor

community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/735,550		Troy Plota	20970.1.1.1.1

CONFIRMATION NO. 2797

WITHDRAWAL NOTICE



22913
Workman Nydegger
1000 Eagle Gate Tower 60 East South Temple
Suite 1000
Salt Lake City, UT 84111

Date Mailed: 02/22/2021

Letter Regarding a New Notice and/or the Status of the Application

If a new notice or Filing Receipt is enclosed, applicant may disregard the previous notice mailed on 09/29/2020. The time period for reply runs from the mail date of the new notice. Within the time period for reply, applicant is required to file a reply in compliance with the requirements set forth in the new notice to avoid abandonment of the application.

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at
1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If the reply is not filed electronically via EFS-Web, the reply must be accompanied by a copy of the new notice.

If the Office previously granted a petition to withdraw the holding of abandonment or a petition to revive under 37 CFR 1.137, the status of the application has been returned to pending status.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at
(571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/hsarwari/

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 16/735,550	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	80		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	350		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	1	minus 20 = *	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *	x 240 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
			TOTAL	830		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							

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**Courtesy Reminder for
Application Serial No: 16/735,550**

Attorney Docket No: 20970.1.1.1.1

Customer Number: 22913

Date of Electronic Notification: 02/22/2021

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16735550
	Filing Date		2020-01-06
	First Named Inventor	Troy Plota	
	Art Unit	2612	
	Examiner Name		
	Attorney Docket Number	20970.1.1.1.1	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6339426	B1	2002-01-15	LUI et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						Add

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100149091	A1	2010-06-17	KOTA et al.	
	2	20130044108	A1	2013-02-21	TANAKA et al.	
	3	20140344804	A1	2014-11-20	EIN-GAL et al.	
	4	20170117016	A1	2017-04-27	HOPPE et al.	
	5	20170294210	A1	2017-10-12	ABRAMSON et al.	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	
Attorney Docket Number	20970.1.1.1.1

6	20200193215	A1	2020-06-18	PLOTA et al.
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	Non-Final Office Action received for U.S. Patent Application No. 16/802,254, mailed on January 07, 2021, 9 pages.	

If you wish to add additional non-patent literature document citation information please click the Add button.

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	
Attorney Docket Number	20970.1.1.1.1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John C. Stringham/	Date (YYYY-MM-DD)	2021-03-23
Name/Print	John C. Stringham	Registration Number	40831

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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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.
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Electronic Acknowledgement Receipt

EFS ID:	42255619
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John C. Stringham/Anastasiia Matkovska
Filer Authorized By:	John C. Stringham
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	23-MAR-2021
Filing Date:	06-JAN-2020
Time Stamp:	16:47:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS_16735550_1.pdf	1043799	no	4
			ab98aca64231feff36ef69f7bf6d9286ee5375f1		

Warnings:

Information:					
2	Non Patent Literature	1_47854_617822.pdf	350452	no	9
			e4ce53b7bfceae4cbb5aa12c5727e794b702cdc4		
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1	2797
22913	7590	04/30/2021	EXAMINER	
Workman Nydegger 60 East South Temple Suite 1000 Salt Lake City, UT 84111			LIU, GORDON G	
			ART UNIT	PAPER NUMBER
			2612	
			NOTIFICATION DATE	DELIVERY MODE
			04/30/2021	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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DETAILED ACTION

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. **Claim 1** is pending under this Office action.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159.

Art Unit: 2612

See MPEP §§ 706.02(I)(1) - 706.02(I)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

Claim 1 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-2 of U.S. Patent No. 10,558,342. Although the claims at issue are not identical, they are not patentably distinct from each other because they can read on to each other, see the following mapping table.

Application No. 16/734,550 (Instant Application)	U.S. Patent No. 10,558,342
1. A computer system for automating the shifting of pixels within a digital image, comprising: one or more processors; and	1. A computer system for automating a shifting of pixels within a digital image, comprising: one or more processors; and

one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following: access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image; identify a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask from being shifted;	one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following: access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image; (2. The computer system of claim 1, wherein the executable instructions include instructions that are executable to configure the computer system to identify a particular portion of the digital image to mask, wherein: a mask prevents pixels covered by the mask from being shifted, and receiving an indication of a particular portion of the digital image to mask comprises receiving through a
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receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of the digital image; receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion of the user interface; create a first link between the first starting point and the first ending point, wherein the first link comprises: a non-linear pathway extending between the first starting point and the first ending point a first direction extending from the first starting point to the first ending point; and	user interface a selection of a particular pixel within the digital image.) receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of the digital image; receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion of the user interface; create a first link between the first starting point and the first ending point, wherein the first link comprises: a non-linear pathway extending between the first starting point and the first ending point; and
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a first length extending along the non-linear pathway between the first starting point and the first ending point;	a first length extending along the non-linear pathway between the first starting point and the first ending point;
identify a first set of pixels that lie along the link between the first starting point and the first ending point; and	identify a first set of pixels that lie along the first link between the first starting point and the first ending point; and
shift the first set of pixels in the first direction along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering and re-rendering in a loop the first set of pixels being shifted.	shift the first set of pixels along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering and re-rendering in a loop the first set of pixels being shifted.

Claim 1 of the instant application is drawn to a computer system for automating the shifting of pixels within a digital image, comprising: one or more processors; and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following: access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image; identify a particular portion of the digital image to mask, wherein the mask prevents pixels covered by the mask

Art Unit: 2612

from being shifted; receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of the digital image; receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a first ending portion of the user interface; create a first link between the first starting point and the first ending point, wherein the first link comprises: a non-linear pathway extending between the first starting point and the first ending point a first direction extending from the first starting point to the first ending point; and a first length extending along the non-linear pathway between the first starting point and the first ending point; identify a first set of pixels that lie along the link between the first starting point and the first ending point; and shift the first set of pixels in the first direction along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering and re-rendering in a loop the first set of pixels being shifted.

While the exact wordings of claims 1-2 of the '342 patent may not be the same as that of claim 1 of the instant application, but there is no significant difference in scope between the claim 1 of the instant application and the claims 1-2 of the patent '342. Therefore, Claim 1 of the instant application cannot be considered patentably distinct over claims 1-2 of the '342 patent.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ohta (US 20150262327 A1) and Amirghodsi, etc. (US 20170140514 A1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GORDON G LIU whose telephone number is (571)270-0382. The examiner can normally be reached on Monday - Friday 8:00-5:00.

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, Jennifer Mehmood can be reached on 571-272-2976. 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-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.

/GORDON G LIU/
Primary Examiner, Art Unit 2612

Notice of References Cited	Application/Control No. 16/735,550	Applicant(s)/Patent Under Reexamination Plota et al.	
	Examiner GORDON G LIU	Art Unit 2612	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20150262327-A1	09-2015	Ohta; Takashi	G06T3/0093	345/646
*	B	US-20170140514-A1	05-2017	Amirghodsi; Sohrab	G06T5/005	1/1
	C					
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	F					
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	H					
	I					
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	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	W	
	X	

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 16/735,550	Applicant(s)/Patent Under Reexamination Plota et al.
	Examiner GORDON G LIU	Art Unit 2612

CPC - Searched*		
Symbol	Date	Examiner
(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	04/19/2021	/G.L./

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
345	619	04/19/2021	/G.L./

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Google search: color cycling + palette cycling and image animation with pixel cycling.	04/19/2021	/G.L./

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/GORDON G LIU/ Primary Examiner, Art Unit 2612	
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[Color Cycling in Pixel Art | by Stephen Schroeder | Prototyprblog.prototypr.io](https://blog.prototypr.io)

8:16 AM

[Canvas Cycle: True 8-bit Color Cycling with HTML5www.effectgames.com](https://www.effectgames.com)

Today - Monday, April 19, 2021

8:52 AM

[Parallax barrier - Wikipediaen.wikipedia.org](https://en.wikipedia.org)

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[Old School Color Cycling with HTML5 | EffectGames.comwww.effectgames.com](https://www.effectgames.com)

9:50 PM

Google Translatetranslate.google.com

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9:47 PM

US9105121B2 - Image editing with user interface controls overlaid on image - Google Patentspatents.google.com

9:47 PM

(~patent/US10346017B2) - Google Patentspatents.google.com

9:46 PM

US9858649B2 - Depth-based image blurring - Google Patentspatents.google.com

9:45 PM

US10346017B2 - Automated pixel shifting within a digital image - Google Patentspatents.google.com

9:45 PM

Google Patentspatents.google.com

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google patents - Google Searchwww.google.com

9:44 PM

US Patent for Automated pixel shifting within a digital image Patent (Patent # 10,346,017 issued July 9, 2019) - Justia Patents Searchpatents.justia.com

9:44 PM

A computer system for automating the shifting of pixels within a digital image, comprising: one or more processors; and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at leastwww.google.com

9:34 PM

DAV - 16/735,550 - AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGEdav.uspto.gov

9:32 PM

https://helpx.adobe.com/pdf/animate_reference.pdfhelpx.adobe.com
9:32 PM

[pixel shifting between two points within the image grids in non-linear path + image animation + PDF - Google Search](#)www.google.com
9:20 PM

<https://www.mn.uio.no/astro/english/services/it/help/mathematics/matlab/graphg.pdf>www.mn.uio.no
9:09 PM

[paper.dvi](#)www.cs.cmu.edu

Doc code: IDS

PTO/SB/08a (02-18)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 11/30/2020. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16735550
	Filing Date		2020-01-06
	First Named Inventor	Troy Plota	
	Art Unit	2612	
	Examiner Name		
	Attorney Docket Number	20970.1.1.1.1	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6339426	B1	2002-01-15	LUI et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						Add

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100149091	A1	2010-06-17	KOTA et al.	
	2	20130044108	A1	2013-02-21	TANAKA et al.	
	3	20140344804	A1	2014-11-20	EIN-GAL et al.	
	4	20170117016	A1	2017-04-27	HOPPE et al.	
	5	20170294210	A1	2017-10-12	ABRAMSON et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number		16735550
Filing Date		2020-01-06
First Named Inventor	Troy Plota	
Art Unit	2612	
Examiner Name		
Attorney Docket Number	20970.1.1.1.1	

6	20200193215	A1	2020-06-18	PLOTA et al.
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If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							

If you wish to add additional Foreign Patent Document citation information please click the Add button.

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	Non-Final Office Action received for U.S. Patent Application No. 16/802,254, mailed on January 07, 2021, 9 pages.	

If you wish to add additional non-patent literature document citation information please click the Add button.

EXAMINER SIGNATURE

Examiner Signature	/GORDON G LIU/	Date Considered	04/18/2021
--------------------	----------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	
Attorney Docket Number	20970.1.1.1.1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John C. Stringham/	Date (YYYY-MM-DD)	2021-03-23
Name/Print	John C. Stringham	Registration Number	40831

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

Bibliographic Data

Application No: 16/735,550

Foreign Priority claimed: ☐ Yes ☒ No

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

Verified and Acknowledged: /GORDON G LIU/

Examiner's Signature

Initials

Title:

Automated Pixel Shifting Within a Digital Image

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/06/2020	345	2612	20970.1.1.1.1
RULE			

APPLICANTS

INVENTORS

Troy Plota, Kihei, HI, UNITED STATES

Sascha Connelly, Kihei, HI, UNITED STATES

CONTINUING DATA

This application is a CIP of 16162206 10/16/2018 PAT 10621469

16162206 has PRO of 62574055 10/18/2017

This application is a CON of 15660677 07/26/2017 PAT 10558342

16162206 is a CIP of 15660677 07/26/2017 PAT 10558342

15660677 has PRO of 62514703 06/02/2017

15660677 has PRO of 62368017 07/28/2016

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

01/27/2020

** SMALL ENTITY **

STATE OR COUNTRY

UNITED STATES

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Workman Nydegger

60 East South Temple

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Salt Lake City, UT 84111

UNITED STATES

FILING FEE RECEIVED

\$1,960

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	16/735550
				Filing Date	01-06-2020
				First Named Inventor	Troy Plota
				Art Unit	2845
				Examiner Name	Not Assigned
Sheet	1	Of	3	Attorney Docket Number	20970.1.1.1.1

U.S. PATENT APPLICATION PUBLICATIONS					
Examiner Initials*	Cite No.	Publication Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	20070019007	25-Jan-2007	JUNG	
	2	20090189912	30-Jul-2009	Holtman	
	3	20100134505	3-Jun-2010	ANDERSON	
	4	20110273583	10-Nov-2011	YOSHINO	
	5	20150022518	22-Jan-2015	JVC KENWOOD CORPORATION	
	6	20150262327	17-Sep-2015	OMRON CORPORATION	
	7	20150095882	2-Apr-2015	Jaeger et al.	
	8	20170140514	18-May-2017	Amirghodsi et al.	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published	T 1
	9	International Search Report and Written Opinion for application no. PCT/US2017/044256 mailed on October 6, 2017	
	10	SCICompanion, "Palette Cycling", 6 March 2016 [Online], Retrieved on 21 September 2018 from <URL: http://scicompanion.com/Documentation/palettecycling.html >.	

OFFICE ACTION / NOTICE OF ALLOWANCE / ISSUE NOTIFICATION DOCUMENTS				
Examiner Initials*	Cite No.	Application Number	Mail Date	Document
	11	15/660677	26-Sep-2018	Office Action
	12	15/660677	6-May-2019	Final Office Action
	13	16/102055	2-Oct-2018	Office Action
	14	16/102055	18-Jan-2019	Final Office Action
	15	16/102055	17-Apr-2019	Notice of Allowance
	16	16/162206	26-Dec-2018	Office Action
	17	16/162206	3-May-2019	Final Office Action

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	16/735550
				Filing Date	01-06-2020
				First Named Inventor	Troy Plota
				Art Unit	2845
				Examiner Name	Not Assigned
Sheet	2	Of	3	Attorney Docket Number	20970.1.1.1.1

OFFICE ACTION / NOTICE OF ALLOWANCE / ISSUE NOTIFICATION DOCUMENTS				
Examiner Initials*	Cite No.	Application Number	Mail Date	Document
	18	15/660677	2-Oct-2019	Notice of Allowance
	19	16/162206	27-Nov-2019	Notice of Allowance

EXAMINER SIGNATURE			
Examiner Signature	/GORDON G LIU/	Date Considered	04/18/2021
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			
¹ Applicant is to place a check mark here if the reference is accompanied by a translation into English or if a concise explanation of the relevance, as presently understood by the undersigned attorney of record, of each listed reference that is not in the English language and is unaccompanied by a translation into English is provided with the reference.			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	16/735550
				Filing Date	01-06-2020
				First Named Inventor	Troy Plota
				Art Unit	2845
				Examiner Name	Not Assigned
Sheet	3	Of	3	Attorney Docket Number	20970.1.1.1.1

CERTIFICATION STATEMENT

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- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.

- ☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

- ☒ A certification statement is not submitted herewith.

- ☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments to Deposit Account No. 23-3178 regarding this Information Disclosure Statement

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John C. Stringham/	Date	2020-06-19
Name/Print	John C. Stringham	Registration Number	40831

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S2	4,526	345/619.ccls.	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/02 00:48
S3	37,754	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/02 00:50
S4	41,412	S2 or S3	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/02 00:50
S5	317	S4 and shift with pixel	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/02 00:50
S6	5	S5 and mask with boundary	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/02 00:50
S7	0	("2018/0032236").URPN.	USPAT	OR	OFF	2018/09/02 00:52
S8	5	("20070019007" "20100134505" "20110273583" "20150022518" "20150262327").PN.	US-PGPUB; USPAT	OR	OFF	2018/09/02 01:04
S9	2	cycle same shifting and pixel adj strip	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/02 01:09
S10	2	("20170236028" or "20160270648").pn.	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/02 01:37
S11	0	circular adj shift\$3 adj pixels	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/03 23:33
S12	1	"15660677"	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/03 23:35

S13	2	("9536461" or "20030034992").pn.	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 09:32
S14	121	color adj cycling	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 09:52
S15	31	S14 and mask	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 09:52
S18	78	pixel adj rotating	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 11:32
S19	0	S18 and cycling	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 11:33
S20	14	S18 and shift	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 11:33
S21	1,263	pixel adj shifting	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 15:03
S22	30	S21 and animation	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 15:03
S23	1	"8299413".pn.	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/04 15:06
S24	2	("20150262327" or "20170140514").pn.	US-PGPUB; USPAT; EPO	OR	OFF	2018/09/23 21:08
S25	1	"20170140514".pn.	US-PGPUB; USPAT; EPO	OR	OFF	2018/12/17 21:45
S26	8	palette adj cycling and video	US-PGPUB; USPAT; EPO	OR	OFF	2018/12/17 23:15

S27	12	color adj cycling same (speed or rate)	US-PGPUB; USPAT; EPO	OR	OFF	2018/12/18 11:03
S28	2	"15298663"	US-PGPUB; USPAT; EPO	OR	OFF	2018/12/18 11:56
S29	1	"20090189912".pn.	US-PGPUB; USPAT; EPO	OR	OFF	2018/12/18 17:05
S30	4,526	345/619.ccls.	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:53
S31	40,182	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:53
S32	43,846	S30 or S31	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:53
S33	43,846	S32	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:53
S34	2,444	S33 and threshold with distance	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:54
S35	118	S34 and digital and ink	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:55
S36	0	S35 and shift with pixel	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:55
S37	9	S35 and shift and pixel	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:55
S38	1	"16162206"	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 09:56

S39	5	("20070019007" or "20100134505" or "20110273583" or "20150022518" or "20150095882").pn.	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 10:31
S40	1	"16102055"	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/29 23:22
S41	867	animation and distance adj threshold	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/30 10:48
S42	0	S41 and pixel adj shift	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/30 10:48
S43	14	S41 and pixel with shift\$3	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/30 10:48
S44	3,774	image and animation and pixel and shifting	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/30 11:01
S45	463,503	S44 ad non-linear with pathway	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/30 11:02
S46	0	S44 and non-linear with pathway	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/30 11:02
S47	48	S44 and non-linear and pathway	US-PGPUB; USPAT; EPO	OR	OFF	2019/04/30 11:02
S48	4,527	345/619.ccls.	US-PGPUB; USPAT; EPO	OR	OFF	2019/11/22 19:28
S49	43,527	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	US-PGPUB; USPAT; EPO	OR	OFF	2019/11/22 19:28
S50	47,193	S48 or S49	US-PGPUB; USPAT; EPO	OR	OFF	2019/11/22 19:28

