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.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/09/2020	10681109	IPTLP002C5	5023

19694 7590 05/20/2020

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

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):

Osman Kent, Surrey, UNITED KINGDOM;
Intellectual Pixels Limited, Surrey, UNITED KINGDOM;
David R. Baldwin, Surrey, UNITED KINGDOM;
Nicholas J.N. Murphy, Surrey, UNITED KINGDOM;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

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

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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

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

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

19694 7590 04/27/2020
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Janice McGahey	(Typed or printed name)
/Janice McGahey/	(Signature)
April 28, 2020	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

TITLE OF INVENTION: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	07/27/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
DALENCOURT, YVES	2457	463-031000

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

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

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

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(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 Kwan & Olynick 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: INTELLECTUAL PIXELS LIMITED

(B) RESIDENCE: (CITY and STATE OR COUNTRY): CHERTSEY, SURREY, UNITED KINGDOM

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ☒ Corporation or other private group entity ❑ Government

4a. Fees submitted: ☒ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

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

☒ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 506367

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature /Joshua W. Chang/ Date April 28, 2020

Typed or printed name Joshua W. Chang Registration No. 70,831

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

IPL EX2004
Sony v. IPL, IPR2021-00237
Page 2 of 494

Electronic Patent Application Fee Transmittal

Application Number:	15638020
Filing Date:	29-Jun-2017
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Filer:	Joshua Chang/Janice McGahey
Attorney Docket Number:	IPTLP002C5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1000**

Electronic Acknowledgement Receipt	
EFS ID:	39291920
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	28-APR-2020
Filing Date:	29-JUN-2017
Time Stamp:	20:29:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1000
RAM confirmation Number	E20204RK30011235
Deposit Account	506367
Authorized User	Janice McGahey
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	2020-04-28_IPTLP002C5_Issue_Fee_Trans.pdf	1232416 4c1223f182f02eddd672cab1cf793694e01f28db	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30345 0ee682b37e27c0a14636e2325c8cb7142a7d47ae	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1262761		

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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Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

19694 7590 04/27/2020

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

DATE MAILED: 04/27/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

TITLE OF INVENTION: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	07/27/2020

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

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

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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

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

19694 7590 04/27/2020

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

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Certificate of Mailing or Transmission

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

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

TITLE OF INVENTION: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	07/27/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
DALENCOURT, YVES	2457	463-031000

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

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

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

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

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

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

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

IPL EX2004
Sony v. IPL, IPR2021-00237
Page 8 of 494

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 04/27/2020

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

DATE MAILED: 04/27/2020

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 15/638,020	Applicant(s) Kent et al.	
	Examiner YVES DALENCOURT	Art Unit 2457	AIA (FITF) 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 amendment filed on 04/13/2020 and terminal disclaimer filed on 04/16/2020.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

3. ☑ The allowed claim(s) is/are 21-38 . 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 04/13/2020.
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 _____.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

DETAILED ACTION

This office action is responsive to amendment filed on 03/27/2020.

Continued Examination Under 37 CFR 1.114

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 04/16/2020 has been entered.

Response to Amendment

The Examiner has acknowledged the amended claims 22, 27 – 30, 33 – 35, and the submission of claim 38.

Response to Arguments

Applicant's arguments, see amendment, filed on 04/16/2020, with respect to claims 21 - 38, have been fully considered and are persuasive. The rejection of claims 21 - 38 has been withdrawn.

Reasons for Allowance

This communication warrants no Examiner's reason for allowance, as Applicant's reply makes evident the reason for allowance, satisfying the record as whole as required by rule 37 CFR 1.104 (e). In this case, the substance of applicant's remarks with respect

to the amended claims filed on 04/16/2020 *point out the reason claims are patentable over the prior art of record. Thus, the reason for allowance is in all probability evident from the record and no statement for examiner's reason for allowance is necessary (see MPEP 13202.14).*

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

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8AM-5:30PM.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

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

CLAIMS

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

CLAIM		DATE								
Final	Original	09/02/2018	03/18/2019	09/23/2019	02/06/2020	04/21/2020				
	1	✓	✓	-	-	-				
	2	✓	✓	-	-	-				
	3	✓	✓	-	-	-				
	4	✓	✓	-	-	-				
	5	✓	✓	-	-	-				
	6	✓	✓	-	-	-				
	7	✓	✓	-	-	-				
	8	✓	✓	-	-	-				
	9	✓	✓	-	-	-				
	10	✓	✓	-	-	-				
	11	✓	✓	-	-	-				
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	16	✓	✓	-	-	-				
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	19	✓	✓	-	-	-				
	20	✓	✓	-	-	-				
1	21			✓	✓	=				
2	22			✓	✓	=				
3	23			✓	✓	=				
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7	27			✓	✓	=				
8	28			✓	✓	=				
9	29			✓	✓	=				
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13	33			✓	✓	=				
14	34			✓	✓	=				
15	35			✓	✓	=				
16	36				✓	=				
17	37				✓	=				
18	38					=				

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

CPC - Searched*		
Symbol	Date	Examiner
H04L65/607; H04N21/23412	09/02/2018	YD

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
WEST/CPC (text searched)	09/02/2018	YD
WEST/CPC (updated text search)	03/18/2019	YD
WEST/CPC (updated text search)	09/20/2019	YD
WEST/CPC (updated text search)	02/05/2020	YD
WEST/CPC (updated text search)	04/21/2020	YD

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	WEST/CPC (text searched)	04/21/2020	YD

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	**Art Unit**
	YVES DALENCOURT	2457

CPC							
Symbol						**Type**	**Version**
H04L	/	67	/	00		F	2013-01-01
H04L	/	65	/	607		I	2013-01-01
A63F	/	13	/	25		I	2014-09-02
G06T	/	9	/	00		I	2013-01-01
G06T	/	15	/	005		I	2013-01-01
A63F	/	13	/	12		I	2013-01-01
G06T	/	2200	/	16		A	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
/YVES DALENCOURT/ Primary Examiner, Art Unit 2457	21 April 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2A

U.S. Patent and Trademark Office — Part of Paper No.: 20200421

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	**Art Unit**
	YVES DALENCOURT	2457

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G06F	/	15	/	16

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
/YVES DALENCOURT/ Primary Examiner, Art Unit 2457	21 April 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2A

U.S. Patent and Trademark Office — Part of Paper No.: 20200421

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	**Art Unit**
	YVES DALENCOURT	2457

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		10		19	8	28	17	37						
	2		11		20	9	29	18	38						
	3		12	1	21	10	30								
	4		13	2	22	11	31								
	5		14	3	23	12	32								
	6		15	4	24	13	33								
	7		16	5	25	14	34								
	8		17	6	26	15	35								
	9		18	7	27	16	36								

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	18	
/YVES DALENCOURT/ Primary Examiner, Art Unit 2457	21 April 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2A

U.S. Patent and Trademark Office — Part of Paper No.: 20200421

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Sony v. IPL, IPR2021-00237
Page 19 of 494

Bibliographic Data

Application No: 15/638,020

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /YVES DALENCOURT/ (Examiner's Signature) | (Initials)

Title: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/29/2017	463	2457	IPTLP002C5
RULE			

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David R. Baldwin Surrey, UNITED KINGDOM

Nicholas J.N. Murphy Surrey, UNITED KINGDOM

CONTINUING DATA

This application is a CON of 14192789 02/27/2014 PAT 9699238

14192789 is a CON of 13296776 11/15/2011 PAT 8667093

13296776 is a CON of 12538347 08/10/2009 PAT 8131826

12538347 is a CON of 10037688 01/04/2002 PAT 7587520

10037688 has PRO of 60263854 01/24/2001

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/10/2017

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UNITED STATES

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15638020
Filing Date	2017-06-29
First Named Inventor	Osman KENT
Art Unit	2457
Examiner Name	DALENCOURT, Yves
Attorney Docket Number	IPTLP002C5

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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	6330281	B1	2001-12-11	MANN et al.	
	2	7274368	B1	2007-09-25	KESLIN, Phillip C.	

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	1	200042247	JP	A	2000-02-15	MORIGUCHI, Akihiko		☒
	2	10-015245	JP	A	1998-01-20	NAKATANI, Kazuo		☒

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

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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.	T5
	1	ENGEL, KLAUS ET AL., "Remote 3D Visualization Using Image-Streaming Techniques", Proceedings of the 11th International Conference on Systems Research, Informatic and Cybernetics, Baden-Baden, International Institute for Advanced Studies in Systems Research and Cybernetics, August 1999, pgs.91-96, Germany.	
	2	ENGEL, KLAUS ET AL., "A Framework for Interactive Hardware Accelerated Remote 3D-Visualization", Data Visualization 2000, Proceedings of the Joint EUROGRAPHICS and IEEE TCVG Symposium on Visualization, Springer-Verlag/Wein, May 29-31, 2000, pg.167-178, Amsterdam, Netherland.	
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	5	SCHMIDT, BRIAN ET AL., "The Interactive Performance of SLIM: A Stateless, Thin-Client Architecture", 17th ACM Symposium on Operating Systems Principles, December 1999, pg.32-47, Kiawah Island, SC.	
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	8	LEVOY, MARC, "Polygon-Assisted JPEG and MPEG Compression of Synthetic Images", Computer Graphics Proceedings, Annual Conference Series, August 6-11, 1995, pgs.21-29, Los Angeles, USA.	
	9	LAMOTHE, ANDRE, "Tricks of the Windows, Game Programming Gurus", Fundamentals of 2D and 3D Game Programming, 1999, Indianapolis, USA.	

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	Examiner Name	DALENCOURT, Yves
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	10	CIMINIERA, LUIGI ET AL., "Industrial IEEE 802.3 Networks with Short Delivery Time for Urgent Messages", IEEE Transactions on Industrial Electronics, Vol. 35, No. 1, February 1988, pgs.18-25.	
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	13	HARTWIG, STEPHAN ET AL., "Mobile Multimedia - Challenges and Opportunities Invited Paper", IEEE Transactions on Consumer Electronics, November 2000, pgs.1167-1178, Vol.46, No.4.	
	14	CARNEY, DAN, "Gateway 2000 Unveils Destination Presentation System at FOSE", FCW, March 31, 1996.	
	15	"Gateway Debuts $1,999 PC-TV", CNET, http://www.cnet.com/news/gateway-debuts-1999-pc-tv/, August 26, 1998.	
	16	"Gateway Eyes New Destination with a Hybrid PC/TV System", PC Week, April 1, 1996, pg.39.	
	17	"The Living-Room PC", PC Computing, August 1996, pg.76.	
	18	"Computer-TV Hybrids", Nation's Business, December 1996, pgs.23-28.	
	19	HADDON, LESLIE, "The Development of Interactive Games", The Media Reader: Continuity and Transformation, 1999, pgs.305-327.	
	20	CURTISS, AARON, "Sony's PlayStation Joins the Rich Video Game Party", Los Angeles Times, December 6, 1995, pg.F11.	

EFS Web 2.1.18

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	Examiner Name	DALENCOURT, Yves
	Attorney Docket Number	IPTLP002C5

	21	HAM, TOM, "Fight to the Finish", The Washington Post, October 25, 1995, pgs.7-11.	
	22	SINGHAL, SANDEEP ET AL. "Network Virtual Environments: Design and Implementation", ACM Press, 1999, pgs.2-5, 34-49, 251-269, New York, USA.	
	23	GRAF, RUDOLF F., "Modern Dictionary of Electronics", 7th Ed., 1999, pgs.470 & 739.	
	24	"SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, filed January 27, 2020, 251 pgs.	
	25	"[EXHIBIT A-1: REMOTE 3D VISUALIZATION USING IMAGE-STREAMING TECHNIQUES ("Engel 1999")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 64 pgs.	
	26	"[EXHIBIT A-2: A Framework For Interactive Hardware Accelerated Remote 3D-Visualization ("Engel 2000") SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 75 pgs.	
	27	"[EXHIBIT A-3: U.S. Patent No. 7,274,368 ("Keslin")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 77 pgs.	
	28	"[EXHIBIT A-4: U.S. Patent No. 6,330,281 ("Mann")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 116 pgs.	
	29	"[EXHIBIT A-5: Japanese Patent Application Publication No. JP 2000-42247A ("Moriguchi")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 88 pgs.	
	30	"[EXHIBIT A-6: RICHARDSON AND WOOD, THE RFB PROTOCOL ("Richardson")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 54 pgs.	
	31	"[EXHIBIT A-7: SCHMIDT ET AL., THE INTERACTIVE PERFORMANCE OF SLIM: A STATELESS, THIN-CLIENT ARCHITECTURE ("Schmidt")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 44 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

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	Filing Date	2017-06-29
	First Named Inventor	Osman KENT
	Art Unit	2457
	Examiner Name	DALENCOURT, Yves
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	32	"[EXHIBIT A-8: RICHARDSON ET AL., VIRTUAL NETWORK COMPUTING ("Richardson IEEE")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 27 pgs.	
	33	"[EXHIBIT A-9: Additional Prior Art References] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 28 pgs.	
	34	"[EXHIBIT B-1: REMOTE 3D VISUALIZATION USING IMAGE-STREAMING TECHNIQUES ("Engel 1999")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 64 pgs.	
	35	"[EXHIBIT B-2: A Framework For Interactive Hardware Accelerated Remote 3D-Visualization ("Engel 2000")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 66 pgs.	
	36	"[EXHIBIT B-3: U.S. Patent No. 7,274,368 ("Keslin")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 70 pgs.	
	37	"[EXHIBIT B-4: U.S. Patent No. 6,330,281 ("Mann")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 86 pgs.	
	38	"[EXHIBIT B-5: Japanese Patent Application Publication No. JP 2000-42247A ("Moriguchi")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 70 pgs.	
	39	"[EXHIBIT B-6: RICHARDSON AND WOOD, THE RFB PROTOCOL ("Richardson")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 63 pgs.	
	40	"[EXHIBIT B-7: SCHMIDT ET AL., THE INTERACTIVE PERFORMANCE OF SLIM: A STATELESS, THIN-CLIENT ARCHITECTURE ("Schmidt")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 39 pgs.	
	41	"[EXHIBIT B-8: RICHARDSON ET AL., VIRTUAL NETWORK COMPUTING ("Richardson IEEE"] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 25 pgs.	
	42	"[EXHIBIT B-9: Additional Prior Art References] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 23 pgs.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2017-06-29
	First Named Inventor	Osman KENT
	Art Unit	2457
	Examiner Name	DALENCOURT, Yves
	Attorney Docket Number	IPTLP002C5

	43	"[EXHIBIT C-1: REMOTE 3D VISUALIZATION USING IMAGE-STREAMING TECHNIQUES ("Engel 1999")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 55 pgs.	
	44	"[EXHIBIT C-2: A Framework For Interactive Hardware Accelerated Remote 3D-Visualization ("Engel 2000")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 62 pgs.	
	45	"[EXHIBIT C-3: U.S. Patent No. 7,274,368 ("Keslin")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 61 pgs.	
	46	"[EXHIBIT C-4: U.S. Patent No. 6,330,281 ("Mann")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 61 pgs.	
	47	"[EXHIBIT C-5: Japanese Patent Application Publication No. JP 2000-42247A ("Moriguchi")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 70 pgs.	
	48	"[EXHIBIT C-6: RICHARDSON AND WOOD, THE RFB PROTOCOL ("Richardson")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 39 pgs.	
	49	"[EXHIBIT C-7: SCHMIDT ET AL., THE INTERACTIVE PERFORMANCE OF SLIM: A STATELESS, THIN-CLIENT ARCHITECTURE ("Schmidt")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 26 pgs.	
	50	"[EXHIBIT C-8: RICHARDSON ET AL., VIRTUAL NETWORK COMPUTING ("Richardson IEEE"] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 20 pgs.	

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

EXAMINER SIGNATURE

Examiner Signature	/YVES DALENCOURT/	Date Considered	04/21/2020

*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.

EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15638020
	Filing Date	2017-06-29
	First Named Inventor	Osman KENT
	Art Unit	2457
	Examiner Name	DALENCOURT, Yves
	Attorney Docket Number	IPTLP002C5

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	/Joshua W. Chang/	Date (YYYY-MM-DD)	2020-04-13
Name/Print	Joshua W. Chang	Registration Number	70,831

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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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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

OK TO ENTER: /Y.D/

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: KENT, Osman et al.	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, Yves
Filed: June 29, 2017	Group: 2457
TITLE: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: 5023

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on April 13, 2020.
Signed: /Janice McGahey/
Janice McGahey

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER FINAL

Dear Commissioner:

Applicants respectfully request that the Examiner enter the following amendments in response to the Final Office Action dated February 12, 2020, a response to which is due May 12, 2020. Please enter the following amendments and consider the following remarks:

Amendments to the Claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

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PTO/SB/08b (07-09)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	15638020
Filing Date	2017-06-29
First Named Inventor	Osman KENT
Art Unit	2457
Examiner Name	DALENCOURT, Yves
Attorney Docket Number	IPTLP002C5

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		"[EXHIBIT C-9] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 32 pgs.	
		"[EXHIBIT D-1] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 98 pgs.	
		"[EXHIBIT D-2] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 132 pgs.	
		"[EXHIBIT D-3] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 76 pgs.	
		"[EXHIBIT D-4] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 72 pgs.	
		"[EXHIBIT D-5] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 95 pgs.	
		"[EXHIBIT D-6] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 82 pgs.	
		"[EXHIBIT D-7] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 63 pgs.	
		"[EXHIBIT D-8] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 53 pgs.	
		"[EXHIBIT D-9] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 56 pgs.	

Examiner Signature	/YVES DALENCOURT/	Date Considered	04/21/2020

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

[1] Applicant's unique citation designation number (optional). [2] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 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 2 hours 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, 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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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).
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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.
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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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

WEST Search History for Application 15638020

Creation Date: 2020042116:05

Prior Art Searches

Query	DB	Hits	Op.	Plur.	Thes.	Date
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	54534	OR	YES		09-02-2018
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	66399	OR	YES		09-02-2018
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	19	OR	YES		09-02-2018
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
		2	OR	YES		09-02-2018

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(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17231	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1463	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1199	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	142	OR	YES		09-02-2018
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB,	48	OR	YES		09-02-2018

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	DWPI, TDBD					
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	14	OR	YES		09-02-2018
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
		0	OR	YES		09-02-2018

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@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	139	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	96	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-02-2018

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20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-02-2018
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-02-2018
(H04L65/605).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	5172	OR	YES		09-02-2018
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
(H04L65/607).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7555	OR	YES		09-02-2018
(H04N21/23412).CPC.	PGPB, USPT, EPAB, JPAB,	1542	OR	YES		09-02-2018

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	DWPI, TDBD					
(H04N21/234318).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1850	OR	YES		09-02-2018
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		03-18-2019
		58377	OR	YES		03-18-2019

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displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	71067	OR	YES		03-18-2019
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB,	71067	OR	YES		03-18-2019

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	DWPI, TDBD					
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	20	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		03-18-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3135	OR	YES		09-23-2019
(interactive adj7 software adj7 application) and receiv$3 adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	87	OR	YES		09-23-2019
		15788	OR	YES		09-23-2019

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(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(generat$3 or form$3) adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7721	OR	YES		09-23-2019
((generat$3 or form$3) adj7 updat$3 adj7 image$1) and compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	107	OR	YES		09-23-2019
((generat$3 or form$3) adj7 updat$3 adj7 image$1 and compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7	OR	YES		09-23-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-23-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	62358	OR	YES		09-23-2019
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	76051	OR	YES		09-23-2019
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB,	1	OR	YES		09-23-2019

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	DWPI, TDBD					
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	21	OR	YES		09-23-2019
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	20084	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1651	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1370	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	220	OR	YES		09-23-2019
		1	OR	YES		09-23-2019

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(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	189	OR	YES		09-23-2019
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	59	OR	YES		09-23-2019
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17	OR	YES		09-23-2019
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	895	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or	PGPB, USPT, EPAB, JPAB,	895	OR	YES		09-23-2019

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real-time)	DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	895	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	220	OR	YES		09-23-2019
@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB,	152	OR	YES		09-23-2019

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	DWPI, TDBD					
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	102	OR	YES		09-23-2019
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		09-23-2019
20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-23-2019
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-23-2019
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-23-2019
((((((H04L65/605)))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6103	OR	YES		09-23-2019
6377257.PN.		3	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
((((((**H04L65/607**)))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8985	OR	YES		09-23-2019
((((((**H04N21/23412**)))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1663	OR	YES		09-23-2019
((((((**H04N21/234318**)))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1974	OR	YES		09-23-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3135	OR	YES		09-23-2019
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	15788	OR	YES		09-23-2019
((updat$3 or modif$3 or chang$3) adj7 software adj7 application) and (interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	160	OR	YES		09-23-2019
(updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB,	497807	OR	YES		09-23-2019

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	DWPI, TDBD					
((updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	46	OR	YES		09-23-2019
compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	434	OR	YES		09-23-2019
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3439	OR	YES		09-23-2019
(compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		09-23-2019
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
8667093.pn.		3	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
8131826.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
7587520.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
asymmetric adj7 bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2247	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and (interactive adj7 software adj7 application and receiv$3 adj7 input adj7 signal$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(transmit$3 or send$3) adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB,	72744	OR	YES		09-23-2019

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	DWPI, TDBD					
((transmit$3 or send$3) adj7 input adj7 signal$1) and (asymmetric adj7 bandwidth)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	28	OR	YES		09-23-2019
((transmit$3 or send$3) adj7 input adj7 signal$1 and asymmetric adj7 bandwidth) and client and server	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	9	OR	YES		09-23-2019
6603470.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(6603470.pn.) and transmnit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(6603470.pn.) and transmit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(6603470.pn. and transmit) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
6929549.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(6929549.pn.) and bandwidth		0	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
kent.in.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	26709	OR	YES		09-23-2019
(kent.in.) and asymmetric	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	771	OR	YES		09-23-2019
(kent.in. and asymmetric) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		09-23-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3307	OR	YES		02-06-2020
(interactive adj7 software adj7 application) and receiv$3 adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	95	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	16402	OR	YES		02-06-2020
(generat$3 or form$3) adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB,	8015	OR	YES		02-06-2020

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	DWPI, TDBD					
((generat$3 or form$3) adj7 updat$3 adj7 image$1) and compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	109	OR	YES		02-06-2020
((generat$3 or form$3) adj7 updat$3 adj7 image$1 and compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7	OR	YES		02-06-2020
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	65297	OR	YES		02-06-2020
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	79717	OR	YES		02-06-2020
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	22	OR	YES		02-06-2020
		1	OR	YES		02-06-2020

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(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	21164	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1708	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1422	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	227	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
6377257.uref.	PGPB, USPT, EPAB, JPAB,	210	OR	YES		02-06-2020

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	DWPI, TDBD					
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	63	OR	YES		02-06-2020
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17	OR	YES		02-06-2020
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	923	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	923	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	923	OR	YES		02-06-2020
		227	OR	YES		02-06-2020

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(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	155	OR	YES		02-06-2020
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	104	OR	YES		02-06-2020

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(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		02-06-2020
20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		02-06-2020
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		02-06-2020
(((((((H04L65/605))))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6483	OR	YES		02-06-2020
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
(((((((H04L65/607))))))).CPC.	PGPB, USPT, EPAB, JPAB,	9581	OR	YES		02-06-2020

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	DWPI, TDBD					
(((((((H04N21/23412)))))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1766	OR	YES		02-06-2020
(((((((H04N21/234318)))))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2045	OR	YES		02-06-2020
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3307	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	16402	OR	YES		02-06-2020
((updat$3 or modif$3 or chang$3) adj7 software adj7 application) and (interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	165	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	512215	OR	YES		02-06-2020
((updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	49	OR	YES		02-06-2020
compress$3 adj7 updat$3 adj7 image$1		440	OR	YES		02-06-2020

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3494	OR	YES		02-06-2020
(compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		02-06-2020
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
8667093.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
8131826.pn.	PGPB, USPT, EPAB, JPAB,	2	OR	YES		02-06-2020

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	DWPI, TDBD					
7587520.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
asymmetric adj7 bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2313	OR	YES		02-06-2020
(asymmetric adj7 bandwidth) and (interactive adj7 software adj7 application and receiv$3 adj7 input adj7 signal$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(asymmetric adj7 bandwidth) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		02-06-2020
(asymmetric adj7 bandwidth) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(transmit$3 or send$3) adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	74853	OR	YES		02-06-2020
((transmit$3 or send$3) adj7 input adj7 signal$1) and (asymmetric adj7 bandwidth)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	29	OR	YES		02-06-2020
		9	OR	YES		02-06-2020

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((transmit$3 or send$3) adj7 input adj7 signal$1 and asymmetric adj7 bandwidth) and client and server	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
6603470.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
(6603470.pn.) and transmnit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(6603470.pn.) and transmit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
(6603470.pn. and transmit) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
6929549.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
(6929549.pn.) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
kent.in.	PGPB, USPT, EPAB, JPAB,	27109	OR	YES		02-06-2020

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	DWPI, TDBD					
(kent.in.) and asymmetric	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	790	OR	YES		02-06-2020
(kent.in. and asymmetric) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 game adj7 state$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6664	OR	YES		02-06-2020
((updat$3 or modif$3 or chang$3) adj7 game adj7 state$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		02-06-2020
9959037.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		02-06-2020
(9959037.pn.) and update$3 adj7 software	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(9959037.pn.) and updat$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
interactive adj7 software adj7 application		3389	OR	YES		04-21-2020

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(interactive adj7 software adj7 application) and receiv$3 adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	97	OR	YES		04-21-2020
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	16733	OR	YES		04-21-2020
(generat$3 or form$3) adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8182	OR	YES		04-21-2020
((generat$3 or form$3) adj7 updat$3 adj7 image$1) and compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	110	OR	YES		04-21-2020
((generat$3 or form$3) adj7 updat$3 adj7 image$1 and compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7	OR	YES		04-21-2020
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		04-21-2020
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB,	66891	OR	YES		04-21-2020

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	DWPI, TDBD					
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	81653	OR	YES		04-21-2020
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		04-21-2020
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	22	OR	YES		04-21-2020
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		04-21-2020
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	21792	OR	YES		04-21-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1737	OR	YES		04-21-2020
		1450	OR	YES		04-21-2020

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(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	228	OR	YES		04-21-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		04-21-2020
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	217	OR	YES		04-21-2020
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	64	OR	YES		04-21-2020
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		04-21-2020
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17	OR	YES		04-21-2020
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB,	11	OR	YES		04-21-2020

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	DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	939	OR	YES		04-21-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	939	OR	YES		04-21-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	939	OR	YES		04-21-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	228	OR	YES		04-21-2020
@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020

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complex near game$1)						
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	157	OR	YES		04-21-2020
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	105	OR	YES		04-21-2020
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		04-21-2020
20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		04-21-2020
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		04-21-2020
20050001845		4	OR	YES		04-21-2020

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(((((((**H04L65/605**))))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6662	OR	YES		04-21-2020
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		04-21-2020
(((((((**H04L65/607**))))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	9830	OR	YES		04-21-2020
(((((((**H04N21/23412**))))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1788	OR	YES		04-21-2020
(((((((**H04N21/234318**))))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2065	OR	YES		04-21-2020
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3389	OR	YES		04-21-2020
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB,	16733	OR	YES		04-21-2020

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	DWPI, TDBD					
((updat$3 or modif$3 or chang$3) adj7 software adj7 application) and (interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	166	OR	YES		04-21-2020
(updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	520238	OR	YES		04-21-2020
((updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	49	OR	YES		04-21-2020
compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	443	OR	YES		04-21-2020
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3520	OR	YES		04-21-2020
(compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
		13	OR	YES		04-21-2020

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(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
8667093.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		04-21-2020
8131826.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
7587520.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
asymmetric adj7 bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2329	OR	YES		04-21-2020
(asymmetric adj7 bandwidth) and (interactive adj7 software adj7 application and receiv$3 adj7 input adj7 signal$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
(asymmetric adj7 bandwidth) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB,	12	OR	YES		04-21-2020

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	DWPI, TDBD					
(asymmetric adj7 bandwidth) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
(transmit$3 or send$3) adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	75859	OR	YES		04-21-2020
((transmit$3 or send$3) adj7 input adj7 signal$1) and (asymmetric adj7 bandwidth)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	30	OR	YES		04-21-2020
((transmit$3 or send$3) adj7 input adj7 signal$1 and asymmetric adj7 bandwidth) and client and server	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	9	OR	YES		04-21-2020
6603470.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		04-21-2020
(6603470.pn.) and transmnit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
(6603470.pn.) and transmit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		04-21-2020
(6603470.pn. and transmit) and bandwidth		1	OR	YES		04-21-2020

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
6929549.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
(6929549.pn.) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
kent.in.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	27324	OR	YES		04-21-2020
(kent.in.) and asymmetric	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	796	OR	YES		04-21-2020
(kent.in. and asymmetric) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		04-21-2020
(updat$3 or modif$3 or chang$3) adj7 game adj7 state$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6844	OR	YES		04-21-2020
((updat$3 or modif$3 or chang$3) adj7 game adj7 state$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB,	4	OR	YES		04-21-2020

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	DWPI, TDBD					
9959037.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		04-21-2020
(9959037.pn.) and update$3 adj7 software	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		04-21-2020
(9959037.pn.) and updat$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		04-21-2020
("6330281" | "7274368" | "20020082082" | "20100201696" | "20120100913" | "20120142426" | "20140040358" | "20140179433" | "5550962" | "5742289" | "5790792" | "5801711" | "6055229" | "6057852" | "6094453" | "6205582" | "6344852" | "6377257" | "6384821" | "6438575" | "6603470" | "6628282" | "6658167" | "6929549" | "7587520" | "8131826" | "8560643" | "8667093" | "9106605" | "9699238").PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	75	OR	YES		04-21-2020
(("6330281" | "7274368" | "20020082082" | "20100201696" | "20120100913" | "20120142426" | "20140040358" | "20140179433" | "5550962" | "5742289" | "5790792" | "5801711" | "6055229" | "6057852" | "6094453" | "6205582" | "6344852" | "6377257" | "6384821" | "6438575" | "6603470" | "6628282" | "6658167" | "6929549" | "7587520" | "8131826" | "8560643" | "8667093" | "9106605" | "9699238").PN.) and ((updat$3 or modif$3 or chang$3) adj7 game adj7 state$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		04-21-2020

IPL EX2004
Sony v. IPL, IPR2021-00237
Page 70 of 494

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
* 15/638,020 *	15/638,020	Kent et al.	
	Examiner	**Art Unit**	
	DALENCOURT, YVES	2457	

Document Code - DISQ	**Internal Document - DO NOT MAIL**

TERMINAL DISCLAIMER	☑ APPROVED	☐ DISAPPROVED
Date Filed: 13 April 2020	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

/CHARRISSA S BROWN/

Technology Center: PLRC

Telephone: (571)272-1558

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: KENT, Osman et al.	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, Yves
Filed: June 29, 2017	Group: 2457
TITLE: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: 5023

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

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL

Dear Sir/Madam:

Applicant would like to re-submit a Non-Patent Literature reference that was uploaded April 13, 2020. The referenced labeled "IPTLP002C5_2020-01-27InvalidityContentions.pdf" did not upload correctly which resulted in only the first page being uploaded. Applicant respectfully requests that this replacement file, of the same file name, be used instead.

The fees of $240 for the Information Disclosure Statement were paid April 13, 2020, and the Applicant believes no fees are required for this replacement reference. However, the Commissioner is hereby authorized to charge any required fees, including those for any deficiency, or credit any overpayment to Applicant's Deposit Account No: 50-6367, (**Order No. IPTLP002C5**).

