PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2013-08-06
First Named Inventor	Timothy R. Pryor
Art Unit	
Examiner Name	
Attorney Docket Number	135873.152189-0003

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	3909002		1974-09-30	Levy	
	2	4219847		1980-08-26	Pinkney et al	
	3	4339798		1982-07-13	Hedges et al	
	4	4631676		1986-12-23	Pugh	
	5	4791589		1988-12-13	Blazo et al	
	6	4843568		1989-06-27	Krueger et al	
	7	4908704		1990-03-13	Fujioka et al	
	8	4988981		1991-01-29	Zimmerman et al	

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	9	5008946		1991-04-16	Ando	
	10	5088928		1992-02-18	Chan	
	11	5227986		1993-07-13	Yokota et al	
	12	5249053		1998-09-28	Jain	
	13	5297061		1994-03-22	Dementhon et al	
	14	5365597		1994-11-15	Holeva	
	15	5376796		1994-12-27	Chan et al	
	16	5388059		1995-02-07	DeMenthon	
	17	5454043		1995-09-26	Freeman	
	18	5491507		1996-02-13	Umezawa et al	
	19	5534921		1996-07-09	Sawanobori	

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	20	5572251		1996-11-05	Ogawa	
	21	5581276		1996-12-03	Cipolla et al	
	22	5594469		1997-01-14	Freeman et al	
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	24	5624117		1997-04-29	Ohkubo et al	
	25	5781647		1998-07-14	Fishbine et al	
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	27	5828770		1998-10-27	Leis et al	
	28	5845006		1998-12-01	Sumi et al	
	29	5853327		1998-12-29	Gilboa	
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	Examiner Name	
	Attorney Docket Number	135873.152189-0003

	31	5904484		1999-05-18	Burns	
	32	5926168		1999-07-20	Fan	
	33	5940126		1999-08-17	Kimura	
	34	5982352		1999-11-09	Pryor	
	35	5999840		1999-12-07	Grimson et al	
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	40	6160899		2000-12-12	Lee et al	
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	Attorney Docket Number	135873.152189-0003

	42	6252598		2001-06-26	Segen	
	43	6342917		2002-01-29	Amenta	
	44	6346929		2002-02-12	Fukushima et al	
	45	6359647		2002-03-19	Sengupta et al	
	46	6363160		2002-03-26	Bradski et al	
	47	6373472		2002-04-16	Palalau et al	
	48	6442465		2002-08-27	Breed et al	
	49	6508709		2003-01-21	Karmarkar	
	50	6529617		2003-03-04	Prokoski	
	51	6597817		2003-07-22	Silverbrook	
	52	6663491		2003-12-16	Watabe et al	

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	Examiner Name	
	Attorney Docket Number	135873.152189-0003

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	54	6775361		2004-08-10	Arai et al	
	55	6788336		2004-09-07	Silverbrook	
	56	6911972		2005-06-28	Brinjes	
	57	7489863		2009-02-10	Lee	

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	Application Number	
	Filing Date	2013-08-06
	First Named Inventor	Timothy R. Pryor
	Art Unit	
	Examiner Name	
	Attorney Docket Number	135873.152189-0003

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]
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[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.

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	Attorney Docket Number	135873.152189-0003

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	/Vito A. Ciaravino/	Date (YYYY-MM-DD)	2013-08-06
Name/Print	Vito A. Ciaravino	Registration Number	62749

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 record s.

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.

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (03-13)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Timothy R. Pryor	Nonprovisional Application Number (if known):	
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1), the prioritized examination fee set forth in 37 CFR 1.17(c), and if not already paid, the publication fee set forth in 37 CFR 1.18(d) have been filed with the request. The basic filing fee, search fee, examination fee, and any required excess claims and application size fees are filed with the request or have been already been paid.

2. The application contains or is amended to contain no more than four independent claims and no more than thirty total claims, and no multiple dependent claims.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. The executed inventor's oath or declaration is filed with the application. (37 CFR 1.63 and 1.64)

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Vito A. Ciaravino/	Date 2013-08-06
Name (Print/Typed) Vito A. Ciaravino	Practitioner Registration Number 62749

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☐ *Total of _____ forms are submitted.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Attorney Docket Number:	135873.152189-0003

Filed as Small Entity

Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Request for Prioritized Examination	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				
Publ. Fee- Early, Voluntary, or Normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
		Total in USD ($)		**3100**

Electronic Acknowledgement Receipt

EFS ID:	16512990
Application Number:	13961452
International Application Number:	
Confirmation Number:	3753
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Customer Number:	24335
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Filer Authorized By:	Vito Anthony Ciaravino
Attorney Docket Number:	135873.152189-0003
Receipt Date:	07-AUG-2013
Filing Date:	
Time Stamp:	16:34:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$3100
RAM confirmation Number	3710
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Warnings:					
Information:					
2	Drawings-only black and white line drawings	Drawings.pdf	456703 8f385a99ace5a6db01a87c8876d4e7f14760ad7f	no	7
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3		Spec.pdf	137121 2940391b534f039429988bf756b4d9ce919352c3	yes	32

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	28
Claims	29	31
Abstract	32	32

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Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	613761 475130f937a8967f715406f2e57a2207d8980e03	no	9
Warnings:					
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6	TrackOne Request	Priority_Exam_Request.pdf	101428 3e067d4628766ba856b02b7504800d96ab2b5100	no	1
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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.

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [■] The attached application, or
- [ ] United States application or PCT international application number _____ filed on _____

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

I believe that 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.

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.

LEGAL NAME OF INVENTOR

Inventor: Timothy R. Pryor Date (Optional) 7/30/13

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

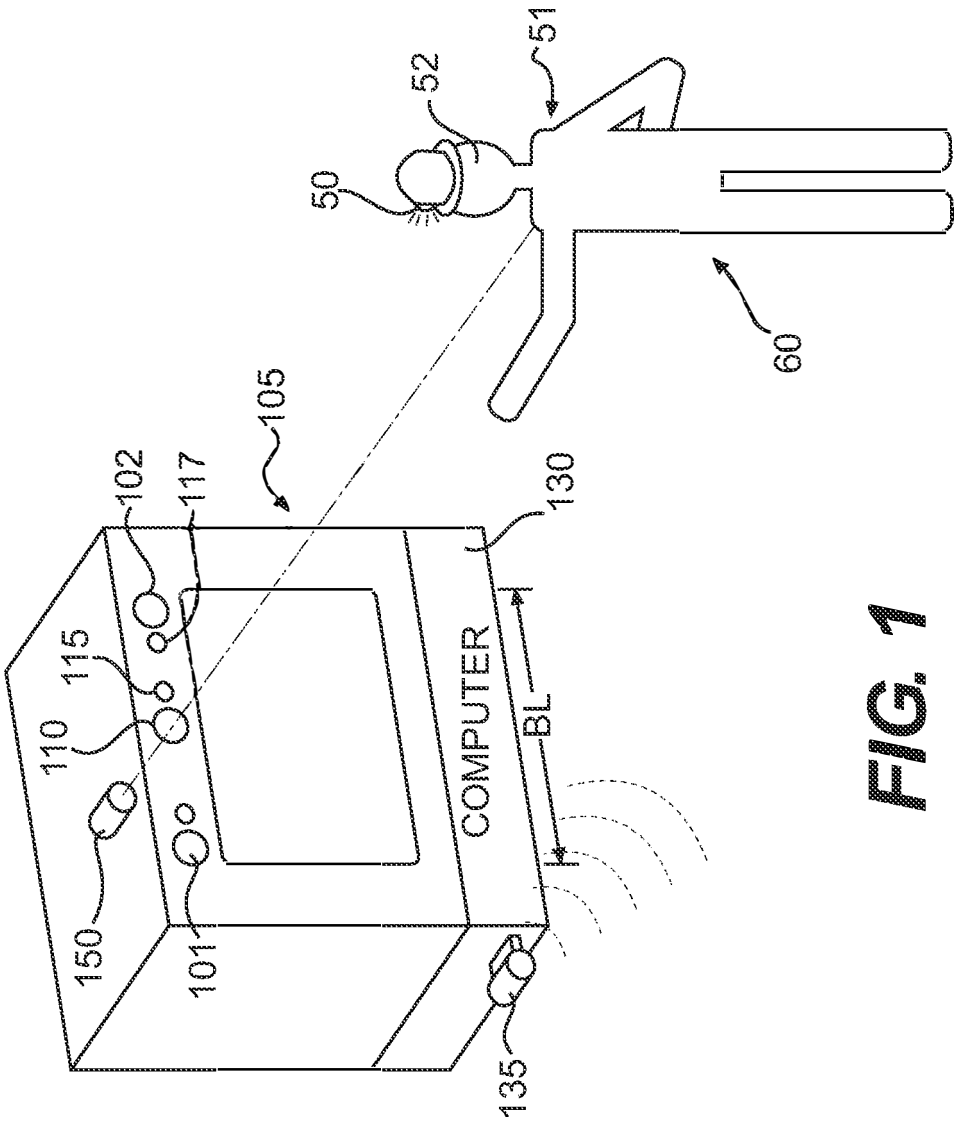

FIG. 1

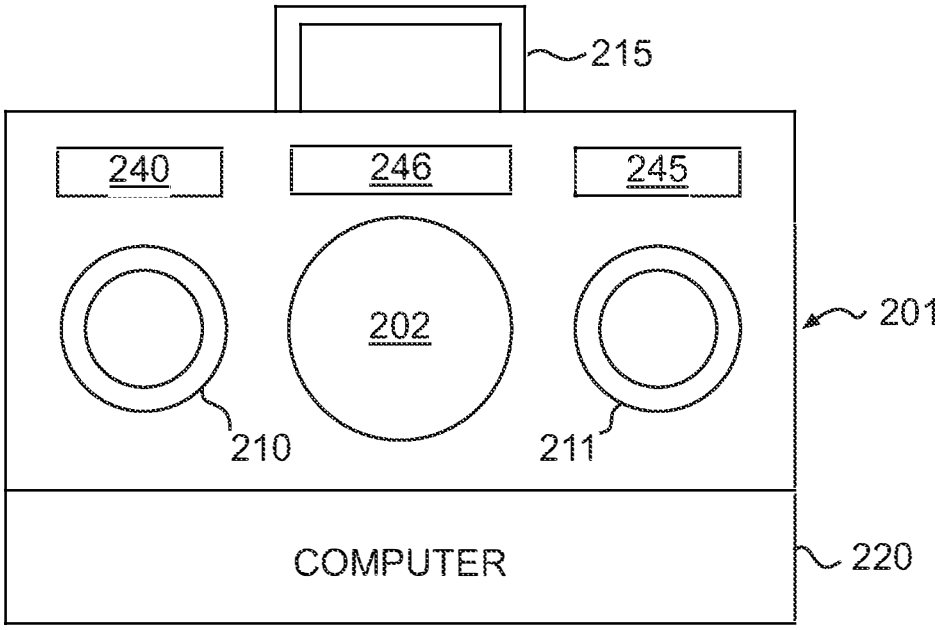

FIG. 2A

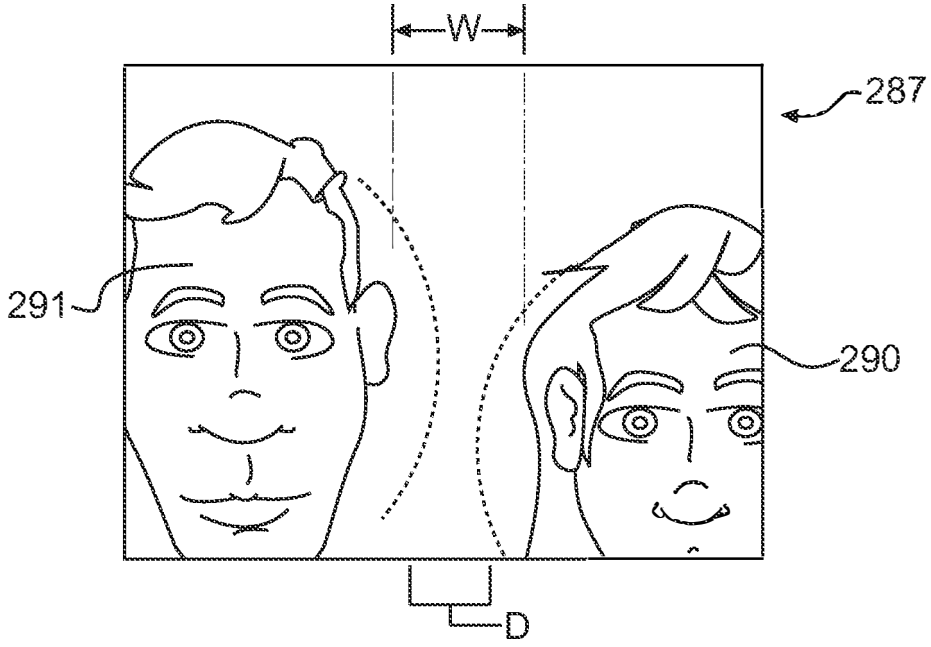

FIG. 2D

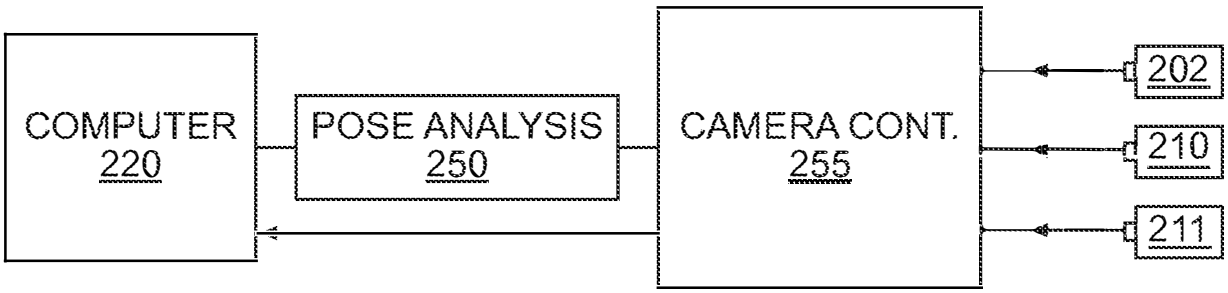
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FIG. 2B

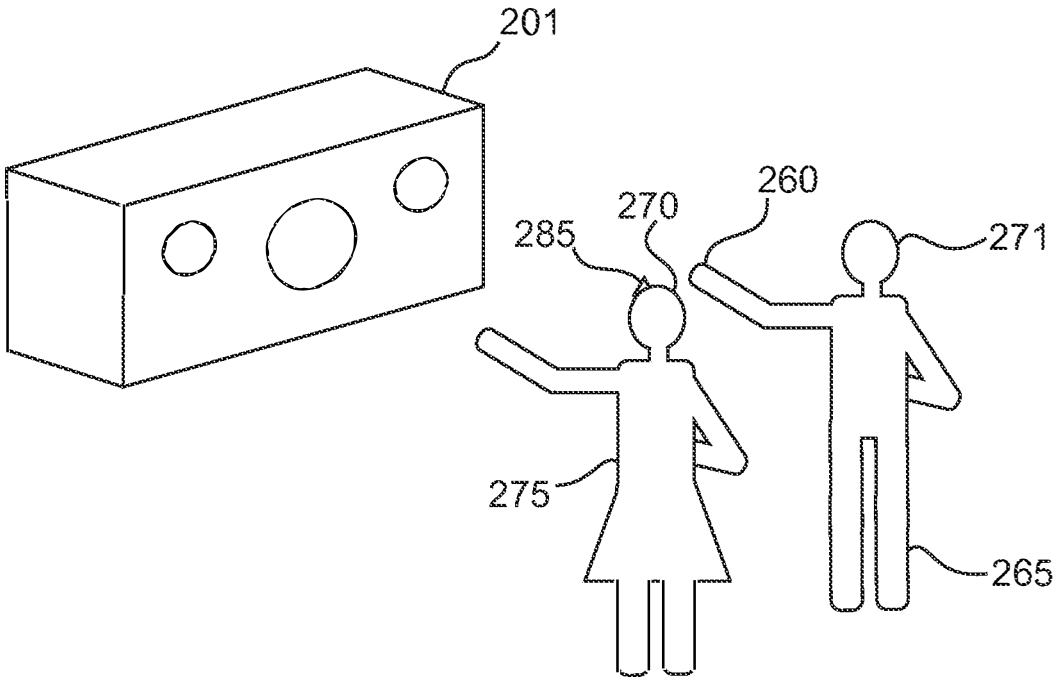
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FIG. 2C

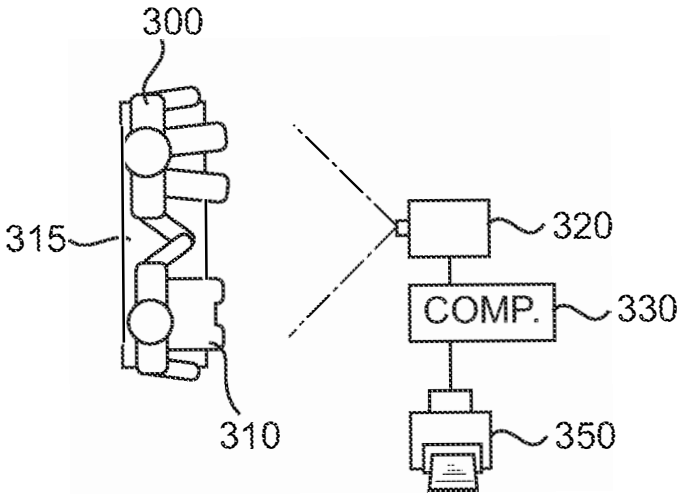
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FIG. 3

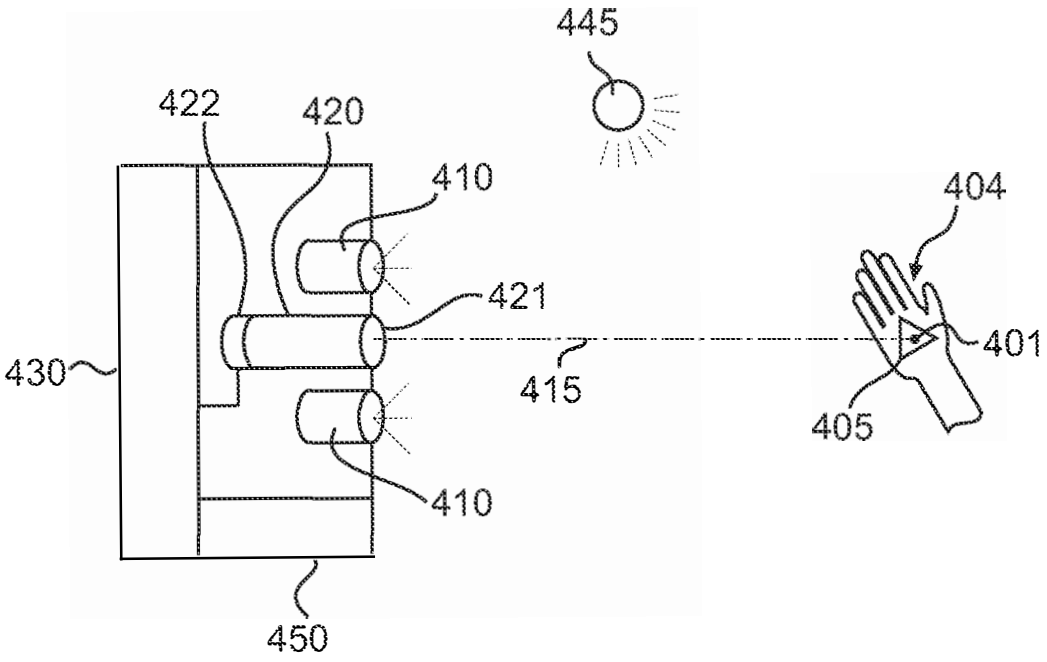
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FIG. 4

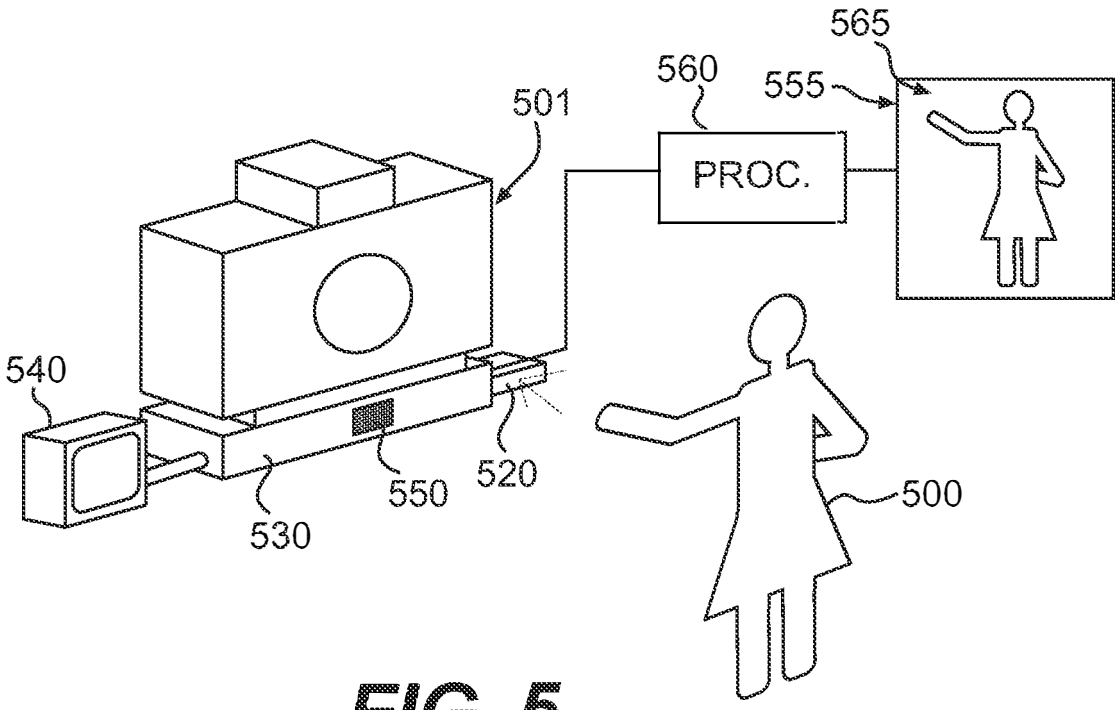
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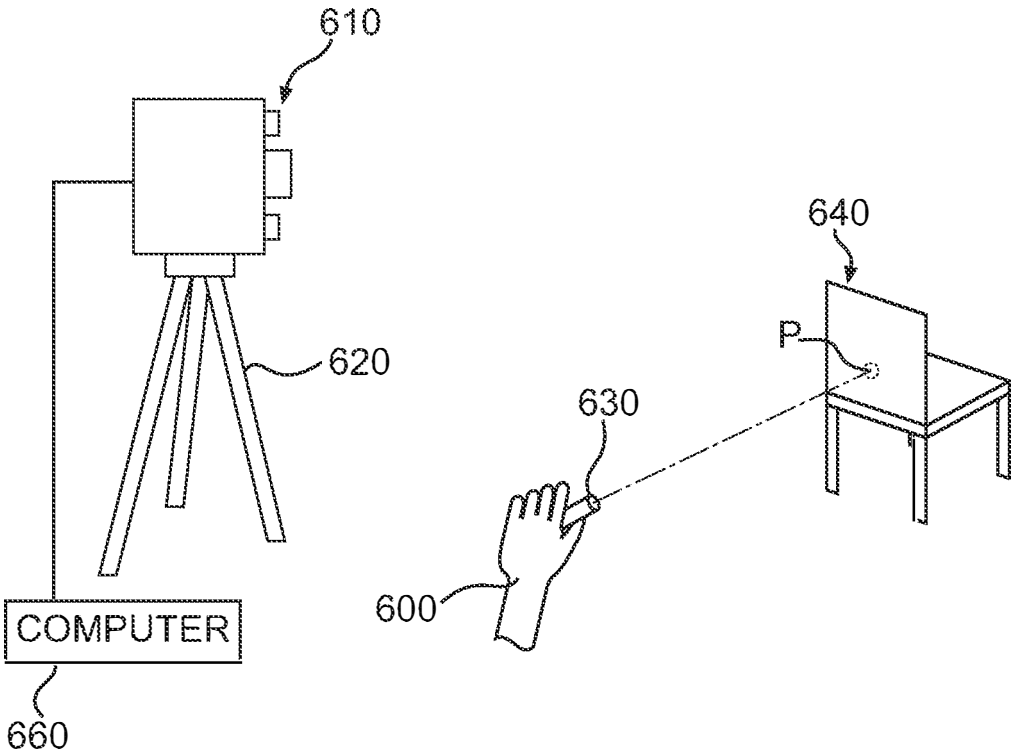
FIG. 5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660

FIG. 6

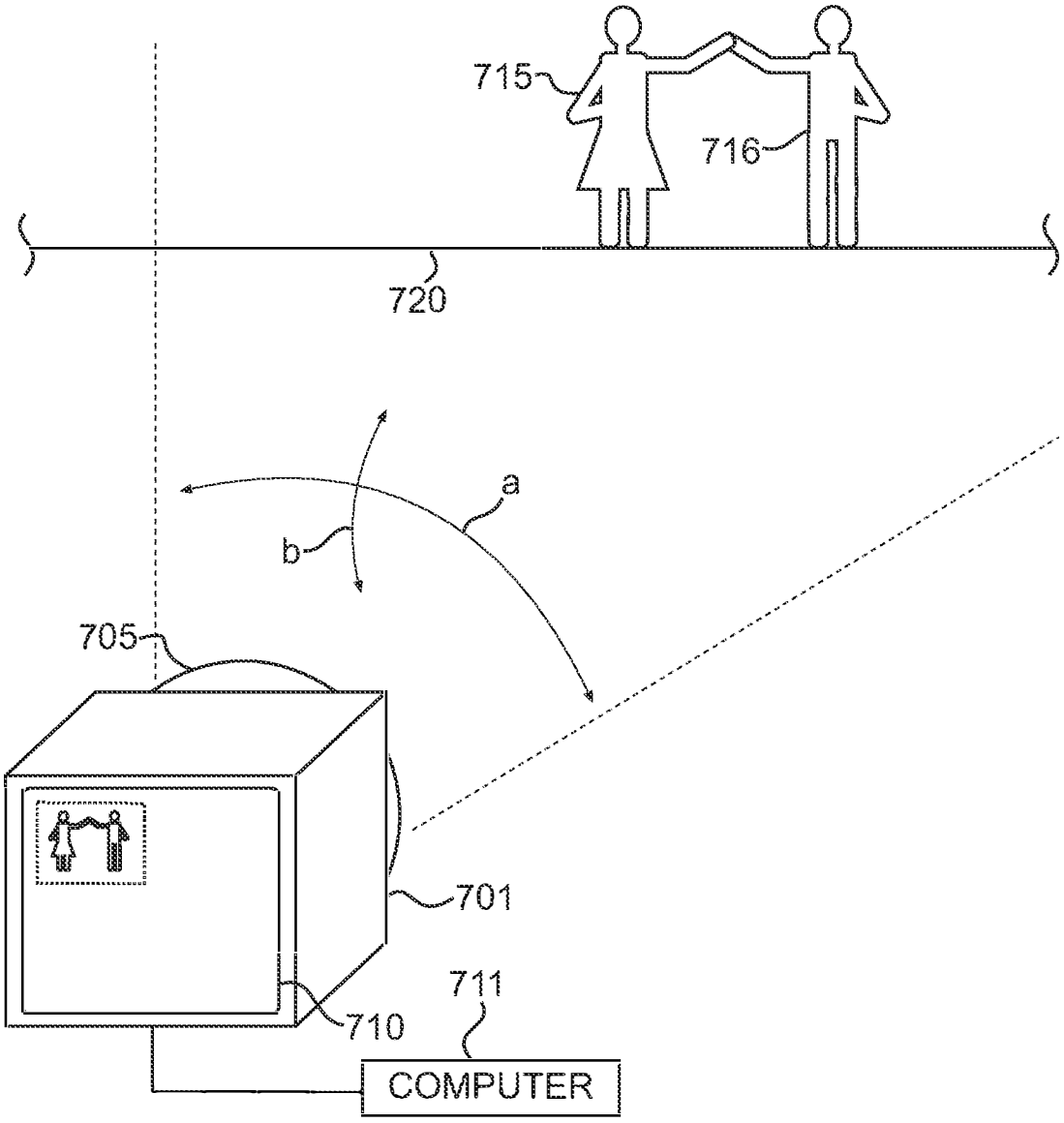

FIG. 7

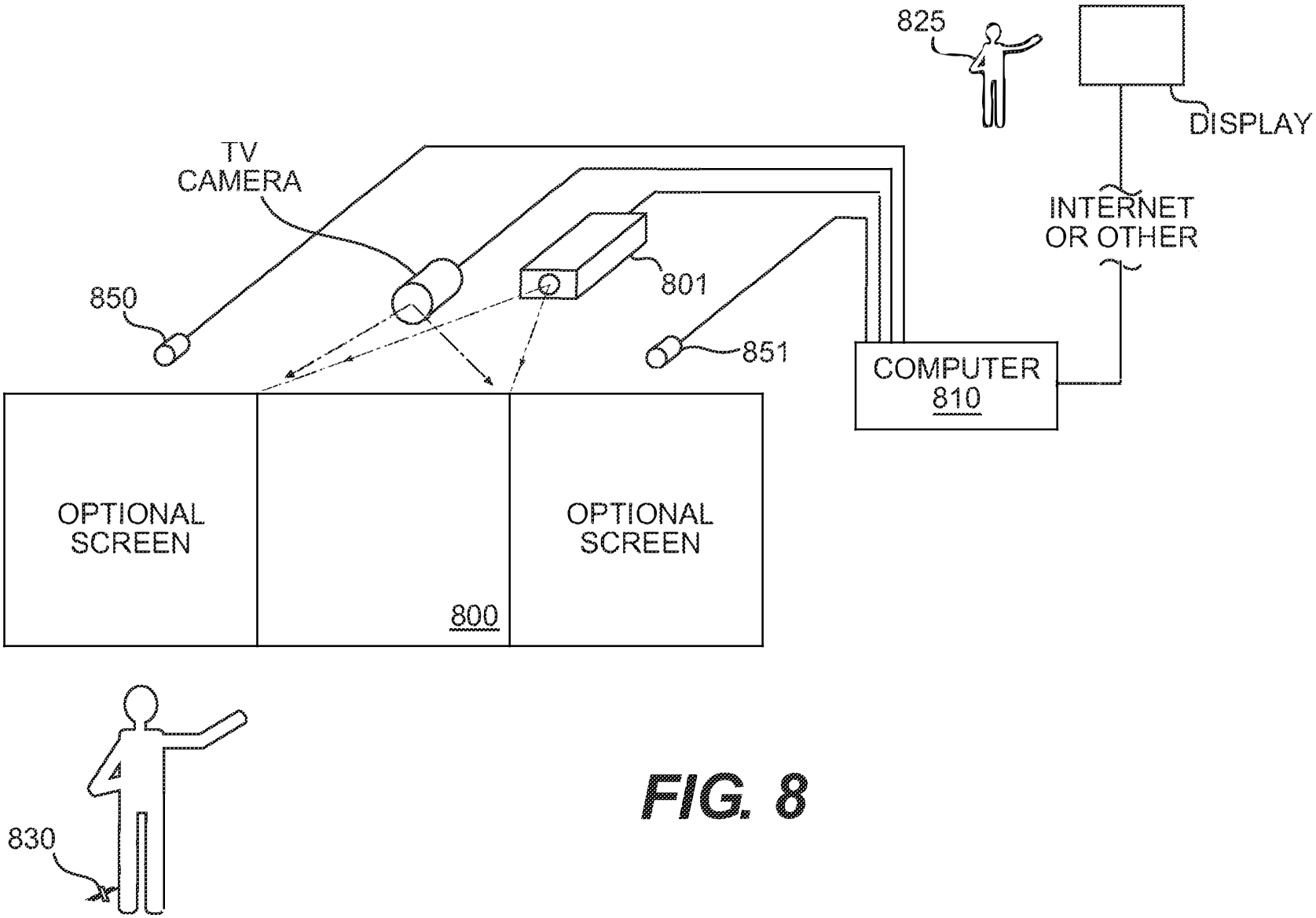

FIG. 8

CAMERA BASED INTERACTION AND INSTRUCTION

INTRODUCTION

[0001] Method and apparatus are disclosed to enhance the quality and usefulness of picture taking for pleasure, commercial, or other business purposes. In a preferred embodiment, stereo photogrammetry is combined with digital image acquisition to acquire or store scenes and poses of interest, and/or to interact with the subject in order to provide data to or from a computer. Other preferred embodiments illustrate applications to control of display systems.