S51	47,193	S50	US-PGPUB; USPAT; EPO	OR	OFF	2019/11/22 19:28
S52	300	S51 and shifting same pixel	US-PGPUB; USPAT; EPO	OR	OFF	2019/11/22 19:28
S53	4	S52 and link with ending adj point	US-PGPUB; USPAT; EPO	OR	OFF	2019/11/22 19:30
S65	4,528	345/619.ccls.	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/17 22:56
S66	51,754	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/17 22:56
S67	55,413	S65 or S66	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/17 22:56
S68	55,413	S67	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/17 22:56
S69	9	S68 and shifting near3 loop	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/17 22:56
S70	15	("20100149091" "20130044108" "20140344804" "20170117016" "20170294210" "20200193215" "6339426" "20070019007" "20090189912" "20100134505" "20110273583" "20150022518" "20150095882" "20150262327" "20170140514").PN.	US-PGPUB; USPAT	OR	ON	2021/04/18 21:34
S71	0	"16735550"	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/18 21:36
S72	2	"9858649".pn.	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/18 21:46

S73	2	"9105121".pn.	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/18 21:47
S74	2	"13629417"	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/18 21:51
S75	0	color adj cycling and palette adj cycling	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/19 09:07
S76	1	color adj cycling and palette near2 cycling	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/19 09:07
S77	7	"15660677"	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/19 09:17
S78	2	("20150262327" or "20170140514").pn.	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/19 09:41
S79	11	palette adj cycling	US-PGPUB; USPAT; EPO	OR	OFF	2021/04/19 09:41

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S54	4,526	345/619.ccls.	US-PGPUB; USPAT	OR	OFF	2019/11/23 20:59
S55	43,527	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	US-PGPUB; USPAT	OR	OFF	2019/11/23 20:59
S56	47,192	S54 or S55	US-PGPUB; USPAT	OR	OFF	2019/11/23 21:00
S57	300	S56 and shifting same pixel	US-PGPUB; USPAT	OR	OFF	2019/11/23 21:00
S58	22	S57 and ending adj point	US-PGPUB; USPAT	OR	OFF	2019/11/23 21:00
S59	1	"16162206"	US-PGPUB; USPAT	OR	OFF	2019/11/23 21:05

S60	0	(Plota and Troy or Connelly and Sascha).as.	US-PGPUB; OR USPAT	OFF	2019/11/23 21:06
S61	4	(Plota and Troy or Connelly and Sascha).in.	US-PGPUB; OR USPAT	OFF	2019/11/23 21:06
S62	458,230	@pd>"20190501"	US-PGPUB; OR USPAT	OFF	2019/11/23 21:07
S63	506	S62 and shifting with pixel	US-PGPUB; OR USPAT	OFF	2019/11/23 21:07
S64	1	S63 and ending adj point	US-PGPUB; OR USPAT	OFF	2019/11/23 21:07

4/19/2021 9:54:03 AM

C:\Users\gliu\Documents\EAST\Workspaces\Case599_16735550CIP15660677RCE.wsp



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1

CONFIRMATION NO. 2797

PUBLICATION NOTICE



OC000000126051164

22913
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

Title:Automated Pixel Shifting Within a Digital Image

Publication No.US-2021-0165560-A1

Publication Date:06/03/2021

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16735550
	Filing Date	2020-01-06
	First Named Inventor	Troy Plota
	Art Unit	2612
	Examiner Name	LIU, GORDON G
	Attorney Docket Number	20970.1.1.1.1

U.S.PATENTS							Remove	
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	5086482	A	1992-02-04	KUMAGAI RYOHEI			
	2	8244061	B1	2012-08-14	CARSON et al.			
If you wish to add additional U.S. Patent citation information please click the Add button.							Add	
U.S.PATENT APPLICATION PUBLICATIONS							Remove	
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	20130201284	A1	2013-08-08	Abeloe Kenneth A.			
If you wish to add additional U.S. Published Application citation information please click the Add button.							Add	
FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	1081956	EP	A1	2001-03-07	UNIVERSITY OF WASHINGTON		
If you wish to add additional Foreign Patent Document citation information please click the Add button							Add	
NON-PATENT LITERATURE DOCUMENTS							Remove	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	LIU, GORDON G
Attorney Docket Number	20970.1.1.1.1

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	GIRGENSOHN, A., et al., "A semi-automatic approach to home video editing," Proceedings of the 13th annual ACM symposium on User interface software and technology, CHI Letters, Vol 2, No. 2, November 08, 2000, pp. 81-89	
	2	International Search Report and Written Opinion received for PCT Patent Application No. PCT/US2018/056377, mailed on Jan 04, 2019, 12 pages	

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	LIU, GORDON G
Attorney Docket Number	20970.1.1.1.1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John C. Stringham/	Date (YYYY-MM-DD)	2021-07-30
Name/Print	John C. Stringham	Registration Number	40831

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 20970-18-1A	FOR FURTHER ACTION		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2018/056377	International filing date (<i>day/month/year</i>) 17 October 2018	(Earliest) Priority Date (<i>day/month/year</i>) 18 October 2017	
Applicant PLOTA, TROY			

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 7.

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2018/056377

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06K 9/00; G06K 9/40; H03L 7/00; H03M 1/12; H04N 7/01; H04N 9/64 (2018.01)

CPC - G09G 2340/0421; G09G 2340/0464; H04N 5/145; H04N 5/21; H04N 7/012; H04N 7/0122; H04N 7/0132 (2018.08)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 348/251; 348/441; 348/459; 348/540; 348/542; 348/572; 382/167; 382/274 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2013/0201284 A1 (VIRGINIA VENTURE INDUSTRIES, LLC) 08 August 2013 (08.08.2013) entire document	1-20
A	US 5,086,482 A (KUMAGAI) 04 February 1992 (04.02.1992) entire document	1-20
A	EP 1 081 956 A1 (UNIVERSITY OF WASHINGTON) 07 March 2007 (07.03.2007) entire document	1-20
A	US 8,244,061 B1 (CARSON et al) 14 August 2012 (14.08.2012) entire document	1-20
A	GIRGENSOHN et al. "A semi-automatic approach to home video editing." In: Proceedings of the 13th annual ACM symposium on User interface software and technology. 08 November 2000 (08.11.2000) Retrieved from <http://fxpal.fxpal.com/publications/a-semi-automatic-approach-to-home-video-editing.pdf> entire document	1-20

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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

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

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

16 December 2018

Date of mailing of the international search report

04 JAN 2019

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450
Facsimile No. 571-273-8300

Authorized officer

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: JOHN C. STRINGHAM
60 EAST SOUTH TEMPLE, SUITE 1000
SALT LAKE CITY, UT 84111

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

04 JAN 2019

Applicant's or agent's file reference

20970-18-1A

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2018/056377

International filing date (day/month/year)

17 October 2018

Priority date (day/month/year)

18 October 2017

International Patent Classification (IPC) or both national classification and IPC

IPC(8) - G06K 9/00; G06K 9/40; H03L 7/00; H03M 1/12; H04N 7/01; H04N 9/64 (2018.01)

CPC - G09G 2340/0421; G09G 2340/0464; H04N 5/145; H04N 5/21; H04N 7/012; H04N 7/0122; H04N 7/0132 (2018.08)

Applicant **PLOTA, TROY**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450
Facsimile No. 571-273-8300

Date of completion of this opinion

16 December 2018

Authorized officer

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (January 2015)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2018/056377

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2018/056377

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement																										
1. Statement	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;">Novelty (N)</td> <td style="width: 10%; vertical-align: top;">Claims</td> <td style="width: 40%; border-bottom: 1px solid black; padding: 2px 5px;">1-20</td> <td style="width: 20%; vertical-align: top;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black; padding: 2px 5px;">None</td> <td style="vertical-align: top;">NO</td> </tr> <tr> <td style="vertical-align: top;">Inventive step (IS)</td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black; padding: 2px 5px;">1-20</td> <td style="vertical-align: top;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black; padding: 2px 5px;">None</td> <td style="vertical-align: top;">NO</td> </tr> <tr> <td style="vertical-align: top;">Industrial applicability (IA)</td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black; padding: 2px 5px;">1-20</td> <td style="vertical-align: top;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black; padding: 2px 5px;">None</td> <td style="vertical-align: top;">NO</td> </tr> </table>	Novelty (N)	Claims	1-20	YES		Claims	None	NO	Inventive step (IS)	Claims	1-20	YES		Claims	None	NO	Industrial applicability (IA)	Claims	1-20	YES		Claims	None	NO		
Novelty (N)	Claims	1-20	YES																								
	Claims	None	NO																								
Inventive step (IS)	Claims	1-20	YES																								
	Claims	None	NO																								
Industrial applicability (IA)	Claims	1-20	YES																								
	Claims	None	NO																								
2. Citations and explanations:	Claims 1-20 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest: Regarding claim 1, the prior art of record, individually or in combination, does not teach or fairly suggest a computer system for automating the shifting of pixels within a video file, comprising: the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; the first digital link comprises the first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point. Regarding claims 2-10, each claim depends from the novel claim 1, and therefore meets the criteria set out in PCT Article 33(2)-(3), for at least the same reasons as the base claim 1. The prior art teaches some of the concepts and/or aspects of the claim limitations as shown below, but does not teach the claim limitations in their entirety and as specifically recited in each of the claims: Virginia discloses a computer system for shifting of pixels within a video file (shifting selected pixels of said pair of images in one or more directions, para 0009, the pixels being shifted in the original 3D video data, para 0029), comprising one or more processors (processor or processors (e.g., digital signal processors, microprocessors, or the like), para 0016); and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following (implemented on a processor or processors (e.g., digital signal processors, microprocessors, or the like) coupled to a memory or memories, para 0016) access, from memory, a digital video file (receives the 3D video signal, para 0035); a first direction (The one or more directions include a horizontal direction, para 0009); and identify a first set of pixels (translating selected pixels in the horizontal and/or vertical directions, para 0029); and shift the first set of pixels in the first direction (shifting selected pixels of said pair of images in one or more directions, para 0009), but fails to teach automating the shifting of pixels within a video file; the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; receive a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of a first video frame; receive a first ending point through the user interface, wherein the first ending point is received through a user selection of a second ending portion of a second video frame; create a first digital link between the first starting point and the first ending point, wherein the first digital link comprises the first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point; and identify the first set of pixels that lie between the first starting point and the first ending point Kumagai discloses a computer system, comprising receive a first starting point (selecting two adjacent top points in a configuration in an image, selecting one top point as a starting point, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47); receive a first ending point (selecting two adjacent top points in a configuration in an image, selecting one top point as a starting point [implicitly, the other top point is ending point], claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47); create a first digital link between the first starting point and the first ending point (selecting two adjacent top points in a configuration in an image; defining a reference line [i.e. a first digital link] connecting the two top points, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47); and identify a first set of pixels that lie between the first starting point and the first ending point (selecting two adjacent top points in a configuration in an image; defining a reference line connecting the two top points; selecting one top point as a starting point; selecting a series of pixels, each being as near to the reference line as possible while being positioned between the reference line and a contour of the configuration, the selected pixels extending continuously from the start point to the other top point, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47), but fails to teach automating the shifting of pixels within a video file; one or more processors; and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following access, from memory, a digital video file, wherein the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; receive the first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of a first video frame; receive the first ending point through the user interface, wherein the first ending point is received through a user selection of a second ending portion of a second video frame; the first digital link comprises a first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point; and shift the first set of pixels in the first direction.																										

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2018/056377

Supplemental Box

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Continuation of:

Washington discloses a computer system, comprising one or more processors (a processor 28, para 0020); and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following (software code for implementing the user interface 12 and shell environment 14, including computer executable instructions and computer readable data are stored on a digital processor readable storage media, such as embedded memory, RAM, ROM, a hard disk, an optical disk, a floppy disk, a magneto-optical disk, an electro-optical disk, or another known or to be implemented transportable or non-transportable processor readable storage media, para 0022) access, from memory, a digital video file (load a video sequence, para 0005); receive a first starting point through a user interface (the operator is able to view the video sequence with highlighted object from a selected starting time point to a selected end time point, para 0011), wherein the first starting point is received through a user selection of a first beginning portion of a first video frame (The operator also can select a starting frame and an ending frame to view a clip of the input video sequence and define the processing range. Such selections are highlighted along the time-line 72, the line 76 designates the starting frame and the line 78 designates the ending frame. The operator selects the starting and ending points 76, 78 then selects 'play' to play the video clip or 'segment' to track objects, para 0034); and receive a first ending point through the user interface (the operator is able to view the video sequence with highlighted object from a selected starting time point to a selected end time point, para 0011), wherein the first ending point is received through a user selection of a second ending portion of a second video frame (The operator also can select a starting frame and an ending frame to view a clip of the input video sequence and define the processing range. Such selections are highlighted along the time-line 72, the line 76 designates the starting frame and the line 78 designates the ending frame. The operator selects the starting and ending points 76, 78 then selects 'play' to play the video clip or 'segment' to track objects, para 0034), but fails to teach automating the shifting of pixels within a video file; the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; create a first digital link between the first starting point and the first ending point, wherein the first digital link comprises a first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point; identify a first set of pixels that lie between the first starting point and the first ending point; and shift the first set of pixels in the first direction.

Regarding claim 11, the prior art of record, individually or in combination, does not teach or fairly suggest a method for automating the shifting of pixels within a video file, comprising: receiving, through the user interface, a first direction associated with the first starting point; and selecting a first set of pixels extending in the first direction away from the first starting point.

Regarding claims 12-17, each claim depends from the novel claim 11, and therefore meets the criteria set out in PCT Article 33(2)-(3), for at least the same reasons as the base claim 11.

The prior art teaches some of the concepts and/or aspects of the claim limitations as shown below, but does not teach the claim limitations in their entirety and as specifically recited in each of the claims:

Virginia discloses a method for shifting of pixels within a video file (shifting selected pixels of said pair of images in one or more directions, para 0009, the pixels being shifted in the original 3D video data, para 0029), comprising receiving a first direction (The one or more directions include a horizontal direction, para 0009); selecting a first set of pixels extending in the first direction (translating selected pixels in the horizontal and/or vertical directions, para 0029); and shifting the first set of pixels, in the first video frame, in the first direction (shifting selected pixels of said pair of images in one or more directions, para 0009), but fails to teach automating the shifting of pixels within a video file; receiving a first indication of a first starting point through a user interface, wherein the first starting point is received through a user selection of a first portion of a first video frame in the video file; receiving, through the user interface, a first direction associated with the first starting point; and selecting a first set of pixels extending in the first direction away from the first starting point.

Kumagai discloses a method, comprising receiving a first indication of a first starting point (selecting two adjacent top points in a configuration in an image, selecting one top point as a starting point, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 In 43-47); selecting a first set of pixels from the first starting point (selecting two adjacent top points in a configuration in an image; defining a reference line connecting the two top points; selecting one top point as a starting point; selecting a series of pixels, each being as near to the reference line as possible while being positioned between the reference line and a contour of the configuration, the selected pixels extending continuously from the start point to the other top point, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 In 43-47), but fails to teach automating the shifting of pixels within a video file; receiving a first indication of a first starting point through a user interface, wherein the first starting point is received through a user selection of a first portion of a first video frame in the video file; receiving, through the user interface, a first direction associated with the first starting point; selecting a first set of pixels extending in the first direction away from the first starting point; and shifting the first set of pixels, in the first video frame, in the first direction.

Washington discloses a method, comprising receiving a first indication of a first starting point through a user interface (the operator is able to view the video sequence with highlighted object from a selected starting time point to a selected end time point, para 0011), wherein the first starting point is received through a user selection of a first portion of a first video frame in the video file (The operator also can select a starting frame and an ending frame to view a clip of the input video sequence and define the processing range. Such selections are highlighted along the time-line 72, the line 76 designates the starting frame and the line 78 designates the ending frame. The operator selects the starting and ending points 76, 78 then selects 'play' to play the video clip or 'segment' to track objects, para 0034), but fails to teach automating the shifting of pixels within a video file; receiving, through the user interface, a first direction associated with the first starting point; selecting a first set of pixels extending in the first direction away from the first starting point; and shifting the first set of pixels, in the first video frame, in the first direction.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2018/056377

Supplemental Box

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Regarding claim 18, the prior art of record, individually or in combination, does not teach or fairly suggest a method for automating the shifting of pixels within a video file, comprising: the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; the first digital comprises the first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point.

Regarding claims 19 and 20, each claim depends from the novel claim 18, and therefore meets the criteria set out in PCT Article 33 (2)-(3), for at least the same reasons as the base claim 18.

The prior art teaches some of the concepts and/or aspects of the claim limitations as shown below, but does not teach the claim limitations in their entirety and as specifically recited in each of the claims:

Virginia discloses a method for shifting of pixels within a video file (shifting selected pixels of said pair of images in one or more directions, para 0009, the pixels being shifted in the original 3D video data, para 0029), comprising accessing, from memory, a digital video file (receives the 3D video signal, para 0035); a first direction (The one or more directions include a horizontal direction, para 0009); identifying a first set of pixels (translating selected pixels in the horizontal and/or vertical directions, para 0029); and shifting the first set of pixels in the first direction (shifting selected pixels of said pair of images in one or more directions, para 0009), but fails to teach automating the shifting of pixels within a video file; the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; receiving a first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of a first video frame; receiving a first ending point through the user interface, wherein the first ending point is received through a user selection of a second ending portion of a second video frame; creating a first digital link between the first starting point and the first ending point, wherein the first digital comprises the first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point; and identifying a first set of pixels that lie between the first starting point and the first ending point.

Kumagai discloses a method, comprising receiving a first starting point (selecting two adjacent top points in a configuration in an image, selecting one top point as a starting point, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47); receiving a first ending point (selecting two adjacent top points in a configuration in an image, selecting one top point as a starting point [implicitly, the other top point is ending point], claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47); creating a first digital link between the first starting point and the first ending point (selecting two adjacent top points in a configuration in an image; defining a reference line [i.e. a first digital link] connecting the two top points, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47); and identifying a first set of pixels that lie between the first starting point and the first ending point (selecting two adjacent top points in a configuration in an image; defining a reference line connecting the two top points; selecting one top point as a starting point; selecting a series of pixels, each being as near to the reference line as possible while being positioned between the reference line and a contour of the configuration, the selected pixels extending continuously from the start point to the other top point, claim 1, between two adjacent top points in the convex hull, a pixel inside of and with nearest distance from the line connecting the top points is successively selected, from one top point to the other, col 1 ln 43-47), but fails to teach automating the shifting of pixels within a video file; accessing, from memory, a digital video file, wherein the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; receiving the first starting point through a user interface, wherein the first starting point is received through a user selection of a first beginning portion of a first video frame; receiving the first ending point through the user interface, wherein the first ending point is received through a user selection of a second ending portion of a second video frame; the first digital comprises a first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point; and shifting the first set of pixels in the first direction.