Respectfully submitted,

Dated: April 14, 2020

/Joshua W. Chang/
Joshua W. Chang
Reg. 70,831

Kwan & Olynick LLP
2000 Hearst Street, Ste. 305
Berkeley, CA 94709
510-900-9501
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Electronic Acknowledgement Receipt

EFS ID:	39154776
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	14-APR-2020
Filing Date:	29-JUN-2017
Time Stamp:	18:56:16
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	Transmittal Letter	4-14-2020_3DL271US7_IPTLP002C5_IDS_replacement_TRANSMITTAL.pdf	92194 385abb407993b967b3f68009bff4d59b61358a8a	no	1
Warnings:					

Information:					
2	Non Patent Literature	IPTLP002C5_2020-01-27InvalidityContentions.pdf	877943 c48e37b9e473876c3f16fb789825b0a5a87a0d10	no	254
Warnings:					
Information:					
			Total Files Size (in bytes):	970137	

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: KENT, Osman et al.	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, Yves
Filed: June 29, 2017	Group: 2457
TITLE: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: 5023

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on April 13, 2020.
Signed: /Janice McGahey/
Janice McGahey

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER FINAL

Dear Commissioner:

Applicants respectfully request that the Examiner enter the following amendments in response to the Final Office Action dated February 12, 2020, a response to which is due May 12, 2020. Please enter the following amendments and consider the following remarks:

Amendments to the Claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

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This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-20 (Cancelled)

21. (Previously Presented) A method of hosting an interactive software application comprising:

running at a server the interactive software application;

receiving at the server user input signals from a client device, wherein the user input signals are used to control updating of the state of the interactive software application;

generating at least one updated image at the server in response to updating the state of the interactive software application; and

compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a compressed frame that can be decompressed and displayed as an updated image at the client device.

22. (Currently Amended) The method as recited in claim 21 wherein a first bandwidth for transmitting the user input data between the client device and the server and a second bandwidth for ~~sending~~ transmitting the compressed updated image from the server to the client device are asymmetric.

23. (Previously Presented) The method as recited in claim 21 wherein the server is configured for bidirectional communications with a plurality of client devices, the bidirectional communication including receiving at the server user input signals and transmitting the compressed updated image.

24. (Previously Presented) The method as recited in claim 21 wherein the server is configured to receive user input data and transmit compressed updated images with a plurality of client devices.

25. (Previously Presented) The method as recited in claim 21 wherein at least two of the plurality of client devices include different device platforms.

26. (Previously Presented) The method as recited in claim 21 wherein the client device is a mobile device.

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27. (Currently Amended) The method as recited in claim 21 wherein the interactive software application is an interactive game that is configured to run at the server, which is in bidirectional communication with a plurality of client devices, and wherein said updating the state of the software application includes updating the game state of the interactive game.

28. (Currently Amended) An image display system, comprising:

a server having a processor and memory configured to execute an interactive software application and further configured for:

receiving at the server user input signals from a client device, wherein the user input signals are used to control updating the state of the interactive software application;

generating at least one updated image at the server in response to updating the state of the interactive software application running on the server by the user input signals; and

compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a frame and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.

29. (Currently Amended) The image display system of claim 28, wherein the user input signals are generated at the client device to update the state of the interactive software application from the state that initiated the current image displayed ~~at~~ on the display coupled to the client device.

30. (Currently Amended) The image display system of claim 28 wherein the server is configured to ~~communicate~~ exchange user input data and compressed updated images with a plurality of client devices.

31. (Previously Presented) The image display system of claim 28 wherein the interactive software application is a game and wherein the client device is a mobile device.

32. (Previously Presented) The image display system of claim 30 wherein the interactive software application is a game and wherein at least one of the plurality of client devices is a mobile device.

33. (Currently Amended) A method of displaying interactive video, comprising:

receiving at a server user input control signals from a client device, wherein the user input control signals are used to control ~~an~~ at least one image in a sequence of images generated from the running of a software gaming application on the server;

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generating a modified image at the server in response to the user input control signals; and

transmitting the modified image to the client device for display as compressed data, wherein the transmitting step comprises compressing the at least one modified image and sending the compressed modified image to the client device once the modified image is generated, and wherein the client device is configured for decompressing of the compressed ~~updated~~ modified image and displaying the ~~updated~~ modified image on a display coupled to the client device.

34. (Currently Amended) The method as recited in claim 33 wherein a first bandwidth ~~allocation to~~ available for receiving user input control signals at the server and a second bandwidth ~~allocated to~~ available for transmitting the modified image to the client device is asymmetric with the second bandwidth ~~allocated to~~ available for transmitting the modified image from the server being greater than the first bandwidth.

35. (Currently Amended) The method as recited in claim 33 wherein the server is configured to ~~communicate~~ exchange user input data and compressed modified images with a plurality of client devices.

36. (Previously Presented) The method as recited in claim 35 wherein at least two of the plurality of client devices include different platforms.

37. (Previously Presented) The method as recited in claim 21 wherein the interactive software application is a game running on the server and wherein updating of the state of the interactive software application includes changing the game state.

38. (New) The method as recited in claim 33 wherein the user input control signals are used to control a plurality of images in the sequence of images generated from the running of a software gaming application on the server.

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REMARKS

This amendment responds to the Final Office Action mailed on February 12, 2020. In the Office Action, the Examiner indicated that the arguments made in the previous amendment were persuasive and withdrew the rejections. Applicants gratefully acknowledge the Examiner's thorough review of the submitted arguments. The examiner is maintaining the nonstatutory obviousness-type double patenting rejections as to claims 21-37 as being unpatentable over claims 1-21 of US 8,667,093. Applicant is submitting concurrently with this filing a terminal disclaimer. Applicant submits that the filing of the terminal disclaimer overcomes the rejections and respectfully requests that the rejections be withdrawn.

Applicant has amended claims 22, 27-30 and 33-35 for clarity purposes. New claim 38 has been added and depends from independent claim 33, a claim noted to be allowable save for the now obviated double patenting rejection. Support for these amendments may be found throughout the specification including, but not limited to, the summary of the invention. No new matter has been added. Applicant respectfully requests entry of the amendments since after entry the claims will be in condition for allowance and no new search is believed to be required.

CONCLUSION

The arguments presented in the remarks section of this current or future amendment/response are believed to provide an adequate response for asserting the allowability of all of the presently pending claims in this present application. To the extent that the applicant has not addressed some issues raised by the Examiner in the Office Action, applicant believes that such unaddressed issues do not require a response at the time since allowability of the claims has been asserted based upon other grounds. However, applicant's lack of response to any of the issues raised by the Examiner does not constitute an admission by the applicant as to the accuracy of the Examiner's assertions with respect to such issues. Applicant specifically reserves the right to respond to such issues at a later time during the prosecution of the present application, should such a need arise.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

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Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No IPTLP002C5).

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

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IPL EX2004
Sony v. IPL, IPR2021-00237
Page 80 of 494

PTO/AIA/26 (04-14)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) IPTLP002C5

In re Application of: KENT, Osman et al.

Application No.: 15/638,020

Filed: June 29, 2017

For: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

The applicant, Intellectual Pixels Limited, 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. 8,667,093 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 and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the 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. 70,831

/Joshua W. Chang/ — Signature
04/13/2020 — Date

Joshua W. Chang — Typed or printed name

Attorney of Record — Title
510-900-9501 — 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.

This collection of information is required by 37 CFR 1.321. 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. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	15638020
Filing Date:	29-Jun-2017
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Filer:	Joshua Chang/Janice McGahey
Attorney Docket Number:	IPTLP002C5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
		Total in USD ($)		**160**

Electronic Acknowledgement Receipt	
EFS ID:	39145035
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	13-APR-2020
Filing Date:	29-JUN-2017
Time Stamp:	20:25:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$160
RAM confirmation Number	E20204CK25230003
Deposit Account	506367
Authorized User	Janice McGahey
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPTLP002C5_FOA_02122020_draftRS2_ForFiling.pdf	40071 2a11d6b025619bbd0c873c01a8eb071ebbebacff	yes	6
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Response After Final Action		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	6	
Warnings:					
Information:					
2	Terminal Disclaimer Filed	IPTLP002C5_Terminal_Disclaimer_04132020.pdf	155695 31c58c99015bb131e795740da4520308a63a12d5	no	2
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30606 eb4d8a5e69b747d15109b89dcedebb5d96252994	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	226372		

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New International Application Filed with the USPTO as a Receiving Office

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Electronic Acknowledgement Receipt

EFS ID:	39146748
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	13-APR-2020
Filing Date:	29-JUN-2017
Time Stamp:	20:37:45
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	Non Patent Literature	ExD-1238Engel1999_.pdf	1169264 79c695c85de6c33579575e805a25473f2f536034	no	98
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Information:					
2	Non Patent Literature	ExD-2238Engel2000_.pdf	615911 c7c871154390dc3f0a21a38ccf355b34e191f1f3	no	132
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Information:					
3	Non Patent Literature	ExD-3238Keslin_.pdf	442511 7387ee0e0e6bf7333094e3685d97e0228a3d06a1	no	76
Warnings:					
Information:					
4	Non Patent Literature	ExD-4238Mann_.pdf	488582 4c4c091b42edaea22d136b8750dfe66dccaafd25	no	72
Warnings:					
Information:					
5	Non Patent Literature	ExD-5238Moriguchi_.pdf	404461 61d4287c308a5196d1f79590402183cf58ab951b	no	95
Warnings:					
Information:					
6	Non Patent Literature	ExD-6238RichardsonRFBProtocol_.pdf	589755 e4a8f28981d70a5315a492710a5f0e3b49fe3164	no	82
Warnings:					
Information:					
7	Non Patent Literature	ExD-7238SchmidtSLIM_.pdf	568474 7d0998adb3f3c593ee2e84197a9121f06353c47d	no	63
Warnings:					
Information:					
8	Non Patent Literature	ExD-8238RichardsonIEEE_.pdf	448119 bca7c2b6109b9355feb97cfcf969eec1e2971edd	no	53
Warnings:					
Information:					

9	Non Patent Literature	ExD-9238AdditionalReferences_.pdf	667729 9fc3e4e97868eccb052ac6ef0c5076ddbfc57826	no	56
Warnings:					
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	15638020
Filing Date	2017-06-29
First Named Inventor	Osman KENT
Art Unit	2457
Examiner Name	DALENCOURT, Yves
Attorney Docket Number	IPTLP002C5

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	2	7274368	B1	2007-09-25	KESLIN, Phillip C.	

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	2	10-015245	JP	A	1998-01-20	NAKATANI, Kazuo		☒

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	1	ENGEL, KLAUS ET AL., "Remote 3D Visualization Using Image-Streaming Techniques", Proceedings of the 11th International Conference on Systems Research, Informatic and Cybernetics, Baden-Baden, International Institute for Advanced Studies in Systems Research and Cybernetics, August 1999, pgs.91-96, Germany.	
	2	ENGEL, KLAUS ET AL., "A Framework for Interactive Hardware Accelerated Remote 3D-Visualization", Data Visualization 2000, Proceedings of the Joint EUROGRAPHICS and IEEE TCVG Symposium on Visualization, Springer-Verlag/Wein, May 29-31, 2000, pg.167-178, Amsterdam, Netherland.	
	3	RICHARDSON, TRISTAN ET AL., "The RFB Protocol", Olivetti Research Laboratory, January 1998, Version 3.3, Rev. July 16, 1998, Cambridge.	
	4	RICHARDSON, TRISTAN ET AL., "Virtual Network Computing", The Olivetti & Oracle Research Laboratory, IEEE Internet Computing, pg. 33-38, Volume 2, Number 1, February 1998.	
	5	SCHMIDT, BRIAN ET AL., "The Interactive Performance of SLIM: A Stateless, Thin-Client Architecture", 17th ACM Symposium on Operating Systems Principles, December 1999, pg.32-47, Kiawah Island, SC.	
	6	SEGAL, MARK ET AL., "The Open GL Graphics System: A Specification", Version 1.0, July 1994.	
	7	MA, KWAN-LIU ET AL., "High Performance Visualization of Time-Varying Volume Data Over A Wide-Area Network", Proceedings of the IEEE/ACM SC2000 Conference, 2000.	
	8	LEVOY, MARC, "Polygon-Assisted JPEG and MPEG Compression of Synthetic Images", Computer Graphics Proceedings, Annual Conference Series, August 6-11, 1995, pgs.21-29, Los Angeles, USA.	
	9	LAMOTHE, ANDRE, "Tricks of the Windows, Game Programming Gurus", Fundamentals of 2D and 3D Game Programming, 1999, Indianapolis, USA.	

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	10	CIMINIERA, LUIGI ET AL., "Industrial IEEE 802.3 Networks with Short Delivery Time for Urgent Messages", IEEE Transactions on Industrial Electronics, Vol. 35, No. 1, February 1988, pgs.18-25.	
	11	FOWLER, JAMES E., "Evaluation of SGI Vizserver", Technical Report, March 31, 2000, Mississippi, USA.	
	12	"SGI Brings Advanced Visualization to the Desktop", HPC Wire, https://www.hpcwire.com/1999/11/17/sgi-brings-advanced-visualization-to-the-desktop/, November 17, 1999.	
	13	HARTWIG, STEPHAN ET AL., "Mobile Multimedia - Challenges and Opportunities Invited Paper", IEEE Transactions on Consumer Electronics, November 2000, pgs.1167-1178, Vol.46, No.4.	
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	21	HAM, TOM, "Fight to the Finish", The Washington Post, October 25, 1995, pgs.7-11.	
	22	SINGHAL, SANDEEP ET AL. "Network Virtual Environments: Design and Implementation", ACM Press, 1999, pgs.2-5, 34-49, 251-269, New York, USA.	
	23	GRAF, RUDOLF F., "Modern Dictionary of Electronics", 7th Ed., 1999, pgs.470 & 739.	
	24	"SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, filed January 27, 2020, 251 pgs.	
	25	"[EXHIBIT A-1: REMOTE 3D VISUALIZATION USING IMAGE-STREAMING TECHNIQUES ("Engel 1999")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 64 pgs.	
	26	"[EXHIBIT A-2: A Framework For Interactive Hardware Accelerated Remote 3D-Visualization ("Engel 2000") SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 75 pgs.	
	27	"[EXHIBIT A-3: U.S. Patent No. 7,274,368 ("Keslin")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 77 pgs.	
	28	"[EXHIBIT A-4: U.S. Patent No. 6,330,281 ("Mann")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 116 pgs.	
	29	"[EXHIBIT A-5: Japanese Patent Application Publication No. JP 2000-42247A ("Moriguchi")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 88 pgs.	
	30	"[EXHIBIT A-6: RICHARDSON AND WOOD, THE RFB PROTOCOL ("Richardson")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 54 pgs.	
	31	"[EXHIBIT A-7: SCHMIDT ET AL., THE INTERACTIVE PERFORMANCE OF SLIM: A STATELESS, THIN-CLIENT ARCHITECTURE ("Schmidt")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 44 pgs.	

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	Art Unit	2457
	Examiner Name	DALENCOURT, Yves
	Attorney Docket Number	IPTLP002C5

	32	"[EXHIBIT A-8: RICHARDSON ET AL., VIRTUAL NETWORK COMPUTING ("Richardson IEEE")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 27 pgs.	
	33	"[EXHIBIT A-9: Additional Prior Art References] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 28 pgs.	
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	37	"[EXHIBIT B-4: U.S. Patent No. 6,330,281 ("Mann")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 86 pgs.	
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	45	"[EXHIBIT C-3: U.S. Patent No. 7,274,368 ("Keslin")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 61 pgs.	
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	48	"[EXHIBIT C-6: RICHARDSON AND WOOD, THE RFB PROTOCOL ("Richardson")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 39 pgs.	
	49	"[EXHIBIT C-7: SCHMIDT ET AL., THE INTERACTIVE PERFORMANCE OF SLIM: A STATELESS, THIN-CLIENT ARCHITECTURE ("Schmidt")] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 26 pgs.	
	50	"[EXHIBIT C-8: RICHARDSON ET AL., VIRTUAL NETWORK COMPUTING ("Richardson IEEE"] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 20 pgs.	

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		"[EXHIBIT D-1] SONY INTERACTIVE ENTERTAINMENT LLC'S INVALIDITY CONTENTIONS PURSUANT TO PATENT LOCAL RULE 3-3", Case No. 8:19-cv-01432-JVS-KES, (January 27, 2020), 98 pgs.	
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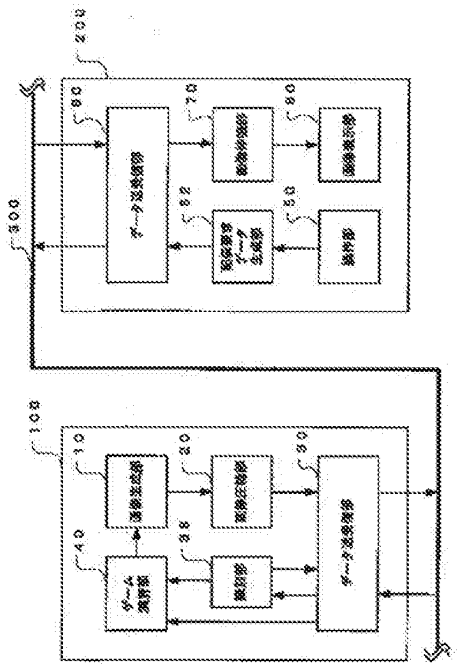
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(54)【発明の名称】　ゲームシステム、ゲームデータ配信装置、ゲーム装置、リアルタイム画像表示システムおよび情報記録媒体

(57)【要約】
【課題】　画像の表示遅延を抑え、リアルタイムに画像を表示することのできるゲームシステム、ゲームデータ配信装置、ゲーム装置、リアルタイム画像表示システムおよび情報記録媒体を提供すること。
【解決手段】　ゲーム端末装置２００から送信される配信要求データに応じて、１画面より小さい所定の処理単位ごとにゲーム画像データを生成する画像生成部１０と、生成した画像データを圧縮する画像圧縮部２０とを含むゲームデータ配信装置１００と、ゲーム画像データを伸張する画像伸張部７０と，ゲーム画像を表示する画像表示部８０とを有するゲーム端末装置２００とを設ける。ゲームデータ配信装置１００に、生成したゲーム画像を順次圧縮，送信させ、ゲーム端末装置２００に、当該画像を順次受信、伸張、表示させる。



【特許請求の範囲】
【請求項1】　配信要求データを伝送する端末装置と、伝送路を介して送信される、前記端末装置からの配信要求データに基づきゲーム画像データを生成し、前記端末装置へ向け伝送するゲームデータ配信装置と、
を含み、前記端末装置は、受信した前記ゲーム画像データを表示するゲームシステムであって、
前記ゲームデータ配信装置は、
前記端末装置からの配信要求データを受信する手段と、
受信した配信要求データに基づき、各画面のゲーム画像データを1画面ごとに生成する手段と、
前記生成したゲーム画像データを、1画面より小さい所定の処理単位ごとに、順次圧縮し、前記端末装置へ向け送信する手段と、
を含み、
前記端末装置は、
プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と、
生成した配信要求データを前記画像生成装置へ向け送信する手段と、
前記ゲーム画像データを受信し、順次伸張する手段と、
この伸張したゲーム画像データを表示する手段と、
を含むことを特徴とするゲームシステム。
【請求項2】　配信要求データを伝送する端末装置と、伝送路を介して送信される、前記端末装置からの配信要求データに基づきゲーム画像データを生成し、前記端末装置へ向け伝送するゲームデータ配信装置と、
を含み、前記端末装置は、受信した前記ゲーム画像データを表示するゲームシステムであって、
前記ゲームデータ配信装置は、
前記端末装置からの配信要求データを受信する手段と、
受信した配信要求データに基づき、各画面のゲーム画像データを、1画面より小さい所定の処理単位ごとに順次生成する手段と、
前記生成したゲーム画像データを順次圧縮し、前記端末装置へ向け送信する手段と、
を含み、
前記端末装置は、
プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と、
生成した配信要求データを前記ゲームデータ配信装置へ向け送信する手段と、
前記ゲーム画像データを受信し、順次伸張する手段と、
この伸張したゲーム画像データを順次表示する手段と、
を含むことを特徴とするゲームシステム。
【請求項3】　請求項1、2のいずれかにおいて、
前記伝送路には複数の端末装置が接続され、
前記ゲームデータ配信装置は、
各端末装置からの前記配信要求データに基づき、各端末装置ごとに前記ゲーム画像データを生成し、生成したゲーム画像データを圧縮し、該当する端末装置へ向け送信することを特徴とするゲームシステム。
【請求項4】　クライアント装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって、
前記クライアント装置からの前記配信要求データを受信する手段と、
受信した配信要求データに基づき、各画面のゲーム画像データを生成する手段と、
前記生成したゲーム画像データを、1画面より小さい所定の処理単位ごとに、順次圧縮し、前記クライアント装置へ向け送信する手段と、
を含むことを特徴とするゲームデータ配信装置。
【請求項5】　クライアント装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって、
前記クライアント装置から前記配信要求データを受信する手段と、
受信した配信要求データに基づき、各画面のゲーム画像データを、1画面より小さい所定の処理単位ごとに順次生成する手段と、
前記生成したゲーム画像データを順次圧縮し、前記クライアント装置へ向け送信する手段と、
を含むことを特徴とするゲームデータ配信装置。
【請求項6】　請求項5において、
前記配信要求データに基づき、送信元のクライアント装置を識別する手段を含み、生成し圧縮した前記ゲーム画像データを、識別した前記クライアント装置へ向け送信することを特徴とするゲームデータ配信装置。
【請求項7】　プレーヤーの操作結果に基づき、配信要求データを生成する手段と、
生成した配信要求データを、伝送路を介してサーバ装置へ向け送信する手段と、
前記配信要求データに基づきサーバ装置が生成して送信したゲーム画像データを受信する受信手段と、
を含むゲーム装置であって、
前記受信手段は、
前記ゲーム画像データを、1画面より小さい所定の処理単位ごとに圧縮された状態で受信し、
前記ゲーム装置は、
受信した前記ゲーム画像データを順次伸張する手段と、
この伸張したゲーム画像データを表示する手段と、
を含むことを特徴とするゲーム装置。
【請求項8】　リアルタイム画像データを生成して、伝送路を介して伝送する画像生成装置と、前記伝送路を介して前記リアルタイム画像データを受信して、前記リアルタイム画像データを表示する画像表示装置とを含むリアルタイム画像表示システムであって、

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前記画像生成装置は、
各画面のリアルタイム画像データを１画面より小さい所定の処理単位ごとに生成する手段と、
前記リアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信する手段と、
を含み、
前記画像表示装置は、
受信した前記リアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示する表示手段を含むことを特徴とするリアルタイム画像表示システム。
【請求項９】　請求項８において、
前記画像生成装置は、前記生成したリアルタイム画像データを順次圧縮する手段を含み、
前記送信手段は、前記圧縮したリアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信し、
前記画像表示装置は、受信した前記圧縮したリアルタイム画像データを順次伸張する手段を含み、
前記表示手段は、前記伸張したリアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示することを特徴とするリアルタイム画像表示システム。
【請求項１０】　クライアント装置から伝送路を介して送信される配信要求データに基づき、ゲーム画像データを生成して前記クライアント装置へ向け送信するための情報が記録されたコンピュータ読みとり可能な情報記録媒体において、
前記情報は、
前記配信要求データに基づきゲーム画像データを生成するための情報と、
生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮し、前記クライアント装置へ向け送信するための情報と、
を含むことを特徴とする情報記録媒体。
【請求項１１】　ゲームプレーヤーの入力したゲーム用のデータに基づき画像生成装置により生成され、送信されるゲーム画像データを、ネットワークを介して受信し、表示するための情報を記録した、コンピュータ読み取り可能な情報記録媒体において、
前記ゲーム画像データは、１画面より小さい所定の処理単位で圧縮されたものであって、
前記情報は、
前記ゲーム画像データを受信し、受信したゲーム画像データを順次伸張するための情報と、
この伸張したゲーム画像データを表示するための情報と、
を含むことを特徴とする情報記録媒体。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、ゲームシステム、ゲームデータ配信装置、ゲーム装置、リアルタイム画像表示システムおよび情報記録媒体に関する。
【０００２】
【背景技術および発明が解決しようとする課題】従来、伝送路を介して他の処理装置で画像を表示する場合、伝送元の処理装置は、画像データの取り扱い易さ等から１画面ごとに画像データを圧縮して伝送し、伝送先の処理装置では１画面ごとに画像データを伸張して表示していた。
【０００３】このため、従来の方法では、画面という単位で画像データを取り扱えるよう、１画面ごとに画像データを圧縮する必要性があった。
【０００４】例えば、図１（Ａ）に示すように、伝送元の処理装置で１画面分の画像の生成を開始してから伝送先の処理装置で画像の表示を開始するまでの間に、１画面分の画像生成時間と、１画面分の画像伸張時間がかかる。したがって、伝送遅延を除いても画像生成から画像表示まで２画面分の遅延時間が生じることになる。
【０００５】このように、画像表示に大幅な遅延が生じる場合には、ネットワーク型ゲームや画像を用いて遠隔地と会議する場合のようにリアルタイムに画像を表示する必要があるにも関わらず、リアルタイム性が確保されないといった問題があった。
【０００６】特に、ゲーム端末の入力に応じて適切なゲーム画像をホストからゲーム端末に伝送する場合、入力に対する画像表示のレスポンスを上げること、すなわち、入力から画像表示までの遅延を抑え、リアルタイム性を確保することが極めて重要である。
【０００７】本発明は、上記の課題に鑑みてなされたものであり、その目的は、画像の表示遅延を抑え、リアルタイムに画像表示できるゲームシステム、ゲームデータ配信装置、ゲーム装置、リアルタイム画像表示システムおよび情報記録媒体を提供することにある。
【０００８】
【課題を解決するための手段】上記課題を解決するため、請求項１記載のゲームシステムは、配信要求データを伝送する端末装置と、伝送路を介して送信される、前記端末装置からの配信要求データに基づきゲーム画像データを生成し、前記端末装置へ向け伝送するゲームデータ配信装置と、を含み、前記端末装置は、受信した前記ゲーム画像データを表示するゲームシステムであって、前記ゲームデータ配信装置は、前記端末装置からの配信要求データを受信する手段と、受信した配信要求データに基づき、各画面のゲーム画像データを１画面ごとに生成する手段と、前記生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに、順次圧縮し、前記端末装置へ向け送信する手段と、を含み、前記端末装置は、プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と、生成した配信要求データを前記画

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像生成装置へ向け送信する手段と、前記ゲーム画像データを受信し，順次伸張する手段と、この伸張したゲーム画像データを表示する手段と、を含むことを特徴とする。

【０００９】ネットワーク型ゲームを行う場合、各ゲーム端末装置でゲームの開始タイミングを合わせることは極めて重要である。特に、プレーヤーの入力に応じて画像を生成する場合、入力に対する反応をリアルタイムに行う必要がある。

【００１０】一方、ゲーム動画像はフレーム間の相関性が少ない、すなわち変化が激しいため、欠落したデータを補間する処理は行いにくい上、画像の高品質性も要求される。

【００１１】本発明によれば、ゲーム画像データを小さな単位で伝送することにより伝送遅延を低減させることができる。また、伝送先では圧縮したデータを伸張する場合も１画面より小さな単位で伸張できるため、リアルタイム性を確保できる。

【００１２】ここで、所定の処理単位としては、例えば、走査線単位または画像圧縮単位等が該当する。また，ＪＰＥＧ圧縮を行う場合には、画像圧縮単位として８×８画素単位を採用することが好ましい。このような単位とすることにより、ゲーム画像データを分割した場合も、圧縮、伸張、表示等の処理が行いやすくなる。

【００１３】また、前記ゲームデータ配信装置は、所定数の走査線単位ごとに前記リアルタイム画像データを生成することも可能である。この場合、前記画像圧縮単位を同時に適用することが好ましい。

【００１４】また、圧縮されたゲーム画像データを小さな単位で伝送することにより，仮に伝送データに誤りがあった場合でもシステム全体への影響を抑えることができる。

【００１５】すなわち、従来のフレーム（１画面）単位での圧縮データ伝送の場合、伝送先で伝送データにエラーが発見され、当該伝送データを再送する場合、少なくとも１画面分のデータを再送しなければならない上、再送できない場合、伝送先では前回表示した画面を再表示する等の処理を行わなければならず、画像の品質劣化が生じていた。

【００１６】本発明によれば、仮に圧縮伝送データに誤りがあった場合であってもデータ再送量を抑えられる上、再送できない場合であっても伝送先では1画面の1部分が欠落した表示で済み、画像を見ている者への不快感を軽減させることができる。

【００１７】また、請求項2記載の発明は、配信要求データを伝送する端末装置と，伝送路を介して送信される、前記端末装置からの配信要求データに基づきゲーム画像データを生成し、前記端末装置へ向け伝送するゲームデータ配信装置と、を含み、前記端末装置は、受信した前記ゲーム画像データを表示するゲームシステムであって、前記ゲームデータ配信装置は、前記端末装置からの配信要求データを受信する手段と，受信した配信要求データに基づき，各画面のゲーム画像データを、１画面より小さい所定の処理単位ごとに順次生成する手段と、前記生成したゲーム画像データを順次圧縮し、前記端末装置へ向け送信する手段と、を含み、前記端末装置は、プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と，生成した配信要求データを前記ゲームデータ配信装置へ向け送信する手段と、前記ゲーム画像データを受信し、順次伸張する手段と，この伸張したゲーム画像データを順次表示する手段と、を含むことを特徴とする。

【００１８】本発明によれば、生成、表示も含めてゲーム画像データを１画面より小さい単位で処理することにより、さらにリアルタイム性が確保される。

【００１９】また、請求項3記載の発明は、請求項1、２のいずれかにおいて、前記伝送路には複数の端末装置が接続され、前記ゲームデータ配信装置は，各端末装置からの前記配信要求データに基づき、各端末装置ごとに前記ゲーム画像データを生成し、生成したゲーム画像データを圧縮し、該当する端末装置へ向け送信することを特徴とするゲームシステム。

【００２０】本発明によれば、複数の端末装置が伝送路に接続された状態においても、各端末装置におけるプレーヤーの操作に応じ，各端末装置においてリアルタイムに画像を表示することのできるゲームシステムを実現できる。

【００２１】また、配信要求データを送信した端末装置にのみゲーム画像データを送信することにより，不要なトラフィックをなくし、リアルタイム性を確保することができる。

【００２２】また、請求項4記載のゲームデータ配信装置は，クライアント装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって，前記クライアント装置からのデータを受信する手段と、受信した配信要求データに基づき、各画面のゲーム画像データを生成する手段と，前記生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに、順次圧縮し、前記クライアント装置へ向け送信する手段と、を含むことを特徴とする。

【００２３】ゲーム端末等のクライアント装置の入力に応じて画像を生成してクライアント装置に当該画像を伝送する場合，入力に対する応答速度が速いこと，すなわち、リアルタイム性が要求される。

【００２４】本発明によれば、１画面より小さい所定の処理単位ごとに画像処理することにより，１画面ごとに処理する方式に比べ、よりリアルタイムに画像を生成、圧縮、伝送することができる。

【００２５】また，請求項5記載の発明は、クライアン

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ト装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって、前記クライアント装置から前記配信要求データを受信する手段と、受信した配信要求データに基づき、各画面のゲーム画像データを、１画面より小さい所定の処理単位ごとに順次生成する手段と、前記生成したゲーム画像データを順次圧縮し、前記クライアント装置へ向け送信する手段と、を含むことを特徴とする。

【００２６】本発明によれば、生成も含めて、１画面より小さい所定の処理単位ごとに画像処理することにより、さらにリアルタイム性が確保される。

【００２７】また、請求項6記載の発明は、請求項5において、前記配信要求データに基づき、送信元のクライアント装置を識別する手段を含み、生成し圧縮した前記ゲーム画像データを、識別した前記クライアント装置へ向け送信することを特徴とする。

【００２８】本発明によれば、当該ゲーム画像データを、識別した前記クライアント装置へ向け送信することにより、不要なトラフィックをなくし、リアルタイム性を確保できる。

【００２９】また、請求項7記載のゲーム装置は、プレーヤーの操作結果に基づき、配信要求データを生成する手段と、生成した配信要求データを、伝送路を介してサーバ装置へ向け送信する手段と、前記配信要求データに基づきサーバ装置が生成して送信したゲーム画像データを受信する受信手段と、を含むゲーム装置であって、前記受信手段は、前記ゲーム画像データを、１画面より小さい所定の処理単位ごとに圧縮された状態で受信し、前記ゲーム装置は、受信した前記ゲーム画像データを順次伸張する手段と、この伸張したゲーム画像データを表示する手段と、を含むことを特徴とする。

【００３０】本発明によれば、１画面より小さい所定の処理単位で、順次伸張して表示することにより、画像表示のリアルタイム性を向上させることができる。

【００３１】また、請求項8記載のリアルタイム画像表示システムは、リアルタイム画像データを生成して、伝送路を介して伝送する画像生成装置と、前記伝送路を介して前記リアルタイム画像データを受信して、前記リアルタイム画像データを表示する画像表示装置とを含むリアルタイム画像表示システムであって、前記画像生成装置は、各画面のリアルタイム画像データを１画面より小さい所定の処理単位ごとに生成する手段と、前記リアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信する手段と、を含み、前記画像表示装置は、受信した前記リアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示する表示手段を含むことを特徴とする。