BACKGROUND

[0002] Representative of USA Patents on Digital cameras are US Pat # 5,534,921, 5,249,053 and many others which describe use of matrix array (CCD or otherwise) based cameras to take pictures of humans or other objects. The images taken are generally comprised of 400,000 or more pixels which are often compressed to smaller record sizes for data storage, for later retrieval and display. Video cameras or Camcorders are also increasingly able to take still photographs as well, and record or transmit them to computers.

[0003] Aside from exposure control (to keep the light reaching the detector array within the dynamic range of same), and range finding (to effect the best lens focus given the object distance in question) there are few cases known to the inventor where the camera taking the picture actually determines some variable in the picture and uses it for the process of obtaining the picture.

[0004] One such example that does not take a picture of humans but rather of data, is exemplified by USP 4,791,589, where a certain wave form signature on an oscilloscope is searched for by processing the digital camera image, and when it is seen, the image stored.

More apropos the function of “Picture Taking” as the general public knows it and of

interest as the primary focus of the instant invention, is US 5,781,650 by Lobo, et al which describes analysis after the fact of recorded images to determine facial content and thus the age of the subject. This disclosure also alludes to a potential point and shoot capability also based on the age classification of the individuals whose picture is desired.

[0005] There is no known picture taking reference based on object position and orientation with respect to the camera, or other objects that I am aware of.

SUMMARY OF THE INVENTION

[0006] High Resolution Digital still cameras employing matrix photodetector array chips to scan the image produced by the camera lens are now commonplace, and will be even more so in a few years as chips and memories become very inexpensive, and pixel density approaches 2000x2000 pixels, rivaling photographic film. Even today Camcorders having 700x500 pixel image chips are common for video based data and stills.

[0007] This invention is aimed at improvements in utilization of these cameras and others which make use of a computer based camera's ability to analyze, in real time if desired, the images obtained. Indeed a picture taking system may be composed of a combination of cameras, some used for purposes other than the recording of the picture proper.

[0008] It is a goal of the invention to provide a method for taking pictures when certain poses of objects, sequences of poses, motions of objects, or any other states or relationships of objects are represented. It is also a goal to allow this to be done in a self timer like mode, when desired scene situations or specific dates or other circumstances exist. In some cases, information as to what is desired may be entered remotely, even over the internet, or radio telephone.

[0009] It is also a goal of the invention to provide a method for selecting from a digital or other picture memory, pictures obtained when certain pre programmed poses of objects,

sequences of poses, or relationships of objects are represented.

[0010] It is a further goal of the invention to provide means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken.

[0011] It is a still further goal to provide all such functions in a 2D or 3D context, and using simple equipment capable of widespread use.

[0012] It is another goal of the invention to feed back data to a subject or subjects having his or her, or their picture taken, in order that they assume another pose or engage in another activity, or juxtaposition of subject positions.

[0013] While this invention is primarily aimed at the general picture taking public at large, it is realized that commercial photographers and cine-photographers, for example in the coming trend to digital "Hollywood" movie making, may benefit greatly from the invention herein, as it potentially allows more cost effective film production by giving the director the ability to expose the camera to the presence of masses of data, but only saving or taking that data which is useful, and if desired, to signal the creation of further data based on data obtained. All this with little or no human intervention as desired, thus saving on the cost of direction, film crews, and other labor or venue related costs.

DRAWINGS DEPICTING PREFERRED EMBODIMENTS OF THE INVENTION

[0014] Figure 1 illustrates means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken.

[0015] Figure 2 illustrates a method for taking pictures when certain pre programmed poses of objects, sequences of poses, or relationships of objects are represented.

[0016] Figure 3 illustrates a self timer like mode, or when specific dates or other circumstances exist, including a system embodiment for taking pictures in shopping malls or

other locales and providing instant print or other hardcopy capability (e.g. on a tee shirt).

[0017] Figure 4 illustrates means to provide all such functions in a 2D or 3D context, using simple equipment capable of widespread use. Various retroreflective artificialtarget configurations are also disclosed.

[0018] Figure 5 illustrates a method to feed back data to a subject having his or her picture taken, in order that the subject assumes another pose or engage in another activity.

[0019] Figure 6 illustrates a commercial version of the invention useful for police departments and real estate agents, among others.

[0020] Figure 7 illustrates an embodiment of the invention used for photography of stage performances.

[0021] Figure 8 illustrates an embodiment of the invention used for ballet instruction and other teaching and interaction activities also with remotely located instructors or players.

EMBODIMENTS OF THE INVENTION

FIGURE 1

[0022] Illustrated in figure 1 of the invention is means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken, and in this context, figure 1 resembles that of co-pending referenced application 9 above. A single camera, or a set, such as a stereo pair are employed to see portions of an object, such as a person, a part of a person such as a hand, leg, foot, fingers, or head, and/or to view datums on an object, portion of an object, or an object held by the person or with which the person interacts. In addition, multiple persons and objects can be seen.

[0023] Where a single camera is employed, 2D measurements of object location relative to the camera (x and y perpendicular to the camera axis) are all that is possible, unless datums of

known shape or spacing are used on the object viewed. Where a stereo pair or more of cameras are employed, 3D (xyz) data of a single point can be provided, for example retro-reflector 50 on the head 52 of person 51. In both cases where 3 or more datums are used on an object, 6 Degree of freedom data can be obtained, allowing object orientation in 3 angular axes as well as range in 3 axes to be obtained. With two or more cameras, such 3D data may also be obtained using other features of objects such as edges of arms and the likely using known photogrammetric techniques.

[0024] The cameras used may also be used to take pictures of an object, or another specialized camera used for that purpose in conjunction with those used to determine the location of object features. Both examples are illustrated in this application.

[0025] As shown in this figure, two cameras 101 and 102 are used as a stereo pair, with each camera located at opposite sides of a TV monitor 105, used for either computer or Television display or both. This is a desirable configuration commercially and discussed the co-pending application references above. In this particular case, an additional camera 110 is shown in the middle of the other two, said added camera used for picture taking, internet telephony and/or other purposes. An optional auxiliary LED light source 115 (or 116 or 117) for illuminating a user 60 or other object is also shown.

[0026] All three cameras are connected to the computer 130 by means of a USB (Universal Serial Bus) daisy chain, or IEEE 1394 firewire connections (faster). Each is accessed, as needed for position and orientation determination, or picture taking.

[0027] Even using a single camera in two dimensions (as is normal today), some position and orientation data or sequences of same can be achieved using modern image processing techniques. (See for example the invention disclosed in USP 4,843,568 of Myron Krueger).

However, accurate sensing and control of systems, such as cameras herein is difficult today with processors cost effective enough to be used by the public at large, and artificial target augmentation of image points is often desirable.

[0028] It is thus possible using the invention to be taking pictures of users of interactive computer systems for whatever purpose. This allows one to automatically capture images of children at play, for example with a computer system such as a computer game. It also enables many other functions which are described below. And it can be used in the field, where the computer, stereo position sensing and picture taking camera, may be co-located together in the same housing.

[0029] It is noted that where retro-reflectors are used, (as opposed to choosing for example less contrasting datums, for example natural object features such as edges of fingers, or clothing features, or targets such as colored dots) then each of the two cameras for stereo location determination needs lights to illuminate retro-reflectors substantially co-located with the camera axes. These lights can alternatively provide general lighting for any other camera or cameras to use in taking photographs or other purposes.

[0030] It is noted that cameras 101 and 102 need not have the image of the retro-reflector or other discernable target be in precise focus, indeed it is often helpful to have a some blur due to defocusing so as to aid sub pixel position solution of datum location. If the LEDs or other light sources are in the near infrared, and the camera lenses are focused in the visible, this occurs naturally, unless the lens is also near infrared chromatic corrected.

[0031] An optional laser pointer (or other suitable illumination source), comprised of diode laser and collimating optics 150 is also usable with the invention to illuminate object portions from which 3D data is desired (such as the neck region of person 51 as shown), or in the

simpler case to designate which areas of a picture are to be focused, or zoomed in on or transmitted or recorded - with or without consideration of 3-D position data of the object. This can be fixed as shown, or optionally hand held by the user, for example in left hand (dotted lines) and used by him or her to designate the point to be measured in 3D location. (see also references above). In addition a person taking pictures, such as a photography can without looking through the viewfinder of the camera, point to appoint on the subject, which is then dealt with by camera typically by focusing the lens system such that the point is in the desired state of focus (usually but not necessarily when the laser spot on the subject appears smallest in diameter and/or of highest contrast). Such as system is particularly useful for cameras with wide fields of view, or those mounted on pan tilt mechanisms, where the mechanism can also be activated to position the camera axis to take the picture with the laser spot for example centered in the camera field.

[0032] In the laser designated case, it is generally the laser spot or other indication on the surface that is imaged, (although one can also instruct, for example using voice recognition software in computer 130 inputted via voice activated microphone 135, the camera processor to obtain and store if desired the image of the area around the spot projected onto the object as well or alternatively), and if the spot is desired, it is often useful that cameras 101 and 102 have band-pass filters which pass the laser wavelength, and any led illumination wavelengths used for retro-reflector illumination for example, but block other wavelengths to the extent possible at low cost. It is noted that the discrimination in an image can also be made on color grounds - i.e. with red diode lasers and red LEDs, the system can analyze the image areas containing reds in the image, for example - with the knowledge that the answer can't lie at any shorter wavelengths (e.g. green, yellow, blue).

[0033] By using two cameras 101 and 102, a superior ranging system for the laser spot

location on the subject results, since the baseline distance "BL" separating the cameras for triangulation based ranging purposes can be sufficient to provide accurate measurement of distance to the object.

FIGURE 2

[0034] As we begin to consider the apparatus of figure 1, it is clear one could do much more to enhance picture taking ability than hereto fore described and contained in the prior art. And it can be done with apparatus capable of field use.

[0035] Figure 2 for example, illustrates a method for taking pictures when certain pre programmed or otherwise desired poses of objects, sequences of poses, or relationships of objects are represented. No such ability is available to photographers today.

[0036] Consider still camera system 201, patterned after that of fig 1 and comprising 3 cameras and associated image scanning chips. The central camera, 202, is for picture taking and has high resolution and color accuracy. The two cameras on either side, 210 and 211, may be lower resolution (allowing lower cost, and higher frame rate, as they have less pixels to scan in a given frame time), with little or no accurate color capability, as they are used to simply see object positions or special datum positions on objects (which may be distinguished however by taught colors for example as taught in some of my co-pending inventions).

[0037] Cost wise the distinction between cameras is important. Today low cost CMOS chips and lenses capable of the providing stereo measurements as described above are $15 or less. High quality CCD color detector arrays and lenses for high quality photo images are over $100, and in many cases $1000 or more.

[0038] An optical viewfinder 215 is one of many ways to indicate to the user what scene information is being gathered by the camera system. The user can in this invention specify with a

viewfinder based readout, the area of the field that is desired. Use of the viewfinder in this manner, whether looked through or displayed on a screen, is for example an alternative to designating an area on the actual object using a laser pointer for the purpose.

[0039] The camera system 201 further contains a computer 220 which processes the data from cameras 210 and 211 to get various position and/or orientation data concerning a person (or other object, or persons plural, etc). Integral light sources as described in fig. 1 above may also be provided such as LED arrays 240 and 245 and xenon flash 246.

[0040] In general, one can use the system to automatically "shoot" pictures for example, when any or all of the following occur, as determined by the position and orientation determining system of the camera of the invention:

[0041] 1. Subject in a certain pose.

[0042] 2. Subject in a sequence of poses.

[0043] 3. Portion of Subject in a sequence of poses (e.g. gestures).

[0044] 4. Subject or portion(s) in a specific location or orientation.

[0045] 5. Subject in position relative to another object or person. For example, this could be bride and groom kissing in a wedding, boy with respect to cake on birthday, and sports events sequences of every description (where the camera can even track the object datums in the field and if desired adjust shutter speed based on relative velocity of camera to subject).

[0046] 6. Ditto all of above with respect to both persons in certain poses or gesture situations.

[0047] 7. When a subject undertakes a particular signal comprising a position or gesture-i.e. a silent command to take the picture (this could be programmed, for example, to correspond to raising one's right hand).

[0048] In addition it is noted that the invention acts as a rangefinder, finding range to the subject, and even to other subjects around the subject, or to all parts of interest on an extensive subject. This allows a desired lens focus to be set based on any or all of this data, as desired. It also allows a sequence of pictures to be taken of different objects or object portions, at different focal depths, or focus positions. The same holds true for exposure of these locations as well.

[0049] It is also possible to use the above criteria for other purposes, such as determining what to record (beyond the recording that is implicit in taking pictures), or in determining what to transmit. The latter is important vis a vis internet activity, where available internet communication bandwidth limits what can be transmitted (at least today). In this case video telephony with the invention comprehends obtaining only those images you really care about in real time. So instead of transmitting low resolution image data at 20 frames a second, you can transmit say 5 (albeit asynchronously gathered) frames of high resolution preferred data. (This doesn't solve flicker problems, but it does mean that poor quality or extraneous material isn't sent!). Criteria such as degree of image motion blur or image focus can also be used in making transmission decisions.

[0050] Figure 2b illustrates a block diagram showing a pose analysis software or hardware module 250 analyzing processed image data (for example utilizing camera image data processed by visionbloks software from Integral Vision Corp.) from the computer 220 (which may be the same physical microprocessor, such as a Intel Pentium 2 in a Dell inspiron 3500 laptop computer, or different) and determining from same when a certain pose for example has been seen. When this occurs, a signal is sent to the camera control module 255 to hold the last frame taken by camera 202, and to display it to the photographer, digitally store it, or transmit it - to someone else, or another data store or display. Such transmission can be by data link, internet,

cell phone, or any other suitable means.

[0051] Another criteria could be that two or more preselected poses were seen one after the other, with a time delay between them, also pre-selected if desired.

[0052] Figure 2C illustrates a specific case whereby a point on one person, say hand 260 of man 265 having head 271, is determined, and a picture is taken by camera system 201 of the invention when this point comes within a distance of approximately 6 inches (or any other desired amount including contact - i.e. zero distance) from another person or object, say the head 270 of woman 275. To obtain the data, one can look for hand or head indications in the image using known machine vision techniques, and/or in a more simple case put a target marker such as colored triangle 285 or other type on the hand or head or both and look for it.

[0053] The use of the natural features of the subjects heads, which are distinguishable by shape and size in a known field containing two persons, is now illustrated. For example, image morphology or template matching in the image field of the solid state TV camera 202 can be used to distinguish the head shapes from background data and data concerning the rest of the features such as hands, etc. of subjects 265 and 275 (or conversely hand shapes if desired can be found and heads excluded, or the hand of the right person, versus the head of the left, and so forth).

[0054] As shown in figure 2D, when the image field 287 of camera 202 after processing contains the two head images, 290 and 291, spaced a distance "W". When W is not within a tolerance D, the picture is not taken; whereas if the heads are close enough, within D as illustrated in dotted lines, the picture is taken.

[0055] Criteria as mentioned can include proximity of other parts of the body, or objects associated with the subjects (which themselves can be objects). In addition, the motion or

relative motion of objects can be the criteria. For example, one could take program the device to take the picture when on two successive frames the condition shown in fig 2D exists where the heads are apart in frame 1, but closer in frame 2 (probably corresponding to a movement say of the boy to kiss the girl). Clearly other sequences are possible as well, such as movement taking place in several frames followed by a sequence of frames in which no movement occurs. Other means to determine motion in front of the camera can also be used in this context, such as ultrasonic sensors.

[0056] It is also noted that the actual position or movement desired can be "Taught" to the computer 220 of the picture taking system. For example, a boy and girl in a wedding could approach each other and kiss beforehand. The sequence of frames of this activity (a "gesture" of sorts by both parties) is recorded, and the speed of approach, the head positions and any other pertinent data determined. When the photographer thinks the picture is right, the computer of the camera system is instructed to take the picture- for example it could be at the instant when after a suitable approach, two head images become joined into one- easily recognizable with machine vision processing software under uniform background conditions. Then in the future, when such a condition is reached in the camera field of view, pictures are taken and stored, or transmitted. This allows a camera to free run whose image field for example takes in the head table at a wedding party, taking only the shots thought to be of most interest. Numerous conditions might be programmed in, or taught in- another at the same party, would be anyone at the head table proposing a toast to the bride and groom, with arm and glass raised. If video is taken, it might be taken from the point at which the arm rises, until after it comes down. Or with suitable voice recognition, when certain toast type words are heard, for example.

APPLICATION TO "3-D" PICTURES

[0057] Where it is desired to take "3-D" pictures, it can be appreciated that each camera, 210 and 211 can take images of the scene in place of camera 202, and that both cameras 210 and 211 outputs can be stored for later presentation in a 3D viewing context, using known display techniques with appropriate polarized glasses or switchable LCD goggles for example. In this case the camera outputs can serve double duty if desired, each both recording picture data, as well as determining position of one or more points on the object or objects desired.

[0058] In addition, or alternatively, one can use in this 3D picture case, the camera 202 (or even a stereo camera pair in place of 202) as a means for determining position and orientation independently from the stereo picture taking cameras.

[0059] If not used for immediate position information, camera 202 does not have to be digital and could employ film or other media to record information.

FIGURE 3

[0060] In a manner resembling that of fig 2 above, the invention can also serve to aid a person to take his or her own picture - a modern "Self timer" if you will. For example any or all of the criteria such as the items 1-7 above, can be used as criteria for the picture to be taken of oneself. This is in addition to other more normal things like taking pictures after a certain time, or on a certain date or time interval, etc. This has particular appeal for taking pictures of one's self, or in any other situation where the photographer is not present (e.g. unattended recording of animals, children, etc.). Similarly, a hand signal or other signal to the camera can be used to trigger the picture to be taken, using the computer camera combination to determine the hand position or movement. This can also be done by voice using microphone input and suitable voice recognition software in the computer.

[0061] Today, in a conventional context, one can as a photographer, choose to shoot a fashion model or other subject, and when you see a pose you like record the picture. But as one's own photographer, this is much more difficult, unless you stream in video and search through the poses after the fact. But even then, you don't know that the poses were what was desired, as no feedback exists during the shoot.

[0062] With the invention, you may program the system to take only those poses which you think you want to get. And it can instruct the subject, when a picture is taken (and the lack thereof indicating to do something different to obtain the desired effect resulting in a picture). The effect desired can be changed in midstream to adjust for changing wants as well, by changing the program of the computer (which could be done using hardware switches, inserting a disc, or otherwise entered as a command). In addition, as mentioned above, the gesture or pose desired, can be taught to the system, by first photographing a variety of acceptable positions or sequences, and putting bounds on how close to these will be accepted for photographing.

[0063] A specialized case is shown in fig. 3, for self taking instant picture or printout device for use in a shopping mall Kiosk or other venue. In this case two sweethearts 300 and 310 are on a bench 315 in front of the digital or other camera 320. When the computer 330 detects from processing the image (or images) of the invention that their faces are in close proximity (for example using the centroid of mass of their head as the position indicator, or even facial features such as described in the Lobo et al patent reference), the computer then instructs the camera to record the picture. A push button or other selector on the device allows the subjects to select what criteria they want – for example when their heads are together for 5 seconds or more, or not together, or hands held, or whatever. Or when their faces are within a certain distance criteria, such as one inch.

[0064] Alternatively, camera 320 may be a video camera and recorder which streams in hundreds or even thousands of frames of image data, and the selection of a group is made automatically by the invention in rapid fashion afterwards, with the subjects selecting their prints from the pre-selected (or taught as above) images as desired. Or the machine itself can make the final selection from the group, sort of as a random slot machine for pictures so to speak, and print the picture using inkjet printer 350 for example. Such a situation could be provided at less cost for example, with an incentive to add in your own criteria for an extra cost, and get pictures to choose from more along the lines desired. Note that in addition to, or instead of prints, they could have magnetic or other machine readable media to take home too.

FIGURE 4

[0065] Figure 4 illustrates means to provide all such functions in a 2D or 3D context, using simple equipment capable of widespread use.

[0066] For example, the simplest case is to use the same single camera such as 110, to both take the picture, and to determine location, according to the invention, of one or more points on the object or objects for purposes of controlling the picture taking, recording, or transmission process in some way.

[0067] As has been disclosed in the aforementioned referenced co-pending applications, one can view using the single camera, one or more such points in two dimensions, or in three dimensions under certain conditions when spaced points on the object have known spacing between them on the surface of the object.

[0068] Identifying points from raw images is processing intensive, as is determination movement gestures of such images, such as an image of an arm or hand in a varying clothing and background situations. But determining the location or movement of one or more artificial

targets such as a colored retro-reflector is easy, accurate and fast, based on brightness (under substantially coaxial illumination) and color - and possibly shape as well if the target is of some distinguishable shape.

[0069] For example, consider retro-reflector (e.g. glass bead Scotchlight 7615 tape by 3M company) 401, on the hand of a subject 404, the retro-reflector having a red reflection filter 405 matched to the wavelength of the LEDs 410 used with (and angularly positioned on or near the axis 415 of) camera 420 comprising lens 421 and detector array 422 used to take the picture of the object desired. When it is desired to determine the position of the hand 404, the red LED's are turned on by camera controller 430, and a bright reflection is seen in the image at the point in question due to the retro-reflection effect.

[0070] Where stereo pairs of cameras are used, as in fig 1 or 2, two reflections are seen whose disparity in location from one camera to the other gives the z distance (range direction) from the camera. In this case light sources are located with each camera of the stereo pair in order that for each camera, the retro-reflectors are properly illuminated with light emanating from point or points angularly near the camera in question.

[0071] The LEDs can be illuminated on alternate camera frames, or at any other time when "picture" type image data is not desired. In this case the camera does not under room lights 445 say, normally see the retro-reflection signal, which is desirable as the bright spot of 401 from the image of the human desired. Processor 450 processing the data, can even be used to subtract out from the recorded image, the shape of the retro-reflector, which might be a noticeably different shape than found in practice (e.g. a triangle). The image can be filled in where the subtraction occurred with color, brightness, contrast and texture or other characteristics of the surroundings. This is particularly easy if the target (retro-reflector or otherwise) is placed on the

human or object in a region of small variation in characteristics needed to be filled in, e.g. the back of one's hand, say. The key is that after processing, the image look like it did without addition of the artificial target.

[0072] If the LEDs are turned on by the camera controller during picture taking, color processing can be used to remove from the stored image of the scene, any indications of bright zones at the LED wavelength used, filling in with color of the surrounding area as desired.

[0073] Clearly both processing techniques just described or others can be used. And the methods work well with stereo pairs of cameras too.

[0074] Retro-reflective or other distinguishable artificial targets can be provided in different decorative designs for wrist, back of hand, rings, forehead, hats, etc. For example, 3 targets in a heart or triangle shape, a square box of 4 targets, or a box or pyramid with line targets on its edges, and so forth.

[0075] Colored targets can be made of cloth, plastic, or the like, including Colored plaids, polka dots, etc. Or coatings or Filters or evaporated on filters may be placed in front of a target such as a plastic retroreflector in order to render it of a given color (if it wasn't made of colored material in the first place).

[0076] Decorative line outlines (also possible in retroreflective bead material) can also be used as target datums, for example down the seam of glove fingers, or shoes, or belts, dress beading, etc.

FIGURE 5

[0077] Figure 5 illustrates further one of many methods by which the invention may be used to feed back data to a subject (or subjects) having his or her picture taken, in order that the subject assume another pose or engage in another activity.

[0078] For example consider fig 5. A girl 500 is having her picture taken by the camera of the invention 501 (in this case a single digital camera version such as illustrated in fig 4), and her positions, orientations or sequences of same, including motions between points are analyzed as described above, in this case by computer 530. The computer has been programmed to look for funny movements and positions, defined here as when the arms are in unusual positions (clearly a subjective issue, programmed as to tolerances, or taught to the system by the person in control of the situation).

[0079] The girl then poses for the camera. When the camera of the invention takes the picture according to its preprogrammed criteria (in this case, for example, defined as when her arms are over her head, and after a significant movement has occurred), it lets her know by lighting light 520 connected by wires not shown to computer 530. During the photo shoot, then she begins to learn what it is looking for (if she hasn't been already told) and does more of the same. If desired, and optional video display 540 or voice out put speaker 550, both connected to computer 530, indicate to her what is desired. This could also be a particular type of pose, e.g. "Cheese-cake" based on historic classical poses learned from photo art (note that she can also make comments for recording too, with optional microphone input not shown. As pointed out above, voice recognition software, such as IBM Via Voice" can be used to recognize commands from the subject or photographer, and cause other results).

[0080] It can be more sophisticated yet. For example, if the computer 530 and any associated software as needed may be used to analyze the model's lips and her smile. In this manner, the invention can be used to photograph all "smiling" poses for example. Or poses where the smile is within certain boundaries of lip curvature even. Similarly, the camera or cameras of the invention can be used, with suitable image analysis software to determine when

the subject's eyes are open a certain amount, or facing the camera for example.