Washington discloses a method, comprising accessing, from memory, a digital video file (load a video sequence, para 0005); receiving a first starting point through a user interface (the operator is able to view the video sequence with highlighted object from a selected starting time point to a selected end time point, para 0011), wherein the first starting point is received through a user selection of a first beginning portion of a first video frame (The operator also can select a starting frame and an ending frame to view a clip of the input video sequence and define the processing range. Such selections are highlighted along the time-line 72, the line 76 designates the starting frame and the line 78 designates the ending frame. The operator selects the starting and ending points 76, 78 then selects 'play' to play the video clip or 'segment' to track objects, para 0034); and receiving a first ending point through the user interface (the operator is able to view the video sequence with highlighted object from a selected starting time point to a selected end time point, para 0011), wherein the first ending point is received through a user selection of a second ending portion of a second video frame (The operator also can select a starting frame and an ending frame to view a clip of the input video sequence and define the processing range. Such selections are highlighted along the time-line 72, the line 76 designates the starting frame and the line 78 designates the ending frame. The operator selects the starting and ending points 76, 78 then selects 'play' to play the video clip or 'segment' to track objects, para 0034), but fails to teach automating the shifting of pixels within a video file; the digital video file comprises information that corresponds to individual pixels within various frames of the digital video file; creating a first digital link between the first starting point and the first ending point, wherein the first digital comprises a first direction extending from the first starting point to the first ending point; and a first length between the first starting point and the first ending point; identifying a first set of pixels that lie between the first starting point and the first ending point; and shifting the first set of pixels in the first direction.

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Search History:

Limited Classification Search

The Patent Analyst performed a limited classification search within the following US, IPC, CPC, ECLA, or F-Term classification areas:

CPC Class/Subclass(es): G09G 2340/0421; G09G 2340/0464; H04N 5/145; H04N 5/21; H04N 7/012; H04N 7/0122; H04N 7/0132 (2018.08)

IPC (8) Class/Subclass(es): G06K 9/00; G06K 9/40; H03L 7/00; H03M 1/12; H04N 7/01; H04N 9/64 (2018.01)

U.S. Class/Subclass(es): 348/251; 348/441; 348/459; 348/540; 348/542; 348/572; 382/167; 382/274

See Global Search Results.

Global Patent Literature Text Search

The Patent Analyst performed the following global text search, which was not limited by classification but may or may not have been limited by other criteria:

Questel Orbit: <https://www.orbit.com>

#	Search query	Results
1	((PLOTAGRAPH)/PA/OPA) AND PD <= 2017-10-18	0
2	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	102700
3	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+ AND ACCESS+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	73854
4	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+ AND ACCESS+ AND DIGITAL+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	63790
5	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+ AND ACCESS+ AND DIGITAL+ AND RECEIV+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	60717
6	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+ AND ACCESS+ AND DIGITAL+ AND RECEIV+ AND (START+ OR BEGIN+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	53811
7	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+ AND ACCESS+ AND DIGITAL+ AND RECEIV+ AND (START+ OR BEGIN+) AND POINT+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	51219
8	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+ AND ACCESS+ AND DIGITAL+ AND	47472

	RECEIV+ AND (START+ OR BEGIN+) AND POINT+ AND USER+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	
9	(AUTOMAT+ AND PIXEL+ AND (SHIFT+ OR MOV+) AND VIDEO+ AND FILE+ AND ACCESS+ AND DIGITAL+ AND RECEIV+ AND (START+ OR BEGIN+) AND POINT+ AND USER+ AND INTERFACE+)/TI/AB/IW/OBJ/ADB/ICLM/TX AND PD <= 2017-10-18	41765
10	9 AND (END+ OR FINISH+)	9978
11	10 AND (CREAT+ OR GENERAT+)	7035
12	11 AND LINK+	1530
13	12 AND DIRECTION+	531
14	13 AND LENGTH+	214
15	(348251)/PCLM AND PD <= 2017-10-18	148
16	(348441)/PCLM AND PD <= 2017-10-18	632
17	(348459)/PCLM AND PD <= 2017-10-18	92
18	(348540)/PCLM AND PD <= 2017-10-18	94
19	(348542)/PCLM AND PD <= 2017-10-18	26
20	(348572)/PCLM AND PD <= 2017-10-18	114
21	(3480E5066)/PCLM AND PD <= 2017-10-18	0
22	(3480E5110)/PCLM AND PD <= 2017-10-18	0
23	(3480E5111)/PCLM AND PD <= 2017-10-18	0
24	(3480E7013)/PCLM AND PD <= 2017-10-18	0
25	(382167)/PCLM AND PD <= 2017-10-18	1391
26	(382274)/PCLM AND PD <= 2017-10-18	773
27	(382275)/PCLM AND PD <= 2017-10-18	821
28	(G06K-009/00)/IPC AND PD <= 2017-10-18	113000
29	(G06K-009/40)/IPC AND PD <= 2017-10-18	9158
30	(H03L-007/00)/IPC AND PD <= 2017-10-18	10429
31	(H03M-001/12)/IPC AND PD <= 2017-10-18	11420
32	(H04N-007/01)/IPC AND PD <= 2017-10-18	13109
33	(H04N-009/64)/IPC AND PD <= 2017-10-18	16019
34	(G09G-005/005)/CPC AND PD <= 2017-10-18	995
35	(G09G-005/006)/CPC AND PD <= 2017-10-18	3510
36	(G09G-2340/0421)/CPC AND PD <= 2017-10-18	404

37	(G09G-2340/0464)/CPC AND PD <= 2017-10-18	863
38	(H04N-005/145)/CPC AND PD <= 2017-10-18	1365
39	(H04N-005/21)/CPC AND PD <= 2017-10-18	3105
40	(H04N-007/012)/CPC AND PD <= 2017-10-18	1719
41	(H04N-007/0122)/CPC AND PD <= 2017-10-18	1367
42	(H04N-007/0132)/CPC AND PD <= 2017-10-18	505
43	(H04N-007/014)/CPC AND PD <= 2017-10-18	738
44	(H04N-001/322192)/CPC AND PD <= 2017-10-18	5606
45	(H04N-017/02)/CPC AND PD <= 2017-10-18	777
46	(H04N-019/86)/CPC AND PD <= 2017-10-18	2125

Google Patents: <https://patents.google.com>

#	Search query	Results
1	automated pixel shifting within video file	73,300
2	inassignee:Plotagraph	0
3	automating shifting pixels within video file, access digital video file, receive starting point through user interface, receive ending point	72,700
4	shift pixels within video file, receive starting point, receive ending point, create digital link	170,000
5	shift pixels within video file, receive starting point, receive ending point, create digital link, direction extending from starting point to ending point	93,400
6	shift pixels within video file, create digital link, direction extending from starting point to ending point, length between first starting point and first ending point	96,700
7	create digital link, direction extending from starting point to ending point, length between first starting point and first ending point, identify pixels between starting point and ending point, shift pixels in direction	132,000
8	shift pixels in video file from starting point to ending point	90,700
9	shift pixels in video file	42,900
10	shift pixels from starting point to ending point	160,000
11	move pixels in direction from user selected starting point to ending point	245,000
12	shift object in image in direction from user selected starting point to ending point	1,060,000
13	shift object in video in direction from user selected starting point to ending point	833,000
14	select starting point in video frame, receive direction, select pixels extending in direction away from starting point, shift pixels	82,600
15	receive starting point through user interface, starting point is user selection of video frame portion in video file	981,000

16	move object in image, receive starting point through user interface, receive ending point	1,200,000
17	user select starting point of video frame portion in video file, user select ending point of video frame portion in video file	1,040,000

Computer Accessed Text Databases Searched

The Patent Analyst searched the following computer accessed text databases:

Google: <https://www.google.com/>

#	Search query	Results
1	automated pixel shifting within video file	10,600,000
2	Plotagraph	502,000
3	automating shifting pixels within video file, access digital video file, receive starting point through user interface, receive ending point	9,070,000
4	shift pixels within video file, receive starting point, receive ending point, create digital link	41,000,000
5	shift pixels within video file, receive starting point, receive ending point, create digital link, direction extending from starting point to ending point	9,670,000
6	shift pixels within video file, create digital link, direction extending from starting point to ending point, length between first starting point and first ending point	9,450,000
7	create digital link, direction extending from starting point to ending point, length between first starting point and first ending point, identify pixels between starting point and ending point, shift pixels in direction	14,000,000
8	shift pixels in video file from starting point to ending point	36,300,000
9	shift pixels in video file	11,200,000
10	shift pixels from starting point to ending point	39,400,000
11	move pixels in direction from user selected starting point to ending point	48,000,000
12	shift object in image in direction from user selected starting point to ending point	236,000,000
13	shift object in video in direction from user selected starting point to ending point	90,200,000
14	select starting point in video frame, receive direction, select pixels extending in direction away from starting point, shift pixels	8,060,000
15	receive starting point through user interface, starting point is user selection of video frame portion in video file	210,000,000
16	move object in image, receive starting point through user interface, receive ending point	412,000,000
17	user select starting point of video frame portion in video file, user select ending point of video frame portion in video file	302,000,000

Google Scholar: <https://scholar.google.com/>

#	Search query	Results
1	automated pixel shifting within video file	21,900
2	Plotagraph	27

3	automating shifting pixels within video file, access digital video file, receive starting point through user interface, receive ending point	17,400
4	shift pixels within video file, receive starting point, receive ending point, create digital link	19,200
5	shift pixels within video file, receive starting point, receive ending point, create digital link, direction extending from starting point to ending point	17,800
6	shift pixels within video file, create digital link, direction extending from starting point to ending point, length between first starting point and first ending point	18,100
7	create digital link, direction extending from starting point to ending point, length between first starting point and first ending point, identify pixels between starting point and ending point, shift pixels in direction	20,500
8	shift pixels in video file from starting point to ending point	22,600
9	shift pixels in video file	41,500
10	shift pixels from starting point to ending point	42,600
11	move pixels in direction from user selected starting point to ending point	30,700
12	shift object in image in direction from user selected starting point to ending point	53,900
13	shift object in video in direction from user selected starting point to ending point	38,200
14	select starting point in video frame, receive direction, select pixels extending in direction away from starting point, shift pixels	20,200
15	receive starting point through user interface, starting point is user selection of video frame portion in video file	36,100
16	move object in image, receive starting point through user interface, receive ending point	40,000
17	user select starting point of video frame portion in video file, user select ending point of video frame portion in video file	27,500

Date search was completed: 16 December 2018

EH/MP

Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This invention is related to commonly-
 assigned U.S. Patent Application Serial No. 09/323,501,
 filed June 1, 1999 for "Video Object Segmentation
 Using Active Contour Modelling With Global Relaxa-
 tion," of Shijun Sun and Yongmin Kim; commonly-
 assigned U.S. Patent Application Serial No. _____,
 attorney docket no. OT2.P55,
 filed on the same day, for "Interactive Video Object
 Processing Environment Which Visually Distinguishes
 Segmented Video Object," of Christopher Lau et al.;
 and commonly-assigned U.S. Patent Application Serial
 No. _____, attorney docket no.
 OT2.P56, filed on the same day, for "Interactive Video
 Object Processing Environment Having Zoom Window,"
 of Christopher Lau et al. The content of all such applica-
 tions are incorporated herein by reference and made a
 part hereof.

BACKGROUND OF THE INVENTION

[0002] This invention relates to user interfaces and
 interactive processing environments for video editing,
 and more particularly to an interactive processing envi-
 ronment for video object segmentation, tracking and
 encoding.

[0003] Graphical user interfaces having windows,
 buttons, dialogue boxes and menus are known, such as
 those available with the Apple Macintosh Operating
 System and the Microsoft Windows-based operating
 systems. The inventions disclosed herein relate to a
 graphical user interface adapted for video editing tasks,
 such as segmentation, tracking and encoding.

[0004] Segmentation is the division of an image into
 semantically meaningful non-overlapping regions.
 When segmenting video, the regions are referred to as
 video objects. Tracking is a method for identifying a
 video object across a series of video frames. Encoding
 is the compression and formatting of video according to
 some conventional or proprietary encoding scheme,
 such as the MPEG-4 encoding scheme.

SUMMARY OF THE INVENTION

[0005] According to the invention, a processing
 environment for video processing includes a user inter-
 face and processing shell from which various video
 processing 'plug-in' programs are executed. The user
 interface allows an operator to load a video sequence,
 define and view one or more video objects on any one
 or more of the frames of the video sequence, edit exist-
 ing video object segmentations, view video objects
 across a series of video frames, and encode video
 objects among a video sequence in a desired format
 (e.g., MPEG-4 encoding). Various encoding parameters

can be adjusted allowing the operator to view the video
 sequence encoded at the various parameter settings.
 One of the advantages of the processing environment is
 that an operator is able to do automatic segmentations
 across a sequence of video frames, rather than time
 consuming manual segmentations for each video
 frame.

[0006] According to one aspect of the invention, the
 user interface includes a main window from which sub-
 ordinate windows are selectively displayed. Among the
 selectable subordinate windows are a video window, a
 time-line window, a zoom window, and an encoding win-
 dow. The user interface also includes a set of menus
 including a menu of plug-in programs, and a set of dia-
 logue boxes, including encoding parameter dialogue
 boxes. The video sequence is viewed and played in the
 video window using VCR-like controls. Video frames
 may be viewed in sequence or out of sequence (e.g., full
 motion video, stepping, or skipping around). The time-
 line window allows the operator to determine where
 within the sequence the current video frame is located.

[0007] According to another aspect of the invention,
 an operator may define an object by selecting a com-
 mand button from the time-line window. The operator
 clicks on points in the video window to outline the por-
 tion of the displayed image which is to be the desired
 video object.

[0008] According to another aspect of this inven-
 tion, the zoom window is concurrently active with the
 video window, while the operator defines the object. In
 particular, the pointing device cursor location is tracked
 concurrently in both the video window and the zoom
 window. Scrolling in the zoom window is automatic to
 track the pointing device cursor. One advantage of this
 is that the operator is able to view a location within the
 video frame, while also viewing a close-up of such loca-
 tion in the zoom window. This allows the operator to pre-
 cisely place a point on a semantically-correct border of
 the object (e.g., at the border of an object being
 depicted in video). In some embodiments the zoom win-
 dow shows a close-up of the pixels of the video window
 in the vicinity of the pointing device cursor.

[0009] According to another aspect of this inven-
 tion, a segmentation plug-in program processes the
 video frame and selected outline to refine the object
 along semantical border lines of the object being
 depicted. The result is a video object.

[0010] According to another aspect of the invention,
 a defined video object is highlighted by one or more of
 the following schemes: overlaying a translucent mask
 which adds a user-selectable color shade to the object;
 outlining the object; viewing the rest of the frame in
 black and white, while viewing the object in color; alter-
 ing the background to view the object alone against a
 solid (e.g., white, black, gray) background; applying one
 filter to the object and another filter to the background.

[0011] According to another aspect of the invention,
 an operator is able to select timepoints in the time-line

window and a tracking algorithm from a plug-ins menu. The tracking algorithm identifies/extracts the defined object across a sequence of video frames. Thus, the operator is able to view the video sequence with high-
 5 highlighted object from a selected starting time point to a selected end time point. Alternatively, the operator may view just the video object (without the remaining portion of the video frames) from such selected starting to ending time points.

[0012] According to another aspect of the invention, the operator may step through the video frames from starting time point onward. The operator may stop or pause the stepping to adjust or redefine the video objects. An advantage of this aspect is that as the tracking algorithm begins to lose the ability to accurately
 10 track an object, the object can be redefined. For example, as some of the background begins to be included as part of the video object during tracking over multiple frames, the boundaries of the video object can be redefined. Further, the object can be redefined into one or
 15 more sub-objects, with each sub-object being tracked and displayed from frame to frame. An advantage of the plug-in interface is that a common or different segmentation plug-ins may be used to segment different objects. For example, one segmentation plug-in may be well adapted for segmenting objects in the presence of affine motion, while another segmentation plug-in is better where the object deforms. Each segmentation plug-in may be applied to an object for which it is most effective.

[0013] According to another aspect of the invention, the time-line window indicates which frames of a sequence have been processed to track/extract a video object.

[0014] According to another aspect of the invention, where sub-objects are being tracked the objects can be combined into a single object just before video encoding. The operator is able to select among a variety of encoding parameters, such as encoding bit rate, motion
 35 vector search range, and fidelity of the encoded shape.

[0015] According to another aspect of the invention, an encoding status of each object is displayed showing the peak signal to noise ratio for each color component of each frame and for the total number of bits encoded for each frame. An advantage of such display is that the operator is able to visualize how peak signal to noise ratio varies between video objects over a sequence of frames or how the total number of bits affects the peak signal to noise ratio of each color component of an object. When the image quality is unsatisfactory, these displays enable the operator to identify a parameter in need of adjusting to balance peak signal to noise ratio and the bit rate. For example, an operator is able to select a higher number of bits to encode one object and a lesser number of bits to encode another object to optimize image quality for a given number of bits.

[0016] According to an advantage of this invention, various processing needs can be met using differing

plug-ins. According to another advantage of the invention, the processing shell provides isolation between the user interface and the plug-ins. Plug-ins do not directly access the video encoder. The plug-ins accomplish segmentation or tracking or another task by interfacing through an API - application program interface module. For example, a segmentation plug-in defines an object and stores the pertinent data in a video object manager portion of the shell. The encoder retrieves the video
 5 objects from the video object manager. Similarly, plug-ins do not directly draw segmentations on the screen, but store them in a central location. A graphical user interface module of the user interface retrieves the data from central location and draws the objects in the video window. As a result, the various plug-ins are insulated from the intricacies of reading various file formats. Thus, data can even be captured from a camcorder or downloaded over a network through the user interface and shell, without regard for plug-in compatibilities.