【００３２】本発明によれば、１画面分の画像データより小さな単位で当該データを生成、伝送することにより、伝送先では原画像をほぼリアルタイムに表示できる。

【００３３】ここで、リアルタイム画像データとしては、例えば、リアルタイム性が要求される画像データ、具体的には、ネットワーク形態の画像を用いた会議システム用の画像データや、ネットワーク形態のゲーム用のゲーム画像データ等が該当する。

【００３４】すなわち、本発明によれば、画像表示にリアルタイム性と高品質性が要求される画像データであっても、フレーム（１画面）単位での遅延を生じさせることなく原画像をほぼリアルタイムに表示できる。

【００３５】また、ここで、所定の処理単位としては、例えば、走査線単位または画像圧縮単位が該当する。例えば、ＪＰＥＧ圧縮を行う場合には、画像圧縮単位として８×８画素単位を採用することが好ましい。このような単位とすることにより、画像データを分割した場合も圧縮、伸張、表示等の処理が行いやすくなる。

【００３６】また、前記画像生成装置は、所定数の走査線単位ごとに前記リアルタイム画像データを生成することも可能である。この場合、前記画像圧縮単位を同時に適用することが好ましい。

【００３７】また、画像データを小さな単位で伝送することにより、仮に伝送データに誤りがあった場合でもシステム全体への影響を抑えることができる。

【００３８】また、請求項9記載の発明は、請求項8において、前記画像生成装置は、前記生成したリアルタイム画像データを順次圧縮する手段を含み、前記送信手段は、前記圧縮したリアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信し、前記画像表示装置は、受信した前記圧縮したリアルタイム画像データを順次伸張する手段を含み、前記表示手段は、前記伸張したリアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示することを特徴とする。

【００３９】本発明によれば、圧縮伝送を行うことにより、伝送帯域のデータ占有量を低減させることができる。この場合も前記所定の単位で当該データを次々と生成、圧縮、伝送、伸張等を行うことにより、画像をリアルタイムに表示できる。

【００４０】ここで、前記圧縮手段による圧縮は、ＭＰＥＧ等のようにＤＣＴ（離散コサイン変換）を用いた圧縮等の各種の圧縮手法を適用可能であるが、特にＪＰＥＧ圧縮を適用することが好ましい。

【００４１】ＪＰＥＧ圧縮を適用することにより、伝送先の画像表示装置は、ＭＰＥＧ圧縮のようにフレーム間の補間を行うことによる遅延の増加を伴わずに原画像に忠実な画像を表示できる。

【００４２】また、請求項１０記載の情報記録媒体は、クライアント装置から伝送路を介して送信される配信要求データに基づき、ゲーム画像データを生成して前記ク

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ライアント装置へ向け送信するための情報が記録されたコンピュータ読みとり可能な情報記録媒体において、前記情報は、前記配信要求データに基づきゲーム画像データを生成するための情報と、生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮し、前記クライアント装置へ向け送信するための情報と、を含むことを特徴とする。

【００４３】ここで、ゲーム画像データとは、マルチプレーヤーゲーム等のように、リアルタイムにゲーム画像を表示することが必要な画像データをいう。

【００４４】本発明によれば、ゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮して送信することにより、生成から表示までの遅延が抑えられ、当該ゲーム画像データを受信したクライアント装置はほぼリアルタイムにゲーム画像を表示できる。

【００４５】また、ここで、所定の処理単位としては、例えば、走査線単位または画像圧縮単位等が該当する。また、ＪＰＥＧ圧縮を行う場合には、画像圧縮単位として８×８画素単位を採用することが好ましい。このような単位とすることにより、ゲーム画像データを分割した場合も、圧縮、伸張、表示等の処理が行いやすくなる。

【００４６】また、請求項１１記載の発明は、ゲームプレーヤーの入力したゲーム用のデータに基づき画像生成装置により生成され、送信されるゲーム画像データを、ネットワークを介して受信し、表示するための情報を記録した、コンピュータ読み取り可能な情報記録媒体において、前記ゲーム画像データは、１画面より小さい所定の処理単位で圧縮されたものであって、前記情報は、前記ゲーム画像データを受信し、受信したゲーム画像データを順次伸張するための情報と、この伸張したゲーム画像データを表示するための情報と、を含むことを特徴とする。

【００４７】本発明によれば、１画面より小さい所定の処理単位で画像処理することにより、画像の生成から表示までの遅延が抑えられ、ゲームプレーヤーは、自分のゲーム操作に対する画像表示をよりリアルタイムに感じることができる。

【００４８】

【発明の実施の形態】以下、本発明をゲームシステムに適用した好適な実施の形態について図面を用いて説明する。

【００４９】なお、本発明の適用は、ゲームシステムに限定されるものではなく、リアルタイムに画像を表示する各種の画像表示システムへの適用も可能である。

【００５０】（第１の実施例）図１は、ゲームシステムによる画像表示のタイミングチャートであり、（Ａ）は従来のタイミングチャートであり、（Ｂ）は本実施の形態の一例に係るゲームシステムを用いた場合のタイミングチャートである。

【００５１】図１（Ａ）に示すように、従来の画像データ表示システムは、１枚の画像単位で画像を取り扱っており、Ａという１枚の画像の入力が終わってから順次に圧縮、伝送、伸張という処理を行い、Ａという１枚の画像全体の伸張処理が終わってから画像を表示出力していた。

【００５２】このため、伝送元の処理装置で画像の生成を開始してから伝送先の処理装置で画像の表示を開始するまでの間に、１画面分の画像生成時間と、１画面分の画像伸張時間がかかる。

【００５３】したがって、画像の入力を開始してから画像の表示出力を開始するまで、伝送遅延を除いても画像入力時間t１のおよそ２倍にあたる時間t２がかかってしまう。

【００５４】２枚目の画像にあたるＢという画像についても同様である。

【００５５】このため、リアルタイムに画像を表示しなければならない場合、この処理方式は画像表示遅延の原因となる。

【００５６】特に、クライアント装置として機能し、ゲーム画像を表示するゲーム端末装置からの入力データに応じて、ホストである画像生成装置でゲーム画像を生成、圧縮、伝送してゲーム端末装置で伸張、表示するゲームシステムの場合、プレーヤーの操作に対する画像表示レスポンスが遅いと、間延びしてしまい、ゲームがつまらないものとなってしまう。

【００５７】図１（Ｂ）に示すように、本実施の形態では、Ａという１枚の画像を４分割し、Ａ０～Ａ３という画像単位で処理している。

【００５８】例えば、Ａ０部分を処理する場合、Ａ０部分の画像の入力が終わると、順次に圧縮、伝送、伸張を行い、伸張が終わった段階でＡ０部分の画像を表示出力する。

【００５９】これにより、１枚の画像の入力にかかる時間t３に対して、１枚の画像の入力が始まって当該画像の出力が始まるまでの時間t４は短くなっており、図１（Ａ）に示す従来の処理方式に比べて画像の表示遅延を抑えることができる。

【００６０】このように、ゲーム画像データを小さな単位で伝送することにより、伝送遅延を低減させることができる。また、伝送先では圧縮したデータを伸張する場合も１画面より小さな単位で伸張表示できるため、リアルタイム性が確保され、ゲームの開始タイミングを適切に同期させることができ、ゲームプレーヤーはリアルタイムなネットワークゲームを快適にプレーすることができる。

【００６１】以下に、この原理をゲームシステムに用いた場合における画像表示の実施例について示す。

【００６２】図２は、本実施の形態の一例に係るゲームシステムの全体図である。

【００６３】図２に示すように、ゲームシステムは、画

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像生成装置としての機能を有するゲームデータ配信装置１００と、ゲームデータ配信装置１００と伝送路である通信回線３００を含むＡＴＭネットワークを介して接続された複数のゲーム端末装置２００－１～５を含んで構成されている。

【００６４】また、ゲーム端末装置２００－１～３はＡ地域、ゲーム端末装置２００－４、５はＡ地域とは遠隔のＢ地域に配置されている。さらに、ゲームデータ配信装置１００とゲーム端末装置２００は、遠隔地同士であり、光ファイバーケーブルを含んで構成される通信回線３００を含むネットワークを介して接続されている。

【００６５】ゲームデータ配信装置１００で生成されたゲーム画像データは、通信回線３００を介して各ゲーム端末装置２００に伝送される。

【００６６】図３は、本実施の形態の一例に係るゲームシステムの機能ブロック図である。

【００６７】ゲームデータ配信装置１００は、ゲーム端末装置２００からの配信要求データに応じてゲーム演算を行うゲーム演算部４０と、各画面のゲーム画像データを１画面より小さい所定の処理単位ごとにゲーム画像データを生成する画像生成部１０と、生成した画像を圧縮する画像圧縮部２０とを含んで構成されている。

【００６８】上記の所定の処理単位については後述する。

【００６９】また、ゲームデータ配信装置１００は、ゲーム端末装置２００からの入力データを受信し、この受信データに基づき、送信元のゲーム端末装置２００を識別する識別部３８と、前記所定の処理単位ごとに圧縮したゲーム画像データを、通信回線３００を介して識別部３８により識別したゲーム端末装置２００へ向け順次送信するデータ送受信部３０とを含んで構成されている。

【００７０】一方、ゲーム端末装置２００は、プレーヤーの操作データが入力される操作部５０と、操作部５０から入力される操作データに基づき、配信要求データを生成する配信要求データ生成部５２と、通信回線３００を介して、配信要求データをゲームデータ配信装置１００へ向け送信し、ゲームデータ配信装置１００から伝送されるゲーム画像データを受信するデータ送受信部６０とを含んで構成されている。

【００７１】また、ゲーム端末装置２００は、受信したゲーム画像データを伸張する画像伸張部７０と、伸張したゲーム画像データから１画面分のゲーム画像データが完成するよう表示する画像表示部８０を含んで構成されている。

【００７２】なお、ここで、識別部３８、ゲーム演算部４０および配信要求データ生成部５２としては、例えばＣＰＵ、画像生成部１０および画像圧縮部３０としては、例えば、ＣＰＵからの命令を受けて画像を生成する、クロックジェネレータ、ＶＲＡＭ、圧縮チップ等を有するゲーム基板等を適用でき、データ送受信部３０、８０としては、例えばＡＴＭスイッチ等の通信機器を適用できる。

【００７３】また、操作部５０としては、例えばレバーやボタン、画像伸張部７０および画像表示部８０としては、例えば、ＣＰＵからの命令を受けて画像を表示する、クロックジェネレータ、ＶＲＡＭ、伸張チップ、ＤＡコンバータ等を有するビデオカードおよびディスプレイ等を適用できる。

【００７４】上記の所定の処理単位としては、例えば、走査線単位またはＪＰＥＧ圧縮を行う場合８×８画素単位であることが好ましい。

【００７５】例えば、ＪＰＥＧ圧縮を行う場合には、６４０×４８０ドットのノンインタレース方式の画面を、８×８画素単位の整数倍であって、かつ、走査線単位に４分割して６４０×１２０ドットずつ生成、圧縮、伝送、伸張、表示することができる。

【００７６】なお、６４０×４８０ドットの画面を６４０×２４０ドットずつ、すなわち、インタレース方式で表示する場合は、２４０ラインを、６４，６４、６４、４８ラインずつ生成等の処理を行うことが好ましい。

【００７７】このような単位で分割することにより、インタレース、ノンインタレースともにアドレス処理が行いやすく、かつ、画像処理のリアルタイム性を向上させることができる。

【００７８】図４は、１画面分のゲーム画像データを４分割して処理する場合の処理順序の概要図である。

【００７９】画像生成部１０は、図１で説明したように、１画面の４分の１にあたる走査線単位ごとにゲーム画像データを生成、圧縮、伝送、伸張、表示等の処理を行う。

【００８０】したがって、画面１４０における処理順序としては、図１の画像Ａ０に対応する画像１５０－１、画像Ａ１に対応する画像１５０－２、画像Ａ２に対応する画像１５０－３、画像Ａ３に対応する画像１５０－４の順に処理することになる。

【００８１】このように、画像データを小さな単位で伝送することにより、仮に伝送データに誤りがあった場合でもシステム全体への影響を抑えることができる。すなわち、従来のフレーム（１画面）単位での圧縮データ伝送の場合、伝送先で伝送データにエラーが発見され、当該伝送データを再送する場合、少なくとも１画像分のデータを再送しなければならない上、再送できない場合、伝送先では前回表示した画像を再度表示する等の処理を行わなければならず、画像の品質劣化が生じていた。

【００８２】本実施の形態によれば、データ再送量を抑えられる上、仮に再送できない場合であっても、伝送先では１画像の１部分が欠落した表示で済み、画像を見ている者への不快感を軽減させることができる。

【００８３】ここで、ゲームシステムの具体的な動作についてフローチャートを用いて説明する。

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【００８４】図5は、図3に示すゲームシステムの動作を示すフローチャートである。

【００８５】まず、図5（Ａ）を用いてプレーヤーの操作からゲーム演算までの処理の流れについて説明する。

【００８６】ゲームプレーヤーは、クライアント装置として機能するゲーム端末装置２００でリアルタイムなネットワークゲームをプレーしている。

【００８７】例えば、プレーヤーがレバーを操作した場合（ステップ２）、その操作情報が操作部５０において操作データとして生成され、この操作データに基づき、配信要求データ生成部５２は、自装置の識別情報も含めた配信要求データを生成する。

【００８８】生成した配信要求データは、データ送受信部６０により通信回線３００を介してサーバ装置として機能するゲームデータ配信装置１００へ向け送信される（ステップ４）。

【００８９】ゲームデータ配信装置１００は、ゲーム端末装置２００から送信される配信要求データを受信する（ステップ６）。識別部３８は、この配信要求データに基づき、配信要求データを送信したゲーム端末装置２００を識別する。配信要求データは、ゲーム演算部４０に送られる。

【００９０】ゲーム演算部４０は、配信要求データに基づきゲーム演算を行う（ステップ８）。

【００９１】次に、図5（Ｂ）を用いてゲーム演算後、画像生成からゲーム端末装置２００での画像表示までの処理の流れについて説明する。

【００９２】画像生成部１０は、ゲーム演算部４０による演算結果に基づき、各画面の4分の1画像ごとにゲーム画像データを順次生成する（ステップ２２）。

【００９３】画像圧縮部２０は、生成されたゲーム画像データを順次圧縮する（ステップ２４）。

【００９４】ここで、画像圧縮部２０による圧縮は、ＭＰＥＧ等のようにＤＣＴ（離散コサイン変換）を用いた圧縮等の各種の圧縮手法を適用可能であるが、特にＪＰＥＧ圧縮を適用することが好ましい。ＪＰＥＧ圧縮を適用することにより、伝送先のゲーム端末装置２００は、ＭＰＥＧ圧縮のようにフレーム間の補間を行うことによる遅延の増加を伴わずに原画像に忠実な画像をリアルタイムに表示できる。

【００９５】データ送受信部３０は、圧縮されたゲーム画像データを、通信回線３００を介して、識別部３８により識別したゲーム端末装置２００へ向け順次送信する（ステップ２６）。なお、データ送受信部３０は、ゲーム画像データのほか圧縮情報等の通常送信するべきデータも送信している。

【００９６】一方、ゲーム端末装置２００においては、データ送受信部６０により、ゲーム画像データを順次受信する（ステップ２８）。

【００９７】画像伸張部７０は、受信した前記圧縮されたゲーム画像データを順次伸張する（ステップ３０）。

【００９８】4分の1画面分のゲーム画像データが伸張された段階で、画像表示部８０は、伸張されたゲーム画像データを表示する（ステップ３２）。この表示処理を4回行うことにより、1画面分のゲーム画像データが完成する。

【００９９】以上説明してきたように、本実施の形態によれば以下の作用効果が奏される。

【０１００】ネットワーク型ゲームを行う場合、各ゲーム端末装置でゲームの開始タイミングを合わせることは極めて重要である。また、ゲーム動画像はフレーム間の相関性が少ない、すなわち変化が激しいため、欠落したデータを補間する処理は行いにくい上、画像の高品質性も要求される。

【０１０１】また、ネットワーク形態のゲームにおいては、プレーヤーの操作に対する画像表示レスポンスを高めることがゲームを快適に行う点で重要である。

【０１０２】本実施の形態によれば、ゲーム画像データを1画面より小さな単位で処理することにより画像の生成から表示までの処理における遅延を低減させることができる。

【０１０３】このように、1画面より小さな単位で処理することによる伝送遅延時間の低減により、リアルタイム性が確保され、ゲームプレーヤーは、自分のレバー操作等に対するゲームの反応をよりリアルタイムに感じることができ、ネットワークゲームを快適にプレーすることができる。

【０１０４】特に、マルチプレーヤーゲームに適用した場合、同時に多人数がリアルタイムなゲーム画像を得ることができるため、非常に効果的である。

【０１０５】さらに、識別部３８によりゲーム端末装置を識別できるため、ゲーム画像の伝送が必要なゲーム端末装置にだけゲーム画像を送ることにより、通信回線３００上のトラフィックを抑え、データ伝送時のリアルタイム性を確保することができる。

【０１０６】また、ゲーム画像データは、所定数の走査線単位で分割されているため、ゲーム端末装置２００の画像表示部８０は、1画面分の画像を伸張してから表示するのではなく、1画面分のうち伸張した部分から表示することができる。これにより、画像表示のリアルタイム性をさらに高めることができる。

【０１０７】また、図1（Ｂ）に示すように、4分の1画面分の画像データずつの取り扱いであっても、圧縮、伝送、伸張の各処理においてはパラレル処理が可能である。これにより、上述したように、1画面分の画像を入力する時間t３よりも短い時間t４で画像の出力を開始することができる。すなわち、画像の表示遅延を抑えることができ、リアルタイムに画像を表示できる。

【０１０８】なお、画像の生成および表示は、所定の単位ごとに分割しなくても従来通りに1画面ごとに生成、

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表示を行ってもよい。

【０１０９】これによれば、上述した形態に比較すればリアルタイム性は若干損なわれるが、画像生成および画像表示時のハードウェア負荷を低減し、従来の方式に比べてリアルタイム性を重視した画像の表示が行える。

【０１１０】（第2の実施例）コンピュータを、情報記録媒体を用いて上述したゲームデータ配信装置１００とほぼ同様に機能させることも可能である。

【０１１１】図6は、本実施の形態の一例に係る情報記録媒体６００および情報記録媒体６００を用いて実現するゲームデータ配信装置１００の機能ブロック図である。

【０１１２】情報記録媒体６００は、クライアント装置として機能するコンピュータ端末から伝送路である通信回線３００を介して送信される配信要求データに基づき、ゲーム画像データを生成して前記コンピュータ端末へ向け送信するための情報を記録した、コンピュータ読み取り可能なものである。

【０１１３】また、ここで、前記情報は、前記配信要求データに基づきゲーム画像データを生成するための生成情報６１０と、生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮するための圧縮情報６２０と、前記コンピュータ端末へ向け送信するための送信情報６３０とを含む。

【０１１４】なお、ここで、ゲーム画像データとは、マルチプレーヤーゲーム等のように、リアルタイムにゲーム画像を表示することが必要な画像データをいう。

【０１１５】これらの情報６１０～６３０は、ゲームデータ配信装置１００の情報読み取り部１１０により読み取られる。生成情報６１０が読み取られることにより画像生成部１０が配信要求データに基づき１画面ごとに画像を生成するよう機能する。

【０１１６】また、圧縮情報６２０が読み取られることにより画像圧縮部２０が、１画面より小さい所定の処理単位ごとに生成画像を圧縮するよう機能する。

【０１１７】さらに、送信情報６３０が読み取られることによりデータ送受信部３０が、１画面より小さい画像データとして圧縮されたゲーム画像データを、配信要求データを送信したコンピュータ端末へ向け送信するよう機能する。

【０１１８】これによれば、情報６１０～６３０をゲームデータ配信装置１００に読み取らせることにより、ゲームデータ配信装置１００にゲーム画像をリアルタイムに圧縮、伝送させることができる。

【０１１９】これにより、当該画像の伝送先のクライアント装置であるコンピュータ端末は、当該画像をリアルタイムに表示することが可能となる。

【０１２０】また、前記生成情報を、１画面より小さい所定の処理単位ごとにゲーム画像データを順次生成する情報として形成することも可能である。これによれば、リアルタイム性をさらに向上させることができる。

【０１２１】（第3の実施例）また、コンピュータを、情報記録媒体を用いて上述したゲーム端末装置２００とほぼ同様に機能させることも可能である。

【０１２２】図7は、本実施の形態の他の一例に係る情報記録媒体７００および情報記録媒体７００を用いて実現するゲーム端末装置２００の機能ブロック図である。

【０１２３】情報記録媒体７００は、プレーヤーの入力したゲーム用のデータに基づき、画像生成装置により生成され、通信回線３００を含むネットワークを介して送信されるゲーム画像データを受信し、表示するための情報を記録した、コンピュータ読み取り可能なものである。

【０１２４】ここで、ゲーム用のデータとは、プレーヤーがレバー等の操作部を操作することによって生じる操作情報を含むデータである。

【０１２５】また、前記ゲーム画像データは、１画面より小さい所定の処理単位で圧縮されたものであって、前記情報は、前記ゲーム画像データを受信し、受信したゲーム画像データを順次伸張するための受信伸張情報７１０と、この伸張したゲーム画像データを表示するための画像表示情報７２０とを含む。

【０１２６】これらの情報７１０、７２０は、ゲーム端末装置２００の情報読み取り部２１０により読み取られる。受信伸張情報７１０が読み取られることにより、データ送受信部６０は前記ゲーム画像データを順次受信し、画像伸張部７０は受信したゲーム画像データを順次伸張するよう機能する。

【０１２７】また、画像表示情報７２０が読み取られることにより、画像表示部８０は、ゲーム画像データを順次表示する。

【０１２８】これによれば、ゲーム端末装置２００は、１画面より小さい処理単位でゲーム画像データを処理することにより、ゲーム画像データの生成から表示までの遅延時間を低減させ、リアルタイム性を確保することができる。

【０１２９】なお、画像表示情報を、伸張されたゲーム画像データが1画面分揃った状態で表示するための情報として形成することも可能である。これによれば、伸張されたゲーム画像データを順次表示する方法に比べ、リアルタイム性は若干損なわれるが、表示時のハードウェア負荷を低減させることができる。

【０１３０】また、情報記録媒体６００，７００としては，ＣＤＲＯＭ、ゲームカセット、ＤＶＤＲＡＭ等の外部情報記録媒体だけでなく，ＲＯＭ，ＲＡＭ等のメモリ、ハードディスク等の内部情報記録媒体も適用可能である。

【０１３１】また、情報読み取り部１１０、２１０としては、上記の媒体に合わせて磁気やレーザー光により読みとるものや、入出力ポート等の信号を読み取るもの等

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を適用できる。その他のハードウェアは上述したものと同様である。

【０１３２】なお、本実施の形態は、ゲーム画像を生成、伝送、表示するゲームネットワークシステムに限られず、リアルタイム画像を生成、伝送、表示するリアルタイム画像表示システムにも適用可能である。

【０１３３】例えば、リアルタイム画像データを生成して、伝送路を介して伝送する画像生成装置と、前記伝送路を介して前記リアルタイム画像データを受信して、前記リアルタイム画像データを表示する画像表示装置とを有するリアルタイム画像表示システムとして以下のものを実現できる。

【０１３４】前記画像生成装置に、１画面より小さい所定の処理単位ごとに前記リアルタイム画像データを生成する画像生成手段と、前記所定の処理単位ごとに前記リアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信する送信手段とを設ける。

【０１３５】また、前記画像表示装置に、受信した前記リアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示する画像表示手段を設ける。

【０１３６】これにより、画像生成に対してリアルタイムに画像表示が可能なリアルタイム画像表示システムを実現できる。

【０１３７】従来は、画像データが機性にされ、伝送先で、できるだけ原画像に近い画像を表示できるよう画像を生成して伝送するということは、あまり考慮されていなかった。

【０１３８】これによれば、１画面分の画像データより小さな単位で当該データを生成、伝送することにより、伝送先では原画像をほぼリアルタイムに表示できる。

【０１３９】ここで、リアルタイム画像データとしては、例えば、リアルタイム性が要求される画像データ、具体的には、ネットワーク形態の画像を用いた会議システム用の画像データ等が該当する。

【０１４０】例えば、本実施の形態を、リアルタイム画像会議システムに適用すれば、各会議の開催される場所間で画像表示の遅れがほとんどなく、快適かつ円滑な会議システムを実現できる。

【０１４１】なお、第１の実施例で説明したゲームシステムも、このリアルタイム画像表示システムを用いてデータ圧縮機能およびデータ伸張機能を省略した形態での実現も可能である。

【０１４２】アナログ映像信号のように圧縮しない画像を送受信する方式も適用可能であるが、必要な伝送帯域量が少ない、加工等が容易等の点からアナログ映像信号を圧縮してデジタルデータ化してデジタル画像データを送受信する方式を適用することが好ましい。

【０１４３】この場合、前記画像生成装置に、前記生成したリアルタイム画像データを順次圧縮する圧縮手段を設け、前記送信手段に、前記圧縮したリアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信させる。

【０１４４】また、前記画像表示装置に、受信した前記圧縮したリアルタイム画像データを順次伸張する伸張手段を設け、前記画像表示手段に、前記伸張したリアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示させる。

【０１４５】これにより、データの圧縮伸張においてもリアルタイム性を向上させるリアルタイム画像表示システムを実現することができる。

【０１４６】また、上述したリアルタイム画像データやゲーム画像データは、必ずしも動画でなくてもよい。例えば、リアルタイム会議でスライドショーやプレゼンテーションのように静止画を連続して送る場合等にも適用できる。

【０１４７】また、上述した伝送路は、光ファイバケーブルや同軸ケーブルのように有線のものだけでなく、衛星通信のように無線のものであってもよい。

【０１４８】

【図面の簡単な説明】

【図１】ゲームシステムによる画像表示のタイミングチャートであり、（Ａ）は従来のタイミングチャートであり、（Ｂ）は本実施の形態の一例に係るゲームシステムを用いた場合のタイミングチャートである。

【図２】本実施の形態の一例に係るゲームシステムの全体図である。

【図３】本実施の形態の一例に係るゲームシステムの機能ブロック図である。

【図４】１画面分のゲーム画像データを４分割して処理する場合の処理順序の概要図である。

【図５】図３に示すゲームシステムの動作を示すフローチャートであり、（Ａ）はプレーヤーの操作からゲーム演算まで、（Ｂ）はゲーム演算後、画像生成から画像表示までの流れを示すフローチャートである。

【図６】本実施の形態の一例に係る情報記録媒体およびこの情報記録媒体を用いて実現するゲームデータ配信装置の機能ブロック図である。

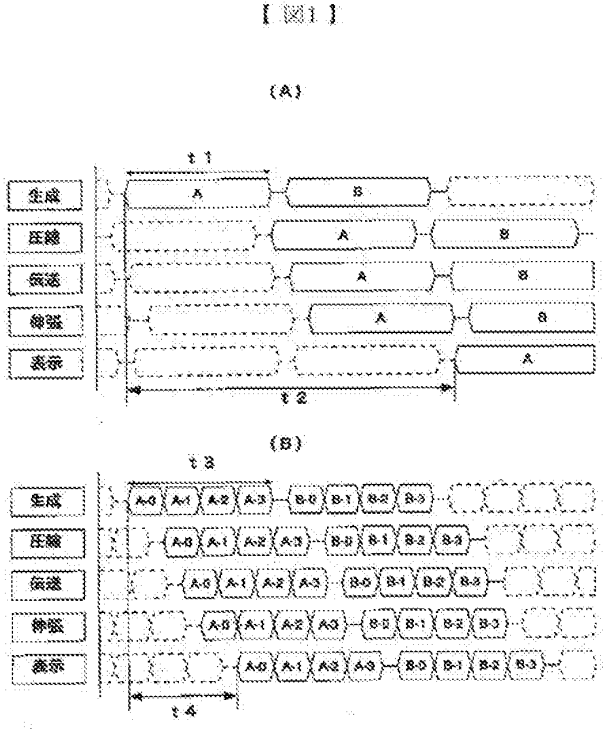
【図７】図７は、本実施の形態の他の一例に係る情報記録媒体およびこの情報記録媒体を用いて実現するゲーム端末装置の機能ブロック図である。

【符号の説明】

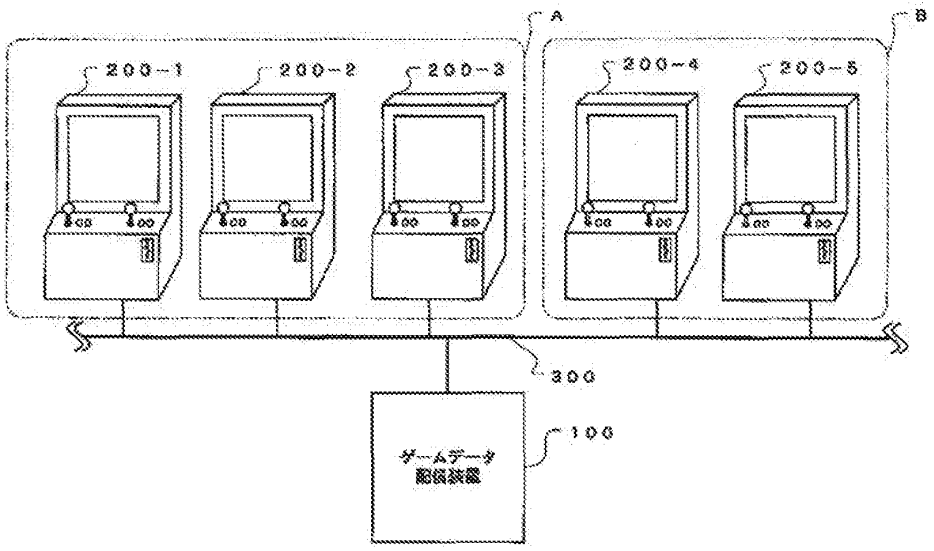
１０　画像生成部
２０　画像圧縮部
３０、６０　データ送受信部
３８　識別部
４０　ゲーム演算部
５０　操作部
５２　配信要求データ生成部
７０　画像伸張部