[0081] Figure 3 above has alluded to possible use of the invention data processing to determine position and/or orientation data from recorded picture frames, after the picture is taken. A method for selecting from memory pictures obtained when certain pre programmed poses of objects sequences of poses, or relationships of objects are represented.

[0082] Selection can be according to criteria for example 1-7 above, but there are some differences. First if the data is taken normally from a single camera such as that of 202 above, 3D information is not available. This being the case, conventional 2D machine vision type image processing (e.g. "Vision Bloks" software from Integral Vision Corp.) can be used to extract object features and their locations in the images retained.

[0083] A second version alternatively could employ a single picture taking camera, but by employing 3 dot or other suitable targets on the photographed object in the camera field, could calculate 3D data related to the object (position and orientation in up to 6 axes can be so calculated by the computer of the invention using target location data in the camera image field).

[0084] A third version, records data from the camera, or in the case of the fig 2 device, all three cameras - all recorded for example on digital media such that the processing can be done after the fact, just as it would have been live.

[0085] Another application can be to monitor the relative change in successive pictures as seen by one or more relatively low resolution cameras and when such change is minimal, cue the high resolution camera requiring a longer exposure to become enabled. In this manner blur of the high resolution camera image is avoided. This is useful in taking pictures of children, for example. This comparison of images can be made without actually measuring distances, but rather by looking for images which are not different within an acceptance band, one to another,

thus indicating the motion is largely stopped. This can be determined by subtracting one image from the other and determining the amount of pixels above a threshold. The more, the less the images are alike. Other techniques can be used as well, such as correlation techniques.

[0086] In some instances it is desirable to have, in taking pictures, a display such as 555, preferably (but not necessarily) life size. This display can be not only used to display the image 565 of the person whose picture is being taken, but as well can display still (or video) images called up from computer memory or other media storage such as DVD discs, and the like. One use of the displayed images is to indicate to the subject a desired pose for example. This can be done by itself, or interactively using the invention. A computer generated and rendered 3D image can also be created using suitable 3D solid modeling software (such as CAD KEY) to show an approximate pose to the model.

[0087] For example the invention disclosed above, allows one to automatically observe the expressions, gestures and continence of a person, by determining the shape of their smile, the direction of eye gaze, and the positions or motion of parts of the body such as the head, arms, hands, etc. Analysis using pre programmed algorithms or taught sequences can then lead to a determination as to what information to display on display 555 controlled in image content by display processor 560.

[0088] As one instance, suppose computer image analysis of data from camera 501 of the invention has determined that the person 500 is not smiling enough, and is in too stationary a pose. A signal from computer 510 is provided to display processor 560 so as to display on display 555 an image of someone (perhaps the same subject at an earlier time, or a computer generated likeness of a subject) having the characteristics desired. The person looks at this display, and sees someone smiling more for example, and in one scenario, tries to mimic the

smile. And so forth. Alternatively, voice generation software, such as included in IBM VIAVOICE can be used to computer generate a voice command, "Smile More" for example, rather than show a visual illustration of the effect desired.

FIGURE 6

[0089] Let us now discuss some other applications of picture taking enabled by the invention. One embodiment can be used to determine location of items in a scene, for example furniture in a house, for which homicide studies or insurance fraud could be an issue (see also figure 1 above, as well as referenced co-pending applications).

[0090] For example, a detective (whose arm 600 is shown) arrives at a murder scene in a room, and he sets the stereo camera 610 of the invention disclosed in fig 2c on a tripod 620 (or other suitable location) and systematically designates, using laser pointer 630, any object desired, such as chair 640 impacted by the laser beam at point P. The camera/computer system of the invention locates the designated point takes a picture of the room, or a portion thereof, including the zone of the designated point P which stands out in the picture due to the laser spot brightness. Optionally, the stereo pair of cameras of the invention can digitize rapidly the xyz coordinates of point p, which can be superposed if desired on the image of the scene including point p itself and its immediate surroundings. This data can be processed by computer 660 as desired and either recorded or transmitted to a remote location along with the images as desired using known communication means. This work can be done outdoors, as well as inside. Numerous points to be digitized can be sensed and/or indicated, as desired.

[0091] The same digitization procedure can be used to digitize a room for a real estate person for example, to develop a data base on a house for sale. And many other such applications exist.

[0092] Finally it should be noted that the invention solves many famous problems of picture taking, for example of children. The digital camera images of the invention can be processed for example using appropriate software such as Vision Bloks to determine if the child's eyes are open (determined for example by recognizing the eye iris in the face area), and if so to take the picture, or after the fact, to select the picture from a group. Or a signal can be given by the system to the child to "open your eyes" so to speak. To determine if the eye is open, the image can be processed for example to look for the white of the eye, or to look for red reflections from the eye. This can even be done with deep red, or near IR light sources like LEDs which do not bother the child.

[0093] Similarly, if the child (or other subject) is in motion, when you want him still, the picture can be analyzed until he is still, and then the picture taken or selected. This can be determined from comparison of successive frames, from motion blur or other characteristics of motion in the image. Or a signal as above can be given to the child to "sit still" (a famous command in picture taking annals).

FIGURE 7

[0094] The invention can also be used for commercial photography and for producing motion pictures. One advantage is that very high resolution images at suitable exposure levels of critical scenes can be taken, but not too many which would overload the memory capacity of a camera system. A means to enhance this is now described.

[0095] It is noted that a camera having an ability to read individual pixels as desired, or at least to choose the lines of pixels to be read, can achieve high rates of scan if one knows apriori where to look apriori for data. Or if one say scans every 20th pixel in either direction xy of the camera, to determine where frame to frame changes are occurring (due to change in pixel

brightness or color). Once change is determined one can often isolate those areas to the ones of interest. For example, even in a "Still" picture, the head often moves (similar to the lovers on the bench in the shopping mall mentioned above). Every 20th pixel, cuts the number of pixels by 400 times, and raises a normal 30hz scan rate to over 1000 scans per second - more than needed in many cases.

[0096] When the area of interest is found, the pixels in that area are all scanned for example.

[0097] Such pixel addressing cameras can also be used for determining the position and change in position of features used to determine, and track, pose and other variables, as has also been discussed in co-pending applications, particularly Camera Based Man-Machine Interfaces US SN 60/142,777, incorporated herein by reference. Of special interest is that same high resolution camera can be used to take the picture desired, while at the same time be used to find or track the object at high speed.

[0098] Such high speed tracking can be interspersed with the taking of pictures. For example if in photographing a ballet, it may be desired only to take pictures of the prima ballerina, who typically is the one, with any male dancer, that is moving the most. By determining the zone to be measured, one can sense quickly what zone should looked at, and high resolution photographs obtained from that zone. This allows one to use a very large format camera in a fixed location (e.g. 5000x5000 pixels) to cover the image of the whole stage via suitable optics, but to only take and store the pixels in a 1000x700 zone of interest movement, or positional or gesture interest for example, providing a 35 times increase in the frame rate needed today with such large pixel cameras. This allows their practical use, without resort to human cameramen, or pan/tilt mechanisms.

[0099] Similar logic holds for quarterbacks in a football game, who often run faster than any defense men around them and can be differentiated accordingly (along with any other issues such as uniform color, design or the like). If possible, it is desirable to have a clearly defined target, such as a retroreflective or bright colored target on one's helmet for example. Indeed helmet color can be chosen accordingly.

[0100] This is illustrated in fig 7 wherein camera 701 composed of lens 705 and an addressable version of a Kodak MegaPixel detector array 710 having 4000x4000 elements and under the control of computer 711 is used to scan the image of a pair of dancers 715 and 716 on stage 720. The field of view of the camera equal to area ab covers the whole stage. But the area scanned out from array 710 is confined to the region in which the dancers were last seen, which is defined as a zone a'b' equal to in this case 500x500 pixels. This still allows DVD type resolutions to be achieved, without pan or tilt of the camera. Similarly such techniques can be used for video conferencing, sports, and other activities as well.

[0101] It should be noted that in the above embodiments the words picture and photograph are interchangeable, as are photographing or photography and picture-taking. The camera used for same is preferably but not necessarily a solid state TV camera whose pixels are scanned serially or randomly under program command.

FIGURE 8

[0102] The invention can also be used to sense positions of people for instructional purposes. Data as to a dancer's movements for example can be obtained, and appropriate images, or data or both transmitted without excessive bandwidth requirements to a remote location for comment or interaction by a trained professional. Combined with life-size screen displays this allows a life like training experience to be gained at low cost, since one professional can watch

10 students in different locations say, each trying her movements alone in the intervening moments. In addition such training can occur in the home, as if one had a private tutor or coach.

[0103] For example consider fig 8. A class of ballet students is practicing near a "mirror" which in this case is comprised life size digital display screen 800 illuminated from the rear by a Sharp brand projector 801 driven by computer 810. By sliding a real mirror in an out the mirror can be a mirror, or a display. If desired, this display can be extensive, and for example using 3 projectors to cover 3 adjacent screens each 6 feet high x9 feet long for example, such that a total length of a large studio is comprised.

[0104] A master instructor 825 (possibly remotely located via the internet or other communication means) can observe the students via TV camera (or cameras). By viewing the students the instructor can make corrections via audio, or by calling up imagery which represents the appropriate moves - for example from a professional doing the same Swan Lake number. In addition, the TV cameras of the invention can monitor the actual location and movements of the student, or students, and their relationship to each other, and if desired to various markers such as 830 on the floor of the studio, placed there to assist in choreographing the piece.

[0105] In addition, if the various gesture and position monitoring aspects of the invention are utilized as described above and in co-pending applications it is possible to have the instructions computer generated using dancers movements as input to a computer analysis program. This is particularly useful if dance routines which are classical in nature, are being attempted, which have known best forms which can be computer modeled.

[0106] In another version, an assistant can be on the scene say working with ten students in a local studio, while the master is remote.

[0107] It is also possible with the invention to provide input image data to projector

computer 810, even from remote internet located sources, which represents other people dancing for example. These can be images of the master, or others in the class - even if all in different locations. OR the images can be those of others who have performed a particular routine in the past, for example Dance of the Sugar plum fairy in the Nutcracker. This imagery could be from the Bolshoi ballet performance of the same dance, displayed in small town ballet studio or home - to illustrate the moves required. The use of life size projection not only gives a feel to this imagery, but further allows, I have discovered, a unique experience for the performer. Namely that the person can perform "with" the troupe displayed. In some cases, in ballet for example, this sometimes can be more useful than watching one's self in the mirror (typical in ballet studios).

[0108] By using the cameras of the invention, such as stereo pair 850 and 851 to determine student positions, it is also possible to control the display in many ways. For example as the student got closer to the display, the persons in the display could appear to come closer to the student. Conversely, it might be desirable to have them move away from the student to keep a constant apparent distance between them for example. And if the student is twirling left, the figures in the ballet depicted on the screen can be caused to turn right (as they are "in the mirror" so to speak) to match the movement of the student in approximate form at least.

[0109] In addition it is often desirable for learning purposes to Control speed of music and video display to match sensed movements of pupil, or from remote master person. Use display techniques which can produce variable motion display, such as variable speed DVD disc or read data in to ram. In addition it is desirable that overlaid could be masters voice.

[0110] The invention can be advantageously used in many performing arts, not just ballet. For example, live theatre, where actors from Hamlet performances of the past can interact

with those practicing. Or where instructors of Skating or Gymnastics, other activities can also interact.

[0111] Sports as well is amenable to the technique, but the size of the "studio" or gym becomes an issue. Basketball for example fits the space aspect of the projection screens and the fields of view of the invention cameras as here described.

[0112] Ability of masters remotely located, and use of copyrighted performance material of famous performers and troupes allows one to franchise the studio concept of the invention. For example each town could have a Bolshoi studio franchise of this type.

[0113] It is noted that this same arrangement can serve other purposes beyond instruction. One is the possibility of remote dating, in which sensed movement of one partner is communicated, along with voice and visual expression to the other. In addition, is possible, as disclosed in co-pending applications, to build the displays described above in the form of a touch screen in which contact of one partner with the display of the other remotely transmitted from afar can occur.

[0114] If one uses large scale touch screens with optional added sensor inputs. As would be the ballet studio example of fig 8 if equipped with touch screen capability, then one can provide a mechanism for marketing of people relative (i.e. life size) objects such as automobiles in facilities such as Auto showrooms. Thus a ballet studio for example, can be used for other purposes, not just instructional, but for selling cars for example, where the display screen is displaying new models (including ones that are figments of design imagination, and where customer input is desired as in a focus group) and where customer inputs voice and action can be detected if desired by the invention. Or in reverse, an underused car showroom can be converted - on demand - into a site which can be used for, among other things, instructional purposes in

performing arts, sports and the like. This gives a reason for being to the show room that transcends selling cars, and helps attract people to the facility. If a car was displayed, on a touch screen, one could walk up to the full size display of the car, and touch the door handle, which would cause the touch screen to sense that same had occurred, and indicate to the computer to cause the display to display the door opening to expose the interior.

CLAIMS

1. A portable device comprising:

a device housing including a forward facing portion, the forward facing portion including an electro-optical sensor having a field of view and a digital camera separate from the electro-optical sensor; and

a processing unit within the device housing and operatively coupled to electro-optical sensor, wherein the processing unit is adapted to control the digital camera in response to a gesture performed in the electro-optical sensor field of view.

2. The portable device of claim 1 wherein the gesture corresponds to an image capture command.

3. The portable device of claim 1 wherein the determined gesture includes a hand motion.

4. The portable device of claim 1 wherein the determined gesture includes a pose.

5. The portable device of claim 1 wherein the electro-optical sensor is fixed in relation to the digital camera.

6. The portable device of claim 1 further including a forward facing light source.

7. The portable device of claim 1 wherein the electro-optical sensor defines a resolution less than a resolution defined by the digital camera.

8. The portable device of claim 1 wherein the electro-optical sensor includes at least one of a CCD detector and a CMOS detector.

9. A computer implemented method comprising:

providing a portable device including a digital camera on a forward facing portion thereof, the digital camera defining a field of view;

determining, using a processing unit, a gesture performed in the digital camera field of view; and

capturing an image to the digital camera in response to the determined gesture corresponding to an image capture command.

10. The method according to claim 9 wherein the determined gesture includes a hand motion.

11. The method according to claim 9 wherein the determined gesture includes a pose.

12. The method according to claim 9 further including providing a forward facing electro-optical sensor and detecting, using the electro-optical sensor, the gesture performed in the digital camera field of view.

13. The method according to claim 12 wherein the electro-optical sensor includes first and second sensors in fixed relation relative to the digital camera.

14. The method according to claim 12 wherein the electro-optical sensor defines a resolution less than a resolution defined by the digital camera.

15. An image capture device comprising:

a digital camera adapted to capture an image and having a field of view;

a sensor adapted to detect a gesture in the digital camera field of view; and

a processing unit operatively coupled to the sensor and to the digital camera, wherein the processing unit is adapted to correlate a gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera.

16. The image capture device of claim 15 wherein the determined gesture includes a hand motion.

17. The image capture device of claim 15 wherein the determined gesture includes a

pose.

18. The image capture device of claim 15 further including a forward facing light source.

19. The image capture device of claim 15 wherein the sensor defines a resolution less than a resolution defined by the digital camera.

20. The image capture device of claim 15 wherein the sensor is fixed in relation to the digital camera.

ABSTRACT

Disclosed are methods and apparatus for instructing persons using computer based programs and/or remote instructors. One or more video cameras obtain images of the student or other participant. In addition images are analyzed by a computer to determine the locations or motions of one or more points on the student. This location data is fed to computer program which compares the motions to known desired movements, or alternatively provides such movement data to an instructor, typically located remotely, who can aid in analyzing student performance. The invention preferably is used with a substantially life-size display, such as a projection display can provide, in order to make the information displayed a realistic partner or instructor for the student. In addition, other applications are disclosed to sports training, dance, and remote dating.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	135873.152189-0003
	Application Number	
Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION	

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Attorney Docket Number	135873.152189-0003	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	2

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Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	13459670	2012-04-30

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13459670	Continuation of	12891480	2010-09-27	8189053	2012-05-29

Prior Application Status	Patented				Remove
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12891480	Continuation of	11376158	2006-03-16	7804530	2010-09-28

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11376158	Continuation of	09568552	2000-05-11	7015950	2006-03-21

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	Application Number	
Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION	

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09568552	non provisional of	60133671	1999-05-11

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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.

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 APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/961,452

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	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			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	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))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	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))									
	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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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/961,452	08/07/2013	2486	1030	135873.152189-0003	20	3

CONFIRMATION NO. 3753

24335
WARNER NORCROSS & JUDD LLP
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900 FIFTH THIRD CENTER
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GRAND RAPIDS, MI 49503-2487

FILING RECEIPT

OC000000063395008

Date Mailed: 08/28/2013

Receipt is acknowledged of this non-provisional 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 APPLICANT, 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 Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections 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**

Inventor(s)

Timothy R. Pryor, Sylvania, OH;

Applicant(s)

Timothy R. Pryor, Sylvania, OH;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/459,670 04/30/2012
which is a CON of 12/891,480 09/27/2010 PAT 8189053
which is a CON of 11/376,158 03/16/2006 PAT 7804530
which is a CON of 09/568,552 05/11/2000 PAT 7015950
which claims benefit of 60/133,671 05/11/1999

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.

If Required, Foreign Filing License Granted: 08/22/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/961,452**
Projected Publication Date: To Be Determined - pending completion of Corrected Papers
Non-Publication Request: No
Early Publication Request: No
**** SMALL ENTITY ****

Title

CAMERA BASED INTERACTION AND INSTRUCTION

Preliminary Class

348

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).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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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).

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003

CONFIRMATION NO. 3753

24335
WARNER NORCROSS & JUDD LLP
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GRAND RAPIDS, MI 49503-2487

FORMALITIES LETTER

OC000000063395009

Date Mailed: 08/28/2013

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. 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 required item(s) identified below must be timely submitted to avoid abandonment:

- A substitute specification in compliance with 37 CFR 1.52, 1.121(b)(3), and 1.125, is required. The substitute specification must be submitted with markings and be accompanied by a clean version (without markings) as set forth in 37 CFR 1.125(c) and a statement that the substitute specification contains no new matter (see 37 CFR 1.125(b)). The specification, claims, and/or abstract page(s) submitted is not acceptable and cannot be scanned or properly stored because:
  - The application contains drawings, but the specification does not contain a brief description of the several views of the drawings as required by 37 CFR 1.74 and 37 CFR 1.77(b)(7).
- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - More than one figure is present and each figure is not labeled "Fig." with a consecutive Arabic numeral (1, 2, etc.) or an Arabic numeral and capital letter in the English alphabet (A, B, etc.)(see 37 CFR 1.84(u)(1)). See Figure(s) FIG. 2. A brief description of the several views of the drawings (see 37 CFR 1.74) should be added or amended to correspond to the corrected numbering of the figures. See also 37 CFR 1.77(b)(7).

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

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:

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Alexandria VA 22313-1450

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

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

/tly/

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Timothy R. Pryor
Art Unit	:	2486
Application No.	:	13/961,452
Filing Date	:	August 7, 2013
For	:	CAMERA BASED INTERACTION AND INSTRUCTION
Attorney Docket No.	:	135873. 152189-0003

Mail Stop Missing Parts
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

In response to the Notice to File Corrected Application Papers mailed August 28, 2013, the shortened period for response being until October 28, 2013, Applicant hereby submits a Substitute Specification in conformance with 37 CFR 1.74. No new matter has been added.

All informalities having been corrected, Applicant respectfully requests the application be deemed formal. The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. 230457.

Respectfully submitted,

TIMOTHY R. PRYOR

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9497956

THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Timothy R. Pryor
Art Unit	:	2486
Application No.	:	13/961,452
Filing Date	:	August 7, 2013
For	:	CAMERA BASED INTERACTION AND INSTRUCTION
Attorney Docket No.	:	135873. 152189-003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBSTITUTE SPECIFICATION UNDER 37 C.F.R. § 1.125

Enclosed are the following:

1) Substitute Specification with markings, showing all changes made in reply to the Notice to File Corrected Application Papers mailed August 28, 2013; and

2) Substitute Specification clean version (without markings).

The Substitute Specification contains no new matter.

Respectfully submitted,

TIMOTHY R. PRYOR

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SUBSTITUTE SPECIFICATION
(Marked-Up Copy)

CAMERA BASED INTERACTION AND INSTRUCTION

INTRODUCTION

[0001] Method and apparatus are disclosed to enhance the quality and usefulness of picture taking for pleasure, commercial, or other business purposes. In a preferred embodiment, stereo photogrammetry is combined with digital image acquisition to acquire or store scenes and poses of interest, and/or to interact with the subject in order to provide data to or from a computer. Other preferred embodiments illustrate applications to control of display systems.

BACKGROUND

[0002] Representative of USA Patents on Digital cameras are US Pat # 5,534,921, 5,249,053 and many others which describe use of matrix array (CCD or otherwise) based cameras to take pictures of humans or other objects. The images taken are generally comprised of 400,000 or more pixels which are often compressed to smaller record sizes for data storage, for later retrieval and display. Video cameras or Camcorders are also increasingly able to take still photographs as well, and record or transmit them to computers.

[0003] Aside from exposure control (to keep the light reaching the detector array within the dynamic range of same), and range finding (to effect the best lens focus given the object distance in question) there are few cases known to the inventor where the camera taking the picture actually determines some variable in the picture and uses it for the process of obtaining the picture.

[0004] One such example that does not take a picture of humans but rather of data, is exemplified by USP 4,791,589, where a certain wave form signature on an oscilloscope is searched for by processing the digital camera image, and when it is seen, the image stored.

More apropos the function of "Picture Taking" as the general public knows it and of

interest as the primary focus of the instant invention, is US 5,781,650 by Lobo, et al which describes analysis after the fact of recorded images to determine facial content and thus the age of the subject. This disclosure also alludes to a potential point and shoot capability also based on the age classification of the individuals whose picture is desired.

[0005] There is no known picture taking reference based on object position and orientation with respect to the camera, or other objects that I am aware of.

SUMMARY OF THE INVENTION

[0006] High Resolution Digital still cameras employing matrix photodetector array chips to scan the image produced by the camera lens are now commonplace, and will be even more so in a few years as chips and memories become very inexpensive, and pixel density approaches 2000x2000 pixels, rivaling photographic film. Even today Camcorders having 700x500 pixel image chips are common for video based data and stills.

[0007] This invention is aimed at improvements in utilization of these cameras and others which make use of a computer based camera's ability to analyze, in real time if desired, the images obtained. Indeed a picture taking system may be composed of a combination of cameras, some used for purposes other than the recording of the picture proper.

[0008] It is a goal of the invention to provide a method for taking pictures when certain poses of objects, sequences of poses, motions of objects, or any other states or relationships of objects are represented. It is also a goal to allow this to be done in a self timer like mode, when desired scene situations or specific dates or other circumstances exist. In some cases, information as to what is desired may be entered remotely, even over the internet, or radio telephone.

[0009] It is also a goal of the invention to provide a method for selecting from a digital or other picture memory, pictures obtained when certain pre programmed poses of objects,

sequences of poses, or relationships of objects are represented.

[0010] It is a further goal of the invention to provide means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken.

[0011] It is a still further goal to provide all such functions in a 2D or 3D context, and using simple equipment capable of widespread use.

[0012] It is another goal of the invention to feed back data to a subject or subjects having his or her, or their picture taken, in order that they assume another pose or engage in another activity, or juxtaposition of subject positions.

[0013] While this invention is primarily aimed at the general picture taking public at large, it is realized that commercial photographers and cine-photographers, for example in the coming trend to digital "Hollywood" movie making, may benefit greatly from the invention herein, as it potentially allows more cost effective film production by giving the director the ability to expose the camera to the presence of masses of data, but only saving or taking that data which is useful, and if desired, to signal the creation of further data based on data obtained. All this with little or no human intervention as desired, thus saving on the cost of direction, film crews, and other labor or venue related costs.

DRAWINGS DEPICTING PREFERRED EMBODIMENTS OF THE INVENTION

[0014] Figure 1 illustrates means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken.

[0015] Figures 2A-2D illustrate[[s]] a method for taking pictures when certain pre programmed poses of objects, sequences of poses, or relationships of objects are represented.

[0016] Figure 3 illustrates a self timer like mode, or when specific dates or other circumstances exist, including a system embodiment for taking pictures in shopping malls or

other locales and providing instant print or other hardcopy capability (e.g. on a tee shirt).

[0017] Figure 4 illustrates means to provide all such functions in a 2D or 3D context, using simple equipment capable of widespread use. Various retroreflective artificialtarget configurations are also disclosed.

[0018] Figure 5 illustrates a method to feed back data to a subject having his or her picture taken, in order that the subject assumes another pose or engage in another activity.

[0019] Figure 6 illustrates a commercial version of the invention useful for police departments and real estate agents, among others.

[0020] Figure 7 illustrates an embodiment of the invention used for photography of stage performances.

[0021] Figure 8 illustrates an embodiment of the invention used for ballet instruction and other teaching and interaction activities also with remotely located instructors or players.

EMBODIMENTS OF THE INVENTION

FIGURE 1

[0022] Illustrated in figure 1 of the invention is means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken, and in this context, figure 1 resembles that of co-pending referenced application 9 above. A single camera, or a set, such as a stereo pair are employed to see portions of an object, such as a person, a part of a person such as a hand, leg, foot, fingers, or head, and/or to view datums on an object, portion of an object, or an object held by the person or with which the person interacts. In addition, multiple persons and objects can be seen.

[0023] Where a single camera is employed, 2D measurements of object location relative to the camera (x and y perpendicular to the camera axis) are all that is possible, unless datums of

known shape or spacing are used on the object viewed. Where a stereo pair or more of cameras are employed, 3D (xyz) data of a single point can be provided, for example retro-reflector 50 on the head 52 of person 51. In both cases where 3 or more datums are used on an object, 6 Degree of freedom data can be obtained, allowing object orientation in 3 angular axes as well as range in 3 axes to be obtained. With two or more cameras, such 3D data may also be obtained using other features of objects such as edges of arms and the likely using known photogrammetric techniques.

[0024] The cameras used may also be used to take pictures of an object, or another specialized camera used for that purpose in conjunction with those used to determine the location of object features. Both examples are illustrated in this application.

[0025] As shown in this figure, two cameras 101 and 102 are used as a stereo pair, with each camera located at opposite sides of a TV monitor 105, used for either computer or Television display or both. This is a desirable configuration commercially and discussed the co-pending application references above. In this particular case, an additional camera 110 is shown in the middle of the other two, said added camera used for picture taking, internet telephony and/or other purposes. An optional auxiliary LED light source 115 (or 116 or 117) for illuminating a user 60 or other object is also shown.

[0026] All three cameras are connected to the computer 130 by means of a USB (Universal Serial Bus) daisy chain, or IEEE 1394 firewire connections (faster). Each is accessed, as needed for position and orientation determination, or picture taking.

[0027] Even using a single camera in two dimensions (as is normal today), some position and orientation data or sequences of same can be achieved using modern image processing techniques. (See for example the invention disclosed in USP 4,843,568 of Myron Krueger).

However, accurate sensing and control of systems, such as cameras herein is difficult today with processors cost effective enough to be used by the public at large, and artificial target augmentation of image points is often desirable.

[0028] It is thus possible using the invention to be taking pictures of users of interactive computer systems for whatever purpose. This allows one to automatically capture images of children at play, for example with a computer system such as a computer game. It also enables many other functions which are described below. And it can be used in the field, where the computer, stereo position sensing and picture taking camera, may be co-located together in the same housing.

[0029] It is noted that where retro-reflectors are used, (as opposed to choosing for example less contrasting datums, for example natural object features such as edges of fingers, or clothing features, or targets such as colored dots) then each of the two cameras for stereo location determination needs lights to illuminate retro-reflectors substantially co-located with the camera axes. These lights can alternatively provide general lighting for any other camera or cameras to use in taking photographs or other purposes.

[0030] It is noted that cameras 101 and 102 need not have the image of the retro-reflector or other discernable target be in precise focus, indeed it is often helpful to have a some blur due to defocusing so as to aid sub pixel position solution of datum location. If the LEDs or other light sources are in the near infrared, and the camera lenses are focused in the visible, this occurs naturally, unless the lens is also near infrared chromatic corrected.

[0031] An optional laser pointer (or other suitable illumination source), comprised of diode laser and collimating optics 150 is also usable with the invention to illuminate object portions from which 3D data is desired (such as the neck region of person 51 as shown), or in the

simpler case to designate which areas of a picture are to be focused, or zoomed in on or transmitted or recorded - with or without consideration of 3-D position data of the object. This can be fixed as shown, or optionally hand held by the user, for example in left hand (dotted lines) and used by him or her to designate the point to be measured in 3D location. (see also references above). In addition a person taking pictures, such as a photography can without looking through the viewfinder of the camera, point to appoint on the subject, which is then dealt with by camera typically by focusing the lens system such that the point is in the desired state of focus (usually but not necessarily when the laser spot on the subject appears smallest in diameter and/or of highest contrast). Such as system is particularly useful for cameras with wide fields of view, or those mounted on pan tilt mechanisms, where the mechanism can also be activated to position the camera axis to take the picture with the laser spot for example centered in the camera field.