[0017] These and other aspects and advantages of the invention will be better understood by reference to the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is a block diagram of an interactive processing environment for video object segmentation, tracking and encoding according to an embodiment of this invention;

Fig. 2 is a block diagram of an exemplary host computing system for the interactive processing environment of Fig. 1;

Fig. 3 is a window depiction of a main user interface window according to an embodiment of this invention;

Fig. 4 is a window depiction of a time-line subordinate window of the user interface of Fig. 3 according to one embodiment of this invention;

Fig. 5 is a window depiction of a video object information subordinate window of the user interface of Fig. 3 according to one embodiment of this invention;

Fig. 6 is a window depiction of an encoder progress subordinate window of the user interface of Fig. 3 according to one embodiment of this invention;

Fig. 7 is a flow chart for an exemplary processing scenario according to an embodiment of this invention;

Fig. 8 is a window depiction of a subordinate video window of the user interface of Fig. 3 according to one embodiment of this invention;

Fig. 9 is a window depiction of a subordinate zoom window of the user interface of Fig. 3 according to one embodiment of this invention; and

Fig. 10 is a depiction of a portion of a video image

showing a video object as designated by a translucent mask overlaying the object according to an embodiment of this invention.

DESCRIPTION OF SPECIFIC EMBODIMENTS

Overview

[0019] Fig. 1 shows a block diagram of an interactive processing environment 10 for segmenting, tracking and encoding video according to one embodiment of the invention. The processing environment 10 includes a user interface 12, a shell environment 14 and a plurality of functional software 'plug-in' programs 16. The user interface receives and distributed operator inputs from various input sources, such as a point and clicking device 26 (e.g., mouse, touch pad, track ball), a key entry device 24 (e.g., a keyboard), or a prerecorded scripted macro 13. The user interface 12 also controls formatting outputs to a display device 22. The shell environment 14 controls interaction between plug-ins 16 and the user interface 12. An input video sequence 11 is input to the shell environment 14. Various plug-in programs 16a-16n may process all or a portion of the video sequence 11. One benefit of the shell 14 is to insulate the plug-in programs from the various formats of potential video sequence inputs. Each plug-in program interfaces to the shell through an application program interface ('API') module 18.

[0020] In one embodiment the interactive processing environment 10 is implemented on a programmed digital computer of the type which is well known in the art, an example of which is shown in Fig. 2. A computer system 20 has a display 22, a key entry device 24, a pointing/clicking device 26, a processor 28, and random access memory (RAM) 30. In addition there commonly is a communication or network interface 34 (e.g., modem; ethernet adapter), a non-volatile storage device such as a hard disk drive 32 and a transportable storage media drive 36 which reads transportable storage media 38. Other miscellaneous storage devices 40, such as a floppy disk drive, CD-ROM drive, zip drive, bernoulli drive or other magnetic, optical or other storage media, may be included. The various components interface and exchange data and commands through one or more buses 42. The computer system 20 receives information by entry through the key entry device 24, pointing/clicking device 26, the network interface 34 or another input device or input port. The computer system 20 may be any of the types well known in the art, such as a mainframe computer, minicomputer, or microcomputer and may serve as a network server computer, a networked client computer or a stand alone computer. The computer system 20 may even be configured as a workstation, personal computer, or a reduced-feature network terminal device.

[0021] In another embodiment the interactive processing environment 10 is implemented in an

embedded system. The embedded system includes similar digital processing devices and peripherals as the programmed digital computer described above. In addition, there are one or more input devices or output devices for a specific implementation, such as image capturing.

[0022] In a best mode embodiment software code for implementing the user interface 12 and shell environment 14, including computer executable instructions and computer readable data are stored on a digital processor readable storage media, such as embedded memory, RAM, ROM, a hard disk, an optical disk, a floppy disk, a magneto-optical disk, an electro-optical disk, or another known or to be implemented transportable or non-transportable processor readable storage media. Similarly, each one of the plug-ins 16 and the corresponding API 18, including digital processor executable instructions and processor readable data are stored on a processor readable storage media, such as embedded memory, RAM, ROM, a hard disk, an optical disk, a floppy disk, a magneto-optical disk, an electro-optical disk, or another known or to be implemented transportable or non-transportable processor readable storage media. The plug-ins 16 (with the corresponding API 18) may be bundled individually on separate storage media or together on a common storage medium. Further, none, one or more of the plug-ins 16 and the corresponding API's 18 may be bundled with the user interface 12 and shell environment 14. Further, the various software programs and plug-ins may be distributed or executed electronically over a network, such as a global computer network.

[0023] Under various computing models, the software programs making up the processing environment 10 are installed at an end user computer or accessed remotely. For stand alone computing models, the executable instructions and data may be loaded into volatile or non-volatile memory accessible to the stand alone computer. For non-resident computer models, the executable instructions and data may be processed locally or at a remote computer with outputs routed to the local computer and operator inputs received from the local computer. One skilled in the art will appreciate the many computing configurations that may be implemented. For non-resident computing models, the software programs may be stored locally or at a server computer on a public or private, local or wide area network, or even on a global computer network. The executable instructions may be run either at the end user computer or at the server computer with the data being displayed at the end user's display device.

Shell Environment

[0024] The shell environment 14 allows an operator to work in an interactive environment to develop, test or use various video processing and enhancement tools. In particular, plug-ins for video object segmentation,

video object tracking and video encoding (e.g., compression) are supported in a preferred embodiment. Differing segmentation algorithms can be developed, tested and implemented as plug-ins 16 for researcher or end user implementation. Similarly, different tracking algorithms and tracking schemes can be implemented as plug-ins 16 to track and extract video object data from a sequence of video frames. The interactive environment 10 with the shell 14 provides a useful environment for creating video content, such as MPEG-4 video content or content for another video format. A pull-down menu or a pop up window is implemented allowing an operator to select a plug-in to process one or more video frames.

[0025] According to a preferred embodiment the shell 14 includes a video object manager. A plug-in program 16, such as a segmentation program accesses a frame of video data, along with a set of user inputs through the shell environment 14. A segmentation plug-in program identifies a video object within a video frame. The video object data is routed to the shell 14 which stores the data within the video object manager module. Such video object data then can be accessed by the same or another plug-in 16, such as a tracking program. The tracking program identifies the video object in subsequent video frames. Data identifying the video object in each frame is routed to the video object manager module. In effect video object data is extracted for each video frame in which the video object is tracked. When an operator completes all video object extraction, editing or filtering of a video sequence, an encoder plug-in 16 may be activated to encode the finalized video sequence into a desired format. Using such a plug-in architecture, the segmentation and tracking plug-ins do not need to interface to the encoder plug-in. Further, such plug-ins do not need to support reading of several video file formats or create video output formats. The shell handles video input compatibility issues, while the user interface handles display formatting issues. The encoder plug-in handles creating a run-time video sequence.

[0026] For a Microsoft Windows operating system environment, the plug-ins 16 are compiled as dynamic link libraries. At processing environment 10 run time, the shell 14 scans a predefined directory for plug-in programs. When present, a plug-in program name is added to a list which is displayed in a window or menu for user selection. When an operator selects to run a plug-in 16, the corresponding dynamic link library is loaded into memory and a processor begins executing instructions from one of a set of pre-defined entry points for the plug-in. To access a video sequence and video object segmentations, a plug-in uses a set of callback functions. A plug-in interfaces to the shell program 14 through a corresponding application program interface module 18.

[0027] In addition, there is a segmentation interface 44 portion of the user interface 12 which is supported by a segmentation plug-in. The segmentation interface 44

makes calls to a segmentation plug-in to support operator selected segmentation commands (e.g., to execute a segmentation plug-in, configure a segmentation plug-in, or perform a boundary selection/edit).

[0028] The API's 18 typically allow the corresponding plug-in to access specific data structures on a linked need-to-access basis only. For example, an API serves to fetch a frame of video data, retrieve video object data from the video object manager, or store video object data with the video object manager. The separation of plug-ins and the interfacing through API's allows the plug-ins to be written in differing program languages and under differing programming environments than those used to create the user interface 12 and shell 14. In one embodiment the user interface 12 and shell 14 are written in C++. The plug-ins can be written in any language, such as the C programming language.

[0029] In a preferred embodiment each plug-in 16 is executed in a separate processing thread. As a result, the user interface 12 may display a dialog box that plug-ins can use to display progress, and from which a user can make a selection to stop or pause the plug-in's execution.

User-Interface Windows

[0030] Referring to Figs. 1 and 3, the user interface 12 includes the segmentation interface 44 and various display windows 54-62, dialogue boxes 64, menus 66 and button bars 68, along with supporting software code for formatting and maintaining such displays. In a preferred embodiment as shown in Fig. 3, the user interface is defined by a main window 50 within which a user selects one or more subordinate windows 52, each of which may be concurrently active at a given time. The subordinate windows 52 may be opened or closed, moved and resized. The main window 50 includes a title bar 65, a menu bar 66 and a button bar 68. In some embodiments the various bars 65-68 may be hidden or viewed at the operator's preference. The main window also includes a window area 70 within which the subordinate windows 52 and dialogue boxes 64 may be viewed.

[0031] In a preferred embodiment there are several subordinate windows 52, including a video window 54, a zoom window 56, a time-line window 58, one or more encoder display windows 60, and one or more data windows 62. The video window 54 displays a video frame or a sequence of frames. For viewing a sequence of frames, the frames may be stepped, viewed in real time, viewed in slow motion or viewed in accelerated time. Included are input controls accessible to the operator by pointing and clicking, or by predefined key sequences. There are stop, pause, play, back, forward, step and other VCR-like controls for controlling the video presentation in the video window 54. In some embodiments there are scaling and scrolling controls also for the video window 54.

[0032] The zoom window 56 displays a zoom view of a portion of the video window 54 at a substantially larger magnification than the video window. The portion displayed in the zoom window 56 is automatically determined according to the position of the pointing device 26 cursor. As the operator moves the pointing device cursor, the zoom window scrolls to follow the cursor and maintain the cursor within the zoom window 56. In a preferred embodiment, the zoom window 56 supporting software keeps the pointing device cursor approximately centered. The purpose of the zoom window 56 is to allow the operator to see down to the pixel level of the video window 54. In doing so, an operator is able to click on a very specific point of the video window 54. More particularly, an operator can accurately place a boundary point of an image object, so as to provide a semantically accurate input for segmenting a video object. By "semantically accurate" it is meant that a selected point can be accurately placed at the image border of an object image (e.g., the edge of a house, tree, hand, or other image object being viewed).

[0033] Referring to Fig. 4, the time-line window 58 includes an incremental time-line 72 of video frames, along with zero or more thumb nail views 74 of select video frames. The operator may click on any point along the time-line 72 and the corresponding image frame is displayed in the video window 54. The frames corresponding to the thumb nail views 74 are selected manually by the operator or automatically. The location and number 73 of such frames are marked on the time-line 72.

[0034] The operator also can select a starting frame and an ending frame to view a clip of the input video sequence and define the processing range. Such selections are highlighted along the time-line 72. In one embodiment the line 76 designates the starting frame and the line 78 designates the ending frame. The operator selects the starting and ending points 76, 78 then selects 'play' to play the video clip or 'segment' to track objects.

[0035] The time line window 58 also includes a respective time-line 80 for each video object defined for the input video sequence 11. A video object is defined by outlining the object followed by segmenting the object. The outlining provides a coarse user-selected boundary of the object. The zoom window allows accurate selection of points along such boundary. In one embodiment there are two outlining modes. In one mode the user draws the entire outline in a continuous mouse motion by holding down a mouse button. In another mode, the user clicks on various border points of the object. Double-clicking is used to signal enclosing of an object in the user-defined polygon. Editing options allow the operator to move the entire outline, add additional points between previously selected points, or remove previously selected points. During segmentation, the object boundary is refined to define the video object more accurately.

[0036] As a video object is tracked from frame to frame using a tracking plug-in, the corresponding time-line 80 highlights the frames for which such video object has been identified, tracked, and extracted. In particular, the video object data is extracted for each frame in which the object is tracked and stored with the video object manager. For example, the time-line window depicted in Fig. 4 shows a time-line 80a for a video object A and another time-line 80b for a video object B. As shown both objects were defined or tracked to the same starting frame denoted on time-line 72 by line 76. Video object A data was extracted all the way to the ending frame (note line 78) of the video clip. Markings 82 provide a visual cue to convey such information to the operator. Video object B data was extracted for only a portion of the excerpt as depicted by the markings 84. The time-lines 72 and 80 also include a marker 81 which indicates the current frame being viewed in the video window 54.

[0037] Referring to Fig. 5, a data window 62 is shown for a given video object. In one embodiment, the operator merely double clicks on the object name in the time-line window 58 or on the object in the video window 54 (or enters some other predefined input), which causes the data window 62 for such video object to appear. The data window 62 includes user-input fields for an object title, translucent mask color, encoding target bit rate, search range and other parameters for use in defining and encoding the corresponding video object.

[0038] Referring to Fig. 6, during encoding an encoder progress window 86 is displayed. The encoder progress window 86 is one of the encoder displays 60, and shows the encoding status for each defined video object in the input video sequence 11. In one embodiment there is a respective information area 88 displaying the number of encoding bits versus frame number and a peak signal to noise ratio (PSNR) versus frame number for each video object. In the display areas 88 depicted, there is a set of bar graphs at each interval of select frame number intervals. One bar at each interval corresponds to the number of bits encoded, another corresponds to the overall PSNR of the frame's pixel data, another corresponds to the PSNR for the Y component of the frame's pixel data, another corresponds to the PSNR for the Cb color component of the frame's pixel data and a fourth corresponds to PSNR for the Cr color component of the frame's pixel data. One skilled in the art will appreciate that there are many formats in which such information and additional encoding information may be displayed to the operator. The bar graphs allow the operator to visualize how PSNR varies among video objects over a sequence of frames or how PSNR for a given component varies among video objects over a sequence of frames. In addition, by presenting information for each Y, Cb and Cr components separately, the operator can visualize how the total bit rate affects the PSNR of each component of an object.

When the image quality or the amount of compression is not satisfactory, the operator can view the graphs to aid in determining which parameters to adjust to achieve a more desirable balance between the PSNR and bit rate results before running the encoder again.

Exemplary Plug-Ins

[0039] In a preferred embodiment, there is a Video Object Segmentation plug-in 16a, a Video Object Tracking plug-in 16b and an MPEG-4 plug-in 16n. An exemplary embodiment for each of the segmentation plug-in 16a and the tracking plug-in 16b are described in commonly-assigned U.S. Patent Application serial No. 09/323,501, filed June 1, 1999 for "Video Object Segmentation Using Active Contour Modelling With Global Relaxation," of Shijun Sun and Yongmin Kim, the content of which is incorporated herein by reference and made a part hereof.

[0040] The video object manager represents the segmented video objects either as polygons or binary masks. Polygons can be converted into binary masks by scan conversion. Binary masks can be converted into polygons by finding and linking the edges of the mask. A plug-in may access the video object in either format. The MPEG-4 plug-in is a conventional MPEG-4 encoder such as developed by the Microsoft Corporation of Redmond, Washington.

Processing Scenario

[0041] Referring to Fig. 7, an exemplary processing scenario 90 commences at step 92 with the operator selecting a command to load in an input file. In one embodiment a dialogue box opens with a list of files in a select directory. The input file may be a still image or a video sequence 11 in any of a variety of conventional or proprietary formats. Once the file is loaded, the first frame is displayed in the video window 54. In addition, the time-line window 58 opens. If the file has predefined video objects then the time-lines 80 for such objects appear in the time-line window 58. If not, then just the video sequence time-line 72 and thumb print views 74 are shown.

[0042] The operator may access the VCR-like controls of the video window 54 to play back or move around in the input video sequence 11. Alternatively, the operator may click on a location along the time-line 72 to select a frame to view in video window 54. Using one of these procedures, at step 94 the operator moves to a desired video frame. Consider the example where the operator desires to track or extract an object within the video sequence. For example, the video sequence 11 may include motion video of a person. The operator may desire to extract the view of the person and apply the view to a different background. Or, perhaps there is an object that is moving quite fast and is not well-defined. To perform some video process of extraction or

enhancement, a segmentation process and tracking process is to be performed on all or a portion of the video sequence.

[0043] At step 96, the operator accesses the segmentation interface 44 (such as by accessing a set of commands from a pull-down menu). The operator selects a command to define a video object. At step 98, the operator then clicks on points at the peripheral edge of the desired object as shown in Fig. 8. In doing so, the operator is making a polygon of line segments. As previously described, the zoom window 56 (see Fig. 9) allows the operator to better see the surrounding region near the location of a cursor 110 of a mouse or other pointing device. Referring to Fig. 9, the region near the cursor 110 is shown in the zoom window 56 with sufficient precision to click on a selected pixel 112 of the video window 54. In particular each pixel of the video window 54 in the vicinity of the pointer 110 is displayed as a large block of pixels on the zoom window 56. Using window 56 to guide the cursor movement in window 54, the operator selects a pixel in window 54, and the change is reflected in pixel block 112 of window 56. As a result the operator is able to make a very accurate selection of object boundary points. Referring to Fig. 10, once the operator indicates that the selection of boundary points is complete the boundary is closed. Once the selection of points is complete, segmentation can occur. At step 100 a segmentation plug-in is activated. The segmentation plug-in receives the video frame data and the object points from the shell 14 and the segmentation plug-in API 18. The segmentation plug-in redefines the edges of the object in the video frame from being a large-segmented polygon to a more semantically-accurate object edge. An edge derivation process is performed as part of the segmentation process to estimate where there is a semantically-accurate edge (e.g., edge of man distinct from background).

[0044] In defining the video object the operator is able to select a method of highlighting the object. Among the various methods are overlaying a translucent mask 116 (see Fig. 10) which adds a color shade to the video data for the object. For example, the operator may select a color filter for a given object. Different objects are assigned differing colors to allow the operator to see the various video objects defined in a given video frame. Alternatively, a thick line can be selected to outline the object. Other methods include showing the video object in black and white or normal color while showing the background in the opposite, or making the background black, white or another pattern. In various embodiments any of many kinds of filtering operations can be performed to visually distinguish the video object from the portions of the video frame which are not part of one or more defined video objects. The video object itself is the original video pixel data. The overlaid mask or the filtered alteration of displayed data serves as a visual cue for distinguishing the video object from the remaining portion of a video frame.