８０　画像表示部
１００　ゲームデータ配信装置
２００　ゲーム端末装置
３００　通信回線
６００、７００　情報記録媒体

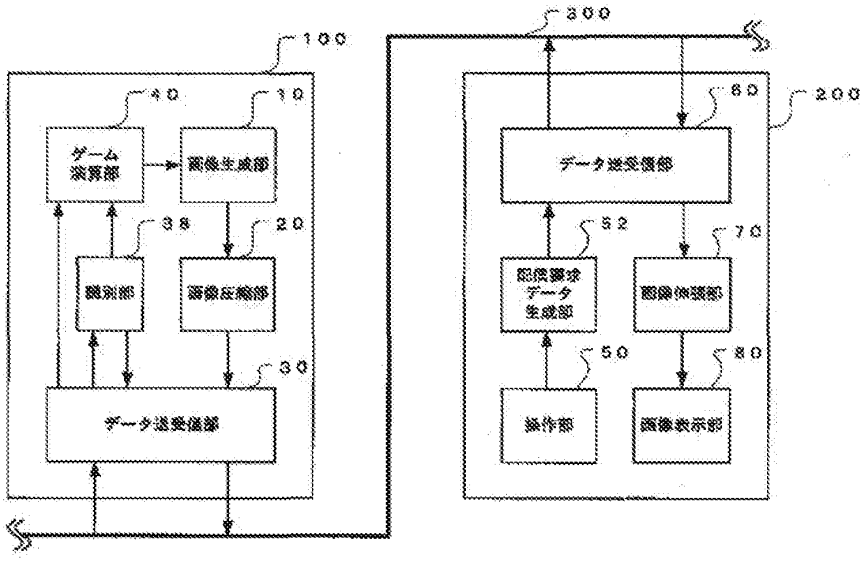
【図１】



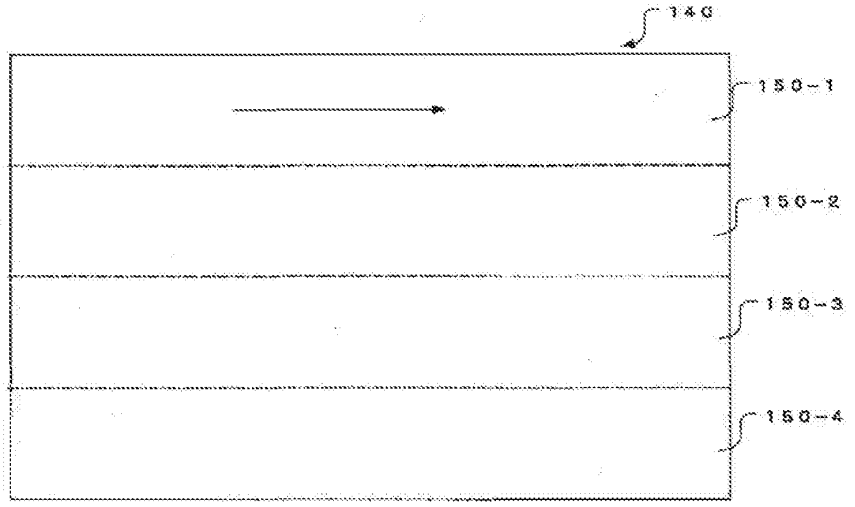
【図２】



【図3】

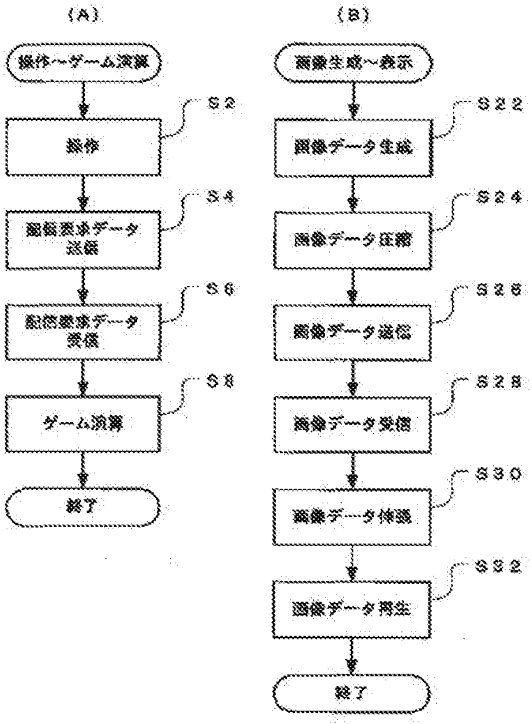


【図4】

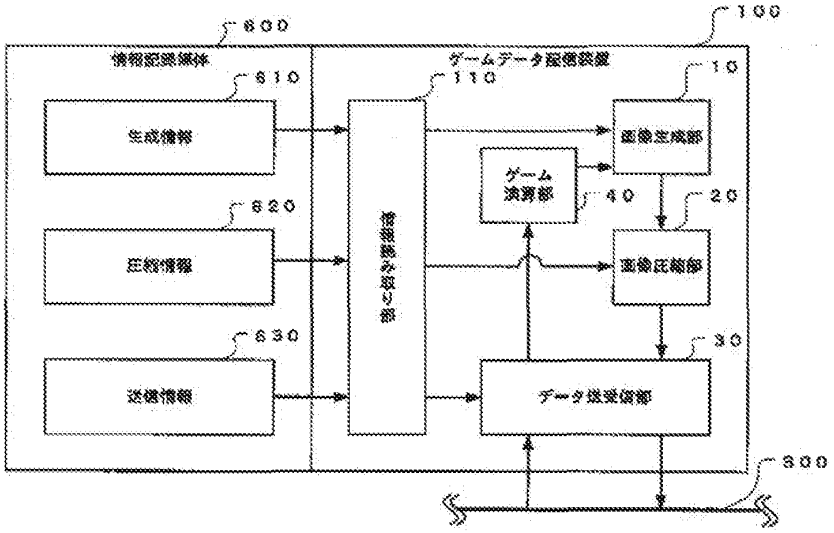


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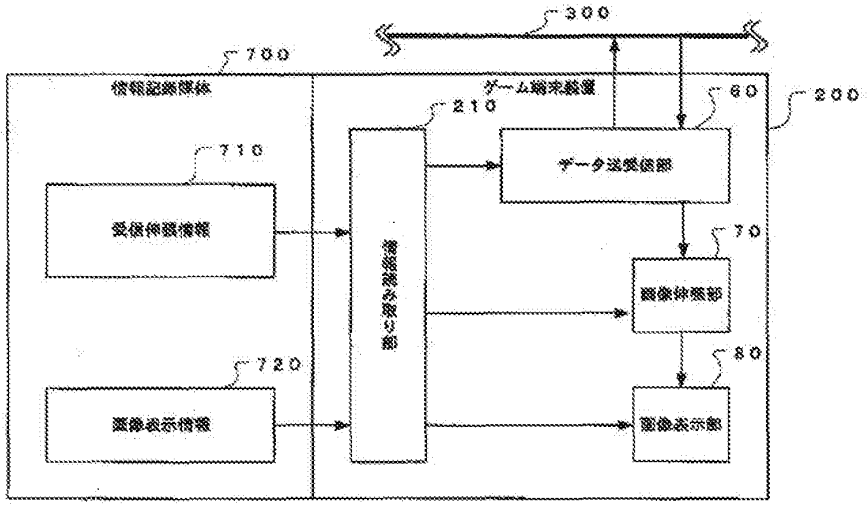
【図５】


(A)
操作～ゲーム演算
S2
操作
S4
振動発生データ送信
S6
振動発生データ受信
S8
ゲーム演算
終了
(B)
画像生成～表示
S22
画像データ生成
S24
画像データ圧縮
S26
画像データ送信
S28
画像データ受信
S30
画像データ伸張
S32
画像データ再生
終了

【図６】


600
情報記憶媒体
610
生成情報
620
圧縮情報
630
送信情報
100
ゲームデータ処理装置
110
10
画像生成部
ゲーム演算部
40
20
画像圧縮部
30
データ送受信部
300

【図7】



【公報種別】特許法第１７条の２の規定による補正の掲載
【部門区分】第１部門第２区分
【発行日】平成17年10月27日(2005.10.27)

【公開番号】特開2000-42247(P2000-42247A)
【公開日】平成12年2月15日(2000.2.15)
【出願番号】特願平10-229374
【国際特許分類第７版】
　Ａ６３Ｆ　13/00
// Ｈ０４Ｌ　12/28
【ＦＩ】
　Ａ６３Ｆ　9/22　Ｇ
　Ｈ０４Ｌ　11/00　３１０Ｚ

【手続補正書】
【提出日】平成17年7月21日(2005.7.21)
【手続補正１】
【補正対象書類名】明細書
【補正対象項目名】全文
【補正方法】変更
【補正の内容】
【書類名】　明細書

【発明の名称】　ゲームシステム、ゲームデータ配信装置、ゲーム装置、リアルタイム画像表示システムおよび情報記録媒体
【特許請求の範囲】
　【請求項１】　配信要求データを伝送する端末装置と、
　伝送路を介して送信される、前記端末装置からの配信要求データに基づき所定のデータを生成し、前記端末装置へ向け伝送するゲームデータ配信装置と、
　を含むゲームシステムであって、
　前記ゲームデータ配信装置は、
　前記端末装置からの配信要求データを受信する手段と、
　受信した配信要求データに基づき，１画面分のゲーム画像を示す全体ゲーム画像データを生成する手段と、
　当該全体ゲーム画像データを、１画面より小さい所定の処理単位ごとに分割してゲーム画像データを生成し、当該ゲーム画像データを順次圧縮し、圧縮したゲーム画像データを前記端末装置へ向け送信する手段と、
　を含み，
　前記端末装置は、
　プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と、
　生成した配信要求データを前記ゲームデータ配信装置へ向け送信する手段と、
　圧縮された前記ゲーム画像データを受信し，順次伸張する手段と、
　この伸張したゲーム画像データに基づき，ゲーム画像を表示する手段と、
　を含むことを特徴とするゲームシステム。
　【請求項２】　配信要求データを伝送する端末装置と、
　伝送路を介して送信される、前記端末装置からの配信要求データに基づきゲーム画像データを生成し，前記端末装置へ向け伝送するゲームデータ配信装置と、
　を含むゲームシステムであって、
　前記ゲームデータ配信装置は、
　前記端末装置からの配信要求データを受信する手段と、

受信した配信要求データに基づき、１画面より小さい所定の処理単位ごとにゲーム画像データを順次生成する手段と、
生成したゲーム画像データを順次圧縮し、前記端末装置へ向け送信する手段と、
を含み、
前記端末装置は、
プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と、
生成した配信要求データを前記ゲームデータ配信装置へ向け送信する手段と、
圧縮された前記ゲーム画像データを受信し、順次伸張する手段と、
この伸張したゲーム画像データに基づき、ゲーム画像を表示する手段と、
を含むことを特徴とするゲームシステム。
【請求項３】　請求項１、２のいずれかにおいて、
前記伝送路には複数の端末装置が接続され、
前記ゲームデータ配信装置は、
各端末装置からの前記配信要求データに基づき、各端末装置ごとに前記ゲーム画像データを生成し、生成したゲーム画像データを圧縮し、該当する端末装置へ向け送信することを特徴とするゲームシステム。
【請求項４】　クライアント装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって、
前記クライアント装置からの前記配信要求データを受信する手段と、
受信した配信要求データに基づき、１画面分のゲーム画像を示す全体ゲーム画像データを生成する手段と、
当該全体ゲーム画像データを、１画面より小さい所定の処理単位ごとに分割してゲーム画像データを生成し、当該ゲーム画像データを順次圧縮し、圧縮したゲーム画像データを前記クライアント装置へ向け送信する手段と、
を含むことを特徴とするゲームデータ配信装置。
【請求項５】　クライアント装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって、
前記クライアント装置から前記配信要求データを受信する手段と、
受信した配信要求データに基づき、１画面より小さい所定の処理単位ごとにゲーム画像データを順次生成する手段と、
生成したゲーム画像データを順次圧縮し、前記クライアント装置へ向け送信する手段と、
を含むことを特徴とするゲームデータ配信装置。
【請求項６】　請求項５において、
前記配信要求データに基づき、送信元のクライアント装置を識別する手段を含み、生成し圧縮した前記ゲーム画像データを、識別した前記クライアント装置へ向け送信することを特徴とするゲームデータ配信装置。
【請求項７】　プレーヤーの操作結果に基づき、配信要求データを生成する手段と、
生成した配信要求データを、伝送路を介してサーバ装置へ向け送信する手段と、
前記配信要求データに基づきサーバ装置が生成して送信したゲーム画像データを受信する受信手段と、
を含むゲーム装置であって、
前記受信手段は、
前記ゲーム画像データを、１画面より小さい所定の処理単位ごとに圧縮された状態で受信し、
前記ゲーム装置は、
受信した前記ゲーム画像データを順次伸張する手段と、
この伸張したゲーム画像データに基づき、ゲーム画像を表示する手段と、

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を含むことを特徴とするゲーム装置。

【請求項８】 リアルタイム画像データを生成して、伝送路を介して伝送する画像生成装置と、前記伝送路を介して前記リアルタイム画像データを受信して、前記リアルタイム画像データを表示する画像表示装置とを含むリアルタイム画像表示システムであって、

前記画像生成装置は、

各画面のリアルタイム画像データを１画面より小さい所定の処理単位ごとに生成する手段と、

前記リアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信する手段と、

を含み、

前記画像表示装置は、

受信した前記リアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示する表示手段を含むことを特徴とするリアルタイム画像表示システム。

【請求項９】 請求項８において、

前記画像生成装置は、前記生成したリアルタイム画像データを順次圧縮する手段を含み、

前記送信手段は、前記圧縮したリアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信し、

前記画像表示装置は、受信した前記圧縮したリアルタイム画像データを順次伸張する手段を含み、

前記表示手段は、前記伸張したリアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示することを特徴とするリアルタイム画像表示システム。

【請求項１０】 クライアント装置から伝送路を介して送信される配信要求データに基づき、ゲーム画像データを生成して前記クライアント装置へ向け送信するためのプログラムが記録されたコンピュータ読みとり可能な情報記録媒体において、

コンピュータを、

前記配信要求データに基づきゲーム画像データを生成するための手段と、

生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮し、前記クライアント装置へ向け送信するための手段として機能させるためのプログラムを記録したことを特徴とする情報記録媒体。

【請求項１１】 ゲームプレーヤーの入力したゲーム用のデータに基づき画像生成装置により生成され、送信されるゲーム画像データを、ネットワークを介して受信し、表示するためのプログラムを記録した、コンピュータ読み取り可能な情報記録媒体において、

前記ゲーム画像データは、１画面より小さい所定の処理単位で圧縮されたものであって、

前記情報記録媒体は、コンピュータを、

前記ゲーム画像データを受信し、受信したゲーム画像データを順次伸張するための手段と、

この伸張したゲーム画像データに基づき、ゲーム画像を表示するための手段として機能させるためのプログラムを記録したことを特徴とする情報記録媒体。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】

本発明は、ゲームシステム、ゲームデータ配信装置、ゲーム装置、リアルタイム画像表示システムおよび情報記録媒体に関する。

【０００２】

【背景技術および発明が解決しようとする課題】

従来、伝送路を介して他の処理装置で画像を表示する場合、伝送元の処理装置は、画像

データの取り扱い易さ等から１画面ごとに画像データを圧縮して伝送し、伝送先の処理装置では１画面ごとに画像データを伸張して表示していた。

【０００３】

このため、従来の方法では、画面という単位で画像データを取り扱えるよう、１画面ごとに画像データを圧縮する必要性があった。

【０００４】

例えば、図１（Ａ）に示すように、伝送元の処理装置で１画面分の画像の生成を開始してから伝送先の処理装置で画像の表示を開始するまでの間に、１画面分の画像生成時間と、１画面分の画像伸張時間がかかる。したがって、伝送遅延を除いても画像生成から画像表示まで２画面分の遅延時間が生じることになる。

【０００５】

このように、画像表示に大幅な遅延が生じる場合には、ネットワーク型ゲームや画像を用いて遠隔地と会議する場合のようにリアルタイムに画像を表示する必要があるにも関わらず、リアルタイム性が確保されないといった問題があった。

【０００６】

特に、ゲーム端末の入力に応じて適切なゲーム画像をホストからゲーム端末に伝送する場合、入力に対する画像表示のレスポンスを上げること、すなわち、入力から画像表示までの遅延を抑え、リアルタイム性を確保することが極めて重要である。

【０００７】

本発明は、上記の課題に鑑みてなされたものであり、その目的は、画像の表示遅延を抑え、リアルタイムに画像表示できるゲームシステム、ゲームデータ配信装置、ゲーム装置、リアルタイム画像表示システムおよび情報記録媒体を提供することにある。

【０００８】

【課題を解決するための手段】

上記課題を解決するため、本発明に係るゲームシステムは、配信要求データを伝送する端末装置と、

伝送路を介して送信される、前記端末装置からの配信要求データに基づきゲーム画像データを生成し、前記端末装置へ向け伝送するゲームデータ配信装置と、　を含み、前記端末装置は、受信した前記ゲーム画像データを表示するゲームシステムであって、

前記ゲームデータ配信装置は、

前記端末装置からの配信要求データを受信する手段と、

受信した配信要求データに基づき、１画面分のゲーム画像を示す全体ゲーム画像データを生成する手段と、

当該全体ゲーム画像データを、１画面より小さい所定の処理単位ごとに分割してゲーム画像データを生成し、当該ゲーム画像データを順次圧縮し、圧縮したゲーム画像データを前記端末装置へ向け送信する手段と、

を含み、

前記端末装置は、

プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と、

生成した配信要求データを前記ゲームデータ配信装置へ向け送信する手段と、

圧縮された前記ゲーム画像データを受信し、順次伸張する手段と、

この伸張したゲーム画像データに基づき、ゲーム画像を表示する手段と、

を含むことを特徴とする。

【０００９】

ネットワーク型ゲームを行う場合、各ゲーム端末装置でゲームの開始タイミングを合わせることは極めて重要である。特に、プレーヤーの入力に応じて画像を生成する場合、入力に対する反応をリアルタイムに行う必要がある。

【００１０】

一方、ゲーム動画像はフレーム間の相関性が少ない、すなわち変化が激しいため、欠落したデータを補間する処理は行いにくい上、画像の高品質性も要求される。

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【００１１】
本発明によれば、ゲーム画像データを小さな単位で伝送することにより伝送遅延を低減させることができる。また、伝送先では圧縮したデータを伸張する場合も１画面より小さな単位で伸張できるため、リアルタイム性を確保できる。

【００１２】
ここで、所定の処理単位としては、例えば、走査線単位または画像圧縮単位等が該当する。また、ＪＰＥＧ圧縮を行う場合には、画像圧縮単位として８×８画素単位を採用してもよい。このような単位とすることにより、ゲーム画像データを分割した場合も、圧縮、伸張、表示等の処理が行いやすくなる。

【００１３】
また、前記ゲームデータ配信装置は、所定数の走査線単位ごとに前記リアルタイム画像データを生成することも可能である。この場合、前記画像圧縮単位を同時に適用してもよい。

【００１４】
また、圧縮されたゲーム画像データを小さな単位で伝送することにより，仮に伝送データに誤りがあった場合でもシステム全体への影響を抑えることができる。

【００１５】
すなわち、従来のフレーム（１画面）単位での圧縮データ伝送の場合、伝送先で伝送データにエラーが発見され、当該伝送データを再送する場合、少なくとも１画面分のデータを再送しなければならない上、再送できない場合、伝送先では前回表示した画面を再表示する等の処理を行わなければならず，画像の品質劣化が生じていた。

【００１６】
これによれば、仮に圧縮伝送データに誤りがあった場合であってもデータ再送量を抑えられる上、再送できない場合であっても伝送先では１画面の１部分が欠落した表示で済み、画像を見ている者への不快感を軽減させることができる。

【００１７】
また、本発明に係るゲームシステムは、配信要求データを伝送する端末装置と、
伝送路を介して送信される、前記端末装置からの配信要求データに基づきゲーム画像データを生成し、前記端末装置へ向け伝送するゲームデータ配信装置と、
を含むゲームシステムであって、
前記ゲームデータ配信装置は、
前記端末装置からの配信要求データを受信する手段と、
受信した配信要求データに基づき，１画面より小さい所定の処理単位ごとにゲーム画像データを順次生成する手段と、
生成したゲーム画像データを順次圧縮し，前記端末装置へ向け送信する手段と，
を含み、
前記端末装置は、
プレーヤーの操作結果に基づき、前記配信要求データを生成する手段と、
圧縮された前記ゲーム画像データを受信し，順次伸張する手段と、
この伸張したゲーム画像データに基づき，ゲーム画像を表示する手段と、
を含むことを特徴とする。

【００１８】
本発明によれば、生成、表示も含めてゲーム画像データを１画面より小さい単位で処理することにより、さらにリアルタイム性が確保される。

【００１９】
また、前記伝送路には複数の端末装置が接続され，
前記ゲームデータ配信装置は、
各端末装置からの前記配信要求データに基づき，各端末装置ごとに前記ゲーム画像データを生成し、生成したゲーム画像データを圧縮し，該当する端末装置へ向け送信してもよい。

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【００２０】
これによれば、複数の端末装置が伝送路に接続された状態においても、各端末装置におけるプレーヤーの操作に応じ、各端末装置においてリアルタイムに画像を表示することのできるゲームシステムを実現できる。

【００２１】
また、配信要求データを送信した端末装置にのみゲーム画像データを送信することにより、不要なトラフィックをなくし、リアルタイム性を確保することができる。

【００２２】
また、本発明に係るゲームデータ配信装置は、クライアント装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって、
前記クライアント装置からのデータを受信する手段と、
受信した配信要求データに基づき、１画面分のゲーム画像を示す全体ゲーム画像データを生成する手段と、
当該全体ゲーム画像データを、１画面より小さい所定の処理単位ごとに分割してゲーム画像データを生成し、当該ゲーム画像データを順次圧縮し、圧縮したゲーム画像データを前記クライアント装置へ向け送信する手段と、
を含むことを特徴とする。

【００２３】
ゲーム端末等のクライアント装置の入力に応じて画像を生成してクライアント装置に当該画像を伝送する場合、入力に対する応答速度が速いこと、すなわち、リアルタイム性が要求される。

【００２４】
本発明によれば、１画面より小さい所定の処理単位ごとに画像処理することにより、１画面ごとに処理する方式に比べ、よりリアルタイムに画像を生成、圧縮、伝送することができる。

【００２５】
また、本発明に係るゲームデータ配信装置は、クライアント装置からネットワークを介して送信される配信要求データに基づきゲーム画像データを生成して前記クライアント装置へ向け送信するゲームデータ配信装置であって、
前記クライアント装置から前記配信要求データを受信する手段と、
受信した配信要求データに基づき、１画面より小さい所定の処理単位ごとにゲーム画像データを順次生成する手段と、
生成したゲーム画像データを順次圧縮し、前記クライアント装置へ向け送信する手段と、
を含むことを特徴とする。

【００２６】
本発明によれば、生成も含めて、１画面より小さい所定の処理単位ごとに画像処理することにより、さらにリアルタイム性が確保される。

【００２７】
また、前記ゲームデータ配信装置は、前記配信要求データに基づき、送信元のクライアント装置を識別する手段を含み、生成し圧縮した前記ゲーム画像データを、識別した前記クライアント装置へ向け送信してもよい。

【００２８】
これによれば、当該ゲーム画像データを、識別した前記クライアント装置へ向け送信することにより、不要なトラフィックをなくし、リアルタイム性を確保できる。

【００２９】
また、本発明に係るゲーム装置は、プレーヤーの操作結果に基づき、配信要求データを生成する手段と、
生成した配信要求データを、伝送路を介してサーバ装置へ向け送信する手段と、

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前記配信要求データに基づきサーバ装置が生成して送信したゲーム画像データを受信する受信手段と、
を含むゲーム装置であって、
前記受信手段は、
前記ゲーム画像データを、１画面より小さい所定の処理単位ごとに圧縮された状態で受信し、
前記ゲーム装置は、
受信した前記ゲーム画像データを順次伸張する手段と、
この伸張したゲーム画像データに基づき、ゲーム画像を表示する手段と、
を含むことを特徴とする。

【００３０】

本発明によれば、１画面より小さい所定の処理単位で、順次伸張して表示することにより、画像表示のリアルタイム性を向上させることができる。

【００３１】

また、本発明に係るリアルタイム画像表示システムは、リアルタイム画像データを生成して、伝送路を介して伝送する画像生成装置と、前記伝送路を介して前記リアルタイム画像データを受信して、前記リアルタイム画像データを表示する画像表示装置とを含むリアルタイム画像表示システムであって、
前記画像生成装置は、
各画面のリアルタイム画像データを１画面より小さい所定の処理単位ごとに生成する手段と、
前記リアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信する手段と、
を含み、
前記画像表示装置は、
受信した前記リアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示する表示手段を含むことを特徴とする。

【００３２】

本発明によれば、１画面分の画像データより小さな単位で当該データを生成，伝送することにより、伝送先では原画像をほぼリアルタイムに表示できる。

【００３３】

ここで、リアルタイム画像データとしては，例えば、リアルタイム性が要求される画像データ，具体的には、ネットワーク形態の画像を用いた会議システム用の画像データや、ネットワーク形態のゲーム用のゲーム画像データ等が該当する。

【００３４】

すなわち，本発明によれば、画像表示にリアルタイム性と高品質性が要求される画像データであっても、フレーム（１画面）単位での遅延を生じさせることなく原画像をほぼリアルタイムに表示できる。

【００３５】

また，ここで、所定の処理単位としては，例えば，走査線単位または画像圧縮単位が該当する。例えば、ＪＰＥＧ圧縮を行う場合には、画像圧縮単位として８×８画素単位を採用してもよい。このような単位とすることにより，画像データを分割した場合も圧縮，伸張，表示等の処理が行いやすくなる。

【００３６】

また、前記画像生成装置は、所定数の走査線単位ごとに前記リアルタイム画像データを生成することも可能である。この場合、前記画像圧縮単位を同時に適用してもよい。

【００３７】

また、画像データを小さな単位で伝送することにより、仮に伝送データに誤りがあった場合でもシステム全体への影響を抑えることができる。

【００３８】

また、前記画像生成装置は、前記生成したリアルタイム画像データを順次圧縮する手段を含み、

前記送信手段は、前記圧縮したリアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信し、

前記画像表示装置は、受信した前記圧縮したリアルタイム画像データを順次伸張する手段を含み、

前記表示手段は、前記伸張したリアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示してもよい。

【００３９】

これによれば、圧縮伝送を行うことにより、伝送帯域のデータ占有量を低減させることができる。この場合も前記所定の単位で当該データを次々と生成、圧縮、伝送、伸張等を行うことにより、画像をリアルタイムに表示できる。

【００４０】

ここで、前記圧縮手段による圧縮は、ＭＰＥＧ等のようにＤＣＴ（離散コサイン変換）を用いた圧縮等の各種の圧縮手法を適用可能であるが、特にＪＰＥＧ圧縮を適用してもよい。

【００４１】

ＪＰＥＧ圧縮を適用することにより、伝送先の画像表示装置は、ＭＰＥＧ圧縮のようにフレーム間の補間を行うことによる遅延の増加を伴わずに原画像に忠実な画像を表示できる。

【００４２】

また、本発明に係る情報記録媒体は、クライアント装置から伝送路を介して送信される配信要求データに基づき、ゲーム画像データを生成して前記クライアント装置へ向け送信するためのプログラムが記録されたコンピュータ読みとり可能な情報記録媒体において、

コンピュータを、

前記配信要求データに基づきゲーム画像データを生成するための手段と、

生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮し、前記クライアント装置へ向け送信するための手段として機能させるためのプログラムを記録したことを特徴とする。

【００４３】

ここで、ゲーム画像データとは、マルチプレーヤーゲーム等のように、リアルタイムにゲーム画像を表示することが必要な画像データをいう。

【００４４】

本発明によれば、ゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮して送信することにより、生成から表示までの遅延が抑えられ、当該ゲーム画像データを受信したクライアント装置はほぼリアルタイムにゲーム画像を表示できる。

【００４５】

また、ここで、所定の処理単位としては、例えば、走査線単位または画像圧縮単位等が該当する。また、ＪＰＥＧ圧縮を行う場合には、画像圧縮単位として８×８画素単位を採用してもよい。このような単位とすることにより、ゲーム画像データを分割した場合も、圧縮、伸張、表示等の処理が行いやすくなる。

【００４６】

また、本発明に係る情報記録媒体は、ゲームプレーヤーの入力したゲーム用のデータに基づき画像生成装置により生成され、送信されるゲーム画像データを、ネットワークを介して受信し、表示するためのプログラムを記録した、コンピュータ読み取り可能な情報記録媒体において、

前記ゲーム画像データは、１画面より小さい所定の処理単位で圧縮されたものであって、

前記情報記録媒体は、コンピュータを、

前記ゲーム画像データを受信し、受信したゲーム画像データを順次伸張するための手段

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と、
この伸張したゲーム画像データに基づき、ゲーム画像を表示するための手段として機能させるためのプログラムを記録したことを特徴とする。

【００４７】

本発明によれば、１画面より小さい所定の処理単位で画像処理することにより、画像の生成から表示までの遅延が抑えられ、ゲームプレーヤーは、自分のゲーム操作に対する画像表示をよりリアルタイムに感じることができる。

【００４８】

【発明の実施の形態】

以下、本発明をゲームシステムに適用した好適な実施の形態について図面を用いて説明する。

【００４９】

なお、本発明の適用は、ゲームシステムに限定されるものではなく、リアルタイムに画像を表示する各種の画像表示システムへの適用も可能である。

【００５０】

（第１の実施例）

図１は、ゲームシステムによる画像表示のタイミングチャートであり、図１（Ａ）は従来のタイミングチャートであり、図１（Ｂ）は本実施の形態の一例に係るゲームシステムを用いた場合のタイミングチャートである。

【００５１】

図１（Ａ）に示すように、従来の画像データ表示システムは、１枚の画像単位で画像を取り扱っており、Ａという１枚の画像の入力が終わってから順次に圧縮、伝送、伸張という処理を行い、Ａという１枚の画像全体の伸張処理が終わってから画像を表示出力していた。

【００５２】

このため、伝送元の処理装置で画像の生成を開始してから伝送先の処理装置で画像の表示を開始するまでの間に、１画面分の画像生成時間と、１画面分の画像伸張時間がかかる。

【００５３】

したがって、画像の入力を開始してから画像の表示出力を開始するまで、伝送遅延を除いても画像入力時間ｔ１のおよそ２倍にあたる時間ｔ２がかかってしまう。

【００５４】

２枚目の画像にあたるＢという画像についても同様である。

【００５５】

このため、リアルタイムに画像を表示しなければならない場合、この処理方式は画像表示遅延の原因となる。

【００５６】

特に、クライアント装置として機能し、ゲーム画像を表示するゲーム端末装置からの入力データに応じて、ホストである画像生成装置でゲーム画像を生成、圧縮、伝送してゲーム端末装置で伸張、表示するゲームシステムの場合、プレーヤーの操作に対する画像表示レスポンスが遅いと、間延びしてしまい、ゲームがつまらないものとなってしまう。

【００５７】

図１（Ｂ）に示すように、本実施の形態では、Ａという１枚の画像を４分割し、Ａ０～Ａ３という画像単位で処理している。

【００５８】

例えば、Ａ０部分を処理する場合、Ａ０部分の画像の入力が終わると、順次に圧縮、伝送、伸張を行い、伸張が終わった段階でＡ０部分の画像を表示出力する。

【００５９】

これにより、１枚の画像の入力にかかる時間ｔ３に対して、１枚の画像の入力が始まって当該画像の出力が始まるまでの時間ｔ４は短くなっており、図１（Ａ）に示す従来の処

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理方式に比べて画像の表示遅延を抑えることができる。

【００６０】

このように、ゲーム画像データを小さな単位で伝送することにより、伝送遅延を低減させることができる。また、伝送先では圧縮したデータを伸張する場合も１画面より小さな単位で伸張表示できるため、リアルタイム性が確保され、ゲームの開始タイミングを適切に同期させることができ、ゲームプレーヤーはリアルタイムなネットワークゲームを快適にプレーすることができる。

【００６１】

以下に、この原理をゲームシステムに用いた場合における画像表示の実施例について示す。

【００６２】

図２は、本実施の形態の一例に係るゲームシステムの全体図である。

【００６３】

図２に示すように、ゲームシステムは、画像生成装置としての機能を有するゲームデータ配信装置１００と、ゲームデータ配信装置１００と伝送路である通信回線３００を含むＡＴＭネットワークを介して接続された複数のゲーム端末装置２００－１～２００－５を含んで構成されている。

【００６４】

また、ゲーム端末装置２００－１～２００－３はＡ地域、ゲーム端末装置２００－４、２００－５はＡ地域とは遠隔のＢ地域に配置されている。さらに、ゲームデータ配信装置１００とゲーム端末装置２００は、遠隔地同士であり、光ファイバーケーブルを含んで構成される通信回線３００を含むネットワークを介して接続されている。

【００６５】

ゲームデータ配信装置１００で生成されたゲーム画像データは、通信回線３００を介して各ゲーム端末装置２００に伝送される。

【００６６】

図３は、本実施の形態の一例に係るゲームシステムの機能ブロック図である。

【００６７】

ゲームデータ配信装置１００は、ゲーム端末装置２００からの配信要求データに応じてゲーム演算を行うゲーム演算部４０と、各画面のゲーム画像データを１画面より小さい所定の処理単位ごとにゲーム画像データを生成する画像生成部１０と、生成した画像を圧縮する画像圧縮部２０とを含んで構成されている。

【００６８】

上記の所定の処理単位については後述する。

【００６９】

また、ゲームデータ配信装置１００は、ゲーム端末装置２００からの入力データを受信し、この受信データに基づき、送信元のゲーム端末装置２００を識別する識別部３８と、前記所定の処理単位ごとに圧縮したゲーム画像データを、通信回線３００を介して識別部３８により識別したゲーム端末装置２００へ向け順次送信するデータ送受信部３０とを含んで構成されている。