[0032] In the laser designated case, it is generally the laser spot or other indication on the surface that is imaged, (although one can also instruct, for example using voice recognition software in computer 130 inputted via voice activated microphone 135, the camera processor to obtain and store if desired the image of the area around the spot projected onto the object as well or alternatively), and if the spot is desired, it is often useful that cameras 101 and 102 have band-pass filters which pass the laser wavelength, and any led illumination wavelengths used for retro-reflector illumination for example, but block other wavelengths to the extent possible at low cost. It is noted that the discrimination in an image can also be made on color grounds - i.e. with red diode lasers and red LEDs, the system can analyze the image areas containing reds in the image, for example - with the knowledge that the answer can't lie at any shorter wavelengths (e.g. green, yellow, blue).

[0033] By using two cameras 101 and 102, a superior ranging system for the laser spot

location on the subject results, since the baseline distance "BL" separating the cameras for triangulation based ranging purposes can be sufficient to provide accurate measurement of distance to the object.

FIGURES 2A-2D

[0034] As we begin to consider the apparatus of figure 1, it is clear one could do much more to enhance picture taking ability than hereto fore described and contained in the prior art. And it can be done with apparatus capable of field use.

[0035] Figures 2A-2D for example, illustrates a method for taking pictures when certain pre programmed or otherwise desired poses of objects, sequences of poses, or relationships of objects are represented. No such ability is available to photographers today.

[0036] Consider still camera system 201, patterned after that of fig 1 and comprising 3 cameras and associated image scanning chips. The central camera, 202, is for picture taking and has high resolution and color accuracy. The two cameras on either side, 210 and 211, may be lower resolution (allowing lower cost, and higher frame rate, as they have less pixels to scan in a given frame time), with little or no accurate color capability, as they are used to simply see object positions or special datum positions on objects (which may be distinguished however by taught colors for example as taught in some of my co-pending inventions).

[0037] Cost wise the distinction between cameras is important. Today low cost CMOS chips and lenses capable of the providing stereo measurements as described above are $15 or less. High quality CCD color detector arrays and lenses for high quality photo images are over $100, and in many cases $1000 or more.

[0038] An optical viewfinder 215 is one of many ways to indicate to the user what scene information is being gathered by the camera system. The user can in this invention specify with a

viewfinder based readout, the area of the field that is desired. Use of the viewfinder in this manner, whether looked through or displayed on a screen, is for example an alternative to designating an area on the actual object using a laser pointer for the purpose.

[0039] The camera system 201 further contains a computer 220 which processes the data from cameras 210 and 211 to get various position and/or orientation data concerning a person (or other object, or persons plural, etc). Integral light sources as described in fig. 1 above may also be provided such as LED arrays 240 and 245 and xenon flash 246.

[0040] In general, one can use the system to automatically "shoot" pictures for example, when any or all of the following occur, as determined by the position and orientation determining system of the camera of the invention:

[0041] 1. Subject in a certain pose.

[0042] 2. Subject in a sequence of poses.

[0043] 3. Portion of Subject in a sequence of poses (e.g. gestures).

[0044] 4. Subject or portion(s) in a specific location or orientation.

[0045] 5. Subject in position relative to another object or person. For example, this could be bride and groom kissing in a wedding, boy with respect to cake on birthday, and sports events sequences of every description (where the camera can even track the object datums in the field and if desired adjust shutter speed based on relative velocity of camera to subject).

[0046] 6. Ditto all of above with respect to both persons in certain poses or gesture situations.

[0047] 7. When a subject undertakes a particular signal comprising a position or gesture-i.e. a silent command to take the picture (this could be programmed, for example, to correspond to raising one's right hand).

[0048] In addition it is noted that the invention acts as a rangefinder, finding range to the subject, and even to other subjects around the subject, or to all parts of interest on an extensive subject. This allows a desired lens focus to be set based on any or all of this data, as desired. It also allows a sequence of pictures to be taken of different objects or object portions, at different focal depths, or focus positions. The same holds true for exposure of these locations as well.

[0049] It is also possible to use the above criteria for other purposes, such as determining what to record (beyond the recording that is implicit in taking pictures), or in determining what to transmit. The latter is important vis a vis internet activity, where available internet communication bandwidth limits what can be transmitted (at least today). In this case video telephony with the invention comprehends obtaining only those images you really care about in real time. So instead of transmitting low resolution image data at 20 frames a second, you can transmit say 5 (albeit asynchronously gathered) frames of high resolution preferred data. (This doesn't solve flicker problems, but it does mean that poor quality or extraneous material isn't sent!). Criteria such as degree of image motion blur or image focus can also be used in making transmission decisions.

[0050] Figure 2B[[b]] illustrates a block diagram showing a pose analysis software or hardware module 250 analyzing processed image data (for example utilizing camera image data processed by visionbloks software from Integral Vision Corp.) from the computer 220 (which may be the same physical microprocessor, such as a Intel Pentium 2 in a Dell inspiron 3500 laptop computer, or different) and determining from same when a certain pose for example has been seen. When this occurs, a signal is sent to the camera control module 255 to hold the last frame taken by camera 202, and to display it to the photographer, digitally store it, or transmit it - to someone else, or another data store or display. Such transmission can be by data link, internet,

cell phone, or any other suitable means.

[0051] Another criteria could be that two or more preselected poses were seen one after the other, with a time delay between them, also pre-selected if desired.

[0052] Figure 2C illustrates a specific case whereby a point on one person, say hand 260 of man 265 having head 271, is determined, and a picture is taken by camera system 201 of the invention when this point comes within a distance of approximately 6 inches (or any other desired amount including contact - i.e. zero distance) from another person or object, say the head 270 of woman 275. To obtain the data, one can look for hand or head indications in the image using known machine vision techniques, and/or in a more simple case put a target marker such as colored triangle 285 or other type on the hand or head or both and look for it.

[0053] The use of the natural features of the subjects heads, which are distinguishable by shape and size in a known field containing two persons, is now illustrated. For example, image morphology or template matching in the image field of the solid state TV camera 202 can be used to distinguish the head shapes from background data and data concerning the rest of the features such as hands, etc. of subjects 265 and 275 (or conversely hand shapes if desired can be found and heads excluded, or the hand of the right person, versus the head of the left, and so forth).

[0054] As shown in figure 2D, when the image field 287 of camera 202 after processing contains the two head images, 290 and 291, spaced a distance "W". When W is not within a tolerance D, the picture is not taken; whereas if the heads are close enough, within D as illustrated in dotted lines, the picture is taken.

[0055] Criteria as mentioned can include proximity of other parts of the body, or objects associated with the subjects (which themselves can be objects). In addition, the motion or

relative motion of objects can be the criteria. For example, one could take program the device to take the picture when on two successive frames the condition shown in fig 2D exists where the heads are apart in frame 1, but closer in frame 2 (probably corresponding to a movement say of the boy to kiss the girl). Clearly other sequences are possible as well, such as movement taking place in several frames followed by a sequence of frames in which no movement occurs. Other means to determine motion in front of the camera can also be used in this context, such as ultrasonic sensors.

[0056] It is also noted that the actual position or movement desired can be "Taught" to the computer 220 of the picture taking system. For example, a boy and girl in a wedding could approach each other and kiss beforehand. The sequence of frames of this activity (a "gesture" of sorts by both parties) is recorded, and the speed of approach, the head positions and any other pertinent data determined. When the photographer thinks the picture is right, the computer of the camera system is instructed to take the picture- for example it could be at the instant when after a suitable approach, two head images become joined into one- easily recognizable with machine vision processing software under uniform background conditions. Then in the future, when such a condition is reached in the camera field of view, pictures are taken and stored, or transmitted. This allows a camera to free run whose image field for example takes in the head table at a wedding party, taking only the shots thought to be of most interest. Numerous conditions might be programmed in, or taught in- another at the same party, would be anyone at the head table proposing a toast to the bride and groom, with arm and glass raised. If video is taken, it might be taken from the point at which the arm rises, until after it comes down. Or with suitable voice recognition, when certain toast type words are heard, for example.

APPLICATION TO "3-D" PICTURES

[0057] Where it is desired to take "3-D" pictures, it can be appreciated that each camera, 210 and 211 can take images of the scene in place of camera 202, and that both cameras 210 and 211 outputs can be stored for later presentation in a 3D viewing context, using known display techniques with appropriate polarized glasses or switchable LCD goggles for example. In this case the camera outputs can serve double duty if desired, each both recording picture data, as well as determining position of one or more points on the object or objects desired.

[0058] In addition, or alternatively, one can use in this 3D picture case, the camera 202 (or even a stereo camera pair in place of 202) as a means for determining position and orientation independently from the stereo picture taking cameras.

[0059] If not used for immediate position information, camera 202 does not have to be digital and could employ film or other media to record information.

FIGURE 3

[0060] In a manner resembling that of figs. 2A-2D above, the invention can also serve to aid a person to take his or her own picture - a modern "Self timer" if you will. For example any or all of the criteria such as the items 1-7 above, can be used as criteria for the picture to be taken of oneself. This is in addition to other more normal things like taking pictures after a certain time, or on a certain date or time interval, etc. This has particular appeal for taking pictures of one's self, or in any other situation where the photographer is not present (e.g. unattended recording of animals, children, etc.). Similarly, a hand signal or other signal to the camera can be used to trigger the picture to be taken, using the computer camera combination to determine the hand position or movement. This can also be done by voice using microphone input and suitable voice recognition software in the computer.

[0061] Today, in a conventional context, one can as a photographer, choose to shoot a fashion model or other subject, and when you see a pose you like record the picture. But as one's own photographer, this is much more difficult, unless you stream in video and search through the poses after the fact. But even then, you don't know that the poses were what was desired, as no feedback exists during the shoot.

[0062] With the invention, you may program the system to take only those poses which you think you want to get. And it can instruct the subject, when a picture is taken (and the lack thereof indicating to do something different to obtain the desired effect resulting in a picture). The effect desired can be changed in midstream to adjust for changing wants as well, by changing the program of the computer (which could be done using hardware switches, inserting a disc, or otherwise entered as a command). In addition, as mentioned above, the gesture or pose desired, can be taught to the system, by first photographing a variety of acceptable positions or sequences, and putting bounds on how close to these will be accepted for photographing.

[0063] A specialized case is shown in fig. 3, for self taking instant picture or printout device for use in a shopping mall Kiosk or other venue. In this case two sweethearts 300 and 310 are on a bench 315 in front of the digital or other camera 320. When the computer 330 detects from processing the image (or images) of the invention that their faces are in close proximity (for example using the centroid of mass of their head as the position indicator, or even facial features such as described in the Lobo et al patent reference), the computer then instructs the camera to record the picture. A push button or other selector on the device allows the subjects to select what criteria they want – for example when their heads are together for 5 seconds or more, or not together, or hands held, or whatever. Or when their faces are within a certain distance criteria, such as one inch.

[0064] Alternatively, camera 320 may be a video camera and recorder which streams in hundreds or even thousands of frames of image data, and the selection of a group is made automatically by the invention in rapid fashion afterwards, with the subjects selecting their prints from the pre-selected (or taught as above) images as desired. Or the machine itself can make the final selection from the group, sort of as a random slot machine for pictures so to speak, and print the picture using inkjet printer 350 for example. Such a situation could be provided at less cost for example, with an incentive to add in your own criteria for an extra cost, and get pictures to choose from more along the lines desired. Note that in addition to, or instead of prints, they could have magnetic or other machine readable media to take home too.

FIGURE 4

[0065] Figure 4 illustrates means to provide all such functions in a 2D or 3D context, using simple equipment capable of widespread use.

[0066] For example, the simplest case is to use the same single camera such as 110, to both take the picture, and to determine location, according to the invention, of one or more points on the object or objects for purposes of controlling the picture taking, recording, or transmission process in some way.

[0067] As has been disclosed in the aforementioned referenced co-pending applications, one can view using the single camera, one or more such points in two dimensions, or in three dimensions under certain conditions when spaced points on the object have known spacing between them on the surface of the object.

[0068] Identifying points from raw images is processing intensive, as is determination movement gestures of such images, such as an image of an arm or hand in a varying clothing and background situations. But determining the location or movement of one or more artificial

targets such as a colored retro-reflector is easy, accurate and fast, based on brightness (under substantially coaxial illumination) and color - and possibly shape as well if the target is of some distinguishable shape.

[0069] For example, consider retro-reflector (e.g. glass bead Scotchlight 7615 tape by 3M company) 401, on the hand of a subject 404, the retro-reflector having a red reflection filter 405 matched to the wavelength of the LEDs 410 used with (and angularly positioned on or near the axis 415 of) camera 420 comprising lens 421 and detector array 422 used to take the picture of the object desired. When it is desired to determine the position of the hand 404, the red LED's are turned on by camera controller 430, and a bright reflection is seen in the image at the point in question due to the retro-reflection effect.

[0070] Where stereo pairs of cameras are used, as in fig 1 or 2A, two reflections are seen whose disparity in location from one camera to the other gives the z distance (range direction) from the camera. In this case light sources are located with each camera of the stereo pair in order that for each camera, the retro-reflectors are properly illuminated with light emanating from point or points angularly near the camera in question.

[0071] The LEDs can be illuminated on alternate camera frames, or at any other time when "picture" type image data is not desired. In this case the camera does not under room lights 445 say, normally see the retro-reflection signal, which is desirable as the bright spot of 401 from the image of the human desired. Processor 450 processing the data, can even be used to subtract out from the recorded image, the shape of the retro-reflector, which might be a noticeably different shape than found in practice (e.g. a triangle). The image can be filled in where the subtraction occurred with color, brightness, contrast and texture or other characteristics of the surroundings. This is particularly easy if the target (retro-reflector or otherwise) is placed on the

human or object in a region of small variation in characteristics needed to be filled in, e.g. the back of one's hand, say. The key is that after processing, the image look like it did without addition of the artificial target.

[0072] If the LEDs are turned on by the camera controller during picture taking, color processing can be used to remove from the stored image of the scene, any indications of bright zones at the LED wavelength used, filling in with color of the surrounding area as desired.

[0073] Clearly both processing techniques just described or others can be used. And the methods work well with stereo pairs of cameras too.

[0074] Retro-reflective or other distinguishable artificial targets can be provided in different decorative designs for wrist, back of hand, rings, forehead, hats, etc. For example, 3 targets in a heart or triangle shape, a square box of 4 targets, or a box or pyramid with line targets on its edges, and so forth.

[0075] Colored targets can be made of cloth, plastic, or the like, including Colored plaids, polka dots, etc. Or coatings or Filters or evaporated on filters may be placed in front of a target such as a plastic retroreflector in order to render it of a given color (if it wasn't made of colored material in the first place).

[0076] Decorative line outlines (also possible in retroreflective bead material) can also be used as target datums, for example down the seam of glove fingers, or shoes, or belts, dress beading, etc.

FIGURE 5

[0077] Figure 5 illustrates further one of many methods by which the invention may be used to feed back data to a subject (or subjects) having his or her picture taken, in order that the subject assume another pose or engage in another activity.

[0078] For example consider fig 5. A girl 500 is having her picture taken by the camera of the invention 501 (in this case a single digital camera version such as illustrated in fig 4), and her positions, orientations or sequences of same, including motions between points are analyzed as described above, in this case by computer 530. The computer has been programmed to look for funny movements and positions, defined here as when the arms are in unusual positions (clearly a subjective issue, programmed as to tolerances, or taught to the system by the person in control of the situation).

[0079] The girl then poses for the camera. When the camera of the invention takes the picture according to its preprogrammed criteria (in this case, for example, defined as when her arms are over her head, and after a significant movement has occurred), it lets her know by lighting light 520 connected by wires not shown to computer 530. During the photo shoot, then she begins to learn what it is looking for (if she hasn't been already told) and does more of the same. If desired, and optional video display 540 or voice out put speaker 550, both connected to computer 530, indicate to her what is desired. This could also be a particular type of pose, e.g. "Cheese-cake" based on historic classical poses learned from photo art (note that she can also make comments for recording too, with optional microphone input not shown. As pointed out above, voice recognition software, such as IBM Via Voice" can be used to recognize commands from the subject or photographer, and cause other results).

[0080] It can be more sophisticated yet. For example, if the computer 530 and any associated software as needed may be used to analyze the model's lips and her smile. In this manner, the invention can be used to photograph all "smiling" poses for example. Or poses where the smile is within certain boundaries of lip curvature even. Similarly, the camera or cameras of the invention can be used, with suitable image analysis software to determine when

the subject's eyes are open a certain amount, or facing the camera for example.

[0081] Figure 3 above has alluded to possible use of the invention data processing to determine position and/or orientation data from recorded picture frames, after the picture is taken. A method for selecting from memory pictures obtained when certain pre programmed poses of objects sequences of poses, or relationships of objects are represented.

[0082] Selection can be according to criteria for example 1-7 above, but there are some differences. First if the data is taken normally from a single camera such as that of 202 above, 3D information is not available. This being the case, conventional 2D machine vision type image processing (e.g. "Vision Bloks" software from Integral Vision Corp.) can be used to extract object features and their locations in the images retained.

[0083] A second version alternatively could employ a single picture taking camera, but by employing 3 dot or other suitable targets on the photographed object in the camera field, could calculate 3D data related to the object (position and orientation in up to 6 axes can be so calculated by the computer of the invention using target location data in the camera image field).

[0084] A third version, records data from the camera, or in the case of the fig 2A device, all three cameras - all recorded for example on digital media such that the processing can be done after the fact, just as it would have been live.

[0085] Another application can be to monitor the relative change in successive pictures as seen by one or more relatively low resolution cameras and when such change is minimal, cue the high resolution camera requiring a longer exposure to become enabled. In this manner blur of the high resolution camera image is avoided. This is useful in taking pictures of children, for example. This comparison of images can be made without actually measuring distances, but rather by looking for images which are not different within an acceptance band, one to another,

thus indicating the motion is largely stopped. This can be determined by subtracting one image from the other and determining the amount of pixels above a threshold. The more, the less the images are alike. Other techniques can be used as well, such as correlation techniques.

[0086] In some instances it is desirable to have, in taking pictures, a display such as 555, preferably (but not necessarily) life size. This display can be not only used to display the image 565 of the person whose picture is being taken, but as well can display still (or video) images called up from computer memory or other media storage such as DVD discs, and the like. One use of the displayed images is to indicate to the subject a desired pose for example. This can be done by itself, or interactively using the invention. A computer generated and rendered 3D image can also be created using suitable 3D solid modeling software (such as CAD KEY) to show an approximate pose to the model.

[0087] For example the invention disclosed above, allows one to automatically observe the expressions, gestures and continence of a person, by determining the shape of their smile, the direction of eye gaze, and the positions or motion of parts of the body such as the head, arms, hands, etc. Analysis using pre programmed algorithms or taught sequences can then lead to a determination as to what information to display on display 555 controlled in image content by display processor 560.

[0088] As one instance, suppose computer image analysis of data from camera 501 of the invention has determined that the person 500 is not smiling enough, and is in too stationary a pose. A signal from computer 510 is provided to display processor 560 so as to display on display 555 an image of someone (perhaps the same subject at an earlier time, or a computer generated likeness of a subject) having the characteristics desired. The person looks at this display, and sees someone smiling more for example, and in one scenario, tries to mimic the

smile. And so forth. Alternatively, voice generation software, such as included in IBM VIAVOICE can be used to computer generate a voice command, "Smile More" for example, rather than show a visual illustration of the effect desired.

FIGURE 6

[0089] Let us now discuss some other applications of picture taking enabled by the invention. One embodiment can be used to determine location of items in a scene, for example furniture in a house, for which homicide studies or insurance fraud could be an issue (see also figure 1 above, as well as referenced co-pending applications).

[0090] For example, a detective (whose arm 600 is shown) arrives at a murder scene in a room, and he sets the stereo camera 610 of the invention disclosed in fig 2C[[c]] on a tripod 620 (or other suitable location) and systematically designates, using laser pointer 630, any object desired, such as chair 640 impacted by the laser beam at point P. The camera/computer system of the invention locates the designated point takes a picture of the room, or a portion thereof, including the zone of the designated point P which stands out in the picture due to the laser spot brightness. Optionally, the stereo pair of cameras of the invention can digitize rapidly the xyz coordinates of point p, which can be superposed if desired on the image of the scene including point p itself and its immediate surroundings. This data can be processed by computer 660 as desired and either recorded or transmitted to a remote location along with the images as desired using known communication means. This work can be done outdoors, as well as inside. Numerous points to be digitized can be sensed and/or indicated, as desired.

[0091] The same digitization procedure can be used to digitize a room for a real estate person for example, to develop a data base on a house for sale. And many other such applications exist.

[0092] Finally it should be noted that the invention solves many famous problems of picture taking, for example of children. The digital camera images of the invention can be processed for example using appropriate software such as Vision Bloks to determine if the child's eyes are open (determined for example by recognizing the eye iris in the face area), and if so to take the picture, or after the fact, to select the picture from a group. Or a signal can be given by the system to the child to "open your eyes" so to speak. To determine if the eye is open, the image can be processed for example to look for the white of the eye, or to look for red reflections from the eye. This can even be done with deep red, or near IR light sources like LEDs which do not bother the child.

[0093] Similarly, if the child (or other subject) is in motion, when you want him still, the picture can be analyzed until he is still, and then the picture taken or selected. This can be determined from comparison of successive frames, from motion blur or other characteristics of motion in the image. Or a signal as above can be given to the child to "sit still" (a famous command in picture taking annals).

FIGURE 7

[0094] The invention can also be used for commercial photography and for producing motion pictures. One advantage is that very high resolution images at suitable exposure levels of critical scenes can be taken, but not too many which would overload the memory capacity of a camera system. A means to enhance this is now described.

[0095] It is noted that a camera having an ability to read individual pixels as desired, or at least to choose the lines of pixels to be read, can achieve high rates of scan if one knows apriori where to look apriori for data. Or if one say scans every 20th pixel in either direction xy of the camera, to determine where frame to frame changes are occurring (due to change in pixel

brightness or color). Once change is determined one can often isolate those areas to the ones of interest. For example, even in a "Still" picture, the head often moves (similar to the lovers on the bench in the shopping mall mentioned above). Every 20th pixel, cuts the number of pixels by 400 times, and raises a normal 30hz scan rate to over 1000 scans per second - more than needed in many cases.

[0096] When the area of interest is found, the pixels in that area are all scanned for example.

[0097] Such pixel addressing cameras can also be used for determining the position and change in position of features used to determine, and track, pose and other variables, as has also been discussed in co-pending applications, particularly Camera Based Man-Machine Interfaces US SN 60/142,777, incorporated herein by reference. Of special interest is that same high resolution camera can be used to take the picture desired, while at the same time be used to find or track the object at high speed.

[0098] Such high speed tracking can be interspersed with the taking of pictures. For example if in photographing a ballet, it may be desired only to take pictures of the prima ballerina, who typically is the one, with any male dancer, that is moving the most. By determining the zone to be measured, one can sense quickly what zone should looked at, and high resolution photographs obtained from that zone. This allows one to use a very large format camera in a fixed location (e.g. 5000x5000 pixels) to cover the image of the whole stage via suitable optics, but to only take and store the pixels in a 1000x700 zone of interest movement, or positional or gesture interest for example, providing a 35 times increase in the frame rate needed today with such large pixel cameras. This allows their practical use, without resort to human cameramen, or pan/tilt mechanisms.

[0099] Similar logic holds for quarterbacks in a football game, who often run faster than any defense men around them and can be differentiated accordingly (along with any other issues such as uniform color, design or the like). If possible, it is desirable to have a clearly defined target, such as a retroreflective or bright colored target on one's helmet for example. Indeed helmet color can be chosen accordingly.

[0100] This is illustrated in fig 7 wherein camera 701 composed of lens 705 and an addressable version of a Kodak MegaPixel detector array 710 having 4000x4000 elements and under the control of computer 711 is used to scan the image of a pair of dancers 715 and 716 on stage 720. The field of view of the camera equal to area ab covers the whole stage. But the area scanned out from array 710 is confined to the region in which the dancers were last seen, which is defined as a zone a'b' equal to in this case 500x500 pixels. This still allows DVD type resolutions to be achieved, without pan or tilt of the camera. Similarly such techniques can be used for video conferencing, sports, and other activities as well.

[0101] It should be noted that in the above embodiments the words picture and photograph are interchangeable, as are photographing or photography and picture-taking. The camera used for same is preferably but not necessarily a solid state TV camera whose pixels are scanned serially or randomly under program command.

FIGURE 8

[0102] The invention can also be used to sense positions of people for instructional purposes. Data as to a dancer's movements for example can be obtained, and appropriate images, or data or both transmitted without excessive bandwidth requirements to a remote location for comment or interaction by a trained professional. Combined with life-size screen displays this allows a life like training experience to be gained at low cost, since one professional can watch

10 students in different locations say, each trying her movements alone in the intervening moments. In addition such training can occur in the home, as if one had a private tutor or coach.

[0103] For example consider fig 8. A class of ballet students is practicing near a "mirror" which in this case is comprised life size digital display screen 800 illuminated from the rear by a Sharp brand projector 801 driven by computer 810. By sliding a real mirror in an out the mirror can be a mirror, or a display. If desired, this display can be extensive, and for example using 3 projectors to cover 3 adjacent screens each 6 feet high x9 feet long for example, such that a total length of a large studio is comprised.

[0104] A master instructor 825 (possibly remotely located via the internet or other communication means) can observe the students via TV camera (or cameras). By viewing the students the instructor can make corrections via audio, or by calling up imagery which represents the appropriate moves - for example from a professional doing the same Swan Lake number. In addition, the TV cameras of the invention can monitor the actual location and movements of the student, or students, and their relationship to each other, and if desired to various markers such as 830 on the floor of the studio, placed there to assist in choreographing the piece.

[0105] In addition, if the various gesture and position monitoring aspects of the invention are utilized as described above and in co-pending applications it is possible to have the instructions computer generated using dancers movements as input to a computer analysis program. This is particularly useful if dance routines which are classical in nature, are being attempted, which have known best forms which can be computer modeled.

[0106] In another version, an assistant can be on the scene say working with ten students in a local studio, while the master is remote.

[0107] It is also possible with the invention to provide input image data to projector

computer 810, even from remote internet located sources, which represents other people dancing for example. These can be images of the master, or others in the class - even if all in different locations. OR the images can be those of others who have performed a particular routine in the past, for example Dance of the Sugar plum fairy in the Nutcracker. This imagery could be from the Bolshoi ballet performance of the same dance, displayed in small town ballet studio or home - to illustrate the moves required. The use of life size projection not only gives a feel to this imagery, but further allows, I have discovered, a unique experience for the performer. Namely that the person can perform "with" the troupe displayed. In some cases, in ballet for example, this sometimes can be more useful than watching one's self in the mirror (typical in ballet studios).

[0108] By using the cameras of the invention, such as stereo pair 850 and 851 to determine student positions, it is also possible to control the display in many ways. For example as the student got closer to the display, the persons in the display could appear to come closer to the student. Conversely, it might be desirable to have them move away from the student to keep a constant apparent distance between them for example. And if the student is twirling left, the figures in the ballet depicted on the screen can be caused to turn right (as they are "in the mirror" so to speak) to match the movement of the student in approximate form at least.

[0109] In addition it is often desirable for learning purposes to Control speed of music and video display to match sensed movements of pupil, or from remote master person. Use display techniques which can produce variable motion display, such as variable speed DVD disc or read data in to ram. In addition it is desirable that overlaid could be masters voice.

[0110] The invention can be advantageously used in many performing arts, not just ballet. For example, live theatre, where actors from Hamlet performances of the past can interact

with those practicing. Or where instructors of Skating or Gymnastics, other activities can also interact.

[0111] Sports as well is amenable to the technique, but the size of the "studio" or gym becomes an issue. Basketball for example fits the space aspect of the projection screens and the fields of view of the invention cameras as here described.

[0112] Ability of masters remotely located, and use of copyrighted performance material of famous performers and troupes allows one to franchise the studio concept of the invention. For example each town could have a Bolshoi studio franchise of this type.

[0113] It is noted that this same arrangement can serve other purposes beyond instruction. One is the possibility of remote dating, in which sensed movement of one partner is communicated, along with voice and visual expression to the other. In addition, is possible, as disclosed in co-pending applications, to build the displays described above in the form of a touch screen in which contact of one partner with the display of the other remotely transmitted from afar can occur.