[0045] Rather than have the operator go through every frame manually and select object points, an automatic segmentation is achieved using a tracking plug-in. At step 102 an operator selects a starting video frame and an ending video frame. This is done in the time-line window 58. Time-line 72 displays a line 76 indicating the starting frame, a line 78 indicating the ending frame and a marker 81 indicating the location along the time-line of the frame currently displayed in video window 54. With the segmentation active and the tracking active, the operator plays the desired portion of the video sequence from the selected starting point 76 to the selected ending point 78 at step 104 to accomplish tracking of the video object(s). For each frame, the tracking plug-in receives the video frame data for a current frame, along with the object data from the prior frame. The tracking plug-in then identifies the object in the current frame. In some embodiments the segmentation plug-in automatically refines the object definition for such frame. In other embodiments, segmentation is performed only when specified by the operator. For example, the operator may see the tracking program is starting to include additional pixels or exclude pixels of the semantically correct object. As a result, the operator goes to the frame where such tracking error commences. The operator can now redefine the object or alternatively define the video object into a set of video sub-objects. Each sub-object then is tracked using different segmentation and tracking plug-ins from that point to the end point 78. Another use for defining video sub-objects is where there is a hole or transparent part of the video object which shows a moving background. By excluding the inner hole portion, a sub-object representing the rest of the imaged object without the hole is tracked as a video sub-object.

[0046] Once the video object has been accurately tracked to the operator's satisfaction, the operator can perform image processing enhancement or another desired function as available from one of the plug-ins 16. In one example, the operator may save just the video object in a sequence (e.g., a sequence of a man extracted from the input video sequence, where the man is shown against some predefined or other background.) In such example, the video sub-objects forming an object are combined with the aggregate video object being saved as a separate video sequence. The separate sequence may stand-alone (e.g., object on some predefined background) or be combined with another video clip, in effect overlaying the video object onto another video sequence.

[0047] At some point, the operator makes a determination to save a video clip as an encoded output file. Such encoded output file may become an input video sequence at a later time, or may be a canned clip exported for viewing on a display device outside the processing environment 10. In a preferred embodiment an MPEG-4 encoder is included as a plug-in. At step 106, the operator selects the MPEG-4 encoder to com-

press a video clip and create an output file. Unless previously combined, any video sub-objects which together form a video object are combined into an aggregate video object prior to encoding.

[0048] As previously described, an encoding progress display 86 allows the operator to analyze the output quality by viewing the peak signal to noise ratio per component or per number of bits used in encoding. In addition, the operator can alter some encoding parameters, such as bit rate, motion vector search range and fidelity of encoded shape. The operator can view the results for many different encodings to find the encoding settings that provide the desired trade-off to achieve a satisfactory image quality at some number of bits encoded per pixel.

Meritorious and Advantageous Effects

[0049] According to an advantage of this invention, various processing needs can be met using differing plug-ins. According to another advantage of the invention, the processing shell provides isolation between the user interface and the plug-ins. Plug-ins do not directly access the video encoder. The plug-ins accomplish segmentation or tracking or another task by interfacing through an API - application program interface module. For example, a segmentation plug-in defines an object and stores the pertinent data in a video object manager portion of the shell. The encoder retrieves the video objects from the video object manager. Similarly, plug-ins do not directly draw segmentations on the screen, but store them in a central location. A graphical user interface module of the user interface retrieves the data from central location and draws the objects in the video window. As a result, the various plug-ins are insulated from the intricacies of reading various file formats. Thus, data can even be captured from a camcorder or downloaded over a network through the user interface and shell, without regard for plug-in compatibilities.

[0050] An advantage of the automatically scrolling zoom window is that the operator may view a location within the video frame, while also viewing a close-up of such location in the zoom window. This allows the operator to precisely place a point on a semantically-correct border of the object (e.g., at the border of an object being depicted in video).

[0051] An advantage of the encoding progress display is that the operator is able to visualize how peak signal to noise ratio varies between video objects over a sequence of frames or how the total number of bits affects the peak signal to noise ratio of each component of an object. When the image quality is unsatisfactory, these displays enable the operator to identify a parameter in need of adjusting to balance peak signal to noise ratio and the bit rate.

[0052] Although a preferred embodiment of the invention has been illustrated and described, various alternatives, modifications and equivalents may be

used. Therefore, the foregoing description should not be taken as limiting the scope of the inventions which are defined by the appended claims.

Claims

1. A system including a display, an input device, a processor and a memory storage media and embodying an interactive video processing environment, the system further comprising:

code means for generating display content in a main display window of the interactive video processing environment;

code means for generating display content, pertaining to a segmented video object of an image, in a first subordinate window displayed within the main window; and

code means for generating display content, pertaining to an image encoding process, in a second subordinate window concurrently displayed with the first subordinate window within the main window.

2. The system of claim 1, further comprising:

code means for generating display content in the first subordinate window for tracking the segmented video object among a plurality of video frames.

3. The system of claim 1, in which the code means for generating display content in the first subordinate window generates an image in the first subordinate window, the image including the segmented video object, and in which the code means for generating display content in the second subordinate window generates display content including encoding control parameters for encoding the image.

4. The system of claim 3, in which the code means for generating display content in the second subordinate window generates display content including a desired bit rate and a desired intra-coding period.

5. The system of claim 1, in which the code means for generating display content in the second subordinate window generates display content including encoding control parameters for encoding the segmented video object across a plurality of video frames.

6. The system of claim 1, in which the code means for generating display content in the second subordinate window generates display content including encoding status information for an encoding of a plurality of segmented video objects across a plurality of video frames.

7. The system of claim 6, in which the display content in the second subordinate window comprises a bit rate for an encoding of each one of the plurality of segmented video objects.

8. The system of claim 6, in which the display content in the second subordinate window comprises a signal to noise ratio for an encoding of each one of the plurality of segmented video objects.

9. The system of claim 6, in which the second subordinate window comprises a plurality of display graphs, in which there is a one to one correspondence between respective ones of the plurality of display graphs and each one of the plurality of segmented video objects.

10. The system of claim 6, further comprising:

code means for logically combining the plurality of segmented video objects into a combined object, and wherein the code means for generating display content pertaining to said encoding pertains to an encoding of the combined object.

11. The system of claim 1, in which the input device comprises a pointing device, the system displaying a plurality of first subordinate windows concurrently in the main window, a first one of the plurality of first subordinate windows displaying a video frame, a second one of the plurality of first subordinate windows displaying a zoomed in area of the video frame currently displayed in the first one, wherein a cursor of the pointing device is concurrently displayed in the first one and the second one of the plurality of first subordinate windows, and wherein the second one automatically scrolls to maintain the pointing device cursor in view.

12. The system of claim 11, in which the code means for generating display content pertaining to the segmented video object generates an outline in response to user-selected points in the first one of the plurality of first subordinate windows.

13. The system of claim 11, in which the video frame displayed in the first one of the plurality of first subordinate windows comprises video content including the segmented video object and other video content, in which the code means for generating display content pertaining to the segmented video object generates a translucent object which overlays the segmented video object, the translucent object distinguishing the segmented video object from the other video content in the first one of the plurality of first subordinate windows.

14. The system of claim 1, in which the input device comprises a pointing device, the system displaying a plurality of first subordinate windows concurrently in the main window, a first one of the plurality of first subordinate windows displaying a time sequence of video frames, a second one of the plurality of first subordinate windows displaying a time line, wherein the code means for generating display content pertaining to the segmented video object generates a marking along the time-line for each video frame that has been segmented to define the segmented video object.
15. A digital processor readable storage medium for storing processor-executable instructions and processor-accessible data for maintaining an interactive video processing environment of display windows in response to user inputs, the medium comprising:
- code means for generating display content in a main display window of the interactive video processing environment;
 - code means for generating display content pertaining to a segmented video object in a first subordinate window displayed within the main window; and
 - code means for generating display content, pertaining to an image encoding process, in a second subordinate window concurrently displayed with the first subordinate window within the main window.
16. The medium of claim 15 further comprising:
- code means for generating display content in the first subordinate window for tracking the segmented video object among a plurality of video frames.
17. The medium of claim 15, in which the code means for generating display content in the first subordinate window generates an image in the first subordinate window, the image including the segmented video object, and in which the code means for generating display content in the second subordinate window generates display content including encoding control parameters for encoding the image.
18. The medium of claim 15, in which the code means for generating display content in the second subordinate window comprises means for generating display content including a desired bit rate and a desired intra-coding period.
19. The medium of claim 15, in which the code means for generating display content in the second subordinate window comprising code means for generating display content including encoding control parameters for encoding the segmented video object across a plurality of video frames.
20. The medium of claim 15, in which the code means for generating display content in the second subordinate window comprises code means for generating display content including encoding status information for an encoding of a plurality of segmented video objects across a plurality of video frames.
21. The medium of claim 20, in which the encoding status information display content generating code means comprises means for generating a bit rate for an encoding of each one of the plurality of segmented video objects.
22. The medium of claim 20, in which the encoding status information display content generating code means comprises means for generating a signal to noise ratio for an encoding of each one of the plurality of segmented video objects.
23. The medium of claim 20, in which the second subordinate window comprises a plurality of display graphs, in which there is a one to one correspondence between respective ones of the plurality of display graphs and ones of the plurality of segmented video objects.
24. The medium of claim 20, further comprising:
- code means for logically combining the plurality of segmented video objects into a combined object, and in which the code means for generating display content in the second subordinate window generates display content pertaining to an encoding of the combined object.
25. The medium of claim 15, further comprising:
- code means for generating a plurality of first subordinate windows concurrently in the main window, a first one of the plurality of first subordinate windows displaying a video frame, a second one of the plurality of first subordinate windows displaying a zoomed in area of the video frame currently displayed in the first one, wherein a cursor of a pointing device is concurrently displayed in the first one and the second one of the plurality of first subordinate windows, and wherein the second one automatically scrolls to maintain the pointing device cursor in view.
26. The medium of claim 25, in which the code means for generating display content pertaining to the segmented video object generates an outline in

response to user-selected points in the first one of the plurality of first subordinate windows.

27. The medium of claim 25, in which the video frame displayed in the first one of the plurality of first subordinate windows comprises video content including the segmented video object and other video content, in which the code means for generating display content pertaining to the segmented video object generates a translucent object which overlays the segmented video object, the translucent object distinguishing the segmented video object from the other video content in the first one of the plurality of first subordinate windows.

28. The medium of claim 15, further comprising:

code means for generating a plurality of first subordinate windows concurrently in the main window, a first one of the plurality of first subordinate windows displaying a time sequence of video frames, a second one of the plurality of first subordinate windows displaying a time line, wherein the code means for generating display content pertaining to the segmented video object generates a marking along the time-line for each video frame that has been segmented to define the segmented video object.

29. A method for interactively processing a video sequence on a system having a display, an input device, and a processor, the method comprising the steps of:

generating a main display window of a video processing environment;
generating a first subordinate window within the main display window for displaying a motion video sequence of video frames;
responding to a user input to hold the motion video sequence at a select video frame;
outlining a boundary of a video object;
segmenting the outlined video object;
playing at least a portion of the motion video sequence, during which the video object is tracked to define the segmented video object among a plurality of frames of the motion video sequence;
selectively generating a second subordinate window within the main display window which is concurrently active with the first subordinate window, the second subordinate window displaying information pertaining to an encoding process of said plurality of frames of the motion video sequence; and
encoding said plurality of video frames.

30. The method of claim 29, further comprising the steps of:

selectively generating a third subordinate window within the main display which is concurrently active with the first subordinate window, the third subordinate window displaying a zoomed in area of the first subordinate window, wherein a cursor of the input device is concurrently displayed in the first subordinate window and the third subordinate window;
automatically scrolling the third subordinate window to maintain the pointing device cursor in view during the step of outlining the boundary of the video object.

31. The method of claim 29, further comprising the step of:

overlaying a translucent object onto the segmented video object.

32. The method of claim 29, further comprising the steps of:

selectively generating a third subordinate window within the main display which is concurrently active with the first subordinate window, the third subordinate window displaying a time line;
generating a marking along the time-line for each video frame in which the segmented video object has been tracked.

33. The method of claim 29, in which a plurality of video objects are segmented and tracked, and further comprising the steps of:

selectively generating a third subordinate window within the main display which is concurrently active with the first subordinate window, the third subordinate window displaying a respective time line for each one of the plurality of video objects;
for each respective time-line, generating a marking along said respective time-line for each video frame in which a corresponding one of the plurality of video objects has been tracked.

34. The method of claim 29, in which a plurality of video objects are segmented and tracked, and further comprising the step of:

logically combining the plurality of objects into a combined object prior to the step for encoding, and wherein the plurality of objects are treated as the combined object during the

encoding step.

- 35.** The method for claim 29, in which a plurality of video objects are segmented and tracked, and further comprising the step of:

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generating display content in the second subordinate window pertaining to an encoding of a plurality of segmented video objects, said display content comprising a bit rate for the encoding of each one of the plurality of segmented video objects.

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- 36.** The method for claim 29, in which a plurality of video objects are segmented and tracked, and further comprising the step of:

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generating display content in the second subordinate window pertaining to an encoding of a plurality of segmented video objects, said display content comprising a signal to noise ratio for the encoding of each one of the plurality of segmented video objects.

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- 37.** The method of claim 29, in which a plurality of video objects are segmented and tracked, and further comprising the step of:

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generating a display graph in the second subordinate window for each one of the segmented video objects.

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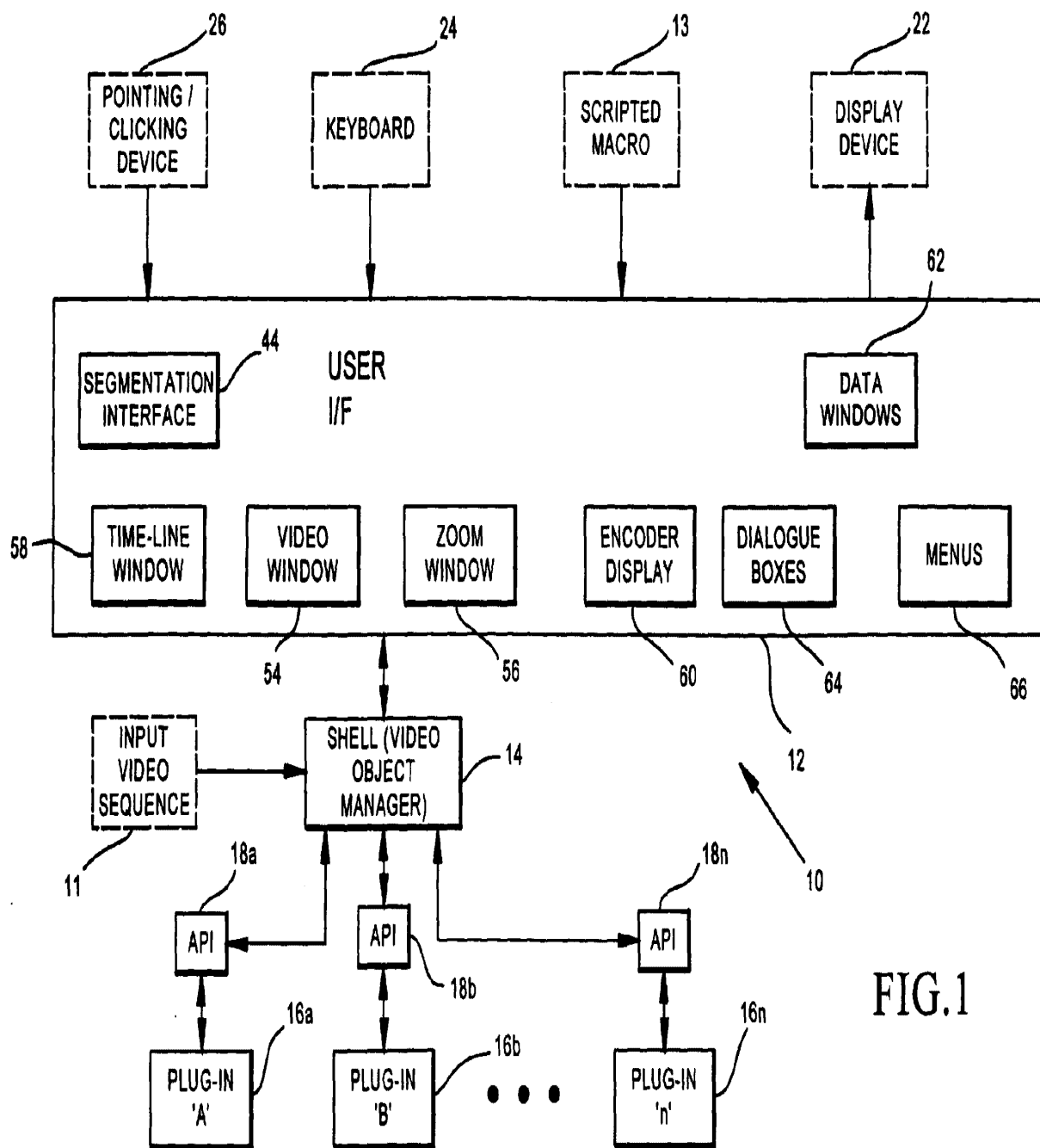