【００７０】

一方、ゲーム端末装置２００は、プレーヤーの操作データが入力される操作部５０と、操作部５０から入力される操作データに基づき、配信要求データを生成する配信要求データ生成部５２と、通信回線３００を介して、配信要求データをゲームデータ配信装置１００へ向け送信し、ゲームデータ配信装置１００から伝送されるゲーム画像データを受信するデータ送受信部６０とを含んで構成されている。

【００７１】

また、ゲーム端末装置２００は、受信したゲーム画像データを伸張する画像伸張部７０と、伸張したゲーム画像データから１画面分のゲーム画像データが完成するよう表示する画像表示部８０を含んで構成されている。

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【００７２】
なお、ここで、識別部３８，ゲーム演算部４０および配信要求データ生成部５２としては、例えばＣＰＵ、画像生成部１０および画像圧縮部３０としては、例えば、ＣＰＵからの命令を受けて画像を生成する，クロックジェネレータ、ＶＲＡＭ，圧縮チップ等を有するゲーム基板等を適用でき、データ送受信部３０、８０としては、例えばＡＴＭスイッチ等の通信機器を適用できる。
【００７３】
また、操作部５０としては，例えばレバーやボタン、画像伸張部７０および画像表示部８０としては、例えば、ＣＰＵからの命令を受けて画像を表示する、クロックジェネレータ、ＶＲＡＭ、伸張チップ，ＤＡコンバータ等を有するビデオカードおよびディスプレイ等を適用できる。
【００７４】
上記の所定の処理単位としては，例えば、走査線単位またはＪＰＥＧ圧縮を行う場合８×８画素単位であることが好ましい。
【００７６】
例えば、ＪＰＥＧ圧縮を行う場合には、６４０×４８０ドットのノンインタレース方式の画面を、８×８画素単位の整数倍であって、かつ、走査線単位に４分割して６４０×１２０ドットずつ生成、圧縮、伝送，伸張、表示することができる。
【００７６】
なお、６４０×４８０ドットの画面を６４０×２４０ドットずつ、すなわち、インタレース方式で表示する場合は、２４０ラインを、６４、６４、６４、４８ラインずつ生成等の処理を行うことが好ましい。
【００７７】
このような単位で分割することにより，インタレース、ノンインタレースともにアドレス処理が行いやすく、かつ、画像処理のリアルタイム性を向上させることができる。
【００７８】
図４は、１画面分のゲーム画像データを４分割して処理する場合の処理順序の概要図である。
【００７９】
画像生成部１０は、図１で説明したように，１画面の４分の１にあたる走査線単位ごとにゲーム画像データを生成、圧縮、伝送、伸張、表示等の処理を行う。
【００８０】
したがって、画面１４０における処理順序としては、図１の画像Ａ０に対応する画像１５０－１，画像Ａ１に対応する画像１５０－２，画像Ａ２に対応する画像１５０－３，画像Ａ３に対応する画像１５０－４の順に処理することになる。
【００８１】
このように、画像データを小さな単位で伝送することにより，仮に伝送データに誤りがあった場合でもシステム全体への影響を抑えることができる。すなわち、従来のフレーム（１画面）単位での圧縮データ伝送の場合，伝送先で伝送データにエラーが発見され、当該伝送データを再送する場合、少なくとも１画像分のデータを再送しなければならない上、再送できない場合、伝送先では前回表示した画像を再度表示する等の処理を行わなければならず，画像の品質劣化が生じていた。
【００８２】
本実施の形態によれば、データ再送量を抑えられる上、仮に再送できない場合であっても、伝送先では１画像の１部分が欠落した表示で済み、画像を見ている者への不快感を軽減させることができる。
【００８３】
ここで，ゲームシステムの具体的な動作についてフローチャートを用いて説明する。
【００８４】
図５は，図３に示すゲームシステムの動作を示すフローチャートである。

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【００８５】
まず、図５（Ａ）を用いてプレーヤーの操作からゲーム演算までの処理の流れについて説明する。

【００８６】
ゲームプレーヤーは、クライアント装置として機能するゲーム端末装置２００でリアルタイムなネットワークゲームをプレーしている。

【００８７】
例えば、プレーヤーがレバーを操作した場合（ステップ２）、その操作情報が操作部５０において操作データとして生成され、この操作データに基づき、配信要求データ生成部５２は、自装置の識別情報も含めた配信要求データを生成する。

【００８８】
生成した配信要求データは、データ送受信部６０により通信回線３００を介してサーバ装置として機能するゲームデータ配信装置１００へ向け送信される（ステップ４）。

【００８９】
ゲームデータ配信装置１００は、ゲーム端末装置２００から送信される配信要求データを受信する（ステップ６）。識別部３８は、この配信要求データに基づき、配信要求データを送信したゲーム端末装置２００を識別する。配信要求データは、ゲーム演算部４０に送られる。

【００９０】
ゲーム演算部４０は、配信要求データに基づきゲーム演算を行う（ステップ８）。

【００９１】
次に、図５（Ｂ）を用いてゲーム演算後、画像生成からゲーム端末装置２００での画像表示までの処理の流れについて説明する。

【００９２】
画像生成部１０は、ゲーム演算部４０による演算結果に基づき、各画面の４分の１画像ごとにゲーム画像データを順次生成する（ステップ２２）。

【００９３】
画像圧縮部２０は、生成されたゲーム画像データを順次圧縮する（ステップ２４）。

【００９４】
ここで、画像圧縮部２０による圧縮は、ＭＰＥＧ等のようにＤＣＴ（離散コサイン変換）を用いた圧縮等の各種の圧縮手法を適用可能であるが、特にＪＰＥＧ圧縮を適用することが好ましい。ＪＰＥＧ圧縮を適用することにより、伝送先のゲーム端末装置２００は、ＭＰＥＧ圧縮のようにフレーム間の補間を行うことによる遅延の増加を伴わずに原画像に忠実な画像をリアルタイムに表示できる。

【００９５】
データ送受信部３０は、圧縮されたゲーム画像データを、通信回線３００を介して、識別部３８により識別したゲーム端末装置２００へ向け順次送信する（ステップ２６）。なお、データ送受信部３０は、ゲーム画像データのほか圧縮情報等の通常送信するべきデータも送信している。

【００９６】
一方、ゲーム端末装置２００においては、データ送受信部６０により、ゲーム画像データを順次受信する（ステップ２８）。

【００９７】
画像伸張部７０は、受信した前記圧縮されたゲーム画像データを順次伸張する（ステップ３０）。

【００９８】
４分の１画面分のゲーム画像データが伸張された段階で、画像表示部８０は、伸張されたゲーム画像データを表示する（ステップ３２）。この表示処理を４回行うことにより、１画面分のゲーム画像データが完成する。

【００９９】

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以上説明してきたように、本実施の形態によれば以下の作用効果が奏される。

【０１００】

ネットワーク型ゲームを行う場合、各ゲーム端末装置でゲームの開始タイミングを合わせることは極めて重要である。また、ゲーム動画像はフレーム間の相関性が少ない、すなわち変化が激しいため、欠落したデータを補間する処理は行いにくい上、画像の高品質性も要求される。

【０１０１】

また、ネットワーク形態のゲームにおいては、プレーヤーの操作に対する画像表示レスポンスを高めることがゲームを快適に行う点で重要である。

【０１０２】

本実施の形態によれば、ゲーム画像データを１画面より小さな単位で処理することにより画像の生成から表示までの処理における遅延を低減させることができる。

【０１０３】

このように、１画面より小さな単位で処理することによる伝送遅延時間の低減により、リアルタイム性が維保され、ゲームプレーヤーは、自分のレバー操作等に対するゲームの反応をよりリアルタイムに感じることができ、ネットワークゲームを快適にプレーすることができる。

【０１０４】

特に、マルチプレーヤーゲームに適用した場合、同時に多人数がリアルタイムなゲーム画像を得ることができるため、非常に効果的である。

【０１０５】

さらに、識別部３８によりゲーム端末装置を識別できるため、ゲーム画像の伝送が必要なゲーム端末装置にだけゲーム画像を送ることにより、通信回線３００上のトラフィックを抑え、データ伝送時のリアルタイム性を確保することができる。

【０１０６】

また、ゲーム画像データは、所定数の走査線単位で分割されているため、ゲーム端末装置２００の画像表示部８０は、１画面分の画像を伸張してから表示するのではなく、１画面分のうち伸張した部分から表示することができる。これにより、画像表示のリアルタイム性をさらに高めることができる。

【０１０７】

また、図１（Ｂ）に示すように、４分の１画面分の画像データずつの取り扱いであっても、圧縮、伝送、伸張の各処理においてはパラレル処理が可能である。これにより、上述したように、１画面分の画像を入力する時間ｔ３よりも短い時間ｔ４で画像の出力を開始することができる。すなわち、画像の表示遅延を抑えることができ、リアルタイムに画像を表示できる。

【０１０８】

なお、画像の生成および表示は、所定の単位ごとに分割しなくても従来通りに１画面ごとに生成、表示を行ってもよい。

【０１０９】

これによれば、上述した形態に比較すればリアルタイム性は若干損なわれるが、画像生成および画像表示時のハードウェア負荷を低減し、従来の方式に比べてリアルタイム性を重視した画像の表示が行える。

【０１１０】

（第２の実施例）

コンピュータを、情報記録媒体を用いて上述したゲームデータ配信装置１００とほぼ同様に機能させることも可能である。

【０１１１】

図６は、本実施の形態の一例に係る情報記録媒体６００および情報記録媒体６００を用いて実現するゲームデータ配信装置１００の機能ブロック図である。

【０１１２】

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情報記録媒体６００は、クライアント装置として機能するコンピュータ端末から伝送路である通信回線３００を介して送信される配信要求データに基づき、ゲーム画像データを生成して前記コンピュータ端末へ向け送信するための情報を記録した、コンピュータ読み取り可能なものである。

【０１１３】

また、ここで、前記情報は、前記配信要求データに基づきゲーム画像データを生成するための生成情報６１０と、生成したゲーム画像データを、１画面より小さい所定の処理単位ごとに順次圧縮するための圧縮情報６２０と、前記コンピュータ端末へ向け送信するための送信情報６３０とを含む。

【０１１４】

なお、ここで、ゲーム画像データとは、マルチプレーヤーゲーム等のように、リアルタイムにゲーム画像を表示することが必要な画像データをいう。

【０１１５】

これらの情報６１０～６３０は、ゲームデータ配信装置１００の情報読み取り部１１０により読み取られる。生成情報６１０が読み取られることにより画像生成部１０が配信要求データに基づき１画面ごとに画像を生成するよう機能する。

【０１１６】

また、圧縮情報６２０が読み取られることにより画像圧縮部２０が、１画面より小さい所定の処理単位ごとに生成画像を圧縮するよう機能する。

【０１１７】

さらに、送信情報６３０が読み取られることによりデータ送受信部３０が、１画面より小さい画像データとして圧縮されたゲーム画像データを、配信要求データを送信したコンピュータ端末へ向け送信するよう機能する。

【０１１８】

これによれば、情報６１０～６３０をゲームデータ配信装置１００に読み取らせることにより、ゲームデータ配信装置１００にゲーム画像をリアルタイムに圧縮、伝送させることができる。

【０１１９】

これにより、当該画像の伝送先のクライアント装置であるコンピュータ端末は、当該画像をリアルタイムに表示することが可能となる。

【０１２０】

また、前記生成情報を、１画面より小さい所定の処理単位ごとにゲーム画像データを順次生成する情報として形成することも可能である。これによれば、リアルタイム性をさらに向上させることができる。

【０１２１】

（第３の実施例）

また、コンピュータを、情報記録媒体を用いて上述したゲーム端末装置２００とほぼ同様に機能させることも可能である。

【０１２２】

図７は、本実施の形態の他の一例に係る情報記録媒体７００および情報記録媒体７００を用いて実現するゲーム端末装置２００の機能ブロック図である。

【０１２３】

情報記録媒体７００は、プレーヤーの入力したゲーム用のデータに基づき、画像生成装置により生成され、通信回線３００を含むネットワークを介して送信されるゲーム画像データを受信し、表示するための情報を記録した、コンピュータ読み取り可能なものである。

【０１２４】

ここで、ゲーム用のデータとは、プレーヤーがレバー等の操作部を操作することによって生じる操作情報を含むデータである。

【０１２５】

また、前記ゲーム画像データは、１画面より小さい所定の処理単位で圧縮されたものであって、前記情報は、前記ゲーム画像データを受信し、受信したゲーム画像データを順次伸張するための受信伸張情報７１０と、この伸張したゲーム画像データを表示するための画像表示情報７２０とを含む。

【０１２６】

これらの情報７１０、７２０は、ゲーム端末装置２００の情報読み取り部２１０により読み取られる。受信伸張情報７１０が読み取られることにより、データ送受信部６０は前記ゲーム画像データを順次受信し、画像伸張部７０は受信したゲーム画像データを順次伸張するよう機能する。

【０１２７】

また、画像表示情報７２０が読み取られることにより、画像表示部８０は、ゲーム画像データを順次表示する。

【０１２８】

これによれば、ゲーム端末装置２００は、１画面より小さい処理単位でゲーム画像データを処理することにより、ゲーム画像データの生成から表示までの遅延時間を低減させ、リアルタイム性を確保することができる。

【０１２９】

なお、画像表示情報を、伸張されたゲーム画像データが１画面分揃った状態で表示するための情報として形成することも可能である。これによれば、伸張されたゲーム画像データを順次表示する方法に比べ、リアルタイム性は若干損なわれるが、表示時のハードウェア負荷を低減させることができる。

【０１３０】

また、情報記録媒体６００、７００としては、ＣＤＲＯＭ、ゲームカセット、ＤＶＤＲＡＭ等の外部情報記録媒体だけでなく、ＲＯＭ、ＲＡＭ等のメモリ、ハードディスク等の内部情報記録媒体も適用可能である。

【０１３１】

また、情報読み取り部１１０、２１０としては、上記の媒体に合わせて磁気やレーザー光により読みとるものや、入出力ポート等の信号を読み取るもの等を適用できる。その他のハードウェアは上述したものと同様である。

【０１３２】

なお、本実施の形態は、ゲーム画像を生成、伝送、表示するゲームネットワークシステムに限られず、リアルタイム画像を生成、伝送、表示するリアルタイム画像表示システムにも適用可能である。

【０１３３】

例えば、リアルタイム画像データを生成して、伝送路を介して伝送する画像生成装置と、前記伝送路を介して前記リアルタイム画像データを受信して、前記リアルタイム画像データを表示する画像表示装置とを有するリアルタイム画像表示システムとして以下のものを実現できる。

【０１３４】

前記画像生成装置に、１画面より小さい所定の処理単位ごとに前記リアルタイム画像データを生成する画像生成手段と、前記所定の処理単位ごとに前記リアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信する送信手段とを設ける。

【０１３５】

また、前記画像表示装置に、受信した前記リアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示する画像表示手段を設ける。

【０１３６】

これにより、画像生成に対してリアルタイムに画像表示が可能なリアルタイム画像表示システムを実現できる。

【０１３７】

従来は、画像データが線性にされ、伝送先で、できるだけ原画像に近い画像を表示でき

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るよう画像を生成して伝送するということは、あまり考慮されていなかった。

【０１３８】

これによれば、１画面分の画像データより小さな単位で当該データを生成、伝送することにより、伝送先では原画像をほぼリアルタイムに表示できる。

【０１３９】

ここで、リアルタイム画像データとしては、例えば、リアルタイム性が要求される画像データ、具体的には、ネットワーク形態の画像を用いた会議システム用の画像データ等が該当する。

【０１４０】

例えば、本実施の形態を、リアルタイム画像会議システムに適用すれば、各会議の開催される場所間で画像表示の遅れがほとんどなく、快適かつ円滑な会議システムを実現できる。

【０１４１】

なお、第１の実施例で説明したゲームシステムも、このリアルタイム画像表示システムを用いてデータ圧縮機能およびデータ伸張機能を省略した形態での実現も可能である。

【０１４２】

アナログ映像信号のように圧縮しない画像を送受信する方式も適用可能であるが、必要な伝送帯域量が少ない、加工等が容易等の点からアナログ映像信号を圧縮してデジタルデータ化してデジタル画像データを送受信する方式を適用することが好ましい。

【０１４３】

この場合、前記画像生成装置に、前記生成したリアルタイム画像データを順次圧縮する圧縮手段を設け、前記送信手段に、前記圧縮したリアルタイム画像データを、前記伝送路を介して前記画像表示装置へ向け順次送信させる。

【０１４４】

また、前記画像表示装置に、受信した前記圧縮したリアルタイム画像データを順次伸張する伸張手段を設け、前記画像表示手段に、前記伸張したリアルタイム画像データから前記１画面分の前記リアルタイム画像データが完成するよう表示させる。

【０１４５】

これにより、データの圧縮伸張においてもリアルタイム性を向上させるリアルタイム画像表示システムを実現することができる。

【０１４６】

また、上述したリアルタイム画像データやゲーム画像データは、必ずしも動画でなくてもよい。例えば、リアルタイム会議でスライドショーやプレゼンテーションのように静止画を連続して送る場合等にも適用できる。

【０１４７】

また、上述した伝送路は、光ファイバケーブルや同軸ケーブルのように有線のものだけでなく、衛星通信のように無線のものであってもよい。

【０１４８】

【図面の簡単な説明】

【図１】

ゲームシステムによる画像表示のタイミングチャートであり、図１（Ａ）は従来のタイミングチャートであり、図１（Ｂ）は本実施の形態の一例に係るゲームシステムを用いた場合のタイミングチャートである。

【図２】

本実施の形態の一例に係るゲームシステムの全体図である。

【図３】

本実施の形態の一例に係るゲームシステムの機能ブロック図である。

【図４】

１画面分のゲーム画像データを４分割して処理する場合の処理順序の概要図である。

【図５】

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図３に示すゲームシステムの動作を示すフローチャートであり、図５（Ａ）はプレーヤーの操作からゲーム演算まで、図５（Ｂ）はゲーム演算後、画像生成から画像表示までの流れを示すフローチャートである。

【図６】

本実施の形態の一例に係る情報記録媒体およびこの情報記録媒体を用いて実現するゲームデータ配信装置の機能ブロック図である。

【図７】

図７は、本実施の形態の他の一例に係る情報記録媒体およびこの情報記録媒体を用いて実現するゲーム端末装置の機能ブロック図である。

【符号の説明】

１０　画像生成部
２０　画像圧縮部
３０、６０　データ送受信部
３８　識別部
４０　ゲーム演算部
５０　操作部
５２　配信要求データ生成部
７０　画像伸張部
８０　画像表示部
１００　ゲームデータ配信装置
２００　ゲーム端末装置
３００　通信回線
６００、７００　情報記録媒体

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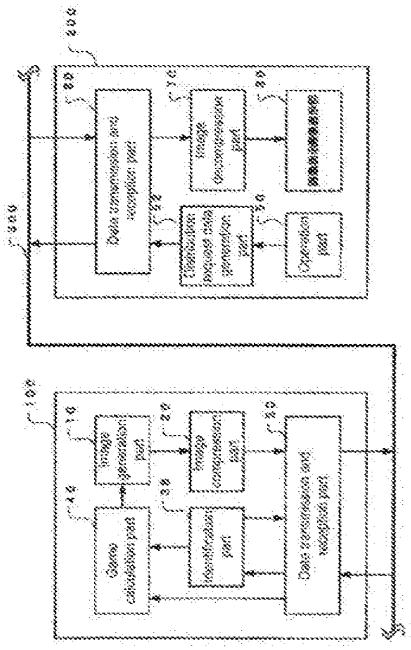
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(54) [Title of the Invention] **A GAME SYSTEM, A GAME DATA DISTRIBUTION APPARATUS, A GAME APPARATUS, A REAL-TIME IMAGE DISPLAY SYSTEM, AND AN INFORMATION RECORDING MEDIUM**

(57) [Abstract]
[Problem] To provide a game system, a game data distribution apparatus, a game apparatus, a real-time image display system, and an information recording medium, which can suppress image display delays and display an image in real time.
[Resolution means] Provided is a game data distribution apparatus 100 which has an image generation part 10 (for generating game image data for each predetermined processing unit smaller than one screen in accordance with distribution request data transmitted from a game terminal apparatus 200) and an image compression part 20 (for compressing the generated image data), as well as the game terminal apparatus 200 which has an image decompression part 70 (for decompressing the game image data) and an image display part 80 (for displaying a game image). The game data distribution apparatus 100 is made to sequentially compress and transmit the generated game image, while the game terminal apparatus 200 is made to sequentially receive, decompress, and display this image.



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[Detailed description of the invention]

[TECHNICAL FIELD OF THE INVENTION]

1

The present invention relates to a game system, a game data distribution apparatus, a game apparatus, a real-time image display system, and an information recording medium.

[BACKGROUND ART AND PROBLEMS TO BE SOLVED BY THE INVENTION]

2

Conventionally, in the case of displaying an image on another processing apparatus via a transmission path, a processing apparatus serving as the transmission source compresses and transmits the image data in each one screen in accordance with the handleability of image data, etc., while the processing apparatus serving as the transmission destination decompresses and displays the image data in each one screen.

3

Consequently, in the conventional method, the image data must be compressed at each one screen in order to handle the image data in a screen unit.

4

For example, as illustrated in FIG. 1(A), from the start of the generation of one screen of the image at a processing apparatus serving as the transmission source to the start of the display of the image at a processing apparatus serving as the transmission destination, it takes one screen of the image generation time and one screen of the image decompression time. Therefore, even if transmission delays are eliminated, two screens of the delay time from image generation to image display occur.

5

In this manner, if significant delays occur in the image display, the image must be displayed in real time as in the case of a conference with a remote area using a network type game; however, the real-time properties are problematically not assured.

6

Particularly when a game image is suitably transmitted from a host to the game terminal in accordance with the input of a game terminal, it is extremely important to raise the response of the image display to the input, that is, suppress delays from input to image display and assure the real-time properties.

7

The present invention has been created in view of the abovementioned problem, with an object of providing a game system, a game data distribution apparatus, a game apparatus, a real-time image display system, and an information recording medium, which can suppress image display delays and display an image in real time.

[SUMMARY OF THE INVENTION]

8

In order to solve the abovementioned problem, a game system according to claim 1 includes: a terminal apparatus for transmitting distribution request data; and a game data distribution apparatus for generating game image data based on the

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distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the game image data to the terminal apparatus, wherein the terminal apparatus displays the received game image data. Herein, the game data distribution apparatus includes: a means for receiving the distribution request data from the terminal apparatus; a means for generating the game image data of each screen in each one screen based on the received distribution request data; and a means for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the terminal apparatus. The terminal apparatus includes: a means for generating the distribution request data based on the operation results of a player; a means for transmitting the generated distribution request data to the image generation apparatus; a means for receiving the game image data and sequentially decompressing the data; and a means for displaying this decompressed game image data.

9

In carrying out a network type game, it is extremely important to match the start timing of the game in each game terminal apparatus. Particularly upon generating the image in accordance with the input of a player, a response to the input must be carried out in real time.

10

In contrast, because a game moving image has little correlation between frames, that is, has drastic changes, processing for interpolating missing data is not easily carried out, requiring high quality images.

11

According to the present invention, transmission delays can be reduced by transmitting the game image data in small units. Moreover, because the compressed data can be decompressed in units smaller than one screen even upon the decompression thereof at the transmission destination, the real-time properties can be assured.

12

Here, a predetermined processing unit corresponds to, for example, a scanning line unit or an image compression unit, etc. Moreover, during JPEG compression, an 8X8 pixel unit is preferably employed as the image compression unit. Even when dividing the game image data, such a unit allows processing such as compression, decompression, and display to be easily carried out.

13

Moreover, the game data distribution apparatus can generate the real-time image data in each predetermined number of scanning line units. In this case, the image compression unit is preferably simultaneously applied.

14

Moreover, by transmitting the compressed game image data in small units, the influence on the entire system can be suppressed even in the event of an error in transmission data.

15

That is, in the case of transmitting compression data in a conventional frame (one screen) unit, if an error is found in the transmission data at the transmission destination, and this transmission data is retransmitted, at least one screen of the data must be retransmitted. If the data cannot be retransmitted, processing such as redisplaying the previously displayed screen at the transmission destination, etc. must be carried out, leading to a deterioration in image quality.

16

According to the present invention, even in the event of an error in compression and transmission data, the data retransmission amount can be suppressed. Even if the data cannot be retransmitted, only a portion of one screen is missing at the transmission destination upon display, making it possible to reduce any discomfort to the person viewing the image.

17

Moreover, the invention according to claim 2 is a game system, including: a terminal apparatus for transmitting distribution request data; and a game data distribution apparatus for generating game image data based on the distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the game image data to the terminal apparatus, wherein the terminal apparatus displays the received game image data. Herein, the game data distribution apparatus includes: a means for receiving the distribution request data from the terminal apparatus; a means for sequentially generating the game image data of each screen for each predetermined processing unit smaller than one screen based on the received distribution request data; and a means for sequentially compressing the generated game image data in addition to transmitting the game image data to the terminal apparatus. The terminal apparatus includes: a means for generating the distribution request data based on the operation results of a player; a means for transmitting the generated distribution request data to the game data distribution apparatus; a means for receiving and sequentially decompressing the game image data; and a means for sequentially displaying this decompressed game image data.

18

According to the present invention, the processing (including generation and display) of the game image data in units smaller than one screen further assures the real-time properties.

19

Moreover, the invention according to claim 3, in any of claims 1 and 2, is the game system, wherein multiple terminal apparatuses are connected to the transmission path, wherein the game data distribution apparatus generates the game image data in each terminal apparatus based on the distribution request data from each terminal apparatus, compresses the generated game image data, and transmits the game image data to the corresponding terminal apparatus.

20

According to the present invention, also in the state in which multiple terminal apparatuses are connected to the transmission path, in accordance with the operation of the player in each terminal apparatus, a game system which can display images in each terminal apparatus in real time can be implemented.

21

Moreover, when the game image data is only transmitted to the terminal apparatus (to which the distribution request data has been transmitted), unnecessary traffic can be eliminated, enabling the real-time properties to be assured.

22

The game data distribution apparatus according to claim 4 is a game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus, the game data distribution apparatus including: a means for receiving the data from the client apparatus; a means for generating the game image data of each screen based on the received distribution

request data; and a means for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the client apparatus.
23

If the image is generated in accordance with the input of the client apparatus such as the game terminal to transmit the image to the client apparatus, a quick response speed to the input, that is the real-time properties, is required.
24

According to the present invention, image processing for each predetermined processing unit smaller than one screen can generate, compress, and transmit an image in more real time than a system of processing in each one screen.
25

Moreover, the invention according to claim 5 is a game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus. Herein, the game data distribution apparatus includes: a means for receiving the distribution request data from the client apparatus; a means for sequentially generating the game image data of each screen for each predetermined processing unit smaller than one screen based on the received distribution request data; and a means for sequentially compressing the generated game image data in addition to transmitting the game image data to the client apparatus.
26

According to the present invention, the image processing (including generation) for each predetermined processing unit smaller than one screen further assures the real-time properties.
27

The invention according to claim 6 includes a means for identifying the client apparatus serving as the transmission source based on the distribution request data, wherein the generated compressed game image data is transmitted to the identified client apparatus.
28

According to the present invention, when this game image data is transmitted to the identified client apparatus, unnecessary traffic can be eliminated, enabling the real-time properties to be assured.
29

The game apparatus according to claim 7 is a game apparatus, including: a means for generating distribution request data based on the operation results of a player; a means for transmitting the generated distribution request data to a server apparatus via a transmission path; and a reception means for receiving game image data which has been generated and transmitted by the server apparatus based on the distribution request data. Herein, the reception means receives the game image data in a compressed state for each predetermined processing unit smaller than one screen. The game apparatus includes: a means for sequentially decompressing the received game image data; and a means for displaying this decompressed game image data.
30

According to the present invention, by sequentially decompressing and displaying the game image data in a predetermined processing unit smaller than one screen, the real-time properties of the image display can be improved.
31

Moreover, the real-time image display system according to claim 8 is a real-time image display system, including: an image generation apparatus for generating real-time image data and transmitting the real-time image data via a transmission path; and an image display apparatus for receiving the real-time image data via the transmission path and displaying the real-time image data. The image generation apparatus includes: a means for generating the real-time image data of each screen for each predetermined processing unit smaller than one screen; and a means for sequentially transmitting the real-time image data to the image display apparatus via the transmission path. The image display apparatus includes a display means for displaying that the one screen of the real-time image data is completed from the received real-time image data.

32

According to the present invention, by generating and transmitting this data in units smaller than one screen of the image data, the original image can be displayed at the transmission destination in nearly real time.

33

Here, the real-time image data corresponds to, for example, image data requiring real-time properties, specifically, image data for a conference system using an image in the network form, game image data for a game in the network form, etc.

34

That is, according to the present invention, even in image data requiring the real-time properties and high quality of the image display, the original image can be displayed in nearly real time without causing delays in a frame (one screen) unit.

35

Moreover, here, a predetermined processing unit corresponds to, for example, the scanning line unit or the image compression unit. For example, during JPEG compression, an 8X8 pixel unit is preferably employed as the image compression unit. Even when dividing the image data, such a unit allows processing such as compression, decompression, and display to be easily carried out.

36

Moreover, the image generation apparatus can generate real-time image data in each predetermined number of scanning line units. In this case, the image compression unit is preferably simultaneously applied.

37

Moreover, by transmitting the image data in small units, the influence on the entire system can be suppressed even in the event of an error in transmission data.

38

Moreover, in the invention according to claim 9, in claim 8, the image generation apparatus includes a means for sequentially compressing the generated real-time image data, wherein the transmission means sequentially transmits the compressed real-time image data to the image display apparatus via the transmission path. The image display apparatus includes a means for sequentially decompressing the received compressed real-time image data. The display means displays that the one screen of the real-time image data is completed from the decompressed real-time image data.

39

According to the present invention, compression and transmission can reduce the data occupied amount of the transmission bandwidth. In this case as well, by sequentially generating, compressing, transmitting, decompressing, etc. this data in the predetermined unit, the image can be displayed in real time.

40

Here, various compression techniques such as compression using DCT (discrete cosine transformation) (such as MPEG) are applicable to compression using the compression means, with the application of JPEG compression particularly preferable.

41

By applying JPEG compression, the image display apparatus serving as the transmission destination can display an image faithful to the original image without involving an increase in delays due to the interpolation between frames as in MPEG compression.

42

Moreover, the information recording medium according to claim 10 is a computer readable information recording medium with information recorded for generating game image data based on distribution request data which is transmitted from a client apparatus via a transmission path in addition to transmitting the game image data to the client apparatus. Herein, the information includes: information for generating the game image data based on the distribution request data; and information for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the client apparatus.

43

Here, the game image data is the image data required to display the game image in real time, as in a multi-player game, etc.

44

According to the present invention, when the game image data is sequentially compressed and transmitted for each predetermined processing unit smaller than one screen, delays from generation to display can be suppressed, while the client apparatus which has received this game image data can display the game image in nearly real time.

45

Moreover, here, a predetermined processing unit corresponds to, for example, the scanning line unit or the image compression unit, etc. Moreover, during JPEG compression, an 8X8 pixel unit is preferably employed as the image compression unit. Even when dividing the game image data, such a unit allows processing such as compression, decompression, and display to be easily carried out.

46

Moreover, the invention according to claim 11 is a computer readable information recording medium with information recorded for receiving game image data (which is generated and transmitted by an image generation apparatus based on game data input by a game player) via a network and displaying the game image data, wherein the game image data is compressed in a predetermined processing unit smaller than one screen. Herein the information includes: information for receiving the game image data and sequentially decompressing the received game image data; and information for displaying this decompressed game image data.

47

According to the present invention, image processing in a predetermined processing unit smaller than one screen can suppress delays from the generation to display of an image, thereby allowing the game player to feel the image display to his/her own game operation in more real time.

[EMBODIMENTS OF THE INVENTION]

48

Preferred embodiments of the present invention applied to a game system will hereinafter be described with reference to the drawings.

49

Note that the application of the present invention is not limited, with the present invention capable of being applied to various image display systems for displaying the image in real time.

50

(Example 1)

FIG. 1 is a timing chart of the image display of a game system, wherein (A) is a conventional timing chart, while (B) is a timing chart using the game system according to one example of the present embodiment.

51

As illustrated in FIG. 1(A), conventional image data display systems handle an image in one image unit, sequentially carry out processing of compression, transmission, and decompression (when the input of one image of A ends), and display and output the image (when the decompression processing of the entire one image of A ends).