[0114] If one uses large scale touch screens with optional added sensor inputs. As would be the ballet studio example of fig 8 if equipped with touch screen capability, then one can provide a mechanism for marketing of people relative (i.e. life size) objects such as automobiles in facilities such as Auto showrooms. Thus a ballet studio for example, can be used for other purposes, not just instructional, but for selling cars for example, where the display screen is displaying new models (including ones that are figments of design imagination, and where customer input is desired as in a focus group) and where customer inputs voice and action can be detected if desired by the invention. Or in reverse, an underused car showroom can be converted - on demand - into a site which can be used for, among other things, instructional purposes in

performing arts, sports and the like. This gives a reason for being to the show room that transcends selling cars, and helps attract people to the facility. If a car was displayed, on a touch screen, one could walk up to the full size display of the car, and touch the door handle, which would cause the touch screen to sense that same had occurred, and indicate to the computer to cause the display to display the door opening to expose the interior.

SUBSTITUTE SPECIFICATION
(Clean Copy)

CAMERA BASED INTERACTION AND INSTRUCTION

INTRODUCTION

[0001] Method and apparatus are disclosed to enhance the quality and usefulness of picture taking for pleasure, commercial, or other business purposes. In a preferred embodiment, stereo photogrammetry is combined with digital image acquisition to acquire or store scenes and poses of interest, and/or to interact with the subject in order to provide data to or from a computer. Other preferred embodiments illustrate applications to control of display systems.

BACKGROUND

[0002] Representative of USA Patents on Digital cameras are US Pat # 5,534,921, 5,249,053 and many others which describe use of matrix array (CCD or otherwise) based cameras to take pictures of humans or other objects. The images taken are generally comprised of 400,000 or more pixels which are often compressed to smaller record sizes for data storage, for later retrieval and display. Video cameras or Camcorders are also increasingly able to take still photographs as well, and record or transmit them to computers.

[0003] Aside from exposure control (to keep the light reaching the detector array within the dynamic range of same), and range finding (to effect the best lens focus given the object distance in question) there are few cases known to the inventor where the camera taking the picture actually determines some variable in the picture and uses it for the process of obtaining the picture.

[0004] One such example that does not take a picture of humans but rather of data, is exemplified by USP 4,791,589, where a certain wave form signature on an oscilloscope is searched for by processing the digital camera image, and when it is seen, the image stored.

More apropos the function of "Picture Taking" as the general public knows it and of interest as the primary focus of the instant invention, is US 5,781,650 by Lobo, et al which describes analysis after the fact of recorded images to determine facial content and thus the age of the subject. This disclosure also alludes to a potential point and shoot capability also based on the age classification of the individuals whose picture is desired.

[0005] There is no known picture taking reference based on object position and orientation with respect to the camera, or other objects that I am aware of.

SUMMARY OF THE INVENTION

[0006] High Resolution Digital still cameras employing matrix photodetector array chips to scan the image produced by the camera lens are now commonplace, and will be even more so in a few years as chips and memories become very inexpensive, and pixel density approaches 2000x2000 pixels, rivaling photographic film. Even today Camcorders having 700x500 pixel image chips are common for video based data and stills.

[0007] This invention is aimed at improvements in utilization of these cameras and others which make use of a computer based camera's ability to analyze, in real time if desired, the images obtained. Indeed a picture taking system may be composed of a combination of cameras, some used for purposes other than the recording of the picture proper.

[0008] It is a goal of the invention to provide a method for taking pictures when certain poses of objects, sequences of poses, motions of objects, or any other states or relationships of objects are represented. It is also a goal to allow this to be done in a self timer like mode, when desired scene situations or specific dates or other circumstances exist. In some cases, information as to what is desired may be entered remotely, even over the internet, or radio telephone.

[0009] It is also a goal of the invention to provide a method for selecting from a digital or

other picture memory, pictures obtained when certain pre programmed poses of objects, sequences of poses, or relationships of objects are represented.

[0010] It is a further goal of the invention to provide means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken.

[0011] It is a still further goal to provide all such functions in a 2D or 3D context, and using simple equipment capable of widespread use.

[0012] It is another goal of the invention to feed back data to a subject or subjects having his or her, or their picture taken, in order that they assume another pose or engage in another activity, or juxtaposition of subject positions.

[0013] While this invention is primarily aimed at the general picture taking public at large, it is realized that commercial photographers and cine-photographers, for example in the coming trend to digital "Hollywood" movie making, may benefit greatly from the invention herein, as it potentially allows more cost effective film production by giving the director the ability to expose the camera to the presence of masses of data, but only saving or taking that data which is useful, and if desired, to signal the creation of further data based on data obtained. All this with little or no human intervention as desired, thus saving on the cost of direction, film crews, and other labor or venue related costs.

DRAWINGS DEPICTING PREFERRED EMBODIMENTS OF THE INVENTION

[0014] Figure 1 illustrates means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken.

[0015] Figures 2A-2D illustrate a method for taking pictures when certain pre programmed poses of objects, sequences of poses, or relationships of objects are represented.

[0016] Figure 3 illustrates a self timer like mode, or when specific dates or other

circumstances exist, including a system embodiment for taking pictures in shopping malls or other locales and providing instant print or other hardcopy capability (e.g. on a tee shirt).

[0017] Figure 4 illustrates means to provide all such functions in a 2D or 3D context, using simple equipment capable of widespread use. Various retroreflective artificialtarget configurations are also disclosed.

[0018] Figure 5 illustrates a method to feed back data to a subject having his or her picture taken, in order that the subject assumes another pose or engage in another activity.

[0019] Figure 6 illustrates a commercial version of the invention useful for police departments and real estate agents, among others.

[0020] Figure 7 illustrates an embodiment of the invention used for photography of stage performances.

[0021] Figure 8 illustrates an embodiment of the invention used for ballet instruction and other teaching and interaction activities also with remotely located instructors or players.

EMBODIMENTS OF THE INVENTION

FIGURE 1

[0022] Illustrated in figure 1 of the invention is means by which users engaged in digital camera based activities, or other activities, using a computer can have their pictures taken, and in this context, figure 1 resembles that of co-pending referenced application 9 above. A single camera, or a set, such as a stereo pair are employed to see portions of an object, such as a person, a part of a person such as a hand, leg, foot, fingers, or head, and/or to view datums on an object, portion of an object, or an object held by the person or with which the person interacts. In addition, multiple persons and objects can be seen.

[0023] Where a single camera is employed, 2D measurements of object location relative

to the camera (x and y perpendicular to the camera axis) are all that is possible, unless datums of known shape or spacing are used on the object viewed. Where a stereo pair or more of cameras are employed, 3D (xyz) data of a single point can be provided, for example retro-reflector 50 on the head 52 of person 51. In both cases where 3 or more datums are used on an object, 6 Degree of freedom data can be obtained, allowing object orientation in 3 angular axes as well as range in 3 axes to be obtained. With two or more cameras, such 3D data may also be obtained using other features of objects such as edges of arms and the likely using known photogrammetric techniques.

[0024] The cameras used may also be used to take pictures of an object, or another specialized camera used for that purpose in conjunction with those used to determine the location of object features. Both examples are illustrated in this application.

[0025] As shown in this figure, two cameras 101 and 102 are used as a stereo pair, with each camera located at opposite sides of a TV monitor 105, used for either computer or Television display or both. This is a desirable configuration commercially and discussed the co-pending application references above. In this particular case, an additional camera 110 is shown in the middle of the other two, said added camera used for picture taking, internet telephony and/or other purposes. An optional auxiliary LED light source 115 (or 116 or 117) for illuminating a user 60 or other object is also shown.

[0026] All three cameras are connected to the computer 130 by means of a USB (Universal Serial Bus) daisy chain, or IEEE 1394 firewire connections (faster). Each is accessed, as needed for position and orientation determination, or picture taking.

[0027] Even using a single camera in two dimensions (as is normal today), some position and orientation data or sequences of same can be achieved using modern image processing

techniques. (See for example the invention disclosed in USP 4,843,568 of Myron Krueger). However, accurate sensing and control of systems, such as cameras herein is difficult today with processors cost effective enough to be used by the public at large, and artificial target augmentation of image points is often desirable.

[0028] It is thus possible using the invention to be taking pictures of users of interactive computer systems for whatever purpose. This allows one to automatically capture images of children at play, for example with a computer system such as a computer game. It also enables many other functions which are described below. And it can be used in the field, where the computer, stereo position sensing and picture taking camera, may be co-located together in the same housing.

[0029] It is noted that where retro-reflectors are used, (as opposed to choosing for example less contrasting datums, for example natural object features such as edges of fingers, or clothing features, or targets such as colored dots) then each of the two cameras for stereo location determination needs lights to illuminate retro-reflectors substantially co-located with the camera axes. These lights can alternatively provide general lighting for any other camera or cameras to use in taking photographs or other purposes.

[0030] It is noted that cameras 101 and 102 need not have the image of the retro-reflector or other discernable target be in precise focus, indeed it is often helpful to have a some blur due to defocusing so as to aid sub pixel position solution of datum location. If the LEDs or other light sources are in the near infrared, and the camera lenses are focused in the visible, this occurs naturally, unless the lens is also near infrared chromatic corrected.

[0031] An optional laser pointer (or other suitable illumination source), comprised of diode laser and collimating optics 150 is also usable with the invention to illuminate object

portions from which 3D data is desired (such as the neck region of person 51 as shown), or in the simpler case to designate which areas of a picture are to be focused, or zoomed in on or transmitted or recorded - with or without consideration of 3-D position data of the object. This can be fixed as shown, or optionally hand held by the user, for example in left hand (dotted lines) and used by him or her to designate the point to be measured in 3D location. (see also references above). In addition a person taking pictures, such as a photography can without looking through the viewfinder of the camera, point to appoint on the subject, which is then dealt with by camera typically by focusing the lens system such that the point is in the desired state of focus (usually but not necessarily when the laser spot on the subject appears smallest in diameter and/or of highest contrast). Such as system is particularly useful for cameras with wide fields of view, or those mounted on pan tilt mechanisms, where the mechanism can also be activated to position the camera axis to take the picture with the laser spot for example centered in the camera field.

[0032] In the laser designated case, it is generally the laser spot or other indication on the surface that is imaged, (although one can also instruct, for example using voice recognition software in computer 130 inputted via voice activated microphone 135, the camera processor to obtain and store if desired the image of the area around the spot projected onto the object as well or alternatively), and if the spot is desired, it is often useful that cameras 101 and 102 have band-pass filters which pass the laser wavelength, and any led illumination wavelengths used for retro-reflector illumination for example, but block other wavelengths to the extent possible at low cost. It is noted that the discrimination in an image can also be made on color grounds - i.e. with red diode lasers and red LEDs, the system can analyze the image areas containing reds in the image, for example - with the knowledge that the answer can't lie at any shorter wavelengths (e.g. green, yellow, blue).

[0033] By using two cameras 101 and 102, a superior ranging system for the laser spot location on the subject results, since the baseline distance "BL" separating the cameras for triangulation based ranging purposes can be sufficient to provide accurate measurement of distance to the object.

FIGURES 2A-2D

[0034] As we begin to consider the apparatus of figure 1, it is clear one could do much more to enhance picture taking ability than hereto fore described and contained in the prior art. And it can be done with apparatus capable of field use.

[0035] Figures 2A-2D for example, illustrates a method for taking pictures when certain pre programmed or otherwise desired poses of objects, sequences of poses, or relationships of objects are represented. No such ability is available to photographers today.

[0036] Consider still camera system 201, patterned after that of fig 1 and comprising 3 cameras and associated image scanning chips. The central camera, 202, is for picture taking and has high resolution and color accuracy. The two cameras on either side, 210 and 211, may be lower resolution (allowing lower cost, and higher frame rate, as they have less pixels to scan in a given frame time), with little or no accurate color capability, as they are used to simply see object positions or special datum positions on objects (which may be distinguished however by taught colors for example as taught in some of my co-pending inventions).

[0037] Cost wise the distinction between cameras is important. Today low cost CMOS chips and lenses capable of the providing stereo measurements as described above are $15 or less. High quality CCD color detector arrays and lenses for high quality photo images are over $100, and in many cases $1000 or more.

[0038] An optical viewfinder 215 is one of many ways to indicate to the user what scene

information is being gathered by the camera system. The user can in this invention specify with a viewfinder based readout, the area of the field that is desired. Use of the viewfinder in this manner, whether looked through or displayed on a screen, is for example an alternative to designating an area on the actual object using a laser pointer for the purpose.

[0039] The camera system 201 further contains a computer 220 which processes the data from cameras 210 and 211 to get various position and/or orientation data concerning a person (or other object, or persons plural, etc). Integral light sources as described in fig. 1 above may also be provided such as LED arrays 240 and 245 and xenon flash 246.

[0040] In general, one can use the system to automatically "shoot" pictures for example, when any or all of the following occur, as determined by the position and orientation determining system of the camera of the invention:

[0041] 1. Subject in a certain pose.

[0042] 2. Subject in a sequence of poses.

[0043] 3. Portion of Subject in a sequence of poses (e.g. gestures).

[0044] 4. Subject or portion(s) in a specific location or orientation.

[0045] 5. Subject in position relative to another object or person. For example, this could be bride and groom kissing in a wedding, boy with respect to cake on birthday, and sports events sequences of every description (where the camera can even track the object datums in the field and if desired adjust shutter speed based on relative velocity of camera to subject).

[0046] 6. Ditto all of above with respect to both persons in certain poses or gesture situations.

[0047] 7. When a subject undertakes a particular signal comprising a position or gesture-i.e. a silent command to take the picture (this could be programmed, for example, to correspond

to raising one's right hand).

[0048] In addition it is noted that the invention acts as a rangefinder, finding range to the subject, and even to other subjects around the subject, or to all parts of interest on an extensive subject. This allows a desired lens focus to be set based on any or all of this data, as desired. It also allows a sequence of pictures to be taken of different objects or object portions, at different focal depths, or focus positions. The same holds true for exposure of these locations as well.

[0049] It is also possible to use the above criteria for other purposes, such as determining what to record (beyond the recording that is implicit in taking pictures), or in determining what to transmit. The latter is important vis a vis internet activity, where available internet communication bandwidth limits what can be transmitted (at least today). In this case video telephony with the invention comprehends obtaining only those images you really care about in real time. So instead of transmitting low resolution image data at 20 frames a second, you can transmit say 5 (albeit asynchronously gathered) frames of high resolution preferred data. (This doesn't solve flicker problems, but it does mean that poor quality or extraneous material isn't sent!). Criteria such as degree of image motion blur or image focus can also be used in making transmission decisions.

[0050] Figure 2B illustrates a block diagram showing a pose analysis software or hardware module 250 analyzing processed image data (for example utilizing camera image data processed by visionbloks software from Integral Vision Corp.) from the computer 220 (which may be the same physical microprocessor, such as a Intel Pentium 2 in a Dell inspiron 3500 laptop computer, or different) and determining from same when a certain pose for example has been seen. When this occurs, a signal is sent to the camera control module 255 to hold the last frame taken by camera 202, and to display it to the photographer, digitally store it, or transmit it -

to someone else, or another data store or display. Such transmission can be by data link, internet, cell phone, or any other suitable means.

[0051] Another criteria could be that two or more preselected poses were seen one after the other, with a time delay between them, also pre-selected if desired.

[0052] Figure 2C illustrates a specific case whereby a point on one person, say hand 260 of man 265 having head 271, is determined, and a picture is taken by camera system 201 of the invention when this point comes within a distance of approximately 6 inches (or any other desired amount including contact - i.e. zero distance) from another person or object, say the head 270 of woman 275. To obtain the data, one can look for hand or head indications in the image using known machine vision techniques, and/or in a more simple case put a target marker such as colored triangle 285 or other type on the hand or head or both and look for it.

[0053] The use of the natural features of the subjects heads, which are distinguishable by shape and size in a known field containing two persons, is now illustrated. For example, image morphology or template matching in the image field of the solid state TV camera 202 can be used to distinguish the head shapes from background data and data concerning the rest of the features such as hands, etc. of subjects 265 and 275 (or conversely hand shapes if desired can be found and heads excluded, or the hand of the right person, versus the head of the left, and so forth).

[0054] As shown in figure 2D, when the image field 287 of camera 202 after processing contains the two head images, 290 and 291, spaced a distance "W". When W is not within a tolerance D, the picture is not taken; whereas if the heads are close enough, within D as illustrated in dotted lines, the picture is taken.

[0055] Criteria as mentioned can include proximity of other parts of the body, or objects

associated with the subjects (which themselves can be objects). In addition, the motion or relative motion of objects can be the criteria. For example, one could take program the device to take the picture when on two successive frames the condition shown in fig 2D exists where the heads are apart in frame 1, but closer in frame 2 (probably corresponding to a movement say of the boy to kiss the girl). Clearly other sequences are possible as well, such as movement taking place in several frames followed by a sequence of frames in which no movement occurs. Other means to determine motion in front of the camera can also be used in this context, such as ultrasonic sensors.

[0056] It is also noted that the actual position or movement desired can be "Taught" to the computer 220 of the picture taking system. For example, a boy and girl in a wedding could approach each other and kiss beforehand. The sequence of frames of this activity (a "gesture" of sorts by both parties) is recorded, and the speed of approach, the head positions and any other pertinent data determined. When the photographer thinks the picture is right, the computer of the camera system is instructed to take the picture- for example it could be at the instant when after a suitable approach, two head images become joined into one- easily recognizable with machine vision processing software under uniform background conditions. Then in the future, when such a condition is reached in the camera field of view, pictures are taken and stored, or transmitted. This allows a camera to free run whose image field for example takes in the head table at a wedding party, taking only the shots thought to be of most interest. Numerous conditions might be programmed in, or taught in- another at the same party, would be anyone at the head table proposing a toast to the bride and groom, with arm and glass raised. If video is taken, it might be taken from the point at which the arm rises, until after it comes down. Or with suitable voice recognition, when certain toast type words are heard, for example.

APPLICATION TO "3-D" PICTURES

[0057] Where it is desired to take "3-D" pictures, it can be appreciated that each camera, 210 and 211 can take images of the scene in place of camera 202, and that both cameras 210 and 211 outputs can be stored for later presentation in a 3D viewing context, using known display techniques with appropriate polarized glasses or switchable LCD goggles for example. In this case the camera outputs can serve double duty if desired, each both recording picture data, as well as determining position of one or more points on the object or objects desired.

[0058] In addition, or alternatively, one can use in this 3D picture case, the camera 202 (or even a stereo camera pair in place of 202) as a means for determining position and orientation independently from the stereo picture taking cameras.

[0059] If not used for immediate position information, camera 202 does not have to be digital and could employ film or other media to record information.

FIGURE 3

[0060] In a manner resembling that of figs. 2A-2D above, the invention can also serve to aid a person to take his or her own picture - a modern "Self timer" if you will. For example any or all of the criteria such as the items 1-7 above, can be used as criteria for the picture to be taken of oneself. This is in addition to other more normal things like taking pictures after a certain time, or on a certain date or time interval, etc. This has particular appeal for taking pictures of one's self, or in any other situation where the photographer is not present (e.g. unattended recording of animals, children, etc.). Similarly, a hand signal or other signal to the camera can be used to trigger the picture to be taken, using the computer camera combination to determine the hand position or movement. This can also be done by voice using microphone input and suitable voice recognition software in the computer.

[0061] Today, in a conventional context, one can as a photographer, choose to shoot a fashion model or other subject, and when you see a pose you like record the picture. But as one's own photographer, this is much more difficult, unless you stream in video and search through the poses after the fact. But even then, you don't know that the poses were what was desired, as no feedback exists during the shoot.

[0062] With the invention, you may program the system to take only those poses which you think you want to get. And it can instruct the subject, when a picture is taken (and the lack thereof indicating to do something different to obtain the desired effect resulting in a picture). The effect desired can be changed in midstream to adjust for changing wants as well, by changing the program of the computer (which could be done using hardware switches, inserting a disc, or otherwise entered as a command). In addition, as mentioned above, the gesture or pose desired, can be taught to the system, by first photographing a variety of acceptable positions or sequences, and putting bounds on how close to these will be accepted for photographing.

[0063] A specialized case is shown in fig. 3, for self taking instant picture or printout device for use in a shopping mall Kiosk or other venue. In this case two sweethearts 300 and 310 are on a bench 315 in front of the digital or other camera 320. When the computer 330 detects from processing the image (or images) of the invention that their faces are in close proximity (for example using the centroid of mass of their head as the position indicator, or even facial features such as described in the Lobo et al patent reference), the computer then instructs the camera to record the picture. A push button or other selector on the device allows the subjects to select what criteria they want – for example when their heads are together for 5 seconds or more, or not together, or hands held, or whatever. Or when their faces are within a certain distance criteria, such as one inch.

[0064] Alternatively, camera 320 may be a video camera and recorder which streams in hundreds or even thousands of frames of image data, and the selection of a group is made automatically by the invention in rapid fashion afterwards, with the subjects selecting their prints from the pre-selected (or taught as above) images as desired. Or the machine itself can make the final selection from the group, sort of as a random slot machine for pictures so to speak, and print the picture using inkjet printer 350 for example. Such a situation could be provided at less cost for example, with an incentive to add in your own criteria for an extra cost, and get pictures to choose from more along the lines desired. Note that in addition to, or instead of prints, they could have magnetic or other machine readable media to take home too.

FIGURE 4

[0065] Figure 4 illustrates means to provide all such functions in a 2D or 3D context, using simple equipment capable of widespread use.

[0066] For example, the simplest case is to use the same single camera such as 110, to both take the picture, and to determine location, according to the invention, of one or more points on the object or objects for purposes of controlling the picture taking, recording, or transmission process in some way.

[0067] As has been disclosed in the aforementioned referenced co-pending applications, one can view using the single camera, one or more such points in two dimensions, or in three dimensions under certain conditions when spaced points on the object have known spacing between them on the surface of the object.

[0068] Identifying points from raw images is processing intensive, as is determination movement gestures of such images, such as an image of an arm or hand in a varying clothing and background situations. But determining the location or movement of one or more artificial

targets such as a colored retro-reflector is easy, accurate and fast, based on brightness (under substantially coaxial illumination) and color - and possibly shape as well if the target is of some distinguishable shape.

[0069] For example, consider retro-reflector (e.g. glass bead Scotchlight 7615 tape by 3M company) 401, on the hand of a subject 404, the retro-reflector having a red reflection filter 405 matched to the wavelength of the LEDs 410 used with (and angularly positioned on or near the axis 415 of) camera 420 comprising lens 421 and detector array 422 used to take the picture of the object desired. When it is desired to determine the position of the hand 404, the red LED's are turned on by camera controller 430, and a bright reflection is seen in the image at the point in question due to the retro-reflection effect.

[0070] Where stereo pairs of cameras are used, as in fig 1 or 2A, two reflections are seen whose disparity in location from one camera to the other gives the z distance (range direction) from the camera. In this case light sources are located with each camera of the stereo pair in order that for each camera, the retro-reflectors are properly illuminated with light emanating from point or points angularly near the camera in question.

[0071] The LEDs can be illuminated on alternate camera frames, or at any other time when "picture" type image data is not desired. In this case the camera does not under room lights 445 say, normally see the retro-reflection signal, which is desirable as the bright spot of 401 from the image of the human desired. Processor 450 processing the data, can even be used to subtract out from the recorded image, the shape of the retro-reflector, which might be a noticeably different shape than found in practice (e.g. a triangle). The image can be filled in where the subtraction occurred with color, brightness, contrast and texture or other characteristics of the surroundings. This is particularly easy if the target (retro-reflector or otherwise) is placed on the

human or object in a region of small variation in characteristics needed to be filled in, e.g. the back of one's hand, say. The key is that after processing, the image look like it did without addition of the artificial target.

[0072] If the LEDs are turned on by the camera controller during picture taking, color processing can be used to remove from the stored image of the scene, any indications of bright zones at the LED wavelength used, filling in with color of the surrounding area as desired.

[0073] Clearly both processing techniques just described or others can be used. And the methods work well with stereo pairs of cameras too.

[0074] Retro-reflective or other distinguishable artificial targets can be provided in different decorative designs for wrist, back of hand, rings, forehead, hats, etc. For example, 3 targets in a heart or triangle shape, a square box of 4 targets, or a box or pyramid with line targets on its edges, and so forth.

[0075] Colored targets can be made of cloth, plastic, or the like, including Colored plaids, polka dots, etc. Or coatings or Filters or evaporated on filters may be placed in front of a target such as a plastic retroreflector in order to render it of a given color (if it wasn't made of colored material in the first place).

[0076] Decorative line outlines (also possible in retroreflective bead material) can also be used as target datums, for example down the seam of glove fingers, or shoes, or belts, dress beading, etc.

FIGURE 5

[0077] Figure 5 illustrates further one of many methods by which the invention may be used to feed back data to a subject (or subjects) having his or her picture taken, in order that the subject assume another pose or engage in another activity.

[0078] For example consider fig 5. A girl 500 is having her picture taken by the camera of the invention 501 (in this case a single digital camera version such as illustrated in fig 4), and her positions, orientations or sequences of same, including motions between points are analyzed as described above, in this case by computer 530. The computer has been programmed to look for funny movements and positions, defined here as when the arms are in unusual positions (clearly a subjective issue, programmed as to tolerances, or taught to the system by the person in control of the situation).

[0079] The girl then poses for the camera. When the camera of the invention takes the picture according to its preprogrammed criteria (in this case, for example, defined as when her arms are over her head, and after a significant movement has occurred), it lets her know by lighting light 520 connected by wires not shown to computer 530. During the photo shoot, then she begins to learn what it is looking for (if she hasn't been already told) and does more of the same. If desired, and optional video display 540 or voice out put speaker 550, both connected to computer 530, indicate to her what is desired. This could also be a particular type of pose, e.g. "Cheese-cake" based on historic classical poses learned from photo art (note that she can also make comments for recording too, with optional microphone input not shown. As pointed out above, voice recognition software, such as IBM Via Voice" can be used to recognize commands from the subject or photographer, and cause other results).

[0080] It can be more sophisticated yet. For example, if the computer 530 and any associated software as needed may be used to analyze the model's lips and her smile. In this manner, the invention can be used to photograph all "smiling" poses for example. Or poses where the smile is within certain boundaries of lip curvature even. Similarly, the camera or cameras of the invention can be used, with suitable image analysis software to determine when

the subject's eyes are open a certain amount, or facing the camera for example.

[0081] Figure 3 above has alluded to possible use of the invention data processing to determine position and/or orientation data from recorded picture frames, after the picture is taken. A method for selecting from memory pictures obtained when certain pre programmed poses of objects sequences of poses, or relationships of objects are represented.

[0082] Selection can be according to criteria for example 1-7 above, but there are some differences. First if the data is taken normally from a single camera such as that of 202 above, 3D information is not available. This being the case, conventional 2D machine vision type image processing (e.g. "Vision Bloks" software from Integral Vision Corp.) can be used to extract object features and their locations in the images retained.

[0083] A second version alternatively could employ a single picture taking camera, but by employing 3 dot or other suitable targets on the photographed object in the camera field, could calculate 3D data related to the object (position and orientation in up to 6 axes can be so calculated by the computer of the invention using target location data in the camera image field).

[0084] A third version, records data from the camera, or in the case of the fig 2A device, all three cameras - all recorded for example on digital media such that the processing can be done after the fact, just as it would have been live.

[0085] Another application can be to monitor the relative change in successive pictures as seen by one or more relatively low resolution cameras and when such change is minimal, cue the high resolution camera requiring a longer exposure to become enabled. In this manner blur of the high resolution camera image is avoided. This is useful in taking pictures of children, for example. This comparison of images can be made without actually measuring distances, but rather by looking for images which are not different within an acceptance band, one to another,

thus indicating the motion is largely stopped. This can be determined by subtracting one image from the other and determining the amount of pixels above a threshold. The more, the less the images are alike. Other techniques can be used as well, such as correlation techniques.

[0086] In some instances it is desirable to have, in taking pictures, a display such as 555, preferably (but not necessarily) life size. This display can be not only used to display the image 565 of the person whose picture is being taken, but as well can display still (or video) images called up from computer memory or other media storage such as DVD discs, and the like. One use of the displayed images is to indicate to the subject a desired pose for example. This can be done by itself, or interactively using the invention. A computer generated and rendered 3D image can also be created using suitable 3D solid modeling software (such as CAD KEY) to show an approximate pose to the model.

[0087] For example the invention disclosed above, allows one to automatically observe the expressions, gestures and continence of a person, by determining the shape of their smile, the direction of eye gaze, and the positions or motion of parts of the body such as the head, arms, hands, etc. Analysis using pre programmed algorithms or taught sequences can then lead to a determination as to what information to display on display 555 controlled in image content by display processor 560.