FIG.1

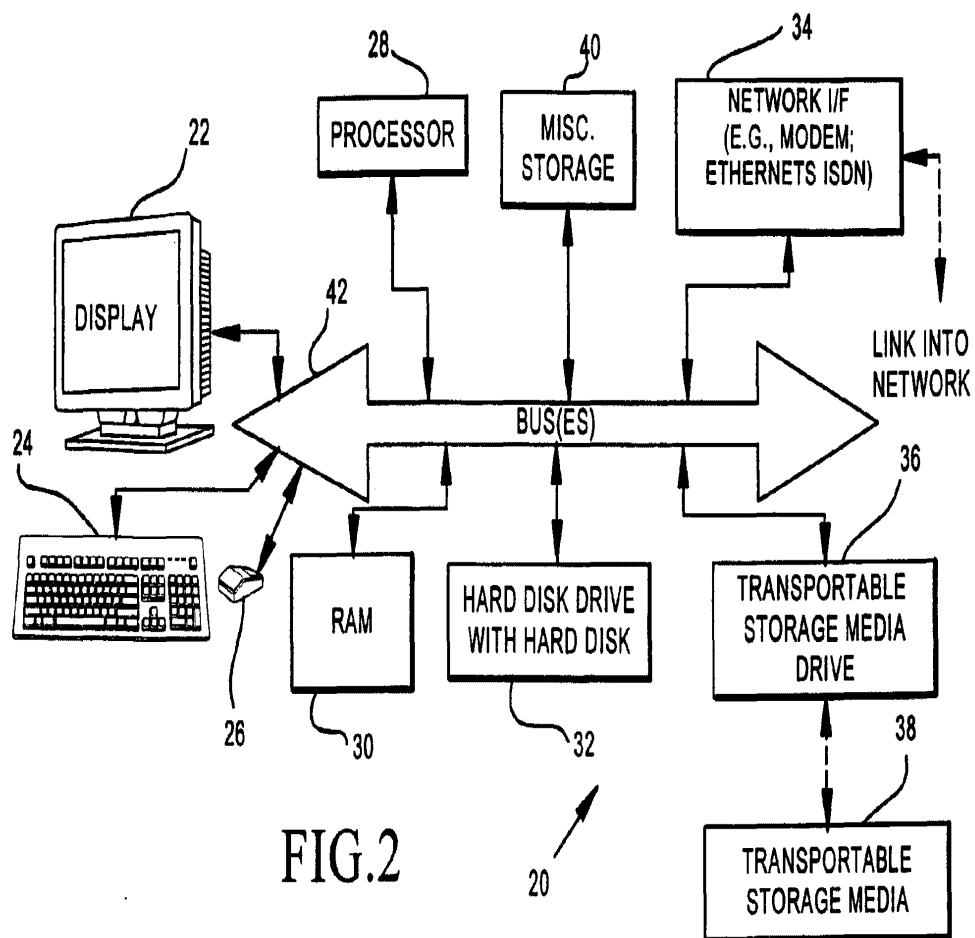


FIG.3

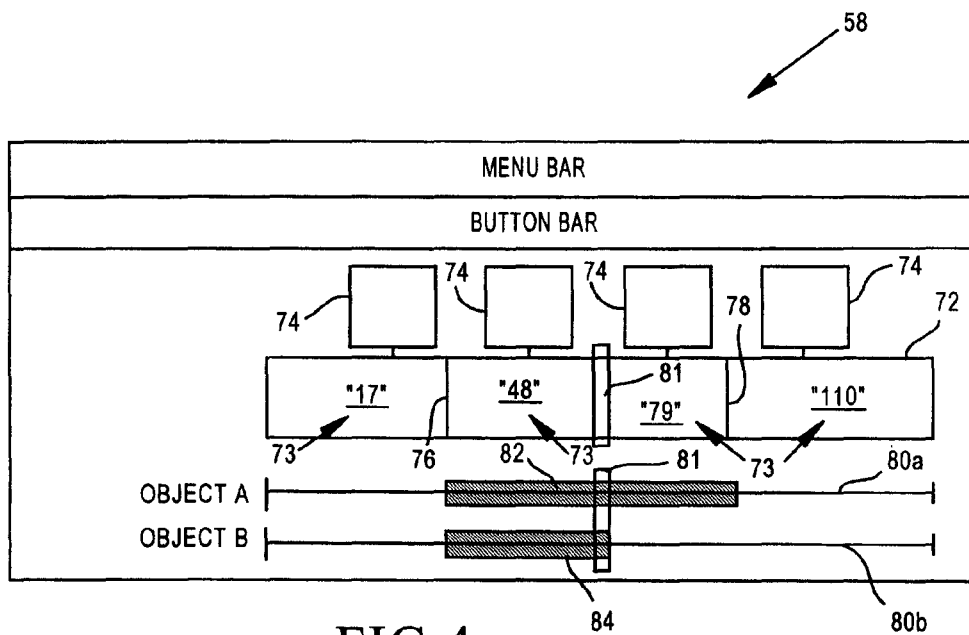
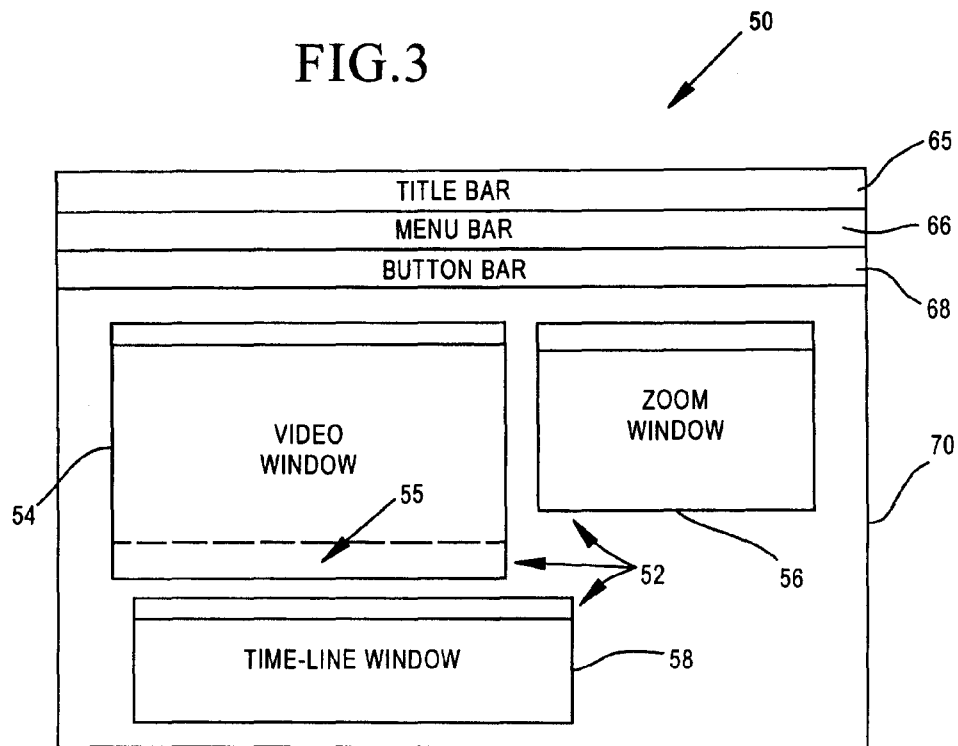


FIG.4

FIG.5

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GENERAL

DESCRIPTORS

NAME

TARGET BIT RATE

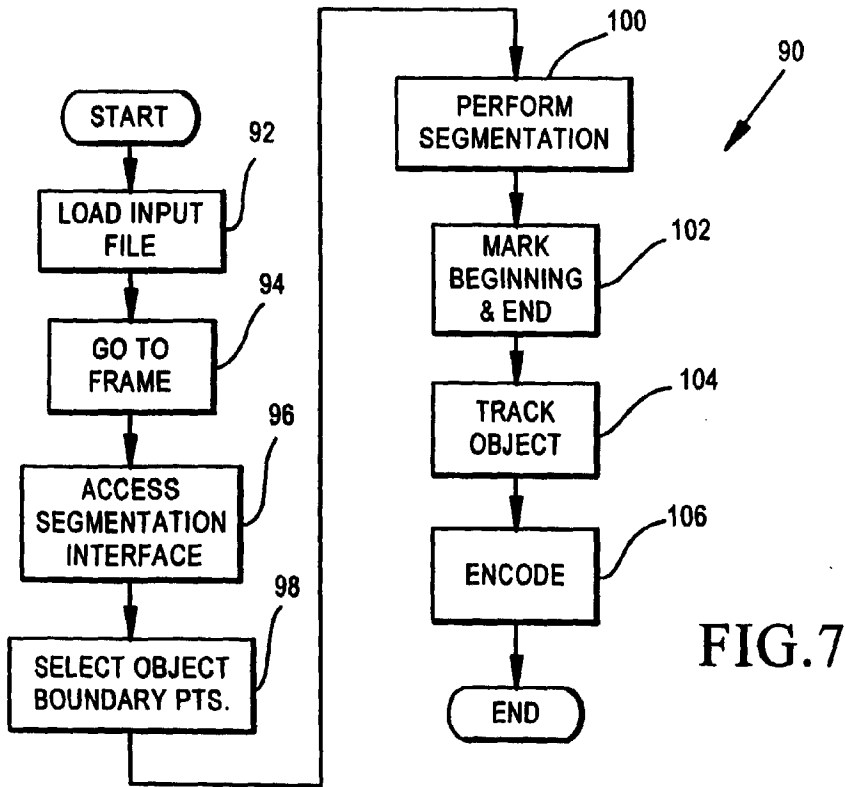
SEARCH RANGE

M

☐ ENABLE CR

OK

CANCEL



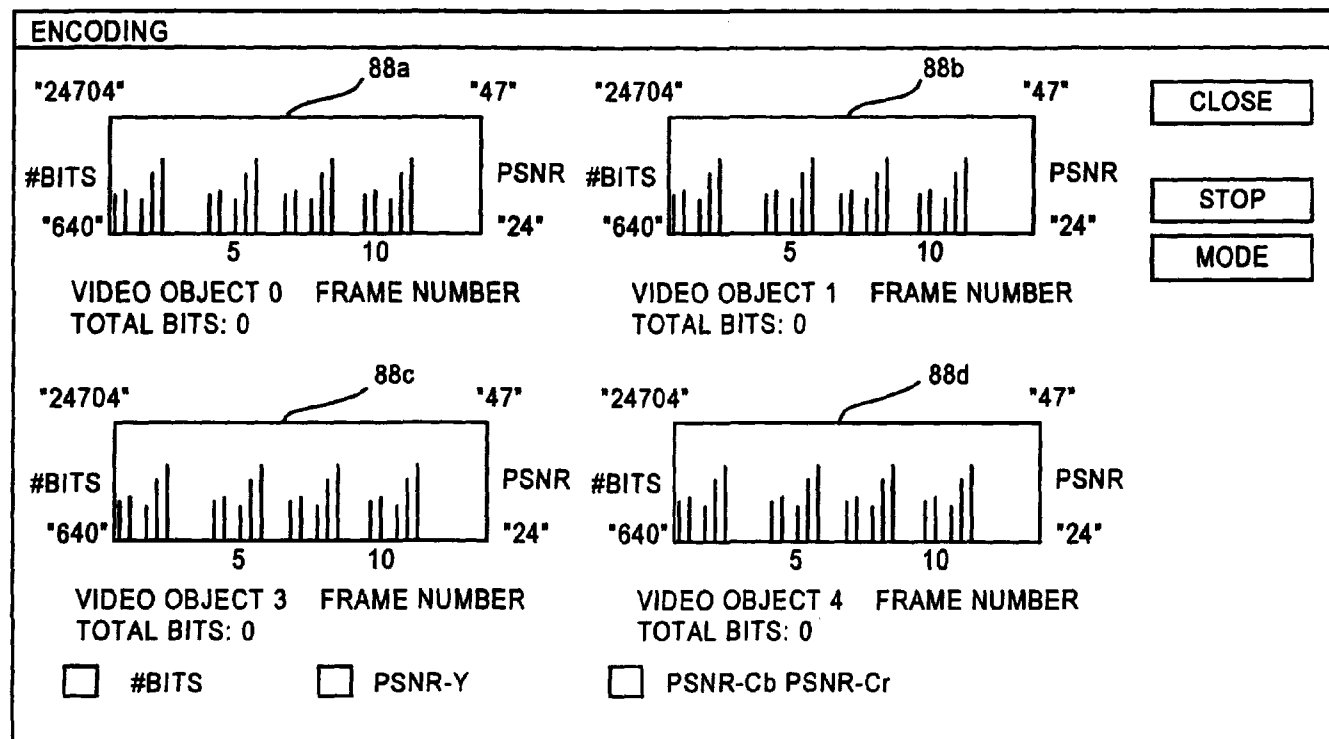


FIG.6

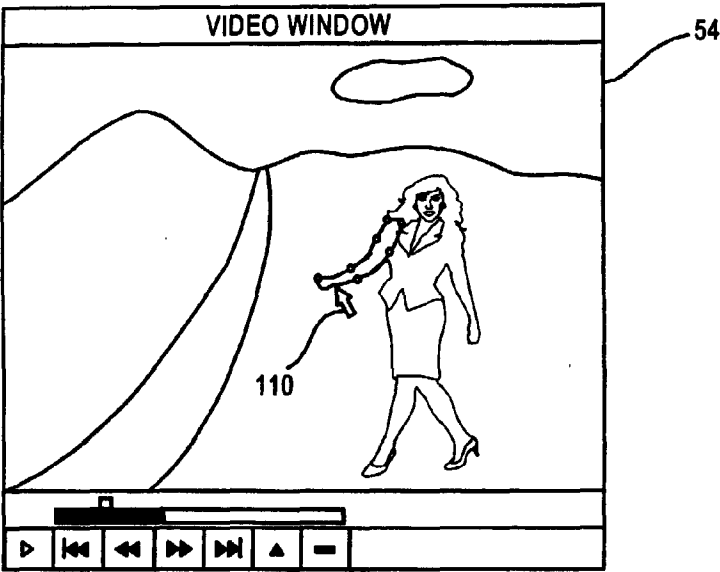


FIG. 8

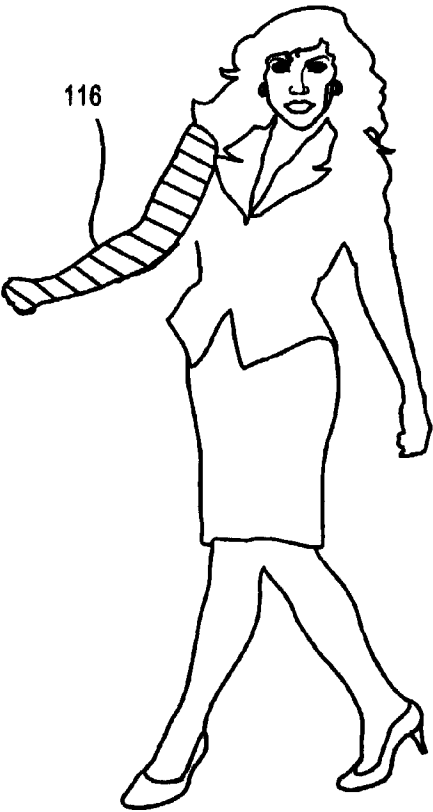


FIG. 10

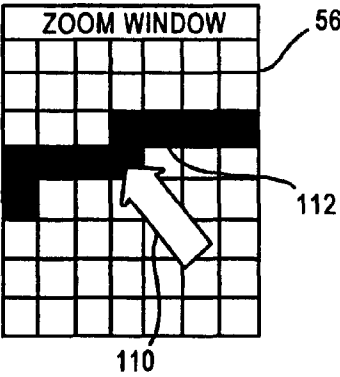


FIG. 9



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 20 2836

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 829 821 A (DA VINCI SYSTEMS INC) 18 March 1998 (1998-03-18)	1-3, 5, 6, 8-17, 19, 20, 22-34, 36, 37	H04N7/26 G06F3/033 G06F9/44 G11B27/031
Y	* page 3, line 42 - page 3, line 58 * * page 10, line 18 - page 10, line 28; figures 1, 2, 7 *	4, 7, 18, 21, 35	
X	US 5 760 767 A (BARDINI RICHARD A ET AL) 2 June 1998 (1998-06-02)	1-3, 15-17	
A	* abstract; figures 2, 3 * * column 3, line 38 - column 4, line 23 *	4-14, 18-37	
Y	WO 94 24823 A (DATA TRANSLATION INC) 27 October 1994 (1994-10-27) * page 4, line 12 - page 4, line 30 *	4, 7, 18, 21, 35	
A	WO 98 45809 A (AVID TECHNOLOGY INC) 15 October 1998 (1998-10-15) * abstract *	1-37	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	WO 98 46006 A (AT & T CORP ; UNIV COLUMBIA (US)) 15 October 1998 (1998-10-15) * abstract *	1-37	H04N G06F G11B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 19 September 2000	Examiner Schoeyer, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1508 03.02 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 20 2836

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-09-2000

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0829821	A	18-03-1998	US	6097853 A	01-08-2000
US 5760767	A	02-06-1998	NONE		
WO 9424823	A	27-10-1994	AU	687392 B	26-02-1998
			AU	6550494 A	08-11-1994
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			CN	1125031 A	19-06-1996
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			AU	6787298 A	30-10-1998
			EP	0972269 A	19-01-2000
WO 9846006	A	15-10-1998	EP	0922360 A	16-06-1999

EPO FORM P0489

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

Electronic Patent Application Fee Transmittal

Application Number:	16735550			
Filing Date:	06-Jan-2020			
Title of Invention:	Automated Pixel Shifting Within a Digital Image			
First Named Inventor/Applicant Name:	Troy Plota			
Filer:	John C. Stringham/Workman Nydegger			
Attorney Docket Number:	20970.1.1.1.1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	130	130
Total in USD (\$)				130

Electronic Acknowledgement Receipt

EFS ID:	43391241
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John C. Stringham/Anne Frederickson
Filer Authorized By:	John C. Stringham
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	30-JUL-2021
Filing Date:	06-JAN-2020
Time Stamp:	16:39:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 130
RAM confirmation Number	E20217TG40031252
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS_16735550_1.pdf	1043959	no	4
			dddc7777290c9c0e2a84e9510ab6884e77973b4		
Warnings:					
Information:					
2	Non Patent Literature	1_asemiautomatica_667125.pdf	1243345	no	9
			1c594abfd08485a1600d15e4787b7d2b35ea27e7		
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3	Non Patent Literature	2_WO2019079517ISR_667126.pdf	740097	no	12
			40c83be407b945efe19cc483a326c7d2b7a719e0		
Warnings:					
Information:					
4	Foreign Reference	1_EP1081956A1_667123.pdf	1134631	no	20
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Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	37965	no	2
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Warnings:					
Information:					
Total Files Size (in bytes):			4199997		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

VIA eFILE

PATENT APPLICATION
Docket No: 20970.1.1.1.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of		)
	Troy Plata	)
		)
Serial No.:	16/735,550	) Art Unit
		) 2612
Filed:	January 6, 2020	)
		)
Conf. No.:	2797	)
		)
For:	AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL AGE	)
		)
Examiner:	GORDON G. LIU	)
		)
Customer No.:	22913	)

PETITION FOR EXTENSION OF TIME

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 C.F.R. § 1.136(a), it is respectfully requested that the shortened statutory period which was set for responding to the Office Action dated April 30, 2021 (paper no. 20210418), be extended for 3 Month(s) until October 30, 2021.

Payment in the amount of \$740 using the Credit Card payment option in E-Filer with RAM will be used to cover the payment of the fees with respect to this extension of time.