52

Consequently, from the start of the generation of the image at a processing apparatus serving as the transmission source to the start of the display of the image at a processing apparatus serving as the transmission destination, it takes one screen of the image generation time and one screen of the image decompression time.

53

Therefore, from the start of the image input to the start of the display and output of the image, it takes approximately two-fold that of the image input time t1 excluding transmission delays.

54

An image B corresponding to the second image is the same.

55

Consequently, if the image must be displayed in real time, this processing system causes image display delays.

56

Particularly in the case of the game system (in which, in accordance with the input data of a game terminal apparatus which functions as the client apparatus and displays a game image, the game image is generated, compressed, and transmitted at an image generation apparatus serving as a host, and decompressed and displayed at the game terminal apparatus), if an image display response to the operation of a player is slow, it causes sluggishness and makes the game boring.

57

As illustrated in FIG. 1(B), in the present embodiment, one image A is divided into four and processed as image units of A0 to A3.

58

For example, in the case of processing the A0 part, once the image input of the A0 part ends, the compression, transmission, and decompression thereof are sequentially carried out. When the decompression ends, the image of the A0 part is displayed and output.

59

As a result, the time t4 from the start of the input of one image to the start of the output of this image is shorter than the time t3 for inputting one image, making it possible to suppress display delays of the image compared with the conventional processing system illustrated in FIG. 1(A).

60

In this manner, by transmitting the game image data in smaller units, transmission delays can be reduced. Moreover, even if the compressed data is decompressed at the transmission destination, the data can be decompressed and displayed in units smaller than one screen. Therefore, the real-time properties can be assured, the start timing of the game can be suitably synchronized, and the game player can comfortably play a real-time network game.

61

An example of the image display using this principle for the game system will hereinafter be presented.

62

FIG. 2 is an overall view of the game system according to one example of the present embodiment.

63

As illustrated in FIG. 2, the game system is configured to include: a game data distribution apparatus 100 functioning as the image generation apparatus; and multiple game terminal apparatuses 200-1 to 5 connected to the game data distribution apparatus 100 via an ATM network including a communication line 300 serving as a transmission path.

64

Moreover, the game terminal apparatuses 200-1 to 3 are disposed in area A, while the game terminal apparatuses 200-4,5 are disposed in area B remote from area A. Further, both the game data distribution apparatus 100 and the game terminal apparatuses 200 are in remote areas and connected via a network including the communication line 300 configured to include an optical fiber cable.

65

The game image data generated in the game data distribution apparatus 100 is transmitted to each game terminal apparatus 200 via the communication line 300.

66

FIG. 3 is a functional block diagram of the game system according to one example of the present embodiment.

67

The game data distribution apparatus 100 is configured to include: a game calculation part 40 which carries out game calculations in accordance with distribution request data from the game terminal apparatus 200; an image generation part for generating the game image data of each screen for each predetermined processing unit smaller than one screen; and an image compression part 20 for compressing the generated image.

68

The predetermined processing unit will be mentioned later.

69

Moreover, the game data distribution apparatus 100 is configured to include: an identification part 38 for receiving the input data from the game terminal apparatus 200 in addition to identifying the game terminal apparatus 200 serving as the transmission source based on this received data; and a data transmission and reception part 30 for sequentially transmitting the game image data (compressed for

each predetermined processing unit) to the game terminal apparatus 200 (identified by the identification part 38) via the communication line 300.
70

In contrast, the game terminal apparatus 200 is configured to include: an operation part 50 in which the operation data of the player is input; a distribution request data generation part 52 for generating the distribution request data based on the operation data input from the operation part 50; and a data transmission and reception part 60 which transmits the distribution request data to the game data distribution apparatus 100 via the communication line 300 in addition to receiving the game image data transmitted from the game data distribution apparatus 100.
71

Moreover, the game terminal apparatus 200 is configured to include: an image decompression part 70 for decompressing the received game image data; and an image display part 80 for displaying that one screen of the game image data is completed from the decompressed game image data.
72

Note that here, as the identification part 38, the game calculation part 40, and the distribution request data generation part 52, for example, a CPU can be applied; as an image generation part 10 and an image compression part 30, for example, a game substrate which receives instructions from the CPU and generates the image, and which has a clock generator, VRAM, compression chip, etc., can be applied; and as the data transmission and reception parts 30, 80, for example, communication equipment such as an ATM switch can be applied.
73

Moreover, as the operation part 50, for example, a lever and a button can be applied, while as the image decompression part 70 and the image display part 80, for example, a video card and display which receive instructions from the CPU and display the image, and which have a clock generator, VRAM, decompression chip, DA converter, etc., can be applied.
74

The abovementioned predetermined processing unit is, for example, preferably an 8X8 pixel unit in the case of the scanning line unit or JPEG compression.
75

For example, in the case of JPEG compression, even if a non-interlace system screen of 640X480 dots can be divided into four (which is an integral multiplication of the 8X8 pixel unit as well as the scanning line unit), and can be generated, compressed, transmitted, decompressed, and displayed per 640X120 dots.
76

Note that a screen of 640X480 dots is displayed per 640X240 dots, that is, in the case of the display in an interlace system, 240 lines are preferably processed (for example, generated) per 64, 64, 64, 48 lines.
77

In the case of division in such a unit, both the interlace and the non-interlace facilitate address processing, enabling improvements in the real-time properties of image processing.
78

FIG. 4 is a schematic diagram of the processing order of the processing involving dividing one screen of game image data into four.
79

As described in FIG. 1, the image generation part 10 carries out processing (such as generation, compression, transmission, decompression, and display) of the game image data for each scanning line unit serving as a quarter of one screen.

80

Therefore, as the processing order in a screen 140, the processing order is an image 150-1 corresponding to an image A0 in FIG. 1, an image 150-2 corresponding to an image A1 in FIG. 1, an image 150-3 corresponding to an image A2 in FIG. 1, and an image 150-4 corresponding to an image A3 in FIG. 1.

81

In this manner, by transmitting the image data in small units, the influence on the entire system can be suppressed even in the event of an error in transmission data. That is, in the case of transmitting compression data in a conventional frame (one screen) unit, if an error is found in the transmission data at the transmission destination and this transmission data is retransmitted, at least one image of the data must be retransmitted. If the data cannot be retransmitted, processing such as redisplaying the previously displayed image at the transmission destination, etc. must be carried out, leading to a deterioration in image quality.

82

According to the present embodiment, the data retransmission amount can be suppressed. Even if the data cannot be retransmitted, only a portion of one image is missing at the transmission destination upon display, making it possible to reduce any discomfort to the person viewing the image.

83

Here, the specific operation of the game system will be described with reference to a flowchart.

84

FIG. 5 is a flowchart illustrating the operation of the game system illustrated in FIG. 3.

85

First, the flow from the operation of a player to game calculation will be described with reference to FIG. 5(A).

86

The game player plays the real-time network game in the game terminal apparatus 200 which functions as the client apparatus.

87

For example, if the player operates the lever (Step 2), the operation information is generated as operation data in the operation part 50, after which, based on this operation data, the distribution request data generation part 52 generates distribution request data including identification information of the self apparatus.

88

The generated distribution request data is transmitted to the game data distribution apparatus 100 (which functions as a server apparatus) via the communication line 300 using the data transmission and reception part 60 (Step 4).

89

The game data distribution apparatus 100 receives the distribution request data transmitted from the game terminal apparatus 200 (Step 6). The identification part 38 identifies the game terminal apparatus 200 (which has transmitted the distribution request data) based on this distribution request data. The distribution request data is transmitted to the game calculation part 40.

90

The game calculation part 40 carries out the game calculation based on the distribution request data (Step 8).

91

Next, the flow after the game calculation from image generation to image display at the game terminal apparatus 200 will be described with reference to FIG. 5(B).

92

Based on the calculation results of the game calculation part 40, the image generation part 10 sequentially generates the game image data in each quarter image of each screen (Step 22).

93

The image compression part 20 sequentially compresses the generated game image data (Step 24).

94

Here, various compression techniques such as compression using DCT (discrete cosine transformation) (such as MPEG) are applicable to compression using the image compression part 20, with the application of JPEG compression particularly preferable. By applying JPEG compression, the game terminal apparatus 200 serving as the transmission destination can display an image faithful to the original image in real time without involving an increase in delays due to the interpolation between frames as in MPEG compression.

95

The data transmission and reception part 30 sequentially transmits the compressed game image data to the game terminal apparatus 200 (identified by the identification part 38) via the communication line 300

(Step 26). Note that the data transmission and reception part 30 transmits data (such as compression information, which should be normally transmitted) in addition to the game image data.

96

In contrast, in the game terminal apparatus 200, the data transmission and reception part 60 sequentially receives the game image data (Step 28).

97

The image decompression part 70 sequentially decompresses the received compressed game image data (Step 30).

98

When a quarter screen of the game image data is decompressed, the image display part 80 displays the decompressed game image data (Step 32). Executing this display processing four times completes one screen of the game image data.

99

As described above, the present embodiment exerts the following operations and effects.

100

In carrying out a network type game, it is extremely important to match the start timing of the game in each game terminal apparatus. Moreover, because a game moving image has little correlation between frames, that is, has drastic changes, processing for interpolating missing data is not easily carried out, requiring high quality images.

101

Moreover, in the game in the network form, enhancing an image display response to the operation of the player is important to comfortably play the game.

102

According to the present embodiment, processing of the game image data in units smaller than one screen can reduce the delay in processing from the generation to the display of images.

103

In this manner, a reduction in the transmission delay time due to processing in units smaller than one screen can assure the real-time properties, allowing the game player to feel a response to the game with respect to his/her own lever operation in more real time and to comfortably play the network game.

104

Particularly upon application to a multi-player game, a large number of persons can simultaneously receive real-time game images, which is very effective.

105

Further, because the identification part 38 can identify the game terminal apparatuses, when the game image is transmitted only to the game terminal apparatus which requires the transmission of the game image, it becomes possible to suppress traffic on the communication line 300, thereby assuring the real-time properties upon data transmission.

106

Moreover, because the game image data is divided in each predetermined number of scanning line units, the image display part 80 of the game terminal apparatus 200 is not displayed after decompressing one screen of the image, but can be displayed from the decompressed part of one screen. As a result, the real-time properties of the image display can be further enhanced.

107

Moreover, as illustrated in FIG. 1(B), even in the case of handling for each quarter screen of the image data, parallel processing can be used in each processing of compression, transmission, and decompression. As a result, as mentioned above, the output of the image can be started for a time t4 shorter than the time t3 for inputting one screen of the image. That is, while image display delays can be suppressed, the image can be displayed in real time.

108

Note that the image may be generated and displayed in each one screen (as conventionally carried out) without any division.

109

As a result, compared with the abovementioned embodiment, although the real-time properties are slightly impaired, the hardware load upon image generation and image display can be reduced. In addition, compared with conventional systems, the image can be displayed while focusing on the real-time properties.

110

(Example 2)

A computer can be made to function as the abovementioned game data distribution apparatus 100 using an information recording medium in nearly the same way.

111

FIG. 6 is a functional block diagram of an information recording medium 600 according to one example of the present embodiment as well as a game data distribution apparatus 100 implemented using this information recording medium 600.

112

The information recording medium 600 is computer readable with information recorded for generating the game image data based on the distribution request data which is transmitted from a computer terminal (functioning as the client apparatus) via the communication line 300 (serving as a transmission path) in addition to transmitting the game image data to the computer terminal.

113

Moreover, here, the information includes: generation information 610 for generating the game image data based on the distribution request data; compression information 620 for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen; and transmission information 630 to be transmitted to the computer terminal.

114

Note that here, the game image data is the image data required to display the game image in real time, as in a multi-player game, etc.

115

The information 610, 630 is read by an information reading part 110 of the game data distribution apparatus 100. If the generation information 610 is read, the image generation part 10 functions to generate the image in each one screen based on the distribution request data.

116

Moreover, when the compression information 620 is read, the image compression part 20 functions to compress a generated image for each predetermined processing unit smaller than one screen.

117

Further, when the transmission information 630 is read, the data transmission and reception part 30 functions to transmit the game image data (compressed as image data smaller than one screen) to the computer terminal (which has transmitted the distribution request data).

118

As a result, when the information 610 to 630 is read by the game data distribution apparatus 100, the game image can be compressed and transmitted to the game data distribution apparatus 100 in real time.

119

As a result, the computer terminal which is the client apparatus serving as the transmission destination of this image can display this image in real time.

120

Moreover, the generation information can be formed as information for sequentially generating the game image data for each predetermined processing unit smaller than one screen. As a result, the real-time properties can be further improved.

121

(Example 3)

Moreover, a computer can be made to function as the abovementioned game terminal apparatus 200 using an information recording medium in nearly the same way.

122

FIG. 7 is a functional block diagram of an information recording medium 700 according to another example of the present embodiment as well as a game terminal apparatus 200 implemented using this information recording medium 700.

123

The information recording medium 700 is a computer readable information recording medium which receives and displays the game image data (which is generated by an image generation apparatus based on game data input by a game player, and transmitted via a network including the communication line 300).

124

Here, the game data is the data including operation information generated by the operation of an operation part such as the lever by the player.

125

Moreover, the game image data is compressed in a predetermined processing unit smaller than one screen, wherein the information includes: reception decompression information 710 for receiving the game image data and sequentially decompressing the received game image data; and image display information 720 for displaying this decompressed game image data.

126

The information 710, 720 is read by an information reading part 210 of the game terminal apparatus 200. When the reception decompression information 710 is read, the data transmission and reception part 60 sequentially receives the game image data, while the image decompression part 70 functions to sequentially decompress the received game image data.

127

Moreover, when the image display information 720 is read, the image display part 80 sequentially displays the game image data.

128

As a result, when the game terminal apparatus 200 processes the game image data in a processing unit smaller than one screen, the delay time from the generation to display of the game image data can be reduced, thereby assuring the real-time properties.

129

Note that the image display information can be formed as information for displaying the image display information such that one screen of the decompressed game image data is completely arranged. As a result, compared with the method for sequentially displaying the decompressed game image data, although the real-time properties are slightly impaired, the hardware load upon display can be reduced.

130

Moreover, not only external information recording media such as CDROMs, game cassettes, DVDRAMs, etc. but also internal information recording media such as memories (such as ROMs and RAMs) and hard disks are applicable to the information recording media 600, 700.

131

Moreover, those capable of being read with magnets and laser beams in accordance with the abovementioned media, as well as those for reading signals of input and output ports, etc., can be applied to the information reading parts 110, 210. Other hardware loads are the same as mentioned above.

132

Note that the present embodiment is not limited to a game network system for generating, transmitting, and displaying game images, but is applicable to a real-time image display system for generating, transmitting, and displaying a real-time image system.

133

For example, the following can be implemented as a real-time image display system, having: an image generation apparatus for generating real-time image data and transmitting the real-time image data via a transmission path; and an image display apparatus for receiving the real-time image data via the transmission path and displaying the real-time image data.

134

Provided in the image generation apparatus are: an image generation means for generating the real-time image data for each predetermined processing unit smaller than one screen; and a transmission means for sequentially transmitting the real-time image data to the image display apparatus via the transmission path for each predetermined processing unit.

135

Moreover, an image display means for displaying that the one screen of the real-time image data is completed from the received real-time image data is provided in the image display apparatus.

136

As a result, the real-time image display system which can display an image in real time to image generation can be implemented.

137

Conventionally, the image data is sacrificed, wherein it has rarely been considered to generate and transmit the image such that the image which is as similar as possible to the original image can be displayed at the transmission destination.

138

As a result, by generating and transmitting this data in units smaller than one screen of the image data, the original image can be displayed at the transmission destination in nearly real time.

139

Here, the real-time image data corresponds to, for example, image data requiring the real-time properties, specifically, image data for a conference system using the image in the network form, etc.

140

For example, if the present embodiment is applied to a real-time image conference system, the image display is hardly delayed between locations in which each conference is held, making it possible to implement a comfortable and smooth conference system.

141

Note that the game system described in Example 1 can also be implemented (in the form in which a data compression function and a data decompression function are omitted) using this real-time image display system.

142

While a system for transmitting and receiving uncompressed images such as an analog video signal is applicable, a system for compressing the analog video signal, forming digital data, and transmitting and receiving digital image data is preferably applied in terms of the small required transmission bandwidth amount, easy processing, etc.

143

In this case, a compression means for sequentially compressing the generated real-time image data is provided in the image generation apparatus, wherein the transmission means is made to sequentially transmit the compressed real-time image data to the image display apparatus via the transmission path.

144

Moreover, a decompression means for sequentially decompressing the received compressed real-time image data is provided in the image display apparatus, wherein the image display means is made to display that the one screen of the real-time image data is completed from the decompressed real-time image data.

145

As a result, a real-time image display system which improves the real-time properties even in the compression and decompression of the data can be implemented.

146

Moreover, the abovementioned real-time image data and game image data are not necessarily videos. For example, they can be applied to the case of transmitting static images such as for slide shows and presentations at real-time conferences, etc.

147

Moreover, the abovementioned transmission path may be not only wired as in an optical fiber cable and coaxial cable, but may be wireless as in satellite communication.

[BRIEF DESCRIPTION OF DRAWINGS]

148

FIG. 1 is a timing chart of the image display of a game system, wherein (A) is a conventional timing chart, while (B) is a timing chart using the game system according to one example of the present embodiment.

FIG. 2 is an overall view of the game system according to one example of the present embodiment.

FIG. 3 is a functional block diagram of the game system according to one example of the present embodiment.

FIG. 4 is a schematic diagram of the processing order of the processing involving dividing one screen of game image data into four.

FIG. 5 is a flowchart illustrating the operation of the game system illustrated in FIG. 3, wherein (A) is a flowchart illustrating the flow from the operation of a player to game calculation, while (B) is a flowchart illustrating the flow after the game calculation from image generation to image display.

FIG. 6 is a functional block diagram of an information recording medium according to one example of the present embodiment as well as a game data distribution apparatus implemented using this information recording medium.

FIG. 7 is a functional block diagram of an information recording medium according to another example of the present embodiment as well as a game terminal apparatus implemented using this information recording medium.

[Explanation of Symbols]

10 Image generation part
20 Image compression part
30, 60 Data transmission and reception part
38 Identification part
40 Game calculation part
50 Operation part
52 Distribution request data generation part
70 Image decompression part
80 Image display part

100 Game data distribution apparatus
200 Game terminal apparatus
300 Communication line
600, 700 Information recording medium

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What is Claimed is:

1. A game system, comprising: a terminal apparatus for transmitting distribution request data; and a game data distribution apparatus for generating game image data based on the distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the game image data to the terminal apparatus; wherein:

the terminal apparatus displays the received game image data,

the game data distribution apparatus comprises:

a means for receiving the distribution request data from the terminal apparatus;

a means for generating the game image data of each screen in each one screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the terminal apparatus; and

the terminal apparatus comprises:

a means for generating the distribution request data based on the operation results of a player;

a means for transmitting the generated distribution request data to the image generation apparatus;

a means for receiving the game image data and sequentially decompressing the data; and a means for displaying this decompressed game image data.

2. A game system, comprising: a terminal apparatus for transmitting distribution request data; and a game data distribution apparatus for generating game image data based on the distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the game image data to the terminal apparatus, wherein:

the terminal apparatus displays the received game image data;

the game data distribution apparatus comprises:

a means for receiving the distribution request data from the terminal apparatus;

a means for sequentially generating the game image data of each screen for each predetermined processing unit smaller than one screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data in addition to transmitting the game image data to the terminal apparatus,; and

the terminal apparatus includes:

a means for generating the distribution request data based on the operation results of a player;

a means for transmitting the generated distribution request data to the game data distribution apparatus;

a means for receiving and sequentially decompressing the game image data; and

a means for sequentially displaying this decompressed game image data.

3. The game system according to any one of claims 1 and 2, wherein:

multiple terminal apparatuses are connected to the transmission path,

wherein the game data distribution apparatus

generates the game image data in each terminal apparatus based on the distribution request data from each terminal apparatus, compresses the generated game image data, and transmits the game image data to the corresponding terminal apparatus.

4. A game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus, the game data distribution apparatus comprising:

a means for receiving the distribution request data from the client apparatus;

a means for generating the game image data of each screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the client apparatus.

5. A game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus, the game data distribution apparatus comprising:

a means for receiving the distribution request data from the client apparatus;

a means for sequentially generating the game image data of each screen for each predetermined processing unit smaller than one screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data in addition to transmitting the game image data to the client apparatus.

6. The game data distribution apparatus according to Claim 5, comprising

a means for identifying the client apparatus serving as the transmission source based on the distribution request data, wherein the generated compressed game image data is transmitted to the identified client apparatus.

7. A game apparatus, comprising: a means for generating distribution request data based on the operation results of a player;

a means for transmitting the generated distribution request data to a server apparatus via a transmission path; and

a reception means for receiving game image data which has been generated and transmitted by the server apparatus based on the distribution request data,

wherein the reception means

receives the game image data in a compressed state for each predetermined processing unit smaller than one screen,

wherein the game apparatus comprises:

a means for sequentially decompressing the received game image data; and

a means for displaying this decompressed game image data.

8. A real-time image display system, comprising: an image generation apparatus for generating real-time image data and transmitting the real-time image data via a transmission path; and an image display apparatus for receiving the real-time image data via the transmission path and displaying the real-time image data,

wherein the image generation apparatus comprises:

a means for generating the real-time image data of each screen for each predetermined processing unit smaller than one screen; and

a means for sequentially transmitting the real-time image data to the image display apparatus via the transmission path,

wherein the image display apparatus comprises

a display means for displaying that the one screen of the real-time image data is completed from the received real-time image data.

9. The real-time image display system according to Claim 8,

wherein the image generation apparatus comprises a means for sequentially compressing the generated real-time image data,

wherein the transmission means sequentially transmits the compressed real-time image data to the image display apparatus via the transmission path,

wherein the image display apparatus comprises a means for sequentially decompressing the received compressed real-time image data, and

wherein the display means displays that the one screen of the real-time image data is completed from the decompressed real-time image data.

10. A computer readable information recording medium with information recorded for generating game image data based on distribution request data which is transmitted from a client apparatus via a transmission path in addition to transmitting the game image data to the client apparatus,

wherein the information comprises:

information for generating the game image data based on the distribution request data; and

information for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the client apparatus.

11. A computer readable information recording medium with information recorded for receiving game image data (which is generated and transmitted by an image generation apparatus based on game data input by a game player) via a network and displaying the game image data,

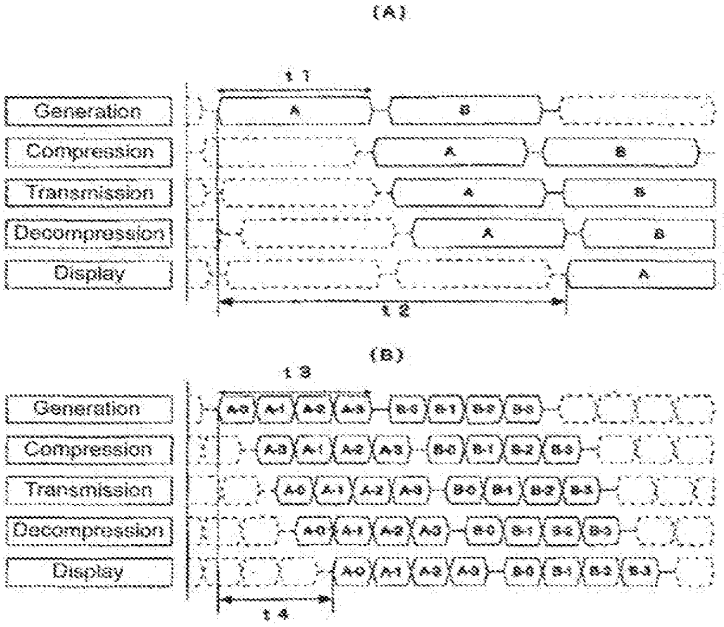
wherein the game image data is compressed in a predetermined processing unit smaller than one screen,

wherein the information comprises:

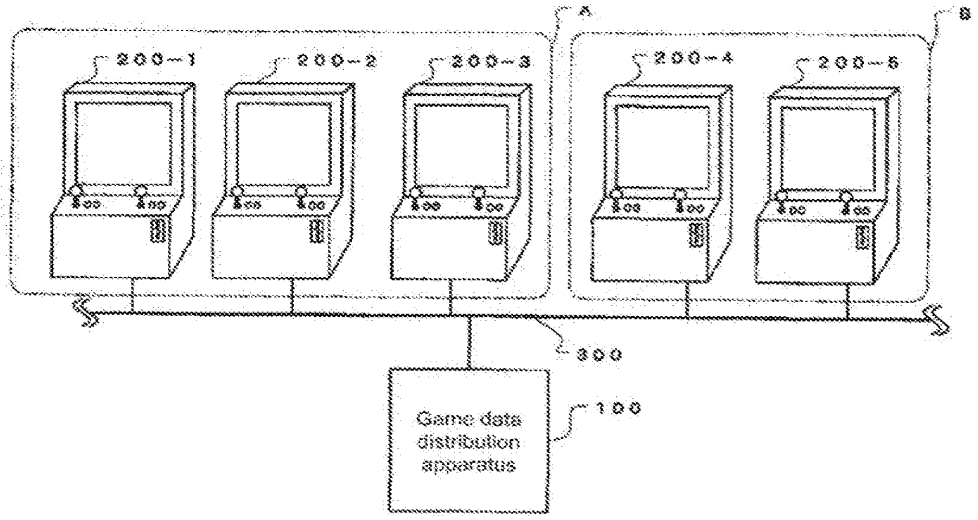
information for receiving the game image data and sequentially decompressing the received game image data; and

information for displaying this decompressed game image data.

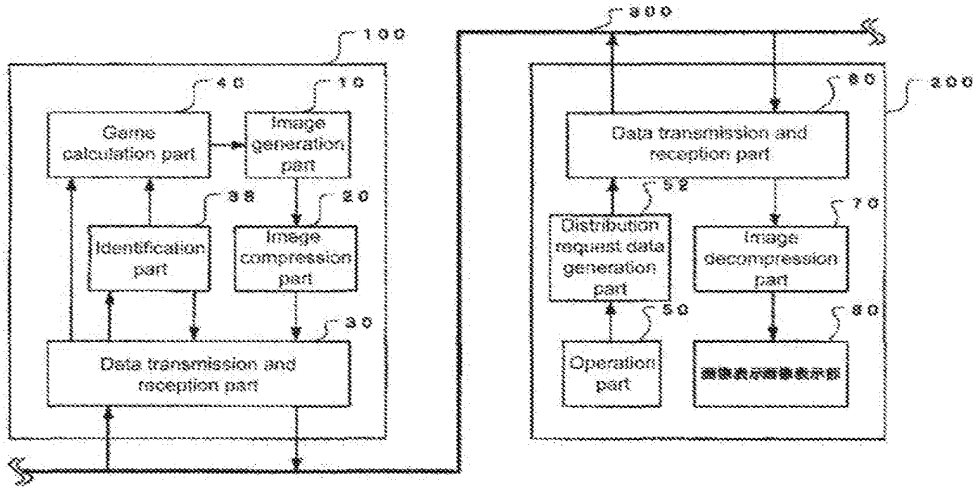
Document Title: Drawings
[FIG. 1]



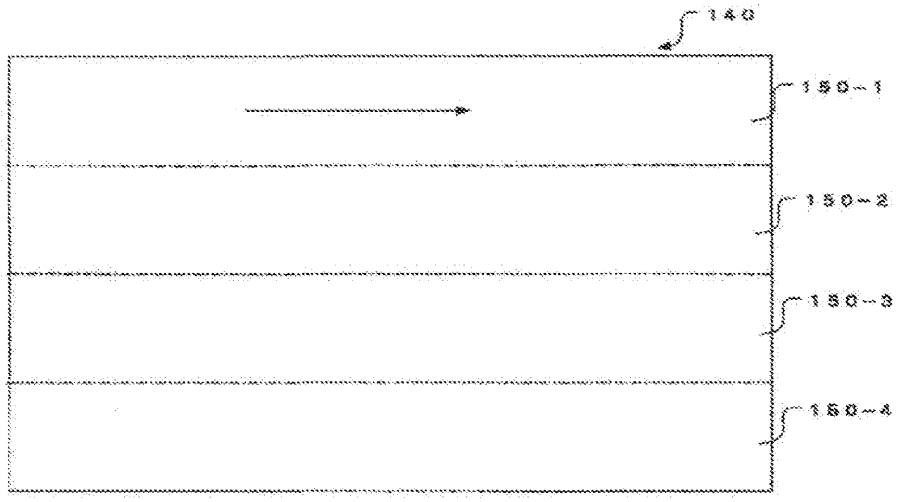
[FIG. 2]



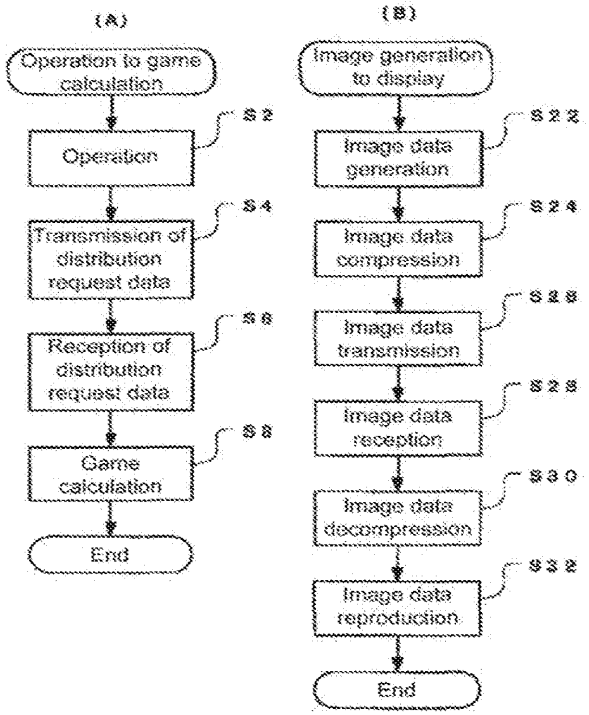
[FIG. 3]


100
40
10
Game calculation part
Image generation part
38
20
Identification part
Image compression part
30
Data transmission and reception part
300
200
80
Data transmission and reception part
52
70
Distribution request data generation part
Image decompression part
50
60
Operation part

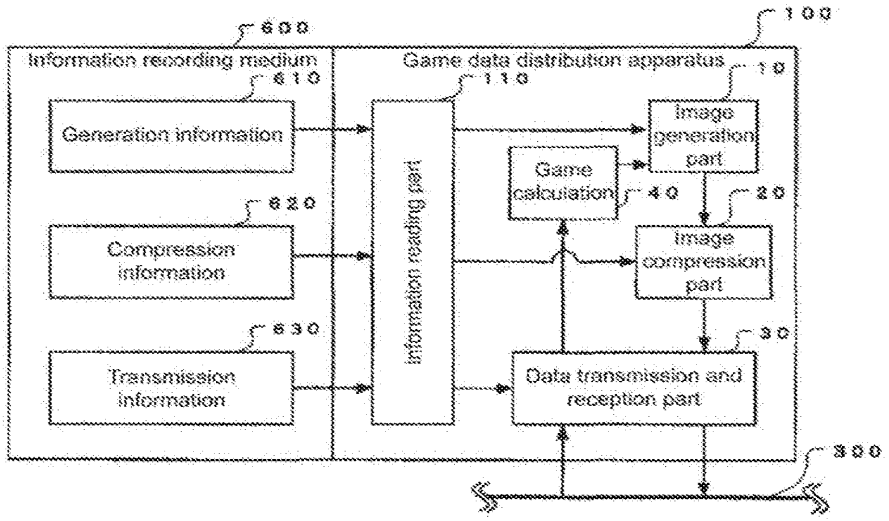
[FIG. 4]


140
150-1
150-2
150-3
150-4

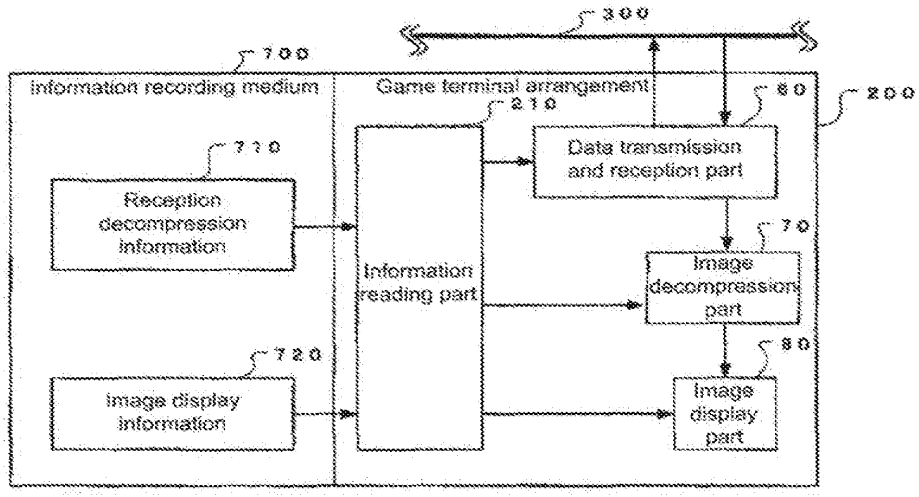
[FIG. 5]


(A)
Operation to game calculation
Operation
S2
Transmission of distribution request data
S4
Reception of distribution request data
S6
Game calculation
S8
End
(B)
Image generation to display
Image data generation
S22
Image data compression
S24
Image data transmission
S26
Image data reception
S28
Image data decompression
S30
Image data reproduction
S32
End

[FIG. 6]


600
Information recording medium
610
Generation information
620
Compression information
630
Transmission information
100
Game data distribution apparatus
110
Information reading part
10
Image generation part
Game calculation
40
20
Image compression part
30
Data transmission and reception part
300

[FIG. 7]


300
700
Information recording medium
Game terminal arrangement
210
80
200
710
Reception decompression information
Data transmission and reception part
70
Information reading part
Image decompression part
80
720
Image display information
Image display part

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[TITLE OF THE INVENTION] A GAME SYSTEM, A GAME DATA DISTRIBUTION APPARATUS, A GAME APPARATUS, A REAL-TIME IMAGE DISPLAY SYSTEM, AND AN INFORMATION RECORDING MEDIUM

[Detailed description of the invention]
[TECHNICAL FIELD OF THE INVENTION]

149

The present invention relates to a game system, a game data distribution apparatus, a game apparatus, a real-time image display system, and an information recording medium.