[0088] As one instance, suppose computer image analysis of data from camera 501 of the invention has determined that the person 500 is not smiling enough, and is in too stationary a pose. A signal from computer 510 is provided to display processor 560 so as to display on display 555 an image of someone (perhaps the same subject at an earlier time, or a computer generated likeness of a subject) having the characteristics desired. The person looks at this display, and sees someone smiling more for example, and in one scenario, tries to mimic the

smile. And so forth. Alternatively, voice generation software, such as included in IBM VIAVOICE can be used to computer generate a voice command, "Smile More" for example, rather than show a visual illustration of the effect desired.

FIGURE 6

[0089] Let us now discuss some other applications of picture taking enabled by the invention. One embodiment can be used to determine location of items in a scene, for example furniture in a house, for which homicide studies or insurance fraud could be an issue (see also figure 1 above, as well as referenced co-pending applications).

[0090] For example, a detective (whose arm 600 is shown) arrives at a murder scene in a room, and he sets the stereo camera 610 of the invention disclosed in fig 2C on a tripod 620 (or other suitable location) and systematically designates, using laser pointer 630, any object desired, such as chair 640 impacted by the laser beam at point P. The camera/computer system of the invention locates the designated point takes a picture of the room, or a portion thereof, including the zone of the designated point P which stands out in the picture due to the laser spot brightness. Optionally, the stereo pair of cameras of the invention can digitize rapidly the xyz coordinates of point p, which can be superposed if desired on the image of the scene including point p itself and its immediate surroundings. This data can be processed by computer 660 as desired and either recorded or transmitted to a remote location along with the images as desired using known communication means. This work can be done outdoors, as well as inside. Numerous points to be digitized can be sensed and/or indicated, as desired.

[0091] The same digitization procedure can be used to digitize a room for a real estate person for example, to develop a data base on a house for sale. And many other such applications exist.

[0092] Finally it should be noted that the invention solves many famous problems of picture taking, for example of children. The digital camera images of the invention can be processed for example using appropriate software such as Vision Bloks to determine if the child's eyes are open (determined for example by recognizing the eye iris in the face area), and if so to take the picture, or after the fact, to select the picture from a group. Or a signal can be given by the system to the child to "open your eyes" so to speak. To determine if the eye is open, the image can be processed for example to look for the white of the eye, or to look for red reflections from the eye. This can even be done with deep red, or near IR light sources like LEDs which do not bother the child.

[0093] Similarly, if the child (or other subject) is in motion, when you want him still, the picture can be analyzed until he is still, and then the picture taken or selected. This can be determined from comparison of successive frames, from motion blur or other characteristics of motion in the image. Or a signal as above can be given to the child to "sit still" (a famous command in picture taking annals).

FIGURE 7

[0094] The invention can also be used for commercial photography and for producing motion pictures. One advantage is that very high resolution images at suitable exposure levels of critical scenes can be taken, but not too many which would overload the memory capacity of a camera system. A means to enhance this is now described.

[0095] It is noted that a camera having an ability to read individual pixels as desired, or at least to choose the lines of pixels to be read, can achieve high rates of scan if one knows apriori where to look apriori for data. Or if one say scans every 20th pixel in either direction xy of the camera, to determine where frame to frame changes are occurring (due to change in pixel

brightness or color). Once change is determined one can often isolate those areas to the ones of interest. For example, even in a "Still" picture, the head often moves (similar to the lovers on the bench in the shopping mall mentioned above). Every 20th pixel, cuts the number of pixels by 400 times, and raises a normal 30hz scan rate to over 1000 scans per second - more than needed in many cases.

[0096] When the area of interest is found, the pixels in that area are all scanned for example.

[0097] Such pixel addressing cameras can also be used for determining the position and change in position of features used to determine, and track, pose and other variables, as has also been discussed in co-pending applications, particularly Camera Based Man-Machine Interfaces US SN 60/142,777, incorporated herein by reference. Of special interest is that same high resolution camera can be used to take the picture desired, while at the same time be used to find or track the object at high speed.

[0098] Such high speed tracking can be interspersed with the taking of pictures. For example if in photographing a ballet, it may be desired only to take pictures of the prima ballerina, who typically is the one, with any male dancer, that is moving the most. By determining the zone to be measured, one can sense quickly what zone should looked at, and high resolution photographs obtained from that zone. This allows one to use a very large format camera in a fixed location (e.g. 5000x5000 pixels) to cover the image of the whole stage via suitable optics, but to only take and store the pixels in a 1000x700 zone of interest movement, or positional or gesture interest for example, providing a 35 times increase in the frame rate needed today with such large pixel cameras. This allows their practical use, without resort to human cameramen, or pan/tilt mechanisms.

[0099] Similar logic holds for quarterbacks in a football game, who often run faster than any defense men around them and can be differentiated accordingly (along with any other issues such as uniform color, design or the like). If possible, it is desirable to have a clearly defined target, such as a retroreflective or bright colored target on one's helmet for example. Indeed helmet color can be chosen accordingly.

[0100] This is illustrated in fig 7 wherein camera 701 composed of lens 705 and an addressable version of a Kodak MegaPixel detector array 710 having 4000x4000 elements and under the control of computer 711 is used to scan the image of a pair of dancers 715 and 716 on stage 720. The field of view of the camera equal to area ab covers the whole stage. But the area scanned out from array 710 is confined to the region in which the dancers were last seen, which is defined as a zone a'b' equal to in this case 500x500 pixels. This still allows DVD type resolutions to be achieved, without pan or tilt of the camera. Similarly such techniques can be used for video conferencing, sports, and other activities as well.

[0101] It should be noted that in the above embodiments the words picture and photograph are interchangeable, as are photographing or photography and picture-taking. The camera used for same is preferably but not necessarily a solid state TV camera whose pixels are scanned serially or randomly under program command.

FIGURE 8

[0102] The invention can also be used to sense positions of people for instructional purposes. Data as to a dancer's movements for example can be obtained, and appropriate images, or data or both transmitted without excessive bandwidth requirements to a remote location for comment or interaction by a trained professional. Combined with life-size screen displays this allows a life like training experience to be gained at low cost, since one professional can watch

10 students in different locations say, each trying her movements alone in the intervening moments. In addition such training can occur in the home, as if one had a private tutor or coach.

[0103] For example consider fig 8. A class of ballet students is practicing near a "mirror" which in this case is comprised life size digital display screen 800 illuminated from the rear by a Sharp brand projector 801 driven by computer 810. By sliding a real mirror in an out the mirror can be a mirror, or a display. If desired, this display can be extensive, and for example using 3 projectors to cover 3 adjacent screens each 6 feet high x9 feet long for example, such that a total length of a large studio is comprised.

[0104] A master instructor 825 (possibly remotely located via the internet or other communication means) can observe the students via TV camera (or cameras). By viewing the students the instructor can make corrections via audio, or by calling up imagery which represents the appropriate moves - for example from a professional doing the same Swan Lake number. In addition, the TV cameras of the invention can monitor the actual location and movements of the student, or students, and their relationship to each other, and if desired to various markers such as 830 on the floor of the studio, placed there to assist in choreographing the piece.

[0105] In addition, if the various gesture and position monitoring aspects of the invention are utilized as described above and in co-pending applications it is possible to have the instructions computer generated using dancers movements as input to a computer analysis program. This is particularly useful if dance routines which are classical in nature, are being attempted, which have known best forms which can be computer modeled.

[0106] In another version, an assistant can be on the scene say working with ten students in a local studio, while the master is remote.

[0107] It is also possible with the invention to provide input image data to projector

computer 810, even from remote internet located sources, which represents other people dancing for example. These can be images of the master, or others in the class - even if all in different locations. OR the images can be those of others who have performed a particular routine in the past, for example Dance of the Sugar plum fairy in the Nutcracker. This imagery could be from the Bolshoi ballet performance of the same dance, displayed in small town ballet studio or home - to illustrate the moves required. The use of life size projection not only gives a feel to this imagery, but further allows, I have discovered, a unique experience for the performer. Namely that the person can perform "with" the troupe displayed. In some cases, in ballet for example, this sometimes can be more useful than watching one's self in the mirror (typical in ballet studios).

[0108] By using the cameras of the invention, such as stereo pair 850 and 851 to determine student positions, it is also possible to control the display in many ways. For example as the student got closer to the display, the persons in the display could appear to come closer to the student. Conversely, it might be desirable to have them move away from the student to keep a constant apparent distance between them for example. And if the student is twirling left, the figures in the ballet depicted on the screen can be caused to turn right (as they are "in the mirror" so to speak) to match the movement of the student in approximate form at least.

[0109] In addition it is often desirable for learning purposes to Control speed of music and video display to match sensed movements of pupil, or from remote master person. Use display techniques which can produce variable motion display, such as variable speed DVD disc or read data in to ram. In addition it is desirable that overlaid could be masters voice.

[0110] The invention can be advantageously used in many performing arts, not just ballet. For example, live theatre, where actors from Hamlet performances of the past can interact

with those practicing. Or where instructors of Skating or Gymnastics, other activities can also interact.

[0111] Sports as well is amenable to the technique, but the size of the "studio" or gym becomes an issue. Basketball for example fits the space aspect of the projection screens and the fields of view of the invention cameras as here described.

[0112] Ability of masters remotely located, and use of copyrighted performance material of famous performers and troupes allows one to franchise the studio concept of the invention. For example each town could have a Bolshoi studio franchise of this type.

[0113] It is noted that this same arrangement can serve other purposes beyond instruction. One is the possibility of remote dating, in which sensed movement of one partner is communicated, along with voice and visual expression to the other. In addition, is possible, as disclosed in co-pending applications, to build the displays described above in the form of a touch screen in which contact of one partner with the display of the other remotely transmitted from afar can occur.

[0114] If one uses large scale touch screens with optional added sensor inputs. As would be the ballet studio example of fig 8 if equipped with touch screen capability, then one can provide a mechanism for marketing of people relative (i.e. life size) objects such as automobiles in facilities such as Auto showrooms. Thus a ballet studio for example, can be used for other purposes, not just instructional, but for selling cars for example, where the display screen is displaying new models (including ones that are figments of design imagination, and where customer input is desired as in a focus group) and where customer inputs voice and action can be detected if desired by the invention. Or in reverse, an underused car showroom can be converted - on demand - into a site which can be used for, among other things, instructional purposes in

performing arts, sports and the like. This gives a reason for being to the show room that transcends selling cars, and helps attract people to the facility. If a car was displayed, on a touch screen, one could walk up to the full size display of the car, and touch the door handle, which would cause the touch screen to sense that same had occurred, and indicate to the computer to cause the display to display the door opening to expose the interior.

Electronic Acknowledgement Receipt

EFS ID:	17131788
Application Number:	13961452
International Application Number:	
Confirmation Number:	3753
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Customer Number:	24335
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Filer Authorized By:	Vito Anthony Ciaravino
Attorney Docket Number:	135873.152189-0003
Receipt Date:	15-OCT-2013
Filing Date:	07-AUG-2013
Time Stamp:	16:25:17
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	Miscellaneous Incoming Letter	Pryor_152189-003_Response_to_Notice_to_File_Corrected_Application_Papers.pdf	129526 c98786470604caa39bf7c2ce9e64a85224f3bc9c	no	1

Warnings:	
Information:	

2	Specification	Pryor_152189-003_Gesture_Camera_Control_Substitute_Specification.pdf	313983 3265fdabe99c87a9fd50169dafe360de7365df80	no	59

Warnings:	
Information:	
Total Files Size (in bytes):	443509

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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

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/961,452

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	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			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
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))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
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))									
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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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/961,452	08/07/2013	2486	1030	135873.152189-0003	20	3

CONFIRMATION NO. 3753

UPDATED FILING RECEIPT

24335
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

Date Mailed: 10/25/2013

Receipt is acknowledged of this non-provisional 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 APPLICANT, 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 Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections 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**

Inventor(s)

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Applicant(s)

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Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/459,670 04/30/2012
which is a CON of 12/891,480 09/27/2010 PAT 8189053
which is a CON of 11/376,158 03/16/2006 PAT 7804530
which is a CON of 09/568,552 05/11/2000 PAT 7015950
which claims benefit of 60/133,671 05/11/1999

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.

If Required, Foreign Filing License Granted: 08/22/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/961,452**
Projected Publication Date: 01/30/2014
Non-Publication Request: No
Early Publication Request: No
** **SMALL ENTITY** **

Title

CAMERA BASED INTERACTION AND INSTRUCTION

Preliminary Class

348

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

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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GRAND RAPIDS MI 49503-2487

Doc Code: TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 13/961,452

1. THE REQUEST FILED August 7, 2013 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination

A. ☒ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;
B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
C. filing a **request for continued examination**;
D. filing a notice of appeal;
E. filing a request for suspension of action;
F. mailing of a notice of allowance;
G. mailing of a final Office action;
H. completion of examination as defined in 37 CFR 41.102; or
I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to Brian W. Brown at 571-272-5338.

/Brian W. Brown/
[*Signature*]

Petitions Examiner, Office of Petitions
(Title)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

24335 7590 12/30/2013
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
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111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

EXAMINER	
HO, TUAN V	
ART UNIT	PAPER NUMBER
2661	

NOTIFICATION DATE	DELIVERY MODE
12/30/2013	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):

patents@wnj.com

Office Action Summary	Application No. 13/961,452	Applicant(s) PRYOR, TIMOTHY R.	
	Examiner TUAN HO	Art Unit 2661	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/7/13*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-20* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *8/7/13* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

2. 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 claims at issue 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); and *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 a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form 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 http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

3. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-33 of U.S. Patent No. 7,015,950 . Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-33 of the Patent' 950.

With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

4. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 7,804,530 . Although the claims at

issue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-23 of the Patent' 530.

With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

5. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,189,053 . Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-20 of the Patent' 053.

With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

6. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (**pre-AIPA** 35 U.S.C. 102(e)).

Claims 1-7 and 9-20 are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Sengupta et al (US 6,359,647) cited by Applicant.

With regard to claim 1, Sengupta et al discloses in Fig. 1, a camera system that comprises the portable device comprising: a device housing including a forward facing portion (camera system 120, col. 3, line 14), the forward facing portion including an electro-optical sensor having a field of view (camera 103, col. 3, line 40) and a digital camera separate from the electro- optical sensor (camera 101 or 102, col. 3, line 41); and a processing unit within the device housing and operatively coupled to electro-optical sensor (camera system 120 includes data base 160, col. 3, line 45), wherein the processing unit is adapted to control the digital camera in response to a gesture performed in the electro-optical sensor field of view (camera 103 detects movements of

an object inherently including a gesture so as to control cameras 101 or 102, col. 3, lines 54+ and col. 4, lines 1-35).

With regard to claims 2 , Sengupta et al discloses in Fig. 1, a camera system that comprises the gesture corresponds to an image capture command (movements of an object are detected by camera 103 corresponding to control commands from system 120).

With regard to claims 3 and 4, Sengupta et al discloses in Fig. 1, a camera system that comprises the determined gesture includes a hand motion or pose (the movement of an object inherently include hand motion or pose of an object).

With regard to claim 5, Sengupta et al discloses in Fig. 1, a camera system that comprises the electro-optical sensor is fixed in relation to the digital camera (camera 103 is fixed in relation to the camera system 120 as shown in Fig. 1).

With regard to claim 6, Sengupta et al discloses in Fig. 1, a camera system that comprises a forward facing light source (a forward light source id inherently included in the camera system since the source is used to illuminate an object in order to generate an optical image on a camera sensor).

With regard to claim 7, Sengupta et al discloses in Fig. 1, a camera system that comprises the electro-optical sensor defines a resolution less than a resolution defined by the digital camera (camera 103 inherently includes an image sensor that has resolutions less than camera 101 or 102 since camera is used to detect a field of view in general).

Claims 9-14 recites what was previously discussed with respect to claims 1-7.

With regard to claim 15, Sengupta et al discloses the same subject matter as discussed with respect to claim 1. It should be noted that claimed “processing unit is adapted to correlate a gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera” is met by camera system correlates movements of an object received by camera 103 so as to control movement of camera 101 or 102, Col. Col. 4, lines 1-46).

Claims 16-20 recites what was discussed with respect to claims 2-6.

7. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 8 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Sengupta et al.

With regard to claim 8, Sengupta et al discloses the same subject matter as discussed with respect to claim1, except for the electro-optical sensor includes at least one of a CCD detector and a CMOS detector.

Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to

convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Coughlan et al (US 7,564,476) discloses a video conference system that comprises determining whether an image frame is appropriate.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan Ho whose telephone number is (571) 272-7365. The examiner can normally be reached on Mon-Fri 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V Ho/

Primary Examiner, Art Unit 2622

Notice of References Cited	Application/Control No. 13/961,452	Applicant(s)/Patent Under Reexamination PRYOR, TIMOTHY R.	
	Examiner TUAN HO	Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,564,476	07-2009	Coughlan et al.	348/14.08
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	303239	H04N 5/23238 or H04N 5/247 or H04N 5/3415	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/24 10:18
L2	4555	348/143,211.4,222.5,211.8,211.9.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/24 10:19
L3	305052	1 or 2	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/24 10:19
L5	58	3 and (sensor and camera and (control$4 same camera same gesture same field same view))	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/24 10:21
L6	151	348/211.8.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/24 10:25
L7	302	timothy near3 pryor	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/24 10:26
L8	5	7 and (sensor and camera and (control$4 same camera same gesture same field same view)).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/24 10:26

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L9	14	(sensor and camera and (control$4 same camera same gesture same field same view)).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2013/12/24 10:27

12/24/2013 10:28:58 AM
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13961452 - GAU: 2661
PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2013-08-06
First Named Inventor	Timothy R. Pryor
Art Unit	
Examiner Name	
Attorney Docket Number	135873.152189-0003

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	3909002		1974-09-30	Levy	
	2	4219847		1980-08-26	Pinkney et al	
	3	4339798		1982-07-13	Hedges et al	
	4	4631676		1986-12-23	Pugh	
	5	4791589		1988-12-13	Blazo et al	
	6	4843568		1989-06-27	Krueger et al	
	7	4908704		1990-03-13	Fujioka et al	
	8	4988981		1991-01-29	Zimmerman et al	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

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	10	5088928		1992-02-18	Chan	
	11	5227986		1993-07-13	Yokota et al	
	12	5249053		1998-09-28	Jain	
	13	5297061		1994-03-22	Dementhon et al	
	14	5365597		1994-11-15	Holeva	
	15	5376796		1994-12-27	Chan et al	
	16	5388059		1995-02-07	DeMenthon	
	17	5454043		1995-09-26	Freeman	
	18	5491507		1996-02-13	Umezawa et al	
	19	5534921		1996-07-09	Sawanobori	

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	20	5572251		1996-11-05	Ogawa	
	21	5581276		1996-12-03	Cipolla et al	
	22	5594469		1997-01-14	Freeman et al	
	23	5616078		1997-04-01	Oh	
	24	5624117		1997-04-29	Ohkubo et al	
	25	5781647		1998-07-14	Fishbine et al	
	26	5781650		1998-07-14	Lobo et al	
	27	5828770		1998-10-27	Leis et al	
	28	5845006		1998-12-01	Sumi et al	
	29	5853327		1998-12-29	Gilboa	
	30	5878174		1999-03-02	Stewart et al	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

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	31	5904484		1999-05-18	Burns	
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	33	5940126		1999-08-17	Kimura	
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	35	5999840		1999-12-07	Grimson et al	
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	37	6098458		2000-08-08	French et al	
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	39	6148100		2000-11-14	Anderson et al	
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	55	6788336		2004-09-07	Silverbrook	
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	57	7489863		2009-02-10	Lee	

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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		☐

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EXAMINER SIGNATURE

Examiner Signature	/Tuan Ho/ (12/23/2013)	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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

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	Examiner Name	
	Attorney Docket Number	135873.152189-0003

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	/Vito A. Ciaravino/	Date (YYYY-MM-DD)	2013-08-06
Name/Print	Vito A. Ciaravino	Registration Number	62749

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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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L13	1	"8189053".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/23 14:53
L14	57	("3909002" | "4219847" | "4339798" | "4631676" | "4791589" | "4843568" | "4908704" | "4988981" | "5008946" | "5088928" | "5227986" | "5249053" | "5297061" | "5365597" | "5376796" | "5388059" | "5454043" | "5491507" | "5534921" | "5572251" | "5581276" | "5594469" | "5616078" | "5624117" | "5781647" | "5781650" | "5828770" | "5845006" | "5853327" | "5878174" | "5904484" | "5926168" | "5940126" | "5982352" | "5999840" | "6052132" | "6098458" | "6108033" | "6148100" | "6160899" | "6204852" | "6252598" | "6342917" | "6346929" | "6359647" | "6363160" | "6373472" | "6442465" | "6508709" | "6529617" | "6597817" | "6663491" | "6750848" | "6775361" | "6788336" | "6911972" | "7489863").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/23 14:54

EAST Search History (Interference)

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BIB DATA SHEET

CONFIRMATION NO. 3753

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/961,452	08/07/2013 RULE	348	2661	135873.152189-0003

APPLICANTS

INVENTORS
Timothy R. Pryor, Sylvania, OH;

** **CONTINUING DATA** *************************
This application is a CON of 13/459,670 04/30/2012
which is a CON of 12/891,480 09/27/2010 PAT 8189053
which is a CON of 11/376,158 03/16/2006 PAT 7804530
which is a CON of 09/568,552 05/11/2000 PAT 7015950
which claims benefit of 60/133,671 05/11/1999

** **FOREIGN APPLICATIONS** *************************

** **IF REQUIRED, FOREIGN FILING LICENSE GRANTED** ** ** SMALL ENTITY **
08/22/2013

Foreign Priority claimed ❑ Yes ☑ No 35 USC 119(a-d) conditions met ❑ Yes ☑ No Verified and Acknowledged /TUAN V HO/ Examiner's Signature	❑ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		OH	7	20	3

ADDRESS

WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487
UNITED STATES

TITLE

CAMERA BASED INTERACTION AND INSTRUCTION

FILING FEE RECEIVED	FEES	
1030	FEES: Authority has been given in Paper No.___________ to charge/credit DEPOSIT ACCOUNT No.___________ for following:	❑ All Fees ❑ 1.16 Fees (Filing) ❑ 1.17 Fees (Processing Ext. of time) ❑ 1.18 Fees (Issue) ❑ Other ______________ ❑ Credit

BIB (Rev. 05/07).

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	Art Unit
	TUAN HO	2661

CPC- SEARCHED		
Symbol	Date	Examiner
H04N 5/23238, H04N 5/247, H04N 5/3415	12/24/13	TH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	211.4, 211.5, 211.8 and 211.9	12/24/13	TH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST and Inventorship Search	12/24/13	TH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Search Histroy	12/24/13	TH

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	**Art Unit**
	TUAN HO	2661

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/24/2013								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
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	8	✓								
	9	✓								
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	18	✓								
	19	✓								
	20	✓								

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"8189053".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/13 09:18
L2	2	("6346929").PN. OR ("8189053").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2013/12/13 09:18
L3	1	("6346929").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2013/12/13 09:21
L4	1	("8189053").URPN.	USPAT	OR	ON	2013/12/13 09:21
L5	1	"7015950".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2013/12/13 09:22
L6	54	("4791589" | "4908704" | "4988981" | "5249053" | "5365597" | "5376796" | "5534921" | "5572251" | "5781650" | "5999840" | "6052132" | "6108033" | "6148100" | "6160899" | "6346929" | "6359647" | "6363160" | "6529617" | "6750848").PN. OR ("7015950").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2013/12/13 09:22

EAST Search History (Interference)

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003

CONFIRMATION NO. 3753

PUBLICATION NOTICE

24335
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
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GRAND RAPIDS, MI 49503-2487

OC00000066344777

Title:CAMERA BASED INTERACTION AND INSTRUCTION

Publication No.US-2014-0028855-A1
Publication Date:01/30/2014

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 Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner	:	Tuan V. Ho
Art Unit	:	2661
Inventor	:	Timothy R. Pryor
Application No.	:	13/961,452
Filing Date	:	August 7, 2013
For	:	CAMERA BASED INTERACTION AND INSTRUCTION
Attorney Docket No.	:	135873.152189-0003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE

In Response to the Official Action dated December 30, 2013, the period for response being until March 30, 2014, please amend the above identified patent application as set forth on the following pages.

CLAIMS

1. (Currently Amended) A portable device comprising:

a device housing including a forward facing portion, the forward facing portion of the device housing including an electro-optical sensor having a field of view and including a digital camera separate from the electro-optical sensor; and

a processing unit within the device housing and operatively coupled to the electro-optical sensor, wherein the processing unit is adapted to control the digital camera in response to a gesture performed in the electro-optical sensor field of view.

2. (Original) The portable device of claim 1 wherein the determined gesture corresponds to an image capture command.

3. (Original) The portable device of claim 1 wherein the determined gesture includes a hand motion.

4. (Original) The portable device of claim 1 wherein the determined gesture includes a pose.

5. (Original) The portable device of claim 1 wherein the electro-optical sensor is fixed in relation to the digital camera.

6. (Original) The portable device of claim 1 further including a forward facing light source.

7. (Original) The portable device of claim 1 wherein the electro-optical sensor defines a resolution less than a resolution defined by the digital camera.

8. (Original) The portable device of claim 1 wherein the electro-optical sensor includes at least one of a CCD detector and a CMOS detector.

9. (Currently Amended) A computer implemented method comprising:

providing a portable device including a digital camera on a forward facing portion thereof, the digital camera defining a field of view;

determining, using a processing unit, a gesture performed in the digital camera field of view, wherein the determined gesture is identified by the processing unit apart from a plurality of gestures; and

capturing an image to the digital camera in response to the determined gesture corresponding to an image capture command.

10. (Original) The method according to claim 9 wherein the determined gesture includes a hand motion.

11. (Original) The method according to claim 9 wherein the determined gesture includes a pose.

12. (Original) The method according to claim 9 further including providing a forward facing electro-optical sensor and detecting, using the electro-optical sensor, the gesture performed in the digital camera field of view.

13. (Original) The method according to claim 12 wherein the electro-optical sensor includes first and second sensors in fixed relation relative to the digital camera.

14. (Original) The method according to claim 12 wherein the electro-optical sensor defines a resolution less than a resolution defined by the digital camera.

15. (Currently Amended) An image capture device comprising:

a digital camera adapted to capture an image and having a field of view;

a sensor adapted to detect a gesture in the digital camera field of view; and

a processing unit operatively coupled to the sensor and to the digital camera, wherein the processing unit is adapted to correlate a gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is identified by the processing unit apart from a plurality of gestures.

16. (Currently Amended) The image capture device of claim 15 wherein the detected ~~determined~~ gesture includes a hand motion.

17. (Currently Amended) The image capture device of claim 15 wherein the detected ~~determined~~ gesture includes a pose.

18. (Original) The image capture device of claim 15 further including a forward facing light source.

19. (Original) The image capture device of claim 15 wherein the sensor defines a resolution less than a resolution defined by the digital camera.

20. (Original) The image capture device of claim 15 wherein the sensor is fixed in relation to the digital camera.

REMARKS

Reconsideration of the above identified patent application is respectfully requested. Claims 1-20 are pending. Claims 1, 9 and 15-17 are amended to more particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Support is set forth at least in Figure 2A and Paragraphs 0469 and 0499 of the Specification as originally filed. The rejection is respectfully traversed.

I. Section 102 Rejection

A. Claims 1-8

As previously presented, independent claim 1 was rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,359,647 to Sengupta et al.

Sengupta discloses a security system for controlling multiple security cameras. The security system "selects the appropriate camera when [an] object traverses from one camera's field of view to another camera's field of view." Col. 3, Lns. 60-64.

With respect to amended independent claim 1, Sengupta does not disclose, teach or suggest a device housing including a forward facing portion having an electro-optical sensor and a digital camera.

Instead, the security system in Sengupta includes a camera handoff system 120 and three security cameras 101, 102, 103, generally shown in Fig. 1 below. The camera handoff system 120 receives the output of the security cameras 101, 102, 103, optionally over a "telephone connection." Col. 3, Lns. 14-15.