The Commissioner is hereby authorized to charge payment of any of the following fees that

may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefore and charge any additional fees that may be required to Deposit Account No. 23-3178.

DATED this 28th day of October, 2021.

Respectfully submitted,

/W. BRAD BARGER/

JOHN C. STRINGHAM
Registration No. 40,831
W. BRAD BARGER
Registration No. 69,566
WORKMAN | NYDEGGER
Attorneys for Applicant
Customer No. 22913

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Troy Plota, <i>et al.</i>	)
		)
		)
Serial No.:	16/735,550	) Art Unit
		) 2612
Confirmation No.:	2797	)
		)
Filed:	January 6, 2020	)
		)
For:	AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE	)
		)
Examiner:	GORDON G. LIU	)
		)

TRANSMITTAL FOR AMENDMENT "A"
AND RESPONSE AND EXTENSION OF TIME

VIA eFILE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Transmitted herewith is an Amendment "A" and Response for entry in the above-identified application.

 X To render the transmitted Amendment "A" and Response timely filed enclosed are the following:

 X Petition for 3 Month Extension of Time (\$740).

- X Payment in the amount of \$740 using the Credit Card payment option in E-Filer with RAM will be used to cover the payment of the fees with respect to this RCE and Extension of Time.
- X The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to **Deposit Account No. 23-3178**: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefore and charge any additional fees that may be required to **Deposit Account No. 23-3178**.

Dated this 28th day of October, 2021.

Respectfully submitted,

/W. BRAD BARGER/

JOHN C. STRINGHAM
Registration No. 40,831
W. BRAD BARGER
Registration No. 69,566
WORKMAN | NYDEGGER
Attorneys for Applicant
Customer No. 22913

Electronic Patent Application Fee Transmittal

Application Number:	16735550			
Filing Date:	06-Jan-2020			
Title of Invention:	Automated Pixel Shifting Within a Digital Image			
First Named Inventor/Applicant Name:	Troy Plota			
Filer:	William Brad Barger/Gabrielle Price			
Attorney Docket Number:	20970.1.1.1.1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	740	740
Miscellaneous:				
Total in USD (\$)				740

Electronic Acknowledgement Receipt

EFS ID:	44134504
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	William Brad Barger/Gabrielle Price
Filer Authorized By:	William Brad Barger
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	28-OCT-2021
Filing Date:	06-JAN-2020
Time Stamp:	16:25:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 740
RAM confirmation Number	E20210RG25284147
Deposit Account	233178
Authorized User	Gabrielle Price

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	20970-1-1-1-1_AmendmentA.pdf	151593	no	11
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Warnings:					
Information:					
2	Extension of Time	20970-1-1-1-1_EOT.pdf	123069	no	2
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3	Transmittal Letter	20970-1-1-1-1_Transmittal.pdf	158999	no	2
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Warnings:					
Information:					
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Warnings:					
Information:					
Total Files Size (in bytes):			471750		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce	
Electronic Petition Request	TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT		
Application Number	16735550		
Filing Date	06-Jan-2020		
First Named Inventor	Troy Plota		
Attorney Docket Number	20970.1.1.1.1		
Title of Invention	Automated Pixel Shifting Within a Digital Image		
☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action ☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.			
Owner	Percent Interest		
Troy Plota	50 %		
Sascha Connelly	50 %		
The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s) 10558342			

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

☒ Small Entity

☐ Micro Entity

☐ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 69566

☐ A sole inventor

☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

☐ A joint inventor; all of whom are signing this request

Signature	/W. Brad Barger/
Name	W. Brad Barger

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	16735550			
Filing Date:	06-Jan-2020			
Title of Invention:	Automated Pixel Shifting Within a Digital Image			
First Named Inventor/Applicant Name:	Troy Plota			
Filer:	William Brad Barger/Gabrielle Price			
Attorney Docket Number:	20970.1.1.1.1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	170	170
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				170

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 16735550

Filing Date: 06-Jan-2020

Applicant/Patent under Reexamination: Plota

Electronic Terminal Disclaimer filed on October 28, 2021

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	44134781
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	William Brad Barger/Gabrielle Price
Filer Authorized By:	William Brad Barger
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	28-OCT-2021
Filing Date:	06-JAN-2020
Time Stamp:	16:27:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 170
RAM confirmation Number	E20210RG27324195
Deposit Account	233178
Authorized User	Gabrielle Price

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	42550	no	3
			f7df9ff75454c61e46c49807be351ac964fc86aa		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	38345	no	2
			9f5bd3e63958a5769a44c75619fe976afb2f860e		

Warnings:

Information:

Total Files Size (in bytes):			80895
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Troy Plota, <i>et al.</i>	)
		)
		)
Serial No.:	16/735,550	) Art Unit
		) 2612
Confirmation No.:	2797	)
		)
Filed:	January 6, 2020	)
		)
For:	AUTOMATED PIXEL SHIFTING WITHIN A	)
	DIGITAL IMAGE	)
		)
Examiner:	GORDON G. LIU	)
		)

AMENDMENT A AND RESPONSE

AFTER NON-FINAL

VIA eFILE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action of April 30, 2021 ("*Office Action*"), (Paper No. 20210418),
please amend and reconsider the above-identified application, in which:

Amendments to the Claims are reflected in the listing of claims which begins on page 2
of this paper.

Remarks/Arguments begin on page 9 of this paper.

AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Currently Amended) A computer system for automating the shifting of pixels within a digital image, comprising:

one or more processors; and

one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following:

access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image;

apply a mask to~~identify~~ a particular portion of the digital image ~~to mask~~, wherein the mask prevents pixels covered by the mask from being shifted;

receive a first starting point through a user interface, ~~wherein the first starting point is received through a user selection of a first beginning portion of the digital image;~~

receive a first ending point through the user interface, ~~wherein the first ending point is received through a user selection of a first ending portion of the user interface;~~

create a first link between the first starting point and the first ending point, wherein the first link comprises:

a non-linear pathway extending a first direction between the first starting point and the first ending point ~~a first direction extending from the first starting point to the first ending point;~~ and

a first length extending along the non-linear pathway between the first

starting point and the first ending point;

identify a first set of pixels that lie along the first link between the first starting point and the first ending point; and

shift the first set of pixels in the first direction along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering ~~and re-rendering~~ in a loop the first set of pixels being shifted.

2. (New) The computer system of claim 1, wherein receiving an indication of a particular portion of the digital image to mask comprises receiving through a user interface a selection of a particular pixel within the digital image.

3. (New) The computer system of claim 2, wherein the executable instructions include instructions that are executable to configure the computer system to apply the mask by:

identifying one or more edges that form a boundary around the particular pixel;

and

generating the mask to cover area within the boundary.

4. (New) The computer system of claim 1, wherein the executable instructions include instructions that are executable to configure the computer system to generate the mask by:

receiving a second indication of a second starting point through a user interface, wherein the second starting point is received through a user selection of a portion of the digital image;

receiving, through the user interface, a second direction associated with the second starting point;

selecting a second set of pixels extending in the second direction away from the second

starting point; and

shifting the second set of pixels in the second direction, wherein shifting the second set of pixels comprises rendering and re-rendering in a loop the second set of pixels being shifted.

5. (New) The computer system of claim 4, wherein the non-linear pathway is different from the second direction.

6. (New) The computer system of claim 4, wherein the first direction is different from the second direction.

7. (New) The computer system of claim 4, wherein a first magnitude of the shifting of the first set of pixels is proportionally related to the first length and a second magnitude of the shifting of the second set of pixels is proportionally related to a second length extending along a pathway between the second starting point and a second ending point.

8. (New) A computer-implemented method, executed on one or more processors, for automating the shifting of pixels within a digital image, the computer-implemented method comprising:

accessing, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image;

applying a mask to a particular portion of the digital image, wherein the mask prevents pixels covered by the mask from being shifted;

receiving a first starting point through a user interface;

receiving a first ending point through the user interface;

creating a first link between the first starting point and the first ending point,

wherein the first link comprises:

- a non-linear pathway extending a first direction between the first starting point and the first ending point ; and
- a first length extending along the non-linear pathway between the first starting point and the first ending point;

identifying a first set of pixels that lie along the first link between the first starting point and the first ending point; and

shifting the first set of pixels in the first direction along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering in a loop the first set of pixels being shifted.

9. (New) The computer-implemented method of claim 8, wherein receiving an indication of a particular portion of the digital image to mask comprises receiving through a user interface a selection of a particular pixel within the digital image.

10. (New) The computer-implemented method of claim 9, wherein applying the mask further comprises:

- identifying one or more edges that form a boundary around the particular pixel;
- and
- generating the mask to cover area within the boundary.

11. (New) The computer-implemented method of claim 8, further comprising:
 - receiving a second indication of a second starting point through a user interface, wherein the second starting point is received through a user selection of a portion of the digital image;
 - receiving, through the user interface, a second direction associated with the second starting point;
 - selecting a second set of pixels extending in the second direction away from the second starting point; and
 - shifting the second set of pixels in the second direction, wherein shifting the second set of pixels comprises rendering and re-rendering in a loop the second set of pixels being shifted.
12. (New) The computer-implemented method of claim 11, wherein the non-linear pathway is different from the second direction.
13. (New) The computer-implemented method of claim 11, wherein the first direction is different from the second direction.
14. (New) The computer-implemented method of claim 11, wherein a first magnitude of the shifting of the first set of pixels is proportionally related to the first length and a second magnitude of the shifting of the second set of pixels is proportionally related to a second length extending along a pathway between the second starting point and a second ending point.
15. (New) A computer-readable media comprising one or more physical computer-readable storage media having stored thereon executable instructions that, when executed at a processor, cause a computer system to perform a method for automating the shifting of pixels within a digital image, the method comprising:

accessing, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image;

applying a mask to a particular portion of the digital image, wherein the mask prevents pixels covered by the mask from being shifted;

receiving a first starting point through a user interface;

receiving a first ending point through the user interface;

creating a first link between the first starting point and the first ending point, wherein the first link comprises:

a non-linear pathway extending a first direction between the first starting point and the first ending point ; and

a first length extending along the non-linear pathway between the first starting point and the first ending point;

identifying a first set of pixels that lie along the first link between the first starting point and the first ending point; and

shifting the first set of pixels in the first direction along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering in a loop the first set of pixels being shifted.

16. (New) The computer-readable media of claim 15, wherein receiving an indication of a particular portion of the digital image to mask comprises receiving through a user interface a selection of a particular pixel within the digital image.

17. (New) The computer-readable media of claim 16, wherein configuring the computer system to apply the mask further comprises:

identifying one or more edges that form a boundary around the particular pixel;

and

generating the mask to cover area within the boundary.

18. (New) The computer-readable media of claim 15, wherein the executable instructions include instructions that are executable to cause the computer system to generate the mask by:

receiving a second indication of a second starting point through a user interface, wherein the second starting point is received through a user selection of a portion of the digital image;

receiving, through the user interface, a second direction associated with the second starting point;

selecting a second set of pixels extending in the second direction away from the second starting point; and

shifting the second set of pixels in the second direction, wherein shifting the second set of pixels comprises rendering and re-rendering in a loop the second set of pixels being shifted.

19. (New) The computer-readable media of claim 18, wherein the non-linear pathway is different from the second direction.

20. (New) The computer-readable media of claim 18, wherein the first direction is different from the second direction.

REMARKS

The Non-Final Office Action ("*Office Action*"), mailed April 30, 2021, considered Claim 1.

By this amendment Claim 1 has been amended. No claims are cancelled and new Claims 2-20 are added. Accordingly, Claims 1-20 are pending, of which claims 1, 8, and 15 are the only independent claims at issue. Support for the claim amendments is found throughout the originally filed application and claims.

Obviousness Type Double Patenting Rejection

In the Office Action, the Examiner rejects claim 1 under the judicially created doctrine of obviousness-type double patenting in view of claims 1 and 2 of US 10,558,342.

An electronically submitted terminal disclaimer relative to US 10,558,342 accompanies this response in order to overcome this rejection. Withdrawal of this rejection and allowance of the pending claims is respectfully requested in view of the terminal disclaimer.

Conclusion

In view of the foregoing, Applicants respectfully submit that the remaining rejections of record are also now moot and do not, therefore, need to be addressed individually at this time. It will be appreciated, however, that Applicants have not acquiesced to any of the purported teachings or assertions made in the Office Action regarding the cited art or the pending application, including any official notice. Instead, Applicants reserve the right to challenge any of the purported teachings or assertions made in the last action at any appropriate time in the future, should the need arise. Furthermore, to the extent that the Examiner has relied on any

official notice, explicitly or implicitly, Applicants specifically request that the Examiner provide references supporting the teachings officially noticed, as well as the required motivation or suggestion to combine the relied upon notice with the other art of record.

In the event the Examiner finds any other issues that would need to be addressed before allowance, the Examiner is invited to contact Applicants' undersigned Attorneys directly.

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefor and charge any additional fees that may be required to Deposit Account No. 23-3178.

Dated this 28th day of October, 2021.

Respectfully submitted,

/W. Brad Barger/

JOHN C. STRINGHAM
Registration No. 40,831
W. Brad Barger
Registration No. 69,566
Attorneys for Applicant
Customer No. 22913

WORKMAN NYDEGGER
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

Application No. 16/735,550
Amendment dated October 28, 2021
Reply to Office Action dated April 30, 2021

Phone: 801-533-9800
Fax: 801-328-1707

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 16/735,550		Filing Date 01/06/2020		☐ To be Mailed			
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO											
APPLICATION AS FILED - PART I											
		(Column 1)		(Column 2)							
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 = *				x \$50 =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 = *				x \$230 =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL					
APPLICATION AS AMENDED - PART II											
		(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	10/28/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0			x \$50 =		0	
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0			x \$240 =		0	
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
								TOTAL ADD'L FEE		0	
		(Column 1)		(Column 2)		(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=			x \$0 =			
	Independent (37 CFR 1.16(h))	*	Minus	***	=			x \$0 =			
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
								TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.								LIE			
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".								/TRINA RIDDICK/			
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".											
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

This collection of information is required by 37 CFR 1.16. 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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NOTICE OF ALLOWANCE AND FEE(S) DUE

22913 7590 12/14/2021
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

EXAMINER	
LIU, GORDON G	
ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 12/14/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1	2797

TITLE OF INVENTION: Automated Pixel Shifting Within a Digital Image

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	03/14/2022

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. 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.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
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)

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.

22913 7590 12/14/2021
Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1	2797

TITLE OF INVENTION: Automated Pixel Shifting Within a Digital Image

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	03/14/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
LIU, GORDON G	2612	345-619000

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/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or 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,

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 ☐ Government

4a. 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)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1	2797
22913	7590	12/14/2021	EXAMINER	
Workman Nydegger 60 East South Temple Suite 1000 Salt Lake City, UT 84111			LIU, GORDON G	
			ART UNIT	PAPER NUMBER
			2612	
DATE MAILED: 12/14/2021				

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 30 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. 16/735,550	Applicant(s) Plota et al.	
	Examiner GORDON G LIU	Art Unit 2612	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 10/28/2021.
☐ 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 1-20. 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. ☐ Notice of References Cited (PTO-892)	5. ☐ Examiner's Amendment/Comment
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.	6. ☒ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. ☐ Other _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	

/GORDON G LIU/ Primary Examiner, Art Unit 2612	
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DETAILED ACTION

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. **Claims 1-20** are allowed under this Office action.

Allowable Subject Matter

Terminal Disclaimer has been filed and approved on 10/28/2021 and **Claims 1-20**, are allowed.

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

Claims 1-20, were carefully reviewed and a search with regards to independent **claims 1, 8, and 15** has been made. Accordingly, those claims are believed to be distinct from the prior arts searched.

Regarding **Claims 1-20**, specifically independent **claims 1, 8, and 15**, the prior art searched was found to neither anticipate nor suggest a computer system for automating the shifting of pixels within a digital image, comprising: one or more processors; and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following: access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image; apply a mask to a particular portion of the digital image, wherein the mask prevents pixels covered by the mask from being shifted; receive a first starting point through a user interface; receive a first ending point through the user interface; create a first link between the first starting point and the first ending point, wherein the first link comprises: a non-linear pathway extending a first direction

Art Unit: 2612

between the first starting point and the first ending point; and a first length extending along the non-linear pathway between the first starting point and the first ending point; identify a first set of pixels that lie along the first link between the first starting point and the first ending point; and shift the first set of pixels in the first direction along the first length of the non-linear pathway, wherein shifting the first set of pixels comprises rendering in a loop the first set of pixels being shifted.

The most relevant arts searched, Ohta (US 20150262327 A1), modified by Amirghodsi, etc. (US 20170140514 A1), teach that a computer system for automating the shifting of pixels within a digital image, comprising: one or more processors; and one or more computer-readable media having stored thereon executable instructions that when executed by the one or more processors configure the computer system to perform at least the following: access, from memory, a digital image file, wherein the digital image file comprises information that corresponds to individual pixels within the digital image; apply a mask to a particular portion of the digital image, wherein the mask prevents pixels covered by the mask from being shifted; receive a first starting point through a user interface; receive a first ending point through the user interface. However, Ohta, modified by Amirghodsi, does not teach every claimed limitation, especially the claimed limitation of **"create a first link between the first starting point and the first ending point, wherein the first link comprises: a non-linear pathway extending a first direction between the first starting point and the first ending point; and a first length extending along the non-linear pathway between the first starting point and the first ending point; identify a first set of pixels that lie along the first link between the first starting point and the first ending point; and shift the first set of pixels in the first direction**

Art Unit: 2612

along the first length of the non- linear pathway, wherein shifting the first set of pixels comprises rendering in a loop the first set of pixels being shifted” (emphasis added).

It is viewed that any of the previously cited references or any of the prior art searched, in part or in whole, cannot be combined in such a way to render the claimed invention obvious.

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 GORDON G LIU whose telephone number is (571)270-0382. The examiner can normally be reached Monday - Friday 8:00-5:00.

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>.