[BACKGROUND ART AND PROBLEMS TO BE SOLVED BY THE INVENTION]]
150

Conventionally, in the case of displaying an image at another processing apparatus via a transmission path, a processing apparatus serving as the transmission source compresses and transmits the image data in each one screen in terms of handleability of image data, etc., while the processing apparatus serving as the transmission destination decompresses and displays the image data on each one screen.
151

Consequently, in a conventional method, the image data must be compressed at each one screen in order to handle the image data in a screen unit.
152

For example, as illustrated in FIG. 1(A), from the start of the generation of one screen of the image at a processing apparatus serving as the transmission source to the start of the display of the image at a processing apparatus serving as the transmission destination, it takes one screen of the image generation time and one screen of the image decompression time. Therefore, even if transmission delay is eliminated, two screens of the delay time from image generation to image display occur.
153

In this manner, if significant delay occurs in the image display, the image must be displayed in real time as in the case of a conference with a remote area using a network type game; however, the real-time properties are problematically not assured.
154

Particularly when a game image is suitably transmitted from a host to the game terminal in accordance with the input of a game terminal, it is extremely important to raise the response of the image display to the input, that is, suppress delays from input to image display and assure the real-time properties.
155

The present invention has been created in view of the abovementioned problem, with the object of providing a game system, a game data distribution apparatus, a game apparatus, a real-time image display system, and an information recording medium, which can suppress image display delays and display an image in real time.

[SUMMARY OF THE INVENTION]

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156

In order to solve the abovementioned problem, a game system according to the present invention includes: a terminal apparatus for transmitting distribution request data; and

a game data distribution apparatus for generating game image data based on the distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the game image data to the terminal apparatus, wherein the terminal apparatus displays the received game image data,

wherein the game data distribution apparatus includes:

a means for receiving the distribution request data from the terminal apparatus;

a means for generating overall game image data indicating one screen of image data based on the received distribution request data; and

a means for dividing the overall game image data for each predetermined processing unit smaller than one screen to generate game image data, sequentially compressing this game image data, and transmitting the compressed game image data to the terminal apparatus,

wherein the terminal apparatus includes:

a means for generating the distribution request data based on the operation results of a player;

a means for transmitting the generated distribution request data to the game data distribution apparatus;

a means for receiving and sequentially decompressing the compressed game image data; and

a means for displaying the game image based on this decompressed game image data.

157

In carrying out a network type game, it is extremely important to match the start timing of the game in each game terminal apparatus. Particularly upon generating the image in accordance with the input of a player, a response to the input must be carried out in real time.

158

In contrast, because a game moving image has little correlation between frames, that is, has drastic changes, processing for interpolating missing data is not easily carried out, requiring high quality images.

159

According to the present invention, transmission delays can be reduced by transmitting the game image data in small units. Moreover, because the compressed data can be decompressed in units smaller than one screen even upon the decompression thereof at the transmission destination, the real-time properties can be assured.

160

Here, a predetermined processing unit corresponds to, for example, a scanning line unit or an image compression unit, etc. Moreover, during JPEG compression, an 8X8 pixel unit may be employed as the image compression unit. Even when dividing the game image data, such a unit allows processing such as compression, decompression, and display to be easily carried out.

161

Moreover, the game data distribution apparatus can generate the real-time image data in each predetermined number of scanning line units. In this case, the image compression unit may be simultaneously applied.

162

Moreover, by transmitting the compressed game image data in small units, the influence on the entire system can be suppressed even in the event of an error in transmission data.

163

That is, in the case of transmitting compression data in a conventional frame (one screen) unit, if an error is found in the transmission data at the transmission destination and this transmission data is retransmitted, at least one screen of the data must be retransmitted. If the data cannot be retransmitted, processing such as redisplaying the previously displayed screen at the transmission destination, etc. must be carried out, leading to a deterioration in image quality.

164

According to this configuration, even in the event of an error in compression and transmission data, the data retransmission amount can be suppressed. Even if the data cannot be retransmitted, only a portion of one screen is missing at the transmission destination upon display, making it possible to reduce any discomfort to the person viewing the image.

165

Moreover, the game system according to the present invention includes: a terminal apparatus for transmitting distribution request data; and

a game data distribution apparatus for generating game image data based on the distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the game image data to the terminal apparatus,

wherein the game data distribution apparatus includes:

a means for receiving the distribution request data from the terminal apparatus;

a means for sequentially generating the game image data for each predetermined processing unit smaller than one screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data in addition to transmitting the game image data to the terminal apparatus,

wherein the terminal apparatus includes:

a means for generating the distribution request data based on the operation results of a player;

a means for receiving and sequentially decompressing the compressed game image data; and

a means for displaying the game image based on this decompressed game image data.

166

According to the present invention, the processing (including generation and display) of the game image data in units smaller than one screen further assures the real-time properties.

167

Moreover, multiple terminal apparatuses are connected to the transmission path,

wherein the game data distribution apparatus:

may generate the game image data in each terminal apparatus based on the distribution request data from each terminal apparatus, compress the generated game image data, and transmit the game image data to the corresponding terminal apparatus.

168

According to this configuration, also in the state in which multiple terminal apparatuses are connected to the transmission path, in accordance with the operation of the player in each terminal apparatus, a game system which can display the image in each terminal apparatus in real time can be implemented.

169

Moreover, when the game image data is only transmitted to the terminal apparatus (to which the distribution request data has been transmitted), unnecessary traffic can be eliminated, enabling the real-time properties to be assured.

170

Moreover, the game data distribution apparatus according to the present invention is a game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus, the game data distribution apparatus including:

a means for receiving the data from the client apparatus;

a means for generating overall game image data indicating one screen of image data based on the received distribution request data; and

a means for dividing the overall game image data for each predetermined processing unit smaller than one screen to generate game image data, sequentially compressing this game image data, and transmitting the compressed game image data to the client apparatus.

171

If the image is generated in accordance with the input of the client apparatus such as the game terminal to transmit the image to the client apparatus, a quick response speed to the input, that is the real-time properties, is required.

172

According to the present invention, image processing for each predetermined processing unit smaller than one screen can generate, compress, and transmit an image in more real time than a system of processing in each one screen.

173

Moreover, the game data distribution apparatus according to the present invention is a game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus, the game data distribution apparatus including:

a means for receiving the distribution request data from the client apparatus;

a means for sequentially generating the game image data for each predetermined processing unit smaller than one screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data in addition to transmitting the game image data to the client apparatus.

174

According to the present invention, the image processing (including generation) for each predetermined processing unit smaller than one screen further assures the real-time properties.

175

Moreover, the game data distribution apparatus may include a means for identifying the client apparatus of the transmission source based on the distribution request data, wherein the generated compressed game image data is transmitted to the identified client apparatus.

176

According to this configuration, when this game image data is transmitted to the identified client apparatus, unnecessary traffic can be eliminated, enabling the real-time properties to be assured.

177

Moreover, the game apparatus according to the present invention includes: a means for generating the distribution request data based on the operation results of a player;

a means for transmitting the generated distribution request data to a server apparatus via a transmission path; and

a reception means for receiving game image data which has been generated and transmitted by the server apparatus based on the distribution request data,

wherein the reception means

receives the game image data in a compressed state for each predetermined processing unit smaller than one screen,

wherein the game apparatus comprises:

a means for sequentially decompressing the received game image data; and

a means for displaying the game image based on this decompressed game image data.

178

According to the present invention, by sequentially decompressing and displaying the game image data in a predetermined processing unit smaller than one screen, the real-time properties of the image display can be improved.

179

Moreover, a real-time image display system according to the present invention is a real-time image display system, including: an image generation apparatus for generating real-time image data and transmitting the real-time image data via a transmission path; and an image display apparatus for receiving the real-time image data via the transmission path and displaying the real-time image data,

wherein the image generation apparatus comprises:

a means for generating the real-time image data of each screen for each predetermined processing unit smaller than one screen; and

a means for sequentially transmitting the real-time image data to the image display apparatus via the transmission path,

wherein the image display apparatus comprises

a display means for displaying that the one screen of the real-time image data is completed from the received real-time image data.

180

According to the present invention, by generating and transmitting this data in units smaller than one screen of the image data, the original image can be displayed at the transmission destination in nearly real time.

181

Here, the real-time image data corresponds to, for example, the image data requiring the real-time properties, specifically, image data for a conference system

using an image in the network form, game image data for a game in the network form, etc.

182

That is, according to the present invention, even in image data requiring the real-time properties and high quality of the image display, the original image can be displayed in nearly real time without causing delays in a frame (one screen) unit.

183

Moreover, here, a predetermined processing unit corresponds to, for example, the scanning line unit or the image compression unit. For example, during JPEG compression, an 8X8 pixel unit may be employed as the image compression unit. Even when dividing the image data, such a unit allows processing such as compression, decompression, and display to be easily carried out.

184

Moreover, the image generation apparatus can generate the real-time image data in each predetermined number of scanning line units. In this case, the image compression unit may be simultaneously applied.

185

Moreover, by transmitting the image data in small units, the influence on the entire system can be suppressed even in the event of an error in transmission data.

186

Moreover, the image generation apparatus includes a means for sequentially compressing the generated real-time image data,

wherein the transmission means sequentially transmits the compressed real-time image data to the image display apparatus via the transmission path,

wherein the image display apparatus includes a means for sequentially decompressing the received compressed real-time image data, and

wherein the display means may display that the one screen of the real-time image data is completed from the decompressed real-time image data.

187

According to this configuration, compression and transmission can reduce the data occupied amount of the transmission bandwidth. In this case as well, by sequentially generating, compressing, transmitting, decompressing, etc. this data in the predetermined unit, the image can be displayed in real time.

188

Here, various compression techniques such as compression using DCT (discrete cosine transformation) (such as MPEG) are applicable to compression using the compression means, wherein JPEG compression may be particularly applied.

189

By applying JPEG compression, the image display apparatus serving as the transmission destination can display images faithful to the original image without involving an increase in delay due to the interpolation between frames as in MPEG compression.

190

Moreover, the information recording medium according to the present invention is a computer readable information recording medium with a program recorded for generating game image data based on distribution request data which is transmitted from a client apparatus via a transmission path in addition to transmitting the game image data to the client apparatus,

wherein a program is recorded for making a computer function as:

a means for generating the game image data based on the distribution request data; and

a means for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the client apparatus.

191

Here, the game image data is the image data required to display the game image in real time, as in a multi-player game, etc.

192

According to the present invention, when the game image data is sequentially compressed and transmitted for each predetermined processing unit smaller than one screen, delays from generation to display can be suppressed, while the client apparatus which has received this game image data can display the game image in nearly real time.

193

Moreover, here, a predetermined processing unit corresponds to, for example, the scanning line unit or the image compression unit, etc. Moreover, during JPEG compression, an 8X8 pixel unit may be employed as the image compression unit. Even when dividing the game image data, such a unit allows processing such as compression, decompression, and display to be easily carried out.

194

Moreover, the information recording medium according to the present invention is a computer readable information recording medium with a program recorded for receiving game image data (which is generated and transmitted by an image generation apparatus based on game data input by a game player) via a network and displaying the game image data,

wherein the game image data is compressed in a predetermined processing unit smaller than one screen,

wherein the information recording medium records a program for making a computer function as:

a means for receiving the game image data and sequentially decompressing the received game image data; and

a means for displaying the game image based on this decompressed game image data.

195

According to the present invention, image processing in a predetermined processing unit smaller than one screen can suppress delay from the generation to display of an image, thereby allowing the game player to feel the image display to his/her own game operation in more real time.

[EMBODIMENTS OF THE INVENTION]

196

Preferred embodiments of the present invention applied to a game system will hereinafter be described with reference to the drawings.

197

Note that the application of the present invention is not limited, with the present invention capable of being applied to various image display systems for displaying the image in real time.

198

(Example 1)

FIG. 1 is a timing chart of the image display of a game system, wherein FIG. 1(A) is a conventional timing chart, while FIG. 1(B) is a timing chart using the game system according to one example of the present embodiment.

199

As illustrated in FIG. 1(A), conventional image data display systems handle an image in one image unit, sequentially carry out processing of compression, transmission, and decompression (when the input of one image of A ends), and display and output the image (when the decompression processing of the entire one image of A ends).

200

Consequently, from the start of the generation of the image at a processing apparatus serving as the transmission source to the start of the display of the image at a processing apparatus serving as the transmission destination, it takes one screen of the image generation time and one screen of the image decompression time.

201

Therefore, from the start of the image input to the start of the display and output of the image, it takes approximately two-fold that of the image input time t1 excluding transmission delays.

202

An image B corresponding to the second image is the same.

203

Consequently, if the image must be displayed in real time, this processing system causes image display delays.

204

Particularly in the case of a game system (in which, in accordance with the input data of a game terminal apparatus which functions as the client apparatus and displays a game image, the game image is generated, compressed, and transmitted at an image generation apparatus serving as a host, and decompressed and displayed at the game terminal apparatus), if an image display response to the operation of a player is slow, it causes sluggishness and makes the game boring.

205

As illustrated in FIG. 1(B), in the present embodiment, one image A is divided into four and processed as image units of A0 to A3.

206

For example, in the case of processing the A0 part, once the image input of the A0 part ends, the compression, transmission, and decompression thereof are sequentially carried out. When the decompression ends, the image of the A0 part is displayed and output.

207

As a result, the time t4 from the start of the input of one image to the start of the output of this image is shorter than the time t3 for inputting one image, making it possible to suppress display delays of the image compared with the conventional processing system illustrated in FIG. 1(A).

208

In this manner, by transmitting the game image data in smaller units, transmission delays can be reduced. Moreover, even if the compressed data is decompressed at the transmission destination, the data can be decompressed and displayed in units smaller than one screen. Therefore, the real-time properties can be assured, the start timing of the game can be suitably synchronized, and the game player can comfortably play a real-time network game.

209

An example of the image display using this principle for the game system will hereinafter be indicated.

210

FIG. 2 is an overall view of the game system according to one example of the present embodiment.

211

As illustrated in FIG. 2, the game system is configured to include: a game data distribution apparatus 100 functioning as the image generation apparatus; and multiple game terminal apparatuses 200-1 to 200-5 connected to the game data distribution apparatus 100 via an ATM network including a communication line 300 serving as a transmission path.

212

Moreover, the game terminal apparatuses 200-1 to 200-3 are disposed in area A, while the game terminal apparatuses 200-4, 200-5 are disposed in area B remote from area A. Further, both the game data distribution apparatus 100 and the game terminal apparatuses 200 are in remote locations and connected via a network including the communication line 300 configured to include an optical fiber cable.

213

The game image data generated in the game data distribution apparatus 100 is transmitted to each game terminal apparatus 200 via the communication line 300.

214

FIG. 3 is a functional block diagram of the game system according to one example of the present embodiment.

215

The game data distribution apparatus 100 is configured to include: a game calculation part 40 which carries out game calculations in accordance with distribution request data from the game terminal apparatus 200; an image generation part for generating the game image data of each screen for each predetermined processing unit smaller than one screen; and an image compression part 20 for compressing the generated images.

216

The predetermined processing unit will be mentioned later.

217

Moreover, the game data distribution apparatus 100 is configured to include: an identification part 38 for receiving the input data from the game terminal apparatus 200 in addition to identifying the game terminal apparatus 200 serving as the transmission source based on this received data; and a data transmission and reception part 30 for sequentially transmitting the game image data (compressed for each predetermined processing unit) to the game terminal apparatus 200 (identified by the identification part 38) via the communication line 300.

218

In contrast, the game terminal apparatus 200 is configured to include: an operation part 50 in which the operation data of the player is input; a distribution request data generation part 52 for generating the distribution request data based on the operation data input from the operation part 50; and a data transmission and reception part 60 which transmits the distribution request data to the game data distribution apparatus 100 via the communication line 300 in addition to receiving the game image data transmitted from the game data distribution apparatus 100.

219

Moreover, the game terminal apparatus 200 is configured to include: an image decompression part 70 for decompressing the received game image data; and an image display part 80 for displaying that one screen of the game image data is completed from the decompressed game image data.

220

Note that here, as the identification part 38, the game calculation part 40, and the distribution request data generation part 52, for example, a CPU can be applied; as an image generation part 10 and an image compression part 30, for example, a game substrate which receives instructions from the CPU and generates the image, and which has a clock generator, VRAM, compression chip, etc., can be applied; and as the data transmission and reception parts 30, 80, for example, communication equipment such as an ATM switch can be applied.

221

Moreover, as the operation part 50, for example, a lever and a button can be applied, while as the image decompression part 70 and the image display part 80, for example, a video card and display which receive instructions from the CPU and display the image, and which have a clock generator, VRAM, decompression chip, DA converter, etc., can be applied.

222

The abovementioned predetermined processing unit is, for example, preferably an 8X8 pixel unit in the case of the scanning line unit or JPEG compression.

223

For example, in the case of JPEG compression, even if a non-interlace system screen of 640X480 dots can be divided into four (which is the integral multiplication of the 8X8 pixel unit as well as the scanning line unit), and can be generated, compressed, transmitted, decompressed, and displayed per 640X120 dots.

224

Note that a screen of 640X480 dots is displayed per 640X240 dots, that is, in the case of the display in an interlace system, 240 lines are preferably processed (for example, generated) per 64, 64, 64, 48 lines.

225

In the case of division in such a unit, both the interlace and the non-interlace facilitate address processing, enabling improvements in the real-time properties of image processing.

226

FIG. 4 is a schematic diagram of the processing order of the processing involving dividing one screen of game image data into four.

227

As described in FIG. 1, the image generation part 10 carries out processing (such as generation, compression, transmission, decompression, and display) of the game image data for each scanning line unit serving as a quarter of one screen.

228

Therefore, as the processing order in a screen 140, the processing order is an image 150-1 corresponding to an image A0 in FIG. 1, an image 150-2 corresponding to an image A1 in FIG. 1, an image 150-3 corresponding to an image A2 in FIG. 1, and an image 150-4 corresponding to an image A3 in FIG. 1.

229

In this manner, by transmitting the image data in small units, the influence on the entire system can be suppressed even in the event of an error in transmission data.

That is, in the case of transmitting compression data in a conventional frame (one screen) unit, if an error is found in the transmission data at the transmission destination, and this transmission data is retransmitted, at least one image of the data must be retransmitted. If the data cannot be retransmitted, processing such as redisplaying the previously displayed image at the transmission destination, etc. must be carried out, leading to a deterioration in image quality.
230

According to the present embodiment, the data retransmission amount can be suppressed. Even if the data cannot be retransmitted, only a portion of one image is missing at the transmission destination upon display, making it possible to reduce any discomfort to the person viewing the image.
231

Here, the specific operation of the game system will be described with reference to a flowchart.
232

FIG. 5 is a flowchart illustrating the operation of the game system illustrated in FIG. 3.
233

First, the flow from the operation of a player to game calculation will be described with reference to FIG. 5(A).
234

The game player plays the real-time network game in the game terminal apparatus 200 which functions as the client apparatus.
235

For example, if the player operates the lever (Step 2), the operation information is generated as operation data in the operation part 50, after which, based on this operation data, the distribution request data generation part 52 generates the distribution request data including identification information of the self apparatus.
236

The generated distribution request data is transmitted to the game data distribution apparatus 100 (which functions as a server apparatus) via the communication line 300 using the data transmission and reception part 60 (Step 4).
237

The game data distribution apparatus 100 receives the distribution request data transmitted from the game terminal apparatus 200 (Step 6). The identification part 38 identifies the game terminal apparatus 200 (which has transmitted the distribution request data) based on this distribution request data. The distribution request data is transmitted to the game calculation part 40.
238

The game calculation part 40 carries out the game calculation based on the distribution request data (Step 8).
239

Next, the flow after the game calculation from image generation to image display at the game terminal apparatus 200 will be described with reference to FIG. 5(B).
240

Based on the calculation results of the game calculation part 40, the image generation part 10 sequentially generates the game image data in each quarter image of each screen (Step 22).
241

The image compression part 20 sequentially compresses the generated game image data (Step 24).

242

Here, various compression techniques such as compression using DCT (discrete cosine transformation) (such as MPEG) are applicable to compression using the image compression part 20, with the application of JPEG compression particularly preferable. By applying JPEG compression, the game terminal apparatus 200 serving as the transmission destination can display images faithful to the original image in real time without involving an increase in delay due to the interpolation between frames as in MPEG compression.

243

The data transmission and reception part 30 sequentially transmits the compressed game image data to the game terminal apparatus 200 (identified by the identification part 38) via the communication line 300 (Step 26). Note that the data transmission and reception part 30 transmits data (such as compression information, which should be normally transmitted), in addition to the game image data.

244

In contrast, in the game terminal apparatus 200, the data transmission and reception part 60 sequentially receives the game image data (Step 28).

245

The image decompression part 70 sequentially decompresses the received compressed game image data (Step 30).

246

When a quarter screen of the game image data is decompressed, the image display part 80 displays the decompressed game image data (Step 32). Execution of this display processing four times completes one screen of the game image data.

247

As described above, the present embodiment exerts the following operations and effects.

248

In carrying out a network type game, it is extremely important to match the start timing of the game in each game terminal apparatus. Moreover, because a game moving image has little correlation between frames, that is, has drastic changes, processing for interpolating missing data is not easily carried out, requiring high quality images.

249

Moreover, in the game in the network form, enhancing an image display response to the operation of the player is important to comfortably play the game.

250

According to the present embodiment, processing of the game image data in units smaller than one screen can reduce delays in processing from the generation to display of the image.

251

In this manner, a reduction in the transmission delay time due to processing in units smaller than one screen can assure the real-time properties, allowing the game player to feel a response to the game with respect to his/her own lever operation in more real time and to comfortably play the network game.

252

Particularly upon application to a multi-player game, a large number of persons can simultaneously receive real-time game images, which is very effective.

253

Further, because the identification part 38 can identify game terminal apparatuses, when the game image is transmitted only to the game terminal apparatus which requires the transmission of the game image, making it possible to suppress traffic on the communication line 300, thereby assuring the real-time properties upon data transmission.

254

Moreover, because the game image data is divided in each predetermined number of scanning line units, the image display part 80 of the game terminal apparatus 200 is not displayed after decompressing one screen of the image, but can be displayed from the decompressed part of one screen. As a result, the real-time properties of the image display can be further enhanced.

255

Moreover, as illustrated in FIG. 1(B), even in the case of handling for each quarter screen of the image data, parallel processing can be used in each processing of compression, transmission, and decompression. As a result, as mentioned above, the output of the image can be started for a time t4 shorter than the time t3 for inputting one screen of the image. That is, while image display delay can be suppressed, the image can be displayed in real time.

256

Note that the image may be generated and displayed in each one screen (as conventionally carried out), without any division.

257

As a result, compared with the abovementioned embodiment, although the real-time properties are slightly impaired, the hardware load upon image generation and image display can be reduced. In addition, compared with conventional systems, the image can be displayed while focusing on the real-time properties.

258

(Example 2)

A computer can be made to function as the abovementioned game data distribution apparatus 100 using an information recording medium in nearly the same way.

259

FIG. 6 is a functional block diagram of an information recording medium 600 according to one example of the present embodiment as well as a game data distribution apparatus 100 implemented using this information recording medium 600.

260

The information recording medium 600 is computer readable with information recorded for generating the game image data based on the distribution request data which is transmitted from a computer terminal (functioning as the client apparatus) via the communication line 300 serving as a transmission path in addition to transmitting the game image data to the computer terminal.

261

Moreover, here, the information includes: generation information 610 for generating game image data based on the distribution request data; compression information 620 for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen; and transmission information 630 to be transmitted to the computer terminal.

262

Note that, here, the game image data is the image data required to display the game image in real time, as in a multi-player game, etc.

263

The information 610, 630 is read by an information reading part 110 of the game data distribution apparatus 100. If the generation information 610 is read, the image generation part 10 functions to generate the image in each one screen based on the distribution request data.

264

Moreover, when the compression information 620 is read, the image compression part 20 functions to compress a generated image for each predetermined processing unit smaller than one screen.

265

Further, when the transmission information 630 is read, the data transmission and reception part 30 functions to transmit the game image data (compressed as image data smaller than one screen) to the computer terminal (which has transmitted the distribution request data).

266

As a result, when the information 610 to 630 is read by the game data distribution apparatus 100, the game image can be compressed and transmitted to the game data distribution apparatus 100 in real time.

267

As a result, the computer terminal which is the client apparatus serving as the transmission destination of this image can display this image in real time.

268

Moreover, the generation information can be formed as information for sequentially generating the game image data for each predetermined processing unit smaller than one screen. As a result, the real-time properties can be further improved.

269

(Example 3)

Moreover, a computer can be made to function as the abovementioned game terminal apparatus 200 using an information recording medium in nearly the same way.

270

FIG. 7 is a functional block diagram of an information recording medium 700 according to another example of the present embodiment as well as a game terminal apparatus 200 implemented using this information recording medium 700.

271

The information recording medium 700 is a computer readable information recording medium which receives and displays the game image data (which is generated by an image generation apparatus based on game data input by a game player, and transmitted via a network including the communication line 300).

272

Here, the game data is the data including operation information generated by the operation of an operation part such as a lever by the player, etc.

273

Moreover, the game image data is compressed in a predetermined processing unit smaller than one screen, wherein the information includes: reception decompression information 710 for receiving the game image data and sequentially decompressing the received game image data; and image display information 720 for displaying this decompressed game image data.

274

The information 710, 720 is read by an information reading part 210 of the game terminal apparatus 200. When the reception decompression information 710 is read, the data transmission and reception part 60 sequentially receives the game image data, while the image decompression part 70 functions to sequentially decompress the received game image data.

275

Moreover, when the image display information 720 is read, the image display part 80 sequentially displays the game image data.

276

As a result, when the game terminal apparatus 200 processes the game image data in a processing unit smaller than one screen, the delay time from the generation to display of the game image data can be reduced, thereby assuring the real-time properties.

277

Note that the image display information can be formed as information for displaying the image display information such that one screen of the decompressed game image data is completely arranged. As a result, compared with the method for sequentially displaying the decompressed game image data, although the real-time properties are slightly impaired, the hardware load upon display can be reduced.

278

Moreover, not only external information recording media such as CDROMs, game cassettes, DVDRAMs, etc. but also internal information recording media such as memories (such as ROMs and RAMs) and hard disks are applicable to the information recording media 600, 700.

279

Moreover, those capable of being read with magnets and laser beams in accordance with the abovementioned media, as well as those for reading signals of input and output ports, etc., can be applied to the information reading parts 110, 210. Other hardware loads are the same as mentioned above.

280

Note that the present embodiment is not limited to a game network system for generating, transmitting, and displaying game images, but is applicable to a real-time image display system for generating, transmitting, and displaying a real-time image system.

281

For example, the following can be implemented as a real-time image display system, having: an image generation apparatus for generating real-time image data and transmitting the real-time image data via a transmission path; and an image display apparatus for receiving the real-time image data via the transmission path and displaying the real-time image data.

282

Provided in the image generation apparatus are: an image generation means for generating the real-time image data for each predetermined processing unit smaller than one screen; and a transmission means for sequentially transmitting the real-time image data to the image display apparatus via the transmission path for each predetermined processing unit.

283

Moreover, an image display means for displaying that the one screen of the real-time image data is completed from the received real-time image data is provided in the image display apparatus.

284

As a result, a real-time image display system which can display an image in real time to image generation can be implemented.

285

Conventionally, the image data is sacrificed, wherein it has rarely been considered to generate and transmit the image such that an image which is as similar as possible to the original image can be displayed at the transmission destination.

286

As a result, by generating and transmitting this data in units smaller than one screen of the image data, the original image can be displayed at the transmission destination in nearly real time.

287

Here, the real-time image data corresponds to, for example, image data requiring the real-time properties, specifically, image data for a conference system using the image in the network form, etc.

288

For example, if the present embodiment is applied to a real-time image conference system, the image display is hardly delayed between locations in which each conference is held, making it possible to implement a comfortable and smooth conference system.

289

Note that the game system described in Example 1 can also be implemented (in the form in which a data compression function and a data decompression function are omitted) using this real-time image display system.

290

While a system for transmitting and receiving an uncompressed image such as an analog video signal is applicable, a system for compressing the analog video signal, forming digital data, and transmitting and receiving digital image data is preferably applied in terms of a small required transmission bandwidth amount, easy processing, etc.

291

In this case, a compression means for sequentially compressing the generated real-time image data is provided in the image generation apparatus, wherein the transmission means is made to sequentially transmit the compressed real-time image data to the image display apparatus via the transmission path.

292

Moreover, a decompression means for sequentially decompressing the received compressed real-time image data is provided in the image display apparatus, wherein the image display means is made to display that the one screen of the real-time image data is completed from the decompressed real-time image data.

293

As a result, a real-time image display system which improves the real-time properties even during the compression and decompression of the data can be implemented.

294

Moreover, the abovementioned real-time image data and game image data are not necessarily videos. For example, they can be applied to the case of transmitting static images such as for slide shows and presentations at real-time conferences, etc.
295

Moreover, the abovementioned transmission path may be not only wired as in an optical fiber cable and coaxial cable, but may be wireless as in satellite communication.

[BRIEF DESCRIPTION OF DRAWINGS]
296

FIG. 1

is a timing chart of the image display of a game system, wherein FIG. 1(A) is a conventional timing chart, while FIG. 1(B) is a timing chart using the game system according to one example of the present embodiment.

FIG. 2

is an overall view of the game system according to one example of the present embodiment.

FIG. 3

is a functional block diagram of the game system according to one example of the present embodiment.

FIG. 4

is a schematic diagram of the processing order of the processing involving dividing one screen of game image data into four.

FIG. 5

is a flowchart illustrating the operation of the game system illustrated in FIG. 3, wherein FIG. 5(A) is a flowchart illustrating the flow from the operation of a player to game calculation, while FIG. 5(B) is a flowchart illustrating the flow after the game calculation from image generation to image display.

FIG. 6

is a functional block diagram of an information recording medium according to one example of the present embodiment as well as a game data distribution apparatus implemented using this information recording medium.

FIG. 7

is a functional block diagram of an information recording medium according to another example of the present embodiment as well as a game terminal apparatus implemented using this information recording medium.