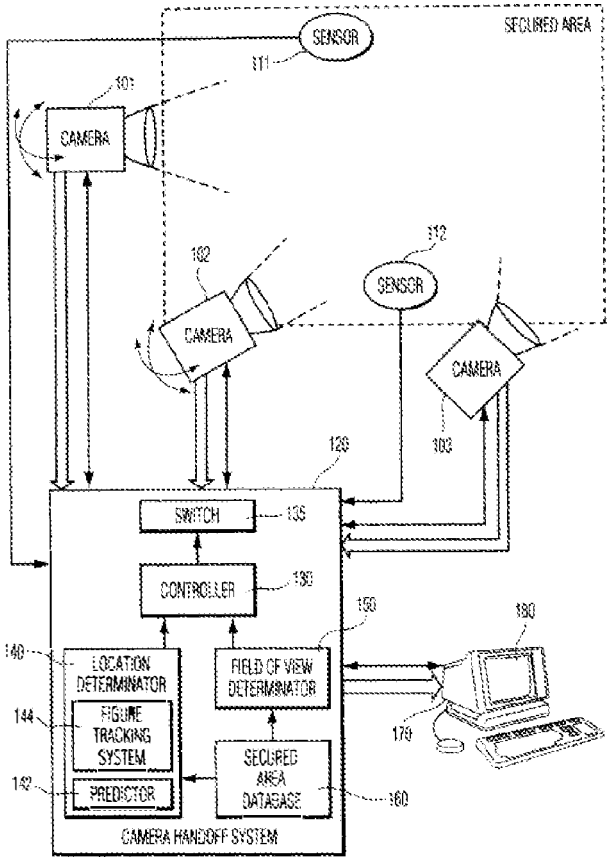

FIG. 1

In the rejection of claim 1, the Office Action equates the "camera handoff system 120" in Sengupta with a device housing in claim 1. Office Action, Page 5. However, the camera handoff system 120 is not a device housing. Instead, the camera handoff system 120 is a system for controlling the handoff of one camera to another camera. Col. 3, Lns. 43-46. This system 120 includes a variety of programming blocks (e.g., controller, predictor, location determinator, secured area database). What the system 120 does not include, and what is recited in amended independent claim 1, is a device housing including a forward facing portion having an electro-optical sensor and a digital camera.

Accordingly, it is respectfully submitted that amended independent claim 1 is allowable over Sengupta.

Dependent claims 2-8 depend directly or indirectly from amended independent claim 1, and are allowable for at least the reasons noted above in connection with that claim.

B. Claims 9-20

As previously presented, independent claims 9 and 15 were rejected under 35 U.S.C. 102(e) as being anticipated by Sengupta.

Sengupta is discussed above. With respect to amended independent claims 9 and 15, Sengupta does not disclose, teach or suggest a processing unit to determine a gesture in a camera field of view, wherein the determined gesture is identified by the processing unit apart from a plurality of gestures as corresponding to an image capture command.

Instead, Sengupta discloses a figure tracking system 144. Col. 4, Lns. 5-6. The figure tracking system 144 tracks objects within a camera field of view. Col. 3, Ln. 66 – Col. 4, Ln. 1. In particular, the figure tracking system 144 "identifies moving objects" and "reports the location of" the moving objects. Col. 4, Lns. 8-14. However, the figure tracking system 144 does not identify a particular gesture apart from a plurality of gestures, where the particular gesture corresponds to an image capture command for a digital camera.

Accordingly, it is respectfully submitted that amended independent claims 9 and 15 are allowable over Sengupta.

Dependent claims 10-14 and 16-20 depend directly or indirectly from amended independent claims 9 or 15, and are allowable for at least the reasons noted above in connection with the respective base claim.

II. Statutory Double Patenting Rejection

Claims 1-20 were provisionally rejected on the grounds of statutory double patenting in view of U.S. Patent Application Serial Numbers 13/961,452. The amendments to claims 1, 9 and 15-17 obviate the statutory double patenting rejection.

III. Obvious-Type Double Patenting Rejections

Claims 1-20 were rejected on the grounds of non-statutory obvious-type double patenting in view of U.S. Patent 7,015,950, U.S. Patent 7,804,530, and U.S. Patent 8,189,053. Terminal Disclaimers are filed contemporaneously with this Response to overcome the non-statutory double patenting rejection.

IV. Conclusion

In view of the above amendments, these remarks, and the attached Terminal Disclaimers, it is respectfully submitted that the present application is fully in condition for allowance. A notice to that effect is earnestly and respectfully requested.

Respectfully submitted,

GESTURE TECHNOLOGY
PARTNERS, LLC

By: Warner Norcross & Judd LLP

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10234338

PTO/AIA/26 (04-13)
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U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

The applicant, Gesture Technology Partners, LLC, owner of 100 percent interest 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** No. 7,015,950 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any 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.

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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.

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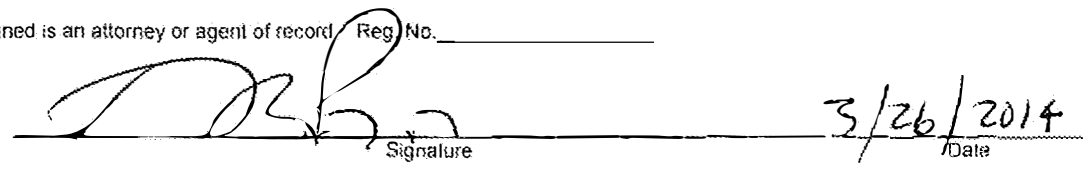
2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____



Signature 3/26/2014 Date

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8635
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional): 135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

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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.

Check either box 1 or 2 below, if appropriate.

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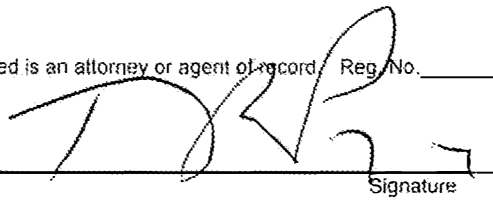

Signature

26 March '14
Date

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8635
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional)
135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

The applicant, Gesture Technology Partners, LLC, owner of 100 percent interest 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** No. 7,804,530 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any 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 applicant 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:

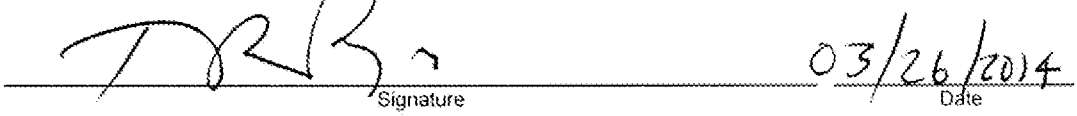
expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☑ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____



Signature

03/26/2014
Date

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8635
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

PATENT ASSIGNMENT

In consideration of the payment by ASSIGNEE to ASSIGNOR of the sum of One Dollar ($1.00), and for other good and valuable consideration, the receipt and sufficiency of which is acknowledged, ASSIGNOR, Timothy R. Pryor, residing at 4148 Stonehenge Drive, Sylvania, Ohio 43560, sells, assigns, and transfers to ASSIGNEE, Gesture Technology Partners, LLC, an Ohio limited liability company, having a place of business at 4148 Stonehenge Drive, Sylvania, Ohio 43560, its entire right, title, and interest in the United States in and to the following patents and patent applications (hereinafter "Patents"):

PATENTS

Patent No.	Issue Date
6,750,848	06/15/2004
7,015,950	03/21/2006
7,804,530	09/28/2010
7,933,431	04/26/2011
8,189,053	05/29/2012
8,194,924	06/05/2012

PATENT APPLICATIONS

Application No.	Filing Date
13/459,670	04/30/2012
13/461,954	05/02/2012
13/714,748	12/14/2012
13/714,755	12/14/2012
13/714,774	12/14/2012
13/850,577	03/26/2013
13/850,602	03/26/2013
13/850,616	03/26/2013
13/961,452	08/07/2013

ASSIGNOR further sells, assigns, and transfers to ASSIGNEE its entire right, title, and interest in and to all claims for damages by reason of past infringement of said Patents with the right to sue for and collect same and in and to all any reissue or reexamination thereof.

ASSIGNOR further covenants that ASSIGNEE will, upon ASSIGNEE's request, be provided promptly with all pertinent facts and documents relating to said Patents as may be known and accessible to ASSIGNOR and will testify as to the same in any interference, litigation, or proceeding related thereto and will promptly execute and deliver to ASSIGNEE, or its legal representatives, any and all papers, instruments, and affidavits required to maintain and enforce said Patents, which may be necessary or desirable to carry out the purposes hereof, or to effect, confirm, or attest to ASSIGNEE's rights hereunder.

IN WITNESS WHEREOF, ASSIGNOR has executed this Assignment as of the date indicated below.

Witness:	Assignor:	Date:
	Timothy R. Pryor	7 August 2013

8897157.3

Electronic Patent Application Fee Transmittal

Application Number:	13961452
Filing Date:	07-Aug-2013
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Attorney Docket Number:	135873.152189-0003

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

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($)
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	3	160	480
		Total in USD ($)		**480**

Electronic Acknowledgement Receipt

EFS ID:	18580468
Application Number:	13961452
International Application Number:	
Confirmation Number:	3753
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Customer Number:	24335
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Filer Authorized By:	Vito Anthony Ciaravino
Attorney Docket Number:	135873.152189-0003
Receipt Date:	27-MAR-2014
Filing Date:	07-AUG-2013
Time Stamp:	10:28:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$480
RAM confirmation Number	14410
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		Response_152189.pdf	70408 0ff3f8f11a8fc454d9f5148c081fdf38487fcb12	yes	9

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	4
Applicant Arguments/Remarks Made in an Amendment	5	9

Warnings:

Information:

2	Terminal Disclaimer Filed	Terminal_Disclaimers.pdf	4224339 1ab6723d148acfe5ae50ffb01eaab037adf33f6a	no	5

Warnings:

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	30333 413e2abb0202d159a37330acebfae42fae774e2	no	2

Warnings:

Information:

Total Files Size (in bytes):	4325080

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/961,452	Filing Date 08/07/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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 $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ 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

AMENDMENT	03/27/2014	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	x $40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	x $210 =	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**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
	☐ 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.

** 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 number found in the appropriate box in column 1.

LIE
/FLORENCE PATTERSON/

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination
	13/961,452	PRYOR, TIMOTHY R.

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☐ APPROVED	☒ DISAPPROVED
Date Filed : 03/27/14	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

3 - Tds all disapproved:

Td's identifies a party who is not the applicant(only for applications filed on/after 9/16/12), see FP 14.26.10.

Below is what needs to be done by applicant to remedy the defects:

For cases filed on/after 9/16/12, 37 CFR 1.321 specifies that the applicant can disclaim, and the terminal disclaimer must specify the extent of the applicant's ownership.

A request under 37 CFR 1.46(c) to change the applicant needs to be filed, which is (1) a request, signed by a 1.33(b) party, (2) a corrected ADS (37 CFR 1.76(c)) that identifies the "new" applicant in the applicant information, and is underlined since it is new, and (3) a 3.73(c) statement showing chain of title to the new applicant. Along with the § 1.46(c) request we need a POA that gives power to the attorney who is signing the TD, along with another copy of the TD, unless they file a TD that is signed by the applicant.

NO FEES are required.

Angie Walker

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

24335 7590 05/14/2014
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

EXAMINER	
HO, TUAN V	

ART UNIT	PAPER NUMBER
2661	

NOTIFICATION DATE	DELIVERY MODE
05/14/2014	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):

patents@wnj.com

Office Action Summary	Application No. 13/961,452	Applicant(s) PRYOR, TIMOTHY R.	
	Examiner TUAN HO	Art Unit 2661	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/27/14*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-20* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

2. Applicant's arguments filed 3/27/14 have been fully considered but they are not persuasive.

With respect to claims 1-8, Applicant argues that " Sengupta does not disclose, teach or suggest a device housing including a forward facing portion having an electro-optical sensor and a digital camera.". In response to the arguments, the examiner notes that claimed device housing is not clearly defined in claim 1; therefore, the examiner tale a broader interpretation and notes that the housing of the cameras and sensors including forward portion so as to take pictures object images such as a human being within a cameras field of view (col. 3, lines 30-37).

With respect to claims 9-20, Applicants argues that "Sengupta does not disclose, teach or suggest a processing unit to determine a gesture in a camera field of view, wherein the determined gesture is identified by the processing unit apart from a plurality of gestures as corresponding to an image capture command.". The examiner notes that when a an object image is a human being, his movements are considered as gestures since the term "gesture" is not clearly defined in the claim.

For the above reasons, the rejections are repeated.

3. 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 claims at issue 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 LongL 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); and 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 a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321 (b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form 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 http ://www. u spto. g ov/patents/process/file/efs/g u idan ce/eTD-i nfo-I.jsp.

Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-33 of U.S. Patent No. 7,015,950 . Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-33 of the Patent' 950. With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

4. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 7,804,530 . Although the claims atissue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-23 of the Patent' 530.

With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to

convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

5. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,189,053 . Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-20 of the Patent' 053. With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.6.

6. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 (c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-7 and 9-20 are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Sengupta et al (US 6,359,647) cited by Applicant.

With regard to claim 1, Sengupta et al discloses in Fig. 1, a camera system that comprises the portable device comprising: a device housing including a forward facing portion (camera system 120, col. 3, line 14), the forward facing portion of the device housing including an electro-optical sensor having a field of view (camera 103, col. 3, line 40) and a digital camera separate from the electro- optical sensor (camera 101 or 102, col. 3, line 41); and a processing unit within the device housing and operatively coupled to electro- optical sensor (camera system 120 includes data base 160, col. 3, line 45), wherein the processing unit is adapted to control the digital camera in response to a gesture performed in the electro-optical sensor field of view (camera 103 detects movements ofan object inherently including a gesture so as to control cameras 101 or 102, col. 3, lines 54+ and col. 4, lines 1-35).

With regard to claims 2, Sengupta et al discloses in Fig. 1, a camera system that comprises the gesture corresponds to an image capture command (movements of an object are detected by camera 103 corresponding to control commands from system

120).

With regard to claims 3 and 4, Sengupta et al discloses in Fig. 1, a camera system that comprises the determined gesture includes a hand motion or pose (the movement of an object inherently include hand motion or pose of an object).

With regard to claim 5, Sengupta et al discloses in Fig. 1, a camera system that comprises the electro-optical sensor is fixed in relation to the digital camera (camera 103 is fixed in relation to the camera system 120 as shown in Fig. 1).

With regard to claim 6, Sengupta et al discloses in Fig. 1, a camera system that comprises a forward facing light source (a forward light source id inherently included in the camera system since the source is used to illuminate an object in order to generate an optical image on a camera sensor).

With regard to claim 7, Sengupta et al discloses in Fig. 1, a camera system that comprises the electro-optical sensor defines a resolution less than a resolution defined by the digital camera (camera 103 inherently includes an image sensor that has resolutions less than camera 101 or 102 since camera is used to detect a field of view in general).

Claims 9-14 recites what was previously discussed with respect to claims 1-7.

I should be noted that claimed “the determined gesture is identified by the processing unit apart from a plurality of gestures” in claim 9 is met by controller 130 which identified the movement of an object and activate the cameras, col. is met by controller 130 which identified the movement of an object and activate the cameras, cols. 3 and 4 .

With regard to claim 15, Sengupta et al discloses the same subject matter as discussed with respect to claim 1. It should be noted that claimed "processing unit is adapted to correlate a gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is indentified by the processing unit apart from a plurality of gestures." is met by camera system correlates movements of an object received by camera 103 so as to control movement of camera 101 or 102, Col. 3 and Col. 4, lines 1-46).

Claims 16-20 recites what was discussed with respect to claims 2-6.

7. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 8 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Sengupta et al.

Sengupta et al discloses the same subject matter as discussed with respect to claim1, except for the electro-optical sensor includes at least one of a CCD detector and a CMOS detector.

Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan Ho whose telephone number is (571) 272-7365. The examiner can normally be reached on Mon-Fri 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).If you would like assistance from a USPT© Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TUAN HO/

Primary Examiner, Art Unit 2661

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	Art Unit
	TUAN HO	2661

CPC- SEARCHED		
Symbol	Date	Examiner
H04N 5/23238, H04N 5/247, H04N 5/3415	12/24/13	TH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	211.4, 211.5, 211.8 and 211.9	12/24/13	TH
	Updated	5/7/14	TH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST and Inventorship Search	12/24/13	TH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Search Histroy	12/24/13	TH

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	606	348/211.4,211.5,211.8,211.9.ccls.	US-PGPUB; USPAT; EPO; JPO	OR	ON	2014/05/07 14:36
L2	301	timothy near3 Pryor	US-PGPUB; USPAT; EPO; JPO	OR	ON	2014/05/07 14:37
L3	3	2 and (device and hous$5 and fac$5 and portion and sensor and camera and gesture and control$4).clm.	US-PGPUB; USPAT; EPO; JPO	OR	ON	2014/05/07 14:38

5/7/2014 2:40:05 PM
C:\Users\tho\Documents\EAST\Workspaces\Default EAST Workspace (Flat Panel LANDSCAPE).wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	**Art Unit**
	TUAN HO	2661

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/24/2013	05/08/2014							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
	20	✓	✓							

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.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

24335 7590 08/13/2014
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

EXAMINER	
HO, TUAN V	

ART UNIT	PAPER NUMBER
2661	

NOTIFICATION DATE	DELIVERY MODE
08/13/2014	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):

patents@wnj.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/961,452	PRYOR, TIMOTHY R.	
	Examiner	Art Unit	
	TUAN HO	2661	

All participants (applicant, applicant's representative, PTO personnel):

(1) *TUAN HO.* (3)____.

(2) *Mr. Ciaravino.* (4)____.

Date of Interview: *07 August 2014.*

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

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

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

Claim(s) discussed: *1*.

Identification of prior art discussed: *Sengupta et al.*

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

Upon a telephone interview, Mr. Ciaravino agreed to send amendments to claims 1, 9 and 15 so as to overcome the rejections based on Sengupta et al.

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

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

☐ Attachment

/TUAN HO/ Primary Examiner, Art Unit 2661	

Summary of Record of Interview Requirements

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

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

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

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

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

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

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

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

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

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

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

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

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

Examiner to Check for Accuracy

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

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. 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.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13961452	Filing Date	2013-08-07	Docket Number (if applicable)	135873.152189-0003	Art Unit	2661
First Named Inventor	Timothy R. Pryor			Examiner Name	Tuan V. Ho		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 230457

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Signature of Registered U.S. Patent Practitioner			
Signature	/Vito A. Ciaravino/	Date (YYYY-MM-DD)	2014-08-14
Name	Vito A. Ciaravino	Registration Number	62749

This collection of information is required by 37 CFR 1.114. 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 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.

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

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.

PTO/AIA/26 (04-13)
Approved for use through 04/30/2013. OMB 0651-0031
U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

The applicant, Gesture Technology Partners, LLC, owner of 100 percent interest 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** No. 7,015,950 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any 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 applicant 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:

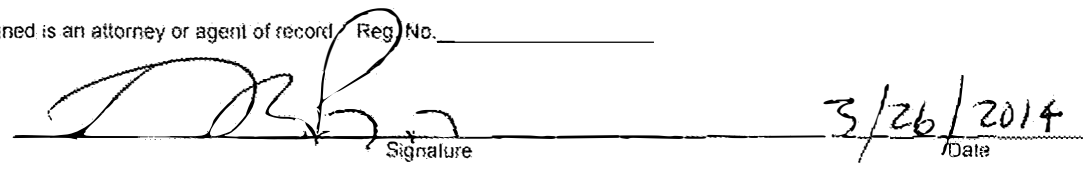
expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☑ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____



Signature 3/26/2014 Date

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8635
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

PTO/AIA/26 (04-13)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional)
135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

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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.

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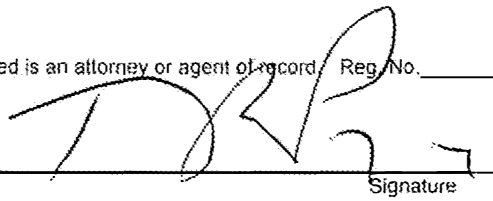

Signature

26 March '14
Date

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8635
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

PTO/AIA/26 (04-13)
Approved for use through 04/30/2013. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional)
135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

The applicant, Gesture Technology Partners, LLC, owner of 100 percent interest 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** No. 7,804,530 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any 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.

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expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
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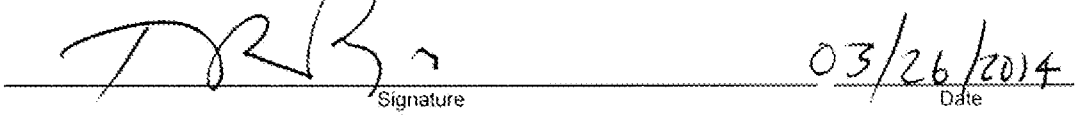
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☑ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____



Signature

03/26/2014
Date

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8635
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

PTO/AIA/96 (08-12)
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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.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Timothy R. Pryor

Application No./Patent No.: 13/961,452 Filed/Issue Date: August 7, 2013

Titled: CAMERA BASED INTERACTION AND INSTRUCTION

Gesture Technology Partners, LLC, a Ohio limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 031005, Frame 0045, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature	Date: 6 August 2014
Timothy R. Pryor	Manager
Printed or Typed Name	Title or Registration Number

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner	:	Tuan V. Ho
Art Unit	:	2661
Inventor	:	Timothy R. Pryor
Application No.	:	13/961,452
Filing Date	:	August 7, 2013
For	:	CAMERA BASED INTERACTION AND INSTRUCTION
Attorney Docket No.	:	135873.152189-0003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE AFTER FINAL REJECTION (37 CFR 1.116)

In Response to the Official Action dated May 14, 2014, the period for response being until August 14, 2014, please amend the above identified patent application as set forth on the following pages.

CLAIMS

1. (Currently Amended) A portable device comprising:

a device housing including a forward facing portion, the forward facing portion of the device housing encompassing ~~including~~ an electro-optical sensor having a field of view and including a digital camera separate from the electro-optical sensor; and

a processing unit within the device housing and operatively coupled to an output of the electro-optical sensor, wherein the processing unit is adapted to:

determine a gesture has been performed in the electro-optical sensor field of view based on the electro-optical sensor output, and

control the digital camera in response to the [[a]] gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory.

2. (Canceled).

3. (Original) The portable device of claim 1 wherein the determined gesture includes a hand motion.

4. (Original) The portable device of claim 1 wherein the determined gesture includes a pose.

5. (Original) The portable device of claim 1 wherein the electro-optical sensor is fixed in relation to the digital camera.

6. (Original) The portable device of claim 1 further including a forward facing light source.

7. (Original) The portable device of claim 1 wherein the electro-optical sensor defines a resolution less than a resolution defined by the digital camera.

8. (Original) The portable device of claim 1 wherein the electro-optical sensor includes at least one of a CCD detector and a CMOS detector.

9. (Currently Amended) A computer implemented method comprising:

providing a portable device including a forward facing portion encompassing a digital camera and an electro-optical sensor ~~on a forward facing portion thereof~~, the electro-optical sensor having an output and ~~digital camera~~ defining a field of view;

determining, using a processing unit, a gesture has been performed in the electro-optical sensor ~~digital camera~~ field of view based on the electro-optical sensor output, wherein the determined gesture corresponds to an image capture command ~~is identified by the processing unit apart from a plurality of gestures~~; and

capturing an image to the digital camera in response to the determined gesture corresponding to the ~~an~~ image capture command.

10. (Original) The method according to claim 9 wherein the determined gesture includes a hand motion.

11. (Original) The method according to claim 9 wherein the determined gesture includes a pose.

12. (Canceled)

13. (Currently Amended) The method according to claim 9 ~~12~~ wherein the electro-optical sensor includes first and second sensors in fixed relation relative to the digital camera.

14. (Currently Amended) The method according to claim 9 ~~12~~ wherein the electro-optical sensor defines a resolution less than a resolution defined by the digital camera.

15. (Currently Amended) An image capture device comprising:

a device housing including a forward facing portion, the forwarding facing portion encompassing a digital camera adapted to capture an image and having a field of view [[;]] and encompassing a sensor adapted to detect a gesture in the digital camera field of view; and

a processing unit operatively coupled to the sensor and to the digital camera, wherein the processing unit is adapted to:

detect a gesture has been performed in the electro-optical sensor field of view based on an output of the electro-optical sensor, and

correlate the [[a]] gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is identified by the processing unit apart from a plurality of gestures.

16. (Previously Presented) The image capture device of claim 15 wherein the detected gesture includes a hand motion.

17. (Previously Presented) The image capture device of claim 15 wherein the detected gesture includes a pose.

18. (Original) The image capture device of claim 15 further including a forward facing light source.

19. (Original) The image capture device of claim 15 wherein the sensor defines a resolution less than a resolution defined by the digital camera.

20. (Original) The image capture device of claim 15 wherein the sensor is fixed in relation to the digital camera.

REMARKS

Reconsideration of the above identified patent application is respectfully requested. Claims 1, 3-11 and 13-20 are pending. Claims 1, 9 and 13-15 are amended to more particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Support is set forth at least in Figure 2A and Paragraphs 0056 and 0063 of the Specification. Claims 2 and 12 are canceled. The rejection is respectfully traversed.

I. Interview Summary

Applicant thanks Examiner Ho for the courtesies extended to Applicant's attorney during the telephone interview on August 7, 2014. Proposed amendments to independent claim 1 were discussed, and it was agreed that the proposed amendments distinguish over U.S. Patent 6,359,647 to Sengupta. The amendments are formally presented in independent claims 1, 9 and 15 in this Response. It is therefore respectfully submitted that amended independent claims 1, 9 and 15 present allowable subject matter in allowable form.

II. Art-Based Rejection

As previously presented, amended independent claims 1, 9 and 15 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,359,647 to Sengupta.

Sengupta discloses a camera handoff system 120 and three security cameras 101, 102, 103, generally shown in Figure 1 below. The camera handoff system 120 "selects

the appropriate camera when [an] object traverses from one camera's field of view to another camera's field of view." Col. 3, Lns. 60-64.

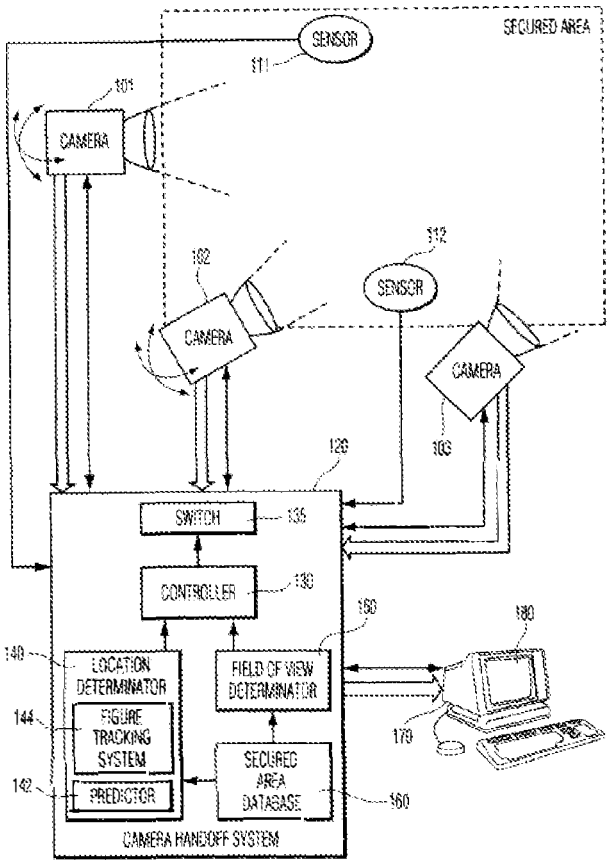

FIG. 1

With respect to amended independent claims 1, 9 and 15, Sengupta does not disclose, teach or suggest: a) a device housing including a forward facing portion that encompasses an electro-optical sensor and a digital camera; or b) a processor to determine a gesture corresponds to an image capture command, which causes the camera to store or capture an image.

With respect to item a), the security system in Sengupta instead includes a camera handoff system 120 and three security cameras 101, 102, 103. However, the camera handoff system 120 is not a device housing, let alone a forward facing portion encompassing an electro-optical sensor and a digital camera. Instead, the camera handoff system 120 is a system for controlling the handoff of one camera to another camera. Col. 3, Lns. 43-46.

With respect to item b), the security system in Sengupta tracks movement of an object "from one camera's field of view to another camera's field of view." Col. 3, Lns. 63-64. However, the security system does not also determine that a gesture corresponds to an image capture command, which causes the camera to store or capture an image. Instead, security system "reports the location of" the moving objects. Col. 4, Lns. 8-14. By contrast, the invention as presently claimed identifies a particular gesture for an image capture command, which causes a digital camera to store an image to memory or capture an image.

Accordingly, and as generally agreed during the telephone interview, it is respectfully submitted that independent claims 1, 9 and 15 are allowable over Sengupta.

Dependent claims 3-8, 10-11, 13-14 and 16-20 depend directly or indirectly from amended independent claims 1, 9 or 15, and are allowable for at least the reasons noted above in connection with the respective base claim.

III. Double Patenting Rejection

Claims 1, 3-11 and 13-20 were rejected on the grounds of non-statutory obvious-type double patenting in view of U.S. Patents 7,015,950, 7,804,530 and 8,189,053.

Terminal Disclaimers are re-filed with this Response, and are now accompanied by a Statement Under 3.73(c). The terminal disclaimer fee of $160 for each Terminal Disclaimer was paid on March 27, 2014. Accordingly, no new fee is believed to be due. The Director is authorized to charge any additional fees or credit overpayment to Deposit Account 23-0457.