Art Unit: 2612

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Mehmood can be reached on 571-272-2976. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit:

<https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for

information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GORDON G LIU/

Primary Examiner, Art Unit 2612

Issue Classification 	Application/Control No. 16/735,550	Applicant(s)/Patent Under Reexamination Plota et al.
	Examiner GORDON G LIU	Art Unit 2612

CPC						
Symbol					Type	Version
G06F	/	3	/	04845	F	2013-01-01
G06F	/	3	/	04812	I	2013-01-01
G06T	/	11	/	60	I	2013-01-01
G06T	/	13	/	80	I	2013-01-01
G06F	/	3	/	0484	I	2013-01-01

CPC Combination Sets					
Symbol				Type	Version
/	/				

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 20	
/GORDON G LIU/ Primary Examiner, Art Unit 2612 (Primary Examiner) _____ (Date) _____		29 November 2021 O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification 	Application/Control No. 16/735,550	Applicant(s)/Patent Under Reexamination Plota et al.
	Examiner GORDON G LIU	Art Unit 2612

INTERNATIONAL CLASSIFICATION			
CLAIMED			
G09G	/	5	/ 00

NON-CLAIMED			
/	/		

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
345	619

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/GORDON G LIU/ Primary Examiner, Art Unit 2612	29 November 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification 	Application/Control No. 16/735,550	Applicant(s)/Patent Under Reexamination Plota et al.
	Examiner GORDON G LIU	Art Unit 2612

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10	19	19										
2	2	11	11	20	20										
3	3	12	12												
4	4	13	13												
5	5	14	14												
6	6	15	15												
7	7	16	16												
8	8	17	17												
9	9	18	18												

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 20	
/GORDON G LIU/ Primary Examiner, Art Unit 2612 (Primary Examiner) _____ (Date) _____		29 November 2021 O.G. Print Claim(s) 1	O.G. Print Figure 1

<i>Search Notes</i> 	Application/Control No. 16/735,550	Applicant(s)/Patent Under Reexamination Plota et al.
	Examiner GORDON G LIU	Art Unit 2612

CPC - Searched*		
Symbol	Date	Examiner
(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	04/19/2021	/G.L./
Updated the above class search.	11/29/2021	/G.L./

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
345	619	04/19/2021	/G.L./
	Updated the above class search.	11/29/2021	/G.L./

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Google search: color cycling + palette cycling and image animation with pixel cycling.	04/19/2021	/G.L./
Updated the above class search.	11/29/2021	/G.L./

/GORDON G LIU/ Primary Examiner, Art Unit 2612	
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<i>Search Notes</i> 	Application/Control No. 16/735,550	Applicant(s)/Patent Under Reexamination Plota et al.
	Examiner GORDON G LIU	Art Unit 2612

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
345	619	11/29/2021	/G.L./
	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	11/29/2021	/G.L./
	(Plota and Troy or Connelly and Sascha).as.	11/29/2021	/G.L./
	(Plota and Troy or Connelly and Sascha).in.	11/29/2021	/G.L./
	@pd>"20210401"	11/29/2021	/G.L./

/GORDON G LIU/ Primary Examiner, Art Unit 2612	
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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L2	4526	345/619.ccls.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/02 12:48 AM
L3	37754	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/02 12:50 AM
L4	41412	L2 or L3	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/02 12:50 AM
L5	317	L4 and shift with pixel	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/02 12:50 AM
L6	5	L5 and mask with boundary	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/02 12:50 AM
L7	0	("2018/0032236").URP N.	(USPAT)	OR	OFF	OFF	2018/09/02 12:52 AM
L8	5	("20070019007" "20100134505" "20110273583" "20150022518" "20150262327").PN.	(US-PGPUB; USPAT)	OR	OFF	OFF	2018/09/02 01:04 AM
L9	2	cycle same shifting and pixel adj strip	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/02 01:09 AM
L10	2	("20170236028" or "20160270648").pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/02 01:37 AM
L11	0	circular adj shift\$3 adj pixels	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/03 11:33 PM
L12	1	"15660677"	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/03 11:35 PM
L13	2	("9536461" or "20030034992").pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 09:32 AM
L14	121	color adj cycling	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 09:52 AM
L15	31	L14 and mask	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 09:52 AM
L18	78	pixel adj rotating	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 11:32 AM
L19	0	L18 and cycling	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 11:33 AM
L20	14	L18 and shift	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 11:33 AM
L21	1263	pixel adj shifting	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 03:03 PM
L22	30	L21 and animation	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 03:03 PM
L23	1	"8299413".pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/04 03:06 PM
L24	2	("20150262327" or	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/09/23

L25	1	"20170140514").pn. "20170140514".pn.	EPO) (US-PGPUB; USPAT; EPO)	OR	OFF	OFF	09:08 PM 2018/12/17 09:45 PM
L26	8	palette adj cycling and video	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/12/17 11:15 PM
L27	12	color adj cycling same (speed or rate)	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/12/18 11:03 AM
L28	2	"15298663"	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/12/18 11:56 AM
L29	1	"20090189912".pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2018/12/18 05:05 PM
L30	4526	345/619.ccls.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:53 AM
L31	40182	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:53 AM
L32	43846	L30 or L31	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:53 AM
L33	43846	L32	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:53 AM
L34	2444	L33 and threshold with distance	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:54 AM
L35	118	L34 and digital and ink	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:55 AM
L36	0	L35 and shift with pixel	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:55 AM
L37	9	L35 and shift and pixel	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:55 AM
L38	1	"16162206"	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 09:56 AM
L39	5	("20070019007" or "20100134505" or "20110273583" or "20150022518" or "20150095882").pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 10:31 AM
L40	1	"16102055"	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/29 11:22 PM
L41	867	animation and distance adj threshold	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/30 10:48 AM
L42	0	L41 and pixel adj shift	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/30 10:48 AM
L43	14	L41 and pixel with shift\$3	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/30 10:48 AM
L44	3774	image and animation and pixel and shifting	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/30 11:01 AM
L45	463503	L44 ad non-linear with pathway	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/30 11:02 AM
L46	0	L44 and non-linear with pathway	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/30 11:02 AM

L47	48	L44 and non-linear and pathway	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/04/30 11:02 AM
L48	4527	345/619.ccls.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/11/22 07:28 PM
L49	43527	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/11/22 07:28 PM
L50	47193	L48 or L49	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/11/22 07:28 PM
L51	47193	L50	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/11/22 07:28 PM
L52	300	L51 and shifting same pixel	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/11/22 07:28 PM
L53	4	L52 and link with ending adj point	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2019/11/22 07:30 PM
L65	4528	345/619.ccls.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/17 10:56 PM
L66	51754	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/17 10:56 PM
L67	55413	L65 or L66	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/17 10:56 PM
L68	55413	L67	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/17 10:56 PM
L69	9	L68 and shifting near3 loop	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/17 10:56 PM
L70	15	("20100149091" "20130044108" "20140344804" "20170117016" "20170294210" "20200193215" "6339426" "20070019007" "20090189912" "20100134505" "20110273583" "20150022518" "20150095882" "20150262327" "20170140514").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2021/04/18 09:34 PM
L71	0	"16735550"	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/18 09:36 PM
L72	2	"9858649".pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/18 09:46 PM
L73	2	"9105121".pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/18 09:47 PM
L74	2	"13629417"	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/18 09:51 PM
L75	0	color adj cycling and palette adj cycling	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/19 09:07 AM
L76	1	color adj cycling and	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/19

L77	7	palette near2 cycling "15660677"	EPO) (US-PGPUB; USPAT; EPO)	OR	OFF	OFF	09:07 AM 2021/04/19 09:17 AM
L78	2	("20150262327" or "20170140514").pn.	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/19 09:41 AM
L79	11	palette adj cycling	(US-PGPUB; USPAT; EPO)	OR	OFF	OFF	2021/04/19 09:41 AM
L80	242188	L4	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DK, EA, EE, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/11/29 07:21 PM
L81	7	L80 AND digital ADJ file AND first ADJ starting ADJ point	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DK, EA, EE, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/11/29 07:23 PM
L82	18	("20130201284" OR "5086482" OR "8244061" OR "20100149091" OR "20130044108" OR "20140344804" OR "20170117016" OR "20170294210" OR "20200193215" OR "6339426" OR "20070019007" OR "20090189912" OR "20100134505" OR "20110273583" OR "20150022518" OR "20150095882" OR "20150262327" OR "20170140514").pn.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/29 07:32 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N54	4526	345/619.ccls.	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 08:59 PM
N55	43527	(G06T11/60 or G06T19/00 or G06T11/00 or G06F9/4443 or G06F3/0481).cpc.	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 08:59 PM
N56	47192	N54 or N55	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:00 PM
N57	300	N56 and shifting same pixel	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:00 PM
N58	22	N57 and ending adj point	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:00 PM
N59	1	"16162206"	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:05 PM
N60	0	(Plota and Troy or Connelly and Sascha).as.	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:06 PM
N61	4	(Plota and Troy or Connelly and Sascha).in.	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:06 PM
N62	458230	@pd>"20190501"	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:07 PM
N63	506	N62 and shifting with pixel	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:07 PM
N64	1	N63 and ending adj point	(US-PGPUB; USPAT)	OR	OFF	OFF	2019/11/23 09:07 PM
N65	59019	N56	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/29 07:24 PM
N66	5	N65 AND digital ADJ file AND first ADJ starting ADJ point	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/29 07:25 PM
N67	0	N60	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/29 07:25 PM
N68	9	N61	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/29 07:26 PM
N69	507041	@pd>"20210401"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/29 07:29 PM
N70	1	N69 AND digital ADJ file AND first ADJ starting ADJ point	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/29 07:29 PM

Doc code: IDS

PTO/SB/08a (02-18)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 11/30/2020. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	LIU, GORDON G
Attorney Docket Number	20970.1.1.1.1

U.S.PATENTS							Remove	
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	5086482	A	1992-02-04	KUMAGAI RYOHEI			
	2	8244061	B1	2012-08-14	CARSON et al.			
If you wish to add additional U.S. Patent citation information please click the Add button.							Add	
U.S.PATENT APPLICATION PUBLICATIONS							Remove	
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	20130201284	A1	2013-08-08	Abeloe Kenneth A.			
If you wish to add additional U.S. Published Application citation information please click the Add button.							Add	
FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	1081956	EP	A1	2001-03-07	UNIVERSITY OF WASHINGTON		
If you wish to add additional Foreign Patent Document citation information please click the Add button.							Add	
NON-PATENT LITERATURE DOCUMENTS							Remove	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	LIU, GORDON G
Attorney Docket Number	20970.1.1.1.1

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	GIRGENSOHN, A., et al., "A semi-automatic approach to home video editing," Proceedings of the 13th annual ACM symposium on User interface software and technology, CHI Letters, Vol 2, No. 2, November 08, 2000, pp. 81-89	
	2	International Search Report and Written Opinion received for PCT Patent Application No. PCT/US2018/056377, mailed on Jan 04, 2019, 12 pages	

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/GORDON G LIU/	Date Considered	11/29/2021
--------------------	----------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	16735550
Filing Date	2020-01-06
First Named Inventor	Troy Plota
Art Unit	2612
Examiner Name	LIU, GORDON G
Attorney Docket Number	20970.1.1.1.1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John C. Stringham/	Date (YYYY-MM-DD)	2021-07-30
Name/Print	John C. Stringham	Registration Number	40831

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

Bibliographic Data

Application No: 16/735,550

Foreign Priority claimed: ☐ Yes ☒ No

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

Verified and Acknowledged:

/GORDON G LIU/

G.G.L

Examiner's Signature

Initials

Title:

Automated Pixel Shifting Within a Digital Image

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/06/2020	345	2612	20970.1.1.1.1
RULE			

APPLICANTS

INVENTORS

Troy Plota, Kihei, HI, UNITED STATES

Sascha Connelly, Kihei, HI, UNITED STATES

CONTINUING DATA

This application is a CIP of 16162206 10/16/2018 PAT 10621469

16162206 has PRO of 62574055 10/18/2017

This application is a CON of 15660677 07/26/2017 PAT 10558342

16162206 is a CIP of 15660677 07/26/2017 PAT 10558342

15660677 has PRO of 62514703 06/02/2017

15660677 has PRO of 62368017 07/28/2016

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

01/27/2020

**** SMALL ENTITY ****

STATE OR COUNTRY

UNITED STATES

ADDRESS

Workman Nydegger

60 East South Temple

Suite 1000

Salt Lake City, UT 84111

UNITED STATES

FILING FEE RECEIVED

\$1,960

Via E-File

PATENT APPLICATION
Docket No. 20970.1.1.1.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:		)
		)
	Troy Plota et al.	)
		)
Serial No:	16/735,550	) Art Unit
		) 2612
Filed:	January 6, 2020	)
		)
Confirmation No.:	2797	)
		)
For:	AUTOMATED PIXEL SHIFTING WITHIN A DIGITAL IMAGE	)
		)
Examiner:	Gordon G. Liu	)
		)
Customer No.:	22913	)

TRANSMITTAL OF ISSUE FEE PAYMENT

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Notice of Allowance and Fee(s) Due dated December 14, 2021, please find enclosed herewith the following items for filing in the United States Patent and Trademark Office in connection with the above identified patent application:

- ☒ Fee(s) Transmittal (PTOL-85) submitted pursuant to 37 C.F.R. § 1.311.
- ☐ A Supplemental Declaration executed by the inventor(s) is submitted pursuant to 37 C.F.R. § 1.67.
- ☐ Pursuant to the request for submission of formal drawings, enclosed are the following:

- ☐ A Letter to the Official Draftsperson;
- ☐ A set of _____ (____) sheets of formal drawings to replace the corresponding drawings originally filed with the subject application.
- ☐ A duplicate set of the _____ (____) sheets of formal drawings with the changes therein highlighted in red.
- ☐ Petition to Excuse Error in Small Entity Status is enclosed.
- ☐ Form PTO-2038 submitting Credit Card Payment in the amount of \$_____ is enclosed to cover the fee deficiency for the Petition to Excuse Error.
- ☒ Payment by credit card using the payment option in E-Filer with RAM will be used to cover the payment of the fees as follows:
- ☒ The \$600.00 government issue fee pursuant to 37 C.F.R. § 1.18.
- ☐ The \$_____ government publication fee pursuant to 37 C.F.R. § 1.18.(d)
- ☒ The Commission is hereby authorized to charge payment of any additional fees or credit any overpayment to Deposit Account No. 23-3178.

Please address all future correspondence in connection with the above-identified patent application to the attention of the undersigned.

Dated this 11th day of March, 2022.

Respectfully submitted,

/John C. Stringham, 40,831/

JOHN C. STRINGHAM
Registration No. 40,831
WORKMAN NYDEGGER
Attorneys for Applicant
Customer No. 022913
Telephone No. 801.533.9800
jstringham@wnlaw.com

PART B - FEE(S) TRANSMITTAL

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

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
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)

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.

22913 7590 12/14/2021

Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/735,550	01/06/2020	Troy Plota	20970.1.1.1.1	2797

TITLE OF INVENTION: Automated Pixel Shifting Within a Digital Image

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	03/14/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
LIU, GORDON G	2612	345-619000

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/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or 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 **Workman Nydegger**

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)

PLOTAGRAPH, INC.

Kihei, Hawaii

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. 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)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. **23-3178**

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 /John C. Stringham/

Date **2022-03-11**

Typed or printed name John C. Stringham

Registration No. **40,831**

Electronic Patent Application Fee Transmittal

Application Number:	16735550			
Filing Date:	06-Jan-2020			
Title of Invention:	Automated Pixel Shifting Within a Digital Image			
First Named Inventor/Applicant Name:	Troy Plota			
Filer:	John C. Stringham/Rachelle Turner			
Attorney Docket Number:	20970.1.1.1.1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	600	600

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt

EFS ID:	45211383
Application Number:	16735550
International Application Number:	
Confirmation Number:	2797
Title of Invention:	Automated Pixel Shifting Within a Digital Image
First Named Inventor/Applicant Name:	Troy Plota
Customer Number:	22913
Filer:	John C. Stringham/Rachelle Turner
Filer Authorized By:	John C. Stringham
Attorney Docket Number:	20970.1.1.1.1
Receipt Date:	11-MAR-2022
Filing Date:	06-JAN-2020
Time Stamp:	18:21:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$600
RAM confirmation Number	E20223AI22050078
Deposit Account	233178
Authorized User	Rachelle Turner

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	20970-1-1-1-1_Transmittal_of_Issue_Fee.pdf	97713	no	2
			85214258285cdb1a5ecca41a7d61e9b5cb79ee62		
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	20970-1-1-1-1_IssueFeeTransmittal.pdf	133350	no	1
			94423b77e794717216ae32c1868104558250766d		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	37634	no	2
			7e6e9b45e510581f17a29627e9921bd7a9a7ffe7		
Warnings:					
Information:					
Total Files Size (in bytes):			268697		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)				Application Number	16/735550
				Filing Date	01-06-2020
				First Named Inventor	Troy Plota
				Art Unit	2845
				Examiner Name	Not Assigned
Sheet	1	Of	3	Attorney Docket Number	20970.1.1.1.1

Change(s) applied

 to document
 P.H.
 12/17/2021

U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initials*	Cite No.	Publication Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	20070019007	25-Jan-2007	JUNG	
	2	20090189912	30-Jul-2009	Holtman	
	3	20100134505	3-Jun-2010	ANDERSON	
	4	20110273583	10-Nov-2011	YOSHINO	
	5	20150022518	22-Jan-2015	~~JVC KENWOOD CORPORATION~~	Takeshita
	6	20150262327	17-Sep-2015	~~OMRON CORPORATION~~	Ohta
	7	20150095882	2-Apr-2015	Jaeger et al.	
	8	20170140514	18-May-2017	Amirghodsi et al.	

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published	T 1
	9	International Search Report and Written Opinion for application no. PCT/US2017/044256 mailed on October 6, 2017	
	10	SCICompanion, "Palette Cycling", 6 March 2016 [Online], Retrieved on 21 September 2018 from <URL: http://scicompanion.com/Documentation/palettecycling.html >.	

OFFICE ACTION / NOTICE OF ALLOWANCE / ISSUE NOTIFICATION DOCUMENTS

Examiner Initials*	Cite No.	Application Number	Mail Date	Document
	11	15/660677	26-Sep-2018	Office Action
	12	15/660677	6-May-2019	Final Office Action
	13	16/102055	2-Oct-2018	Office Action
	14	16/102055	18-Jan-2019	Final Office Action
	15	16/102055	17-Apr-2019	Notice of Allowance
	16	16/162206	26-Dec-2018	Office Action
	17	16/162206	3-May-2019	Final Office Action



APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/735,550	04/12/2022	11301119	20970.1.1.1.1	2797

22913 7590 03/23/2022

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ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

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 Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Troy Plota, Kihei, HI;
Sascha Connelly, Kihei, HI;

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

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