[Explanation of Symbols]
10 Image generation part
20 Image compression unit
30, 60 Data transmission and reception part
38 Identification part
40 Game calculation part
50 Operation part
52 Distribution request data generation part
70 Image decompression part
80 Image display part
100 Game data distribution apparatus
200 Game terminal apparatus
300 Communication line

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600, 700 Information recording medium

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What is Claimed is:

1. A game system, comprising: a terminal apparatus for transmitting distribution request data; and

a game data distribution apparatus for generating predetermined data based on the distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the game image data to the terminal apparatus,

wherein the game data distribution apparatus comprises:

a means for receiving the distribution request data from the terminal apparatus;

a means for generating overall game image data indicating one screen of image data based on the received distribution request data; and

a means for dividing the overall game image data for each predetermined processing unit smaller than one screen to generate game image data, sequentially compressing this game image data, and transmitting the compressed game image data to the terminal apparatus,

wherein the terminal apparatus comprises:

a means for generating the distribution request data based on the operation results of a player;

a means for transmitting the generated distribution request data to the game data distribution apparatus;

a means for receiving and sequentially decompressing the compressed game image data; and

a means for displaying the game image based on this decompressed game image data.

2. A game system, comprising: a terminal apparatus for transmitting distribution request data; and

a game data distribution apparatus for generating game image data based on the distribution request data (from the terminal apparatus) which is transmitted via a transmission in addition to transmitting the data to the terminal apparatus; wherein:

the game data distribution apparatus comprises:

a means for receiving the distribution request data from the terminal apparatus;

a means for sequentially generating the game image data for each predetermined processing unit smaller than one screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data in addition to transmitting the data to the terminal apparatus; and

the terminal apparatus comprises:

a means for generating the distribution request data based on the operation results of a player;

a means for transmitting the generated distribution request data to the game data distribution apparatus;

a means for receiving and sequentially decompressing the compressed game image data; and

a means for displaying the game image based on this decompressed game image data.

3. The game system according to any one of claims 1 and 2, wherein:

multiple terminal apparatuses are connected to the transmission path; and

the game data distribution apparatus generates the game image data in each terminal apparatus based on the distribution request data from each terminal apparatus, compresses the generated game image data, and transmits the game image data to the corresponding terminal apparatus.

4. A game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus, the game data distribution apparatus comprising:

a means for receiving the distribution request data from the client apparatus;

a means for generating overall game image data indicating one screen of image data based on the received distribution request data; and

a means for dividing the overall game image data for each predetermined processing unit smaller than one screen to generate game image data, sequentially compressing this game image data, and transmitting the compressed game image data to the client apparatus.

5. A game data distribution apparatus for generating game image data based on distribution request data which is transmitted from a client apparatus via a network in addition to transmitting the game image data to the client apparatus, the game data distribution apparatus comprising:

a means for receiving the distribution request data from the client apparatus;

a means for sequentially generating the game image data for each predetermined processing unit smaller than one screen based on the received distribution request data; and

a means for sequentially compressing the generated game image data in addition to transmitting the game image data to the client apparatus.

6. The game data distribution apparatus according to claim 5, comprising a means for identifying the client apparatus serving as the transmission source based on the distribution request data, wherein the generated compressed game image data is transmitted to the identified client apparatus.

7. A game apparatus, comprising: a means for generating distribution request data based on the operation results of a player; a means for transmitting the generated distribution request data to a server apparatus via a transmission path; and a reception means for receiving game image data which has been generated and transmitted by the server apparatus based on the distribution request data; wherein:

the reception means receives the game image data in a compressed state for each predetermined processing unit smaller than one screen; and

the game apparatus comprises:

a means for sequentially decompressing the received game image data; and

a means for displaying the game image based on this decompressed game image data.

8. A real-time image display system, comprising: an image generation apparatus for generating real-time image data and transmitting the real-time image data via a

transmission path; and an image display apparatus for receiving the real-time image data via the transmission path and displaying the real-time image data; wherein:

the image generation apparatus comprises:

a means for generating the real-time image data of each screen for each predetermined processing unit smaller than one screen; and

a means for sequentially transmitting the real-time image data to the image display apparatus via the transmission path; and

the image display apparatus comprises a display means for displaying that the one screen of the real-time image data is completed from the received real-time image data.

9. The real-time image display system according to claim 8, wherein:

the image generation apparatus comprises a means for sequentially compressing the generated real-time image data;

the transmission means sequentially transmits the compressed real-time image data to the image display apparatus via the transmission path;

the image display apparatus comprises a means for sequentially decompressing the received compressed real-time image data; and

the display means displays that the one screen of the real-time image data is completed from the decompressed real-time image data.

10. A computer readable information recording medium with a program recorded for generating game image data based on distribution request data which is transmitted from a client apparatus via a transmission path in addition to transmitting the game image data to the client apparatus;

wherein a program is recorded for making a computer function as:

a means for generating the game image data based on the distribution request data; and

a means for sequentially compressing the generated game image data for each predetermined processing unit smaller than one screen in addition to transmitting the game image data to the client apparatus.

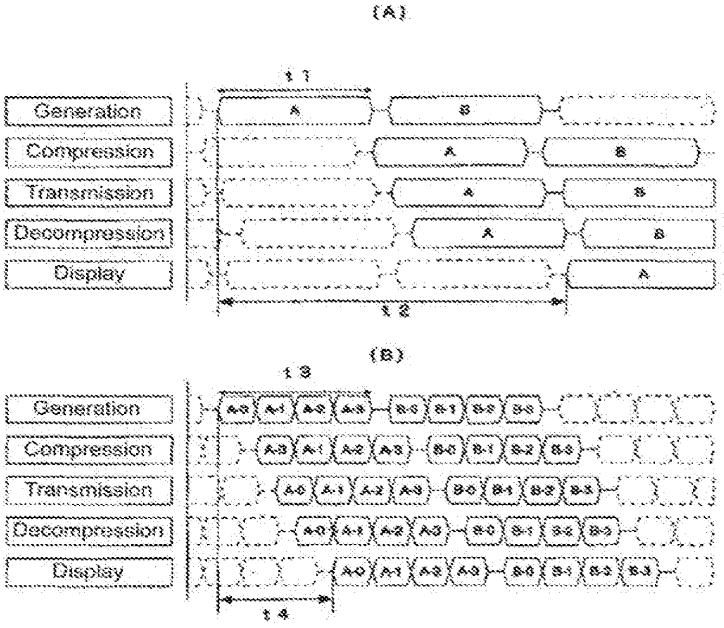
11. A computer readable information recording medium with a program recorded for receiving game image data (which is generated and transmitted by an image generation apparatus based on game data input by a game player) via a network and displaying the game image data, wherein the game image data is compressed in a predetermined processing unit smaller than one screen;

wherein the information recording medium records a program for making a computer function as:

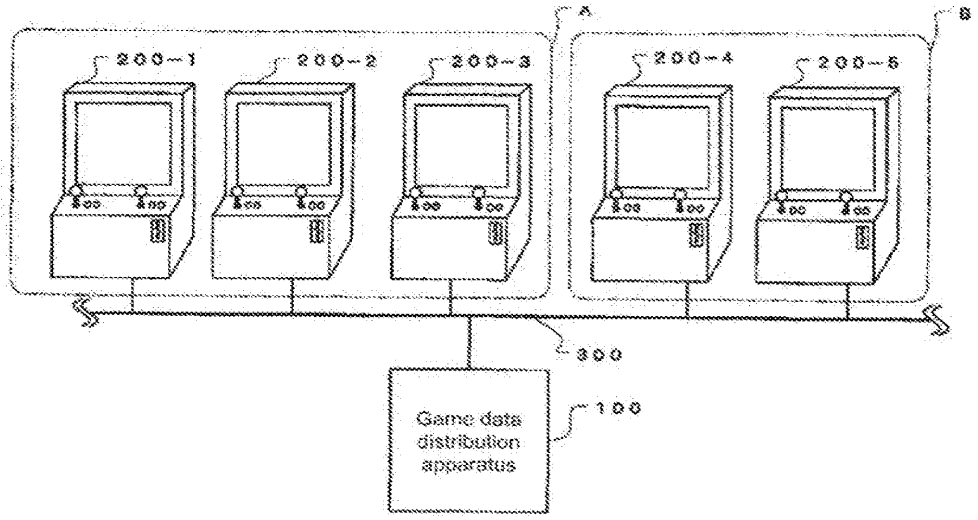
a means for receiving the game image data and sequentially decompressing the received game image data; and

a means for displaying the game image based on this decompressed game image data.

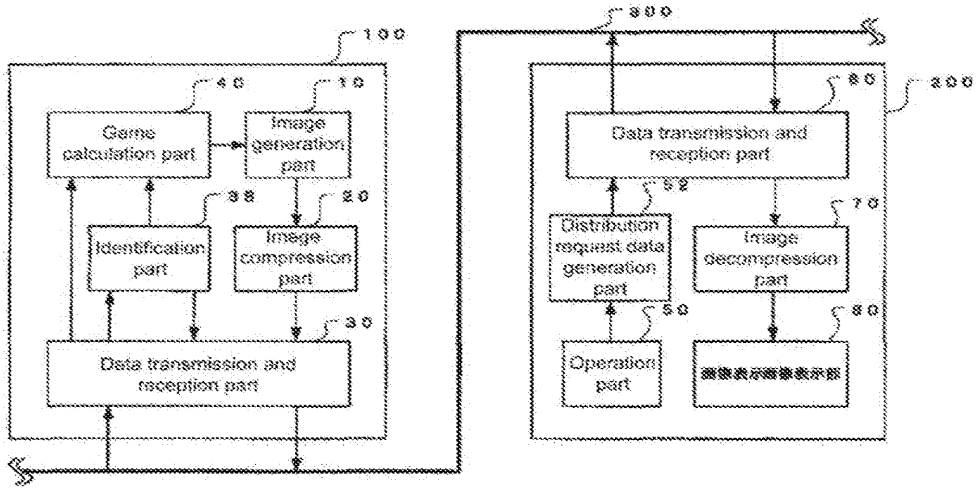
Document Title: Drawings
[FIG. 1]



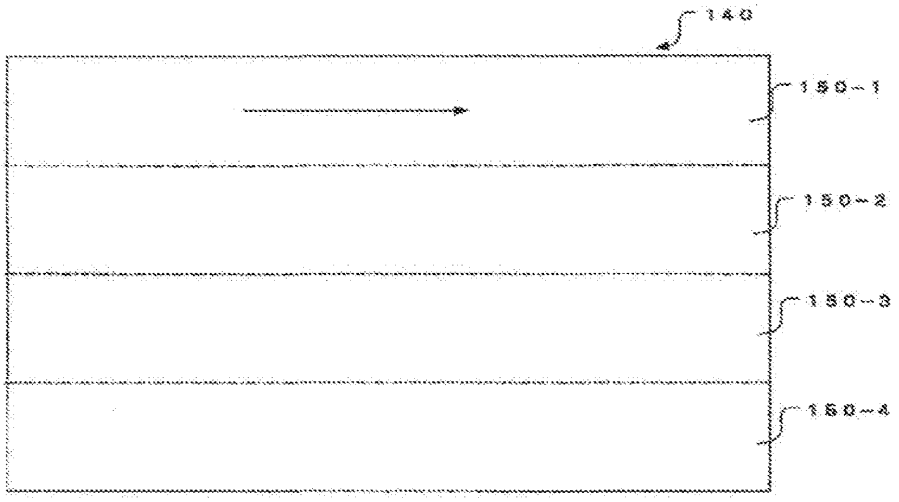
[FIG. 2]



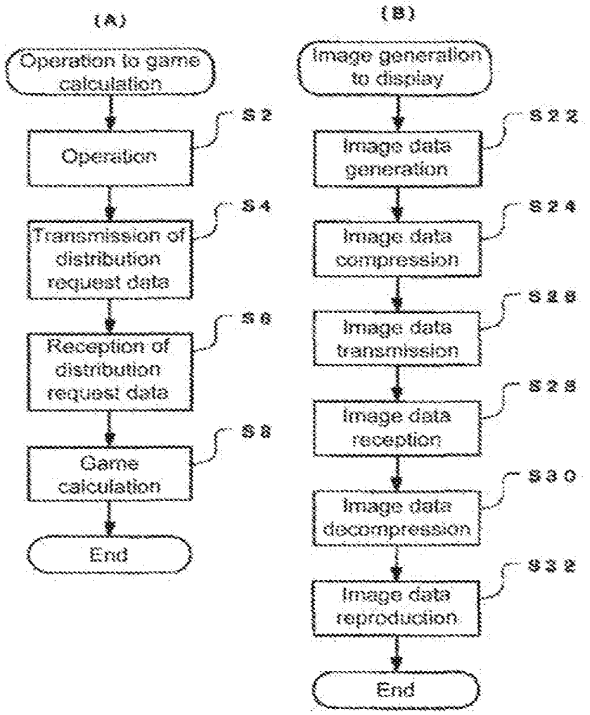
[FIG. 3]


100
40
10
Game calculation part
Image generation part
38
20
Identification part
Image compression part
30
Data transmission and reception part
300
80
200
Data transmission and reception part
52
70
Distribution request data generation part
Image decompression part
50
60
Operation part

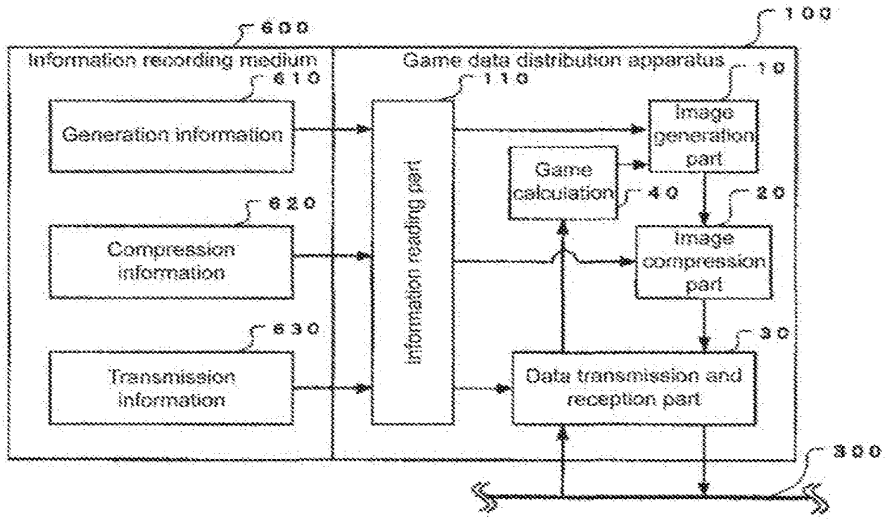
[FIG. 4]


140
150-1
150-2
150-3
150-4

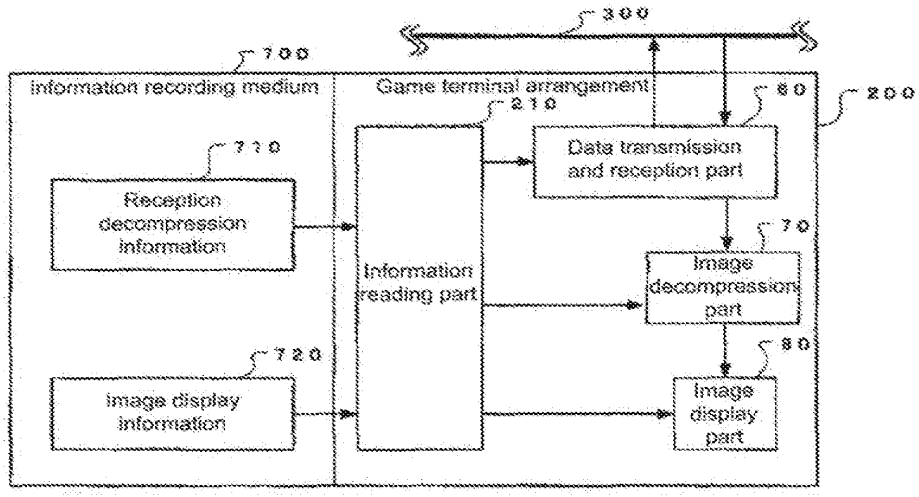
[FIG. 5]


(A)
Operation to game calculation
Operation
S2
Transmission of distribution request data
S4
Reception of distribution request data
S6
Game calculation
S8
End
(B)
Image generation to display
Image data generation
S22
Image data compression
S24
Image data transmission
S26
Image data reception
S28
Image data decompression
S30
Image data reproduction
S32
End

[FIG. 6]


600
Information recording medium
610
Generation information
620
Compression information
630
Transmission information
100
Game data distribution apparatus
110
Information reading part
10
Image generation part
Game calculation
40
20
Image compression part
30
Data transmission and reception part
300

[FIG. 7]


300
700
Information recording medium
Game terminal arrangement
210
80
200
710
Reception decompression information
Data transmission and reception part
70
Information reading part
Image decompression part
80
720
Image display information
Image display part

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JP,10-015245,A(1998)

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Bibliography Close

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(12) [Kind of official gazette] A
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(43) [Date of publication of application] 19980120
(54) [Title of the invention] DATA TRANSMISSION DEVICE, VIDEO GAME MACHINE
(51) [International Patent Classification 6th Edition]
A63F 9/22 H04B 1/707
[FI]

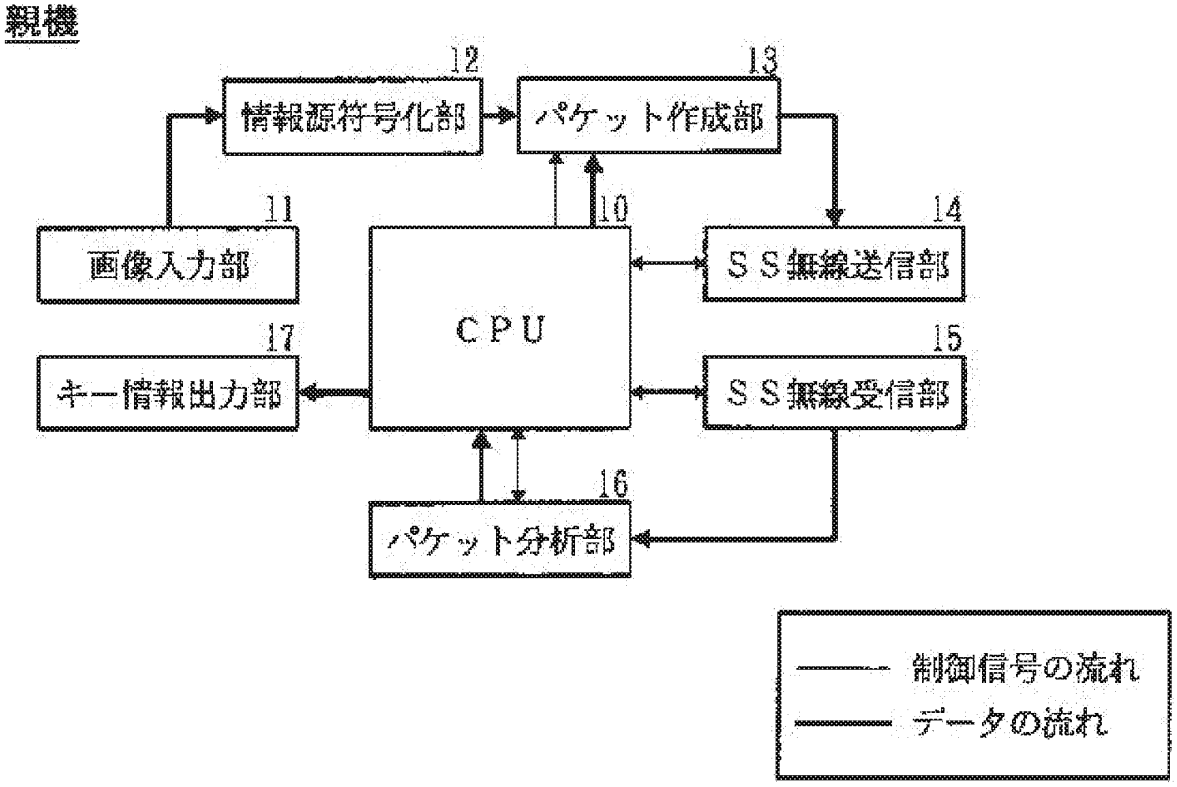
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A63F 9/22 G
H04J 13/00 D
(21) [Application number] 08176597
(22) [Filing date] 19960705
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(72) [Inventor]
[Full name] NAKATANI KAZUO

Overview Close

(57) [Overview]
PROBLEM TO BE SOLVED: To provide a video game machine which can be used to perform an interactive game software between remote rooms.
SOLUTION: A master machine is provided with a transmit section 14 and a receive section 15 with spread spectrum method, and a slave machine is designed in the same manner as the master machine. In the master machine, an image data to be displayed at the slave machine is compressed at an information source coding section 12, and the data is added with the slave machine' s ID at a packet creating section 13 and this data is sent as a packet to the slave machine in a time division multiplex method. The slave machine transmits a key input information, and the information is received by the receive section 15 of the master machine in a time division multiplex method and is applied to games.

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Scope of Claims | Close

[Patent Claims]

[Claim 1]A data transmission device for transmitting data between a parent device and 1 or more child devices of a video game machine is provided.

An encoding means for encoding and compressing image data for transmission from the parent device to the child device ;

A packet creating means for making the encoded image data output from the means as a packet including an identification code of the destination slave device ;

A radio transmission means for sequentially transmitting the packets generated by the means to the respective slave devices by a spread spectrum method ; and cyclic

Radio reception means for receiving and demodulating key information transmitted from each child device by a spread spectrum system ;

A packet analyzing means for analyzing each packet received and demodulated by the receiving means to determine which of the child devices is the key information.

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A parent transmission device provided with a master transmission device is provided in a parent device of the video game machine.
A packet creating means for making the key information for transmission from the child device of the video game machine to the parent device as a packet including an identification code of the child device ;
A radio transmission means for transmitting the packets produced by the means using the allocated time slots according to the spread spectrum method ;
A radio reception means for receiving and demodulating image data transmitted from the parent device in a spread spectrum system ;
A packet analyzing means for analyzing each packet received and demodulated by the receiving means to determine whether the packet includes an identification code of the corresponding child device ;
A decoding means for decoding image data in the received and demodulated packet ;
FIG. 3 is a block diagram showing a configuration of a data transmission apparatus according to a first embodiment of the present invention ;.
[Claim 2]The coding means for the parent data transmission device and the child data transmission device ;The data transmission apparatus according to claim 1, further comprising a function of adding error correction code and checksum data to a packet, and wherein the packet analysis means of the parent data transmission apparatus and the child data transmission apparatus has an error detection and correction function by the error correction code and the checksum data.
[Claim 3]A video game machine comprising a parent data transmission device and a child data transmission device as claimed in claim 1 or 2.

Detailed Description | Close

[Detailed description of the invention]
[0001]
[Technical field of invention] The present invention relates to a data transmission apparatus and a video game machine using a spread spectrum wireless transmission system, and more particularly, to a plurality of players using a plurality of players.

To provide a data transmission device for playing a video game and a video game machine.
[0002]
[Prior art] FIG. 7 is a block diagram showing a configuration example of a conventional

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video game machine, and an external storage device 702 composed of a semiconductor ROM or a CD-ROM stores software and data for a game. When playing a game, this software is read into RAM 703 and executed by CPU 701. The frame memory 705 stores image data to be displayed, and this data is displayed on a display unit (not shown) via an image output unit 36. When the player operates the key information input unit 71, the key input I / F unit 704 accepts the key information and transmits it to the CPU 701. If the game machine has a specification capable of playing a match, the input information is fetched from the key information input unit 71 via the key input I / F unit 704 into the CPU 701 at a constant cycle or a key input interruption. A CPU 701 analyzes a key input value, reflects information corresponding to a key input value on a frame memory 705, and outputs it from an image output part 706 to realize a match play on a display device.
[0003]On the other hand, in a business video game apparatus, it is becoming common practice to play a match play in an arrangement in which the housings 81 and 82 are aligned on the back side as shown in FIG. 8 with respect to a game of a genre of battle fighting. The reason is that, as shown in the front surface 83 of the housing 81, competition play between adjacent game apparatuses using a video game apparatus having 2 key information input portions on a single display device is physically tight to the player, and the reaction of the opponent who performs the key input is visible before the response of the response of the opponent to the screen is reflected on the screen.
[0004]
[Problem to be solved by the invention] The key information input unit 71 of the prior art shown in FIG. 7 includes a key input pad 711 equipped with an input direction key and a push button, a connector 713 connected to the key input I / F unit 704 of the video game device 70, and a cable 712 connecting the key input pad 711 and the connector 713. Then, play is performed within the range in which the cable 712 of the key information input device 71 reaches. Alternatively, the infrared transmission / reception device can be incorporated into the key input pad and the key input I / F unit to play a match play in a wireless environment. In this case, a play can be made within a range of infrared rays, for example, a distance of several meters from the video game machine body. However, in any of these cases, in the case of a game of a competitive play type, a problem that a distance between 2 or more players cannot be sufficiently obtained and a clash or a match is directly seen cannot be solved. In addition, it is not possible to use various environments such as home, for example, play with another room of an apartment.
[0005]An object of the present invention is to provide spread spectrum radio which can be used in a playing environment at a location distant from a room of a condominium, particularly a few 10 to several 100 of meters, in particular.

To provide a data transmission device using a transmission system and a video game

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machine using the device.

[0006]

[Means for solving the problem] To achieve the above object, according to the present invention, there is provided a data transmission apparatus for transmitting data between a parent device and 1 or more child devices of a video game machine, the device being configured to encode and compress image data to be transmitted from a parent device to a child device. A packet creating means for making the encoded image data output from the means a packet including an identification code of the destination slave device, and a radio transmitting means for sequentially transmitting the packet created by the means to each slave device by the spread spectrum method ; and cyclicA radio reception means for receiving and demodulating key information transmitted from each child device by a spread spectrum method, and a packet analysis means for analyzing each packet received and demodulated by the reception means and discriminating which child device is the key information. A packet preparing means which is provided with a parent transmission device equipped with a video game machine, and which is used for making key information for transmitting from a slave device of a video game machine to a parent device as a packet including an identification code of the child device ;A radio transmission means for transmitting a packet generated by the means using a time slot allocated by a spread spectrum method, and a radio reception means for receiving and demodulating image data transmitted from the parent device in a spread spectrum manner ;A packet analyzing means for analyzing each packet received and demodulated by the receiving means to determine whether the packet includes an identification code of the corresponding child device ;To provide a data transmission device which is equipped with a decoding means for decoding image data in a received and demodulated packet and a child data transmission device for each child device of the video game machine.

[0007]Further, in the present invention, the encoding means of the parent data transmission apparatus and the child data transmission apparatus is provided. To provide a data transmission device having a function of adding an error correction code and a data for a sum check to a packet analysis means, and a packet analysis means for the master data transmission device and the slave data transmission device has an error detection and correction function for the error correction code and the sum check data.

[0008]Further, the present invention provides a video game machine characterized in that the parent data transmission device and the child data transmission device are provided in the parent device and the child device.

[0009]

[Embodiment of invention] Hereinafter, embodiments of the present invention will be described. FIG. 3 is a block diagram showing an overall configuration of a video game machine according to an embodiment of the present invention, and a video game device 3

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is connected to a key information input device 32 and a display device 33 in the same manner as in the prior art. For a player who plays a match using the video game device 31, spread spectrum (Spread Spectru) for connecting to the video game device 31 is used.

A master unit 30 and a slave unit 34 of a data transmission apparatus for transmitting data by radio transmission of a system (hereinafter abbreviated as "SS system") are provided, and a key information input unit 35 and a display unit 36 are also connected to the slave unit 34.

[0010]FIG. 1 and FIG. 2 are block diagrams showing a configuration example of the master unit 30 and the slave unit 34 of the data transmission apparatus of the present invention, in which image information output from the video game apparatus 31 is input by an image input unit 11 of the master unit 30, and image information is compressed by an information source encoding unit 12. As for the compression method used here, any coding method such as a motion JPEG,H.261,MPEG may be used as long as it can compress several frames to 30 frames. The image information encoded by the source encoding unit 12 is configured into a packet as shown in FIG. 4 a by the packet creating unit 13. In other words, the bit synchronization signal for transmission control, the frame synchronization signal, and the call signal are added as headers to the slave unit ID information which can be connected to the image encoding information. It is assumed that the packet SUM value is added to protect the image encoding information, the error correction code for protecting the slave unit ID information, the image encoding information, and the slave unit ID information and the error correcting code. The packet thus created is transmitted from the SS radio transmission unit 14.

[0011]The transmitted image information is received by the SS wireless reception unit 21 of the slave unit. Here, the bit synchronization signal is information in which bit information of "0" and "1" is alternately arranged, and since the frame synchronization signal is information in which the head 2 bits or more are composed of "0", when the alternation determination is omitted, the start of synchronization is recognized and the reception of valid packets is started. The packet analyzing unit 22 receives data of a predetermined capacity after frame synchronization information, calculates a SUM value of the data, and compares the sum value with a SUM value included in the received data. If this is correct, the error correction code is decoded and the image coding information and the slave ID information are extracted. The image information thus extracted is decoded by the source decoding unit 23, and is output from the image output unit 24 to the display unit 36 connected to the slave unit 34.

[0012]At the same time, in the child unit, key information is fetched from the key information input unit 25 and held. If the received slave unit ID and the slave unit ID included in the slave unit packet match the ID of the received slave unit, the packet

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creating unit 26 configures a packet as shown in FIG. 4 b. This packet is obtained by adding a bit synchronization signal for transmission control, a frame synchronization signal, and a call signal as headers to the slave unit ID and key information, and adding an error correction code for protecting the slave unit ID and key information, and a packet SUM value for protecting the slave unit ID and key information and the error correction code. This packet is sent from the SS radio transmission unit 27. The transmitted data is received by the SS radio receiving unit 15 of the master unit, and the key information is extracted by the packet analyzing unit 16, and is sequentially output to the key information output unit 17 via the CPU 10.

[0013]In the configuration described above, there is only one slave unit.

In the case where a plurality of pieces of software for use in a video game apparatus connected to a master unit are simultaneously played, and a plurality of slave units are present, data transmitted from the slave unit is received in time division on the side of the master unit, thereby enabling simultaneous play. FIG. 5 is a time chart showing a state in which each packet is transmitted and received at this time, and ID = 0 to 7 are associated with 8 slave sets. 1 frames of multiplexing are divided into 8, each of which is assigned to each time slot as a time slot. The numbers indicated in the figure indicate the ID. As described in FIG. 4, the slave unit that can be transmitted by the slave unit ID included in the image information packet transmitted by the master unit side is designated, and when the slave unit ID = j, the * 8 j th time slot is used. Where j = 0 1,., 7, and is an integer. Each of the slave units transmits in the allocated time slot, and in the master unit side, the number of IDs corresponding to the number of connectable slave units is registered and held in advance, and sequentially and repeatedly sets the ID in the image information packet (M = 1 in the above example) by setting the ID in the image information packet (M = 8). Further, after transmitting the image information packet including the specified child device designation information, the parent device accepts the key information from the designated child device for a predetermined time.

[0014]FIG. 7 is a packet transmission sequence. First, transmission and reception of a transmission request and a transmission response are performed between the CPU 10 of the master unit and the CPU 20 of the slave unit to establish a transport. Next, when the transmission start signal #1 is sent from the CPU 10 of the master unit to the packet creation unit 13, the packet creation unit 13 transmits the image coded data of 1 frames to the SS radio transmission unit 14 together with the slave unit ID = 0 which permits the transmission. Upon receiving this, the SS wireless transmission unit 14 transmits the image information packet to the transmission line while performing communication control.

[0015]In the slave unit (ID = 0), the received information is sent from the SS receiving unit 21 that has received the image information packet to the packet analyzing unit 22, and th

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packet analyzing unit 22 detects whether or not there is a transmission error. When the CPU 20 is notified that the reception result is normal, the CPU 20 instructs the packet analysis unit 22 to fetch the slave unit ID, and the slave unit ID transmitted in response thereto is taken into the CPU 20 and the image information is taken into the image decoding unit 23. When the CPU 20 compares the ID and the received transmission permission slave ID, and if it is the same value, a transmission start signal is sent to a packet preparing part 26. In the packet creating unit 26, key input information corresponding to one time slot is sent to the SS radio transmitting unit 27 together with its own ID. Upon receiving this, the SS wireless transmission unit 27 transmits the key information packet to the transmission line while performing communication control.
[0016]In the master unit, this information