IV. Conclusion

In view of the above amendments, the recent telephone interview, these remarks, and the attached Terminal Disclaimers, it is respectfully submitted that the present application is fully in condition for allowance. A notice to that effect is earnestly and respectfully requested.

Respectfully submitted,

GESTURE TECHNOLOGY
PARTNERS, LLC

By: Warner Norcross & Judd LLP

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11097407

Electronic Patent Application Fee Transmittal

Application Number:	13961452
Filing Date:	07-Aug-2013
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Attorney Docket Number:	135873.152189-0003

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

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($)
Miscellaneous:				
Request for Continued Examination	2801	1	600	600
		Total in USD ($)		**600**

Electronic Acknowledgement Receipt

EFS ID:	19862036
Application Number:	13961452
International Application Number:	
Confirmation Number:	3753
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Customer Number:	24335
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Filer Authorized By:	Vito Anthony Ciaravino
Attorney Docket Number:	135873.152189-0003
Receipt Date:	14-AUG-2014
Filing Date:	07-AUG-2013
Time Stamp:	08:56:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$600
RAM confirmation Number	6752
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Request for Continued Examination (RCE)	RCE_-_0003.PDF	797909 87d6af103607d4563a1f6a0fd8861e09502Ed081	no	3
Warnings:					
Information:					
2	Terminal Disclaimer Filed	Terminal_Disclaimer_with_373c.pdf	4616415 d6b7691e93541778882be621a6ebe27252a70d15	no	5
Warnings:					
Information:					
3		Response_152189.pdf	71258 da9809483344675624 45fbf7381e4f523c2c5f67	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	9

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30484 909edc141152feb18135ef9ed863df90ba700dd1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5516066		

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.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/961,452	PRYOR, TIMOTHY R.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☐ APPROVED	☒ DISAPPROVED
Date Filed : 8/14/14	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

ANDRE ROBINSON

[X] For cases filed on/after 9/16/12, 37 CFR 1.321 specifies that the applicant can disclaim, and the terminal disclaimer must specify the extent of the applicant's ownership.

A request under 37 CFR 1.46(c) to change the applicant needs to be filed, which is (1) a request, signed by a 1.33(b) party, (2) a corrected ADS (37 CFR 1.76(c)) that identifies the "new" applicant in the applicant information, and is underlined since it is new, and (3) a 3.73(c) statement showing chain of title to the new applicant. Along with the § 1.46(c) request we need a POA that gives power to the attorney who is signing the TD, along with another copy of the TD, unless they file a TD that is signed by the applicant.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/961,452	Filing Date 08/07/2013	☐ 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 $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ 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		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	**08/14/2014**	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	x $40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	x $210 =	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**

* 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 number found in the appropriate box in column 1.

LIE
/Chantae Dessau/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

24335 7590 08/26/2014
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

EXAMINER	
HO, TUAN V	

ART UNIT	PAPER NUMBER
2661	

NOTIFICATION DATE	DELIVERY MODE
08/26/2014	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):

patents@wnj.com

Office Action Summary	Application No. 13/961,452	Applicant(s) PRYOR, TIMOTHY R.	
	Examiner TUAN HO	Art Unit 2661	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/14/14*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-20* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/14/14 has been entered.

3. The TD filed on 8/14/14 has been disapproved because:

For cases filed on/after 9/16/12, 37 CFR 1.321 specifies that the applicant can disclaim, and the terminal disclaimer must specify the extent of the applicant's ownership.

A request under 37 CFR 1.46(c) to change the applicant needs to be filed, which is (1) a request, signed by a 1.33(b) party, (2) a corrected ADS (37 CFR 1.76(c)) that identifies the "new" applicant in the applicant information, and is underlined since it is new, and (3) a 3.73(c) statement showing chain of title to the new applicant. Along with the § 1.46(c) request we need a POA that gives power to the attorney who is signing the TD, along with another copy of the TD, unless they file a TD that is signed by the applicant.

For the above reasons, the obvious double patenting rejections are repeated.

4. 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 claims at issue 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 LongL 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van ©mum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and 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 a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321 (b).

The USPT© internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form 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 moreinformation about eTerminal Disclaimers, refer to http ://www. u spto. g ov/patents/process/file/efs/g u idan ce/eTD-i nfo-I.jsp.

5. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-33 of U.S. Patent No. 7,015,950. Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-33 of the Patent' 950. With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

6. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 7,804,530. Although the claims atissue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-23 of the Patent' 530.

With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as toconvert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

7. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,189,053. Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-7 and 9-20 are obvious variants and encompassed by claims 1-20 of the Patent' 053. With regard to claim 8, Official Notice is taken for a CCD detector to be used to covert light into electrical signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD sensor in the electro-optical sensor so as to convert light into electrical signals because the replacement with a CCD sensor would reduce manufacturing cost and easily to be fabricated.

8. Claims 1-20 will be allowable when the double patenting rejections are overcome.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan Ho whose telephone number is (571) 272-7365. The examiner can normally be reached on Mon-Fri 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V Ho/

Primary Examiner, Art Unit 2622

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	**Art Unit**
	TUAN HO	2661

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/24/2013	05/08/2014	08/21/2014						
	1	✓	✓	✓						
	2	✓	✓	✓						
	3	✓	✓	✓						
	4	✓	✓	✓						
	5	✓	✓	✓						
	6	✓	✓	✓						
	7	✓	✓	✓						
	8	✓	✓	✓						
	9	✓	✓	✓						
	10	✓	✓	✓						
	11	✓	✓	✓						
	12	✓	✓	✓						
	13	✓	✓	✓						
	14	✓	✓	✓						
	15	✓	✓	✓						
	16	✓	✓	✓						
	17	✓	✓	✓						
	18	✓	✓	✓						
	19	✓	✓	✓						
	20	✓	✓	✓						

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	Art Unit
	TUAN HO	2661

CPC- SEARCHED		
Symbol	Date	Examiner
H04N 5/23238, H04N 5/247, H04N 5/3415	12/24/13	TH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	211.4, 211.5, 211.8 and 211.9	12/24/13	TH
	Updated	5/7/14	TH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST and Inventorship Search	12/24/13	TH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Search Histroy	12/24/13	TH

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner	:	Tuan V. Ho
Art Unit	:	2661
Inventor	:	Timothy R. Pryor
Application No.	:	13/961,452
Filing Date	:	August 7, 2013
For	:	CAMERA BASED INTERACTION AND INSTRUCTION
Attorney Docket No.	:	135873.152189-0003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE

In Response to the Official Action dated August 26, 2014, the period for response being until December 26, 2014, Applicant submits the following remarks and enclosures.

REMARKS

Reconsideration of the above identified patent application is respectfully requested. Claims 1, 3-11 and 13-20 are pending. The rejection is respectfully traversed.

I. Double Patenting Rejection

Applicant notes with appreciation the Examiner's statement that the pending claims will be allowable when the double patenting rejections are overcome.

Claims 1, 3-11 and 13-20 remain rejected on the grounds of obvious-type double patenting in view of U.S. Patents 7,015,950, 7,804,530 and 8,189,053. As requested in the Office Action, Applicant provides the following:

- Request Under 37 CFR 1.46(c);
- Supplemental Application Data Sheet;
- Terminal Disclaimers; and
- Statement Under 3.73(c)

The terminal disclaimer fee of $160 for each Terminal Disclaimer was paid on March 27, 2014. Accordingly, no new fee is believed to be due. The Director is authorized to charge any additional fees or credit overpayment to Deposit Account 23-0457.

II. Conclusion

In view of these remarks and the enclosures, it is respectfully submitted that the present application is fully in condition for allowance. A notice to that effect is earnestly and respectfully requested.

Respectfully submitted,

GESTURE TECHNOLOGY
PARTNERS, LLC

By: Warner Norcross & Judd LLP

/Vito A. Ciaravino/
Vito A. Ciaravino
Registration No. 62749
900 Fifth Third Center
111 Lyon Street NW
Grand Rapids, MI 49503-2487
(616) 752-2709

11206824

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Timothy R. Pryor

Application No./Patent No.: 13/961,452 Filed/Issue Date: August 7, 2013

Titled: CAMERA BASED INTERACTION AND INSTRUCTION

Gesture Technology Partners, LLC, a Ohio limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 031005, Frame 0045, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

   The document was recorded in the United States Patent and Trademark Office at

   Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

   The document was recorded in the United States Patent and Trademark Office at

   Reel _____, Frame _____, or for which a copy thereof is attached.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature	Date: 6 August 2014
Timothy R. Pryor	Manager
Printed or Typed Name	Title or Registration Number

PTO/AIA/26 (04-13)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional): 135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

The applicant, Gesture Technology Partners, LLC, owner of 100 percent interest 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** No. 7,616,950 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any 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 applicant 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.

Check either box 1 or 2 below, if appropriate.

1. [✓] The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. [ ] The undersigned is an attorney or agent of record. Reg. No. _____

/TRP/ — Signature — 3/26/2014 — Date

Timothy R. Pryor — Typed or printed name

Manager — Title — 313.300.8635 — Telephone Number

[✓] Terminal disclaimer fee under 37 CFR 1.20(d) included.

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 135673.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

The applicant, Gesture Technology Partners, LLC, owner of 100 percent interest 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** No. 8,189,053 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any 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 applicant 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.

Check either box 1 or 2 below, if appropriate.

1. ☑ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____

Signature — Date: 26 March '14

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8635
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional): 135873.152189-0003

In re Application of: Timothy R. Pryor

Application No.: 13/961,452

Filed: August 7, 2013

For: CAMERA BASED INTERACTION AND INSTRUCTION

The applicant, Gesture Technology Partners, LLC, owner of 100 percent interest 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** No. 7,804,530 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any 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.

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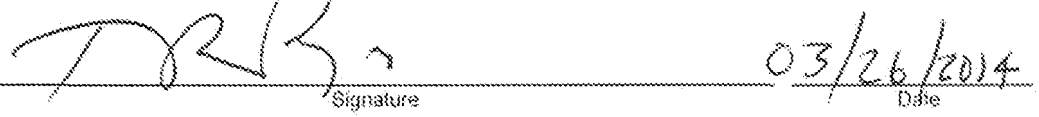
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. [✓] The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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

2. [ ] The undersigned is an attorney or agent of record. Reg. No. _____



Signature — Date: 03/26/2014

Timothy R. Pryor
Typed or printed name

Manager
Title

313.300.8636
Telephone Number

[✓] Terminal disclaimer fee under 37 CFR 1.20(d) included.

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Electronic Acknowledgement Receipt

EFS ID:	19963234
Application Number:	13961452
International Application Number:	
Confirmation Number:	3753
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Customer Number:	24335
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Filer Authorized By:	Vito Anthony Ciaravino
Attorney Docket Number:	135873.152189-0003
Receipt Date:	26-AUG-2014
Filing Date:	07-AUG-2013
Time Stamp:	11:11:57
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	Application Data Sheet	Supplemental_ADS.pdf	1022660 1c165bad c943c082efa92e82bce90461f9f5 bd8	no	6

Warnings:	
Information:	

This is not an USPTO supplied ADS fillable form

2	Miscellaneous Incoming Letter	Request.pdf	16441 a9ea74170520ee0e170119d827afe17cdb42f72c	no	1
Warnings:					
Information:					
3		Response.pdf	20383 8454f36f64afdd07e0d9d37cbe0f5757dbea8cd6	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Applicant Arguments/Remarks Made in an Amendment	2	3

Warnings:					
Information:					
4	Assignee showing of ownership per 37 CFR 3.73.	373c.pdf	875869 1080f7e4519c7efb341274ff3d3a0540cca2cde8	no	2
Warnings:					
Information:					
5	Terminal Disclaimer Filed	Executed_Terminal_Disclaimers.PDF	1038551 fdfc5e100252840aa6c751e6e1edc7b83d6e6c51	no	3
Warnings:					
Information:					
		Total Files Size (in bytes):	2973904		

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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.

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SUPPLEMENTAL **Application Data Sheet 37 CFR 1.76**	Attorney Docket Number	135873.152189-003
	Application Number	
Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION	

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.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Timothy	R.	Pryor	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Sylvania	State/Province	OH	Country of Residence	US

Mailing Address of Inventor:

Address 1	4148 Stonehenge Drive
Address 2	

City	Sylvania	State/Province	OH
Postal Code	43560	**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).

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

Customer Number	24335		
Email Address	patents@wnj.com	Add Email	Remove Email

Application Information:

Title of the Invention	CAMERA BASED INTERACTION AND INSTRUCTION		
Attorney Docket Number	135873.152189-003	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	2

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SUPPLEMENTAL **Application Data Sheet 37 CFR 1.76**	Attorney Docket Number	135873.152189-003
	Application Number	
Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION	

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	24335		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this 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.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	13459670	2012-04-30

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13459670	Continuation of	12891480	2010-09-27	8189053	2012-05-29

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12891480	Continuation of	11376158	2006-03-16	7804530	2010-09-28

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
11376158	Continuation of	09568552	2000-05-11	7015950	2006-03-21

Prior Application Status	Expired	Remove

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

SUPPLEMENTAL **Application Data Sheet 37 CFR 1.76**	Attorney Docket Number	135873.152189-003
	Application Number	
Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
09568552	non provisional of	60133671	1999-05-11

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

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. 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(a).

Remove

Application Number	Country[1]	Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ◉ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

If 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 World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

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.

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

SUPPLEMENTAL **Application Data Sheet 37 CFR 1.76**	Attorney Docket Number	135873.152189-003
	Application Number	
Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION	

Applicant 1

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. ☒

*	Organization Name	Gesture Technology Partners, LLC		
	Mailing Address Information:			
*	**Address 1**	4148 Stonehenge Drive		
	Address 2			
*	**City**	Sylvania	**State/Province**	OH
*	**Country**	US	Postal Code	43560
	Phone Number		Fax Number	
	Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

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

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section 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), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

PTO/AIA/14 (08-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

SUPPLEMENTAL **Application Data Sheet 37 CFR 1.76**	Attorney Docket Number	135873.152189-003
	Application Number	
Title of Invention	CAMERA BASED INTERACTION AND INSTRUCTION	

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:			
Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

Signature:

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

2014-08-26

Signature	/Vito A. Ciaravino/			Date (YYYY-MM-DD)	~~2013-08-06~~
First Name	Vito	Last Name	Ciaravino	Registration Number	62749

Additional Signature may be generated within this form by selecting the Add button.

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner	:	Tuan V. Ho
Art Unit	:	2661
Inventor	:	Timothy R. Pryor
Application No.	:	13/961,452
Filing Date	:	August 7, 2013
For	:	CAMERA BASED INTERACTION AND INSTRUCTION
Attorney Docket No.	:	135873.152189-0003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST UNDER 37 CFR 1.46(c)

The Commissioner is requested to designate GESTURE TECHNOLOGY PARTNERS, LLC as the Applicant in the present application. This Request is signed by a 1.33(b) party below. Submitted herewith are copies of:

- a Supplemental Application Data Sheet; and
- a Statement Under 3.73(c) showing the chain of title to the Applicant.

The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. 230457.

Respectfully submitted,

By: Warner Norcross & Judd LLP

/Vito A. Ciaravino/

Vito A. Ciaravino, 62749
900 Fifth Third Center
111 Lyon Street, N.W.
Grand Rapids, MI 49503-2487
(616) 752-2709

11207215

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/961,452	Filing Date 08/07/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) 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 $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ 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

AMENDMENT **08/26/2014**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	x $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	x $210 =	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

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ 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.

** 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 number found in the appropriate box in column 1.

LIE
/VICTOR BARLOW/

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	13/961,452	PRYOR, TIMOTHY R.	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 26 AUG 2014	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Three TDs filed and approved.

JAB

U.S. Patent and Trademark Office

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

24335 7590 09/18/2014
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

EXAMINER
HO, TUAN V

ART UNIT	PAPER NUMBER
2661	

DATE MAILED: 09/18/2014

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

TITLE OF INVENTION: CAMERA BASED INTERACTION AND INSTRUCTION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	12/18/2014

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

24335 7590 09/18/2014
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

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

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

TITLE OF INVENTION: CAMERA BASED INTERACTION AND INSTRUCTION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	12/18/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
HO, TUAN V	2661	348-211990

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

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

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

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — 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.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — 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.
- ❑ Applicant changing to regular undiscounted fee 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. _____

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.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

24335 7590 09/18/2014

WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

EXAMINER	
HO, TUAN V	

ART UNIT	PAPER NUMBER
2661	

DATE MAILED: 09/18/2014

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

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

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

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

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

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

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

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 13/961,452	Applicant(s) PRYOR, TIMOTHY R.	
	Examiner TUAN HO	Art Unit 2661	AIA (First Inventor to File) Status No

-- 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 *papers filed on 8/26/14.*

   ☐ 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, 3-11 and 13-20 (renumberedas 1-18).* 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)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/TUAN HO/
Primary Examiner, Art Unit 2661

1. The present application is being examined under the pre-AIA first to invent provisions.

2. The Terminal Disclaimers filed on 8/26/14 have been approved.

3. Claims 1, 2-11 and 13-20 are allowed.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan Ho whose telephone number is (571) 272-7365. The examiner can normally be reached on Mon-Fri 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V Ho/

Primary Examiner, Art Unit 2622

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	644	348/211.4,211.5,211.8,211.9.ccls.	US-PGPUB; USPAT; EPO; JPO	OR	ON	2014/09/09 16:10
L2	3242	348/239, "222".1.ccls.	US-PGPUB; USPAT; EPO; JPO	OR	ON	2014/09/09 16:11

9/9/2014 4:11:41 PM
C:\Users\tho\Documents\EAST\Workspaces\Default EAST Workspace (Flat Panel LANDSCAPE).wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	Art Unit
	TUAN HO	2661

CPC- SEARCHED		
Symbol	Date	Examiner
H04N 5/23238, H04N 5/247, H04N 5/3415	12/24/13	TH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
348	211.4, 211.5, 211.8 and 211.9	12/24/13	TH
	Updated	5/7/14	TH
	Updated	9/9/14	TH
348	222.1, 239	9/9/14	TH

SEARCH NOTES		
Search Notes	Date	Examiner
EAST and Inventorship Search	12/24/13	TH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Search Histroy	12/24/13	TH

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	Art Unit
	TUAN HO	2661

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/24/2013	05/08/2014	08/21/2014	09/09/2014					
	1	✓	✓	✓	=					
	2	✓	✓	✓	-					
	3	✓	✓	✓	=					
	4	✓	✓	✓	=					
	5	✓	✓	✓	=					
	6	✓	✓	✓	=					
	7	✓	✓	✓	=					
	8	✓	✓	✓	=					
	9	✓	✓	✓	=					
	10	✓	✓	✓	=					
	11	✓	✓	✓	=					
	12	✓	✓	✓	-					
	13	✓	✓	✓	=					
	14	✓	✓	✓	=					
	15	✓	✓	✓	=					
	16	✓	✓	✓	=					
	17	✓	✓	✓	=					
	18	✓	✓	✓	=					
	19	✓	✓	✓	=					
	20	✓	✓	✓	=					

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	**Art Unit**
	TUAN HO	2661

CPC							
Symbol						**Type**	**Version**
H04N		5	/	23296		F	2013-01-01
G06F		3	/	017		I	2013-01-01
G06F		3	/	0386		I	2013-01-01
H04N		5	/	222		I	2013-01-01
H04N		5	/	232		I	2013-01-01
H04N		5	/	23219		I	2013-01-01
			/				
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CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	18	
/TUAN HO/ Primary Examiner.Art Unit 2661	09/09/2014	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	5

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	**Art Unit**
	TUAN HO	2661

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
348	211.99	H	0	4	N	5 / 232 (2006.01.01)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
348	211.4				

NONE		Total Claims Allowed:
(Assistant Examiner)	(Date)	18
/TUAN HO/ Primary Examiner.Art Unit 2661	09/09/2014	O.G. Print Claim(s): 1 / O.G. Print Figure: 5
(Primary Examiner)	(Date)	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13961452	PRYOR, TIMOTHY R.
	Examiner	**Art Unit**
	TUAN HO	2661

☒ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17												
	2		18												
	3		19												
	4		20												
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/TUAN HO/ Primary Examiner.Art Unit 2661 (Primary Examiner)	09/09/2014 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 5

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

BIB DATA SHEET

CONFIRMATION NO. 3753

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/961,452	08/07/2013 RULE	348	2661	135873.152189-0003

APPLICANTS

INVENTORS

Timothy R. Pryor, Sylvania, OH;

**** CONTINUING DATA ***************************

This application is a CON of 13/459,670 04/30/2012 PAT 8654198
which is a CON of 12/891,480 09/27/2010 PAT 8189053
which is a CON of 11/376,158 03/16/2006 PAT 7804530
which is a CON of 09/568,552 05/11/2000 PAT 7015950
which claims benefit of 60/133,671 05/11/1999

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
08/22/2013

Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No					
Verified and Acknowledged	/TUAN V HO/ Examiner's Signature	Initials	OH	7	20	3

ADDRESS

WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487
UNITED STATES

TITLE

CAMERA BASED INTERACTION AND INSTRUCTION

FILING FEE RECEIVED	FEES: Authority has been given in Paper	☐ All Fees
1030	No._____ to charge/credit DEPOSIT ACCOUNT	☐ 1.16 Fees (Filing)
	No._____ for following:	☐ 1.17 Fees (Processing Ext. of time)
		☐ 1.18 Fees (Issue)
		☐ Other _____
		☐ Credit

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

24335 7590 09/18/2014
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

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

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/961,452	08/07/2013	Timothy R. Pryor	135873.152189-0003	3753

TITLE OF INVENTION: CAMERA BASED INTERACTION AND INSTRUCTION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	12/18/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
HO, TUAN V	2661	348-211990

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Warner Norcross & Judd LLP
2
3

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

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

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by ~~credit card. Form PTO-2038 is attached.~~ EFT
☒ The Director is hereby authorized to charge ~~the required fee(s),~~ any deficiency, or credits any overpayment, to Deposit Account Number 230457 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29 — 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.
☐ Applicant asserting small entity status. See 37 CFR 1.27 — 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.
☐ Applicant changing to regular undiscounted fee 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 /Vito A. Ciaravino/ Date September 18, 2014
Typed or printed name Vito A. Ciaravino Registration No. 62749

Electronic Patent Application Fee Transmittal

Application Number:	13961452
Filing Date:	07-Aug-2013
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Attorney Docket Number:	135873.152189-0003

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

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	480	480
Publ. Fee- Early, Voluntary, or Normal	1504	1	0	0

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**480**

Electronic Acknowledgement Receipt

EFS ID:	20174611
Application Number:	13961452
International Application Number:	
Confirmation Number:	3753
Title of Invention:	CAMERA BASED INTERACTION AND INSTRUCTION
First Named Inventor/Applicant Name:	Timothy R. Pryor
Customer Number:	24335
Filer:	Vito Anthony Ciaravino/Nancy Gravelin
Filer Authorized By:	Vito Anthony Ciaravino
Attorney Docket Number:	135873.152189-0003
Receipt Date:	18-SEP-2014
Filing Date:	07-AUG-2013
Time Stamp:	12:32:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$480
RAM confirmation Number	9246
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Issue Fee Payment (PTO-85B)	NOA.pdf	1104545 c45d108fb5219873ee4009f7204668e970b53bad	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32029 5623e6edcdb1a7e520ce48703cc82ae2043b8ec7	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1136574		

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
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/961,452	08/07/2013	2661	1030	135873.152189-0003	20	3

CONFIRMATION NO. 3753

CORRECTED FILING RECEIPT

24335
WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

Date Mailed: 10/08/2014

Receipt is acknowledged of this non-provisional 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 APPLICANT, 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 Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections 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**

Inventor(s)

Timothy R. Pryor, Sylvania, OH;

Applicant(s)

Gesture Technology Partners, LLC, Sylvania, OH

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/459,670 04/30/2012 PAT 8654198
which is a CON of 12/891,480 09/27/2010 PAT 8189053
which is a CON of 11/376,158 03/16/2006 PAT 7804530
which is a CON of 09/568,552 05/11/2000 PAT 7015950
which claims benefit of 60/133,671 05/11/1999

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.

If Required, Foreign Filing License Granted: 08/22/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/961,452**
Projected Publication Date: Not Applicable
Non-Publication Request: No
Early Publication Request: No
**** SMALL ENTITY ****

Title

CAMERA BASED INTERACTION AND INSTRUCTION

Preliminary Class

348

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).

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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 AssetsControl, 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).

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13961452 - GAU: 2661
	Filing Date	2013-08-06
	First Named Inventor	Timothy R. Pryor
	Art Unit	
	Examiner Name	
	Attorney Docket Number	135873.152189-0003

	9	5008946		1991-04-16	Ando	
	10	5088928		1992-02-18	Chan	
	11	5227986		1993-07-13	Yokota et al	
	12	5249053		~~1993-09-28~~ 9/1993	Jain	
Change(s) applied to document; /K.D.D./ 10/7/2014	13	5297061		1994-03-22	Dementhon et al	
	14	5365597		1994-11-15	Holeva	
	15	5376796		1994-12-27	Chan et al	
	16	5388059		1995-02-07	DeMenthon	
	17	5454043		1995-09-26	Freeman	
	18	5491507		1996-02-13	Umezawa et al	
	19	5534921		1996-07-09	Sawanobori	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2013-08-06
First Named Inventor	Timothy R. Pryor
Art Unit	
Examiner Name	
Attorney Docket Number	135873.152189-0003

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
Change(s) applied to document; /K.D.D./ 10/7/2014	1	3909002		~~1974-09-30~~ 9/1975	Levy	
	2	4219847		1980-08-26	Pinkney et al	
	3	4339798		1982-07-13	Hedges et al	
	4	4631676		1986-12-23	Pugh	
	5	4791589		1988-12-13	Blazo et al	
	6	4843568		1989-06-27	Krueger et al	
	7	4908704		1990-03-13	Fujioka et al	
	8	4988981		1991-01-29	Zimmerman et al	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/961,452	11/04/2014	8878949	135873.152189-0003	3753

24335 7590 10/15/2014

WARNER NORCROSS & JUDD LLP
INTELLECTUAL PROPERTY GROUP
900 FIFTH THIRD CENTER
111 LYON STREET, N.W.
GRAND RAPIDS, MI 49503-2487

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 Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Gesture Technology Partners, LLC, Sylvania, OH
Timothy R. Pryor, Sylvania, OH;

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:21-cv-00040	2/4/2021	Eastern District of Texas

PLAINTIFF	DEFENDANT
Gesture Technology Partners, LLC	Huawei Device Co., Ltd. and Huawei Device USA, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,194,924	6/5/2012	Gesture Technology Partners, LLC
2	7,933,431	4/26/2011	Gesture Technology Partners, LLC
3	8,878,949	11/4/2014	Gesture Technology Partners, LLC
4	8,553,079	10/8/2013	Gesture Technology Partners, LLC
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:21-cv-00041	2/4/2021	Eastern District of Texas

PLAINTIFF	DEFENDANT
Gesture Technology Partners, LLC	Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,194,924	6/5/2012	Gesture Technology Partners, LLC
2	7,933,431	4/26/2011	Gesture Technology Partners, LLC
3	8,878,949	11/4/2014	Gesture Technology Partners, LLC
4	8,553,079	10/8/2013	Gesture Technology Partners, LLC
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AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Western District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:21-cv-00121	2/4/2021	Western District of Texas

PLAINTIFF	DEFENDANT
Gesture Technology Partners, LLC	Apple Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,194,924	6/5/2012	Gesture Technology Partners, LLC
2	7,933,431	4/26/2011	Gesture Technology Partners, LLC
3	8,878,949	11/4/2014	Gesture Technology Partners, LLC
4	8,553,079	10/8/2013	Gesture Technology Partners, LLC
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Western District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:21-cv-00122	2/4/2021	Western District of Texas

PLAINTIFF	DEFENDANT
Gesture Technology Partners, LLC	Lenovo Group Ltd., Lenovo (United States) Inc., and Motorola Mobility LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,194,924	6/5/2012	Gesture Technology Partners, LLC
2	7,933,431	4/26/2011	Gesture Technology Partners, LLC
3	8,878,949	11/4/2014	Gesture Technology Partners, LLC
4	8,553,079	10/8/2013	Gesture Technology Partners, LLC
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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AO 120 (Rev. 08/10)

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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:21-cv-00123	2/4/2021	Western District of Texas

PLAINTIFF	DEFENDANT
Gesture Technology Partners, LLC	LG Electronics Inc. and LG Electronics U.S.A., Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,194,924	6/5/2012	Gesture Technology Partners, LLC
2	7,933,431	4/26/2011	Gesture Technology Partners, LLC
3	8,878,949	11/4/2014	Gesture Technology Partners, LLC
4	8,553,079	10/8/2013	Gesture Technology Partners, LLC
5	7,804,530	9/28/2010	Gesture Technology Partners, LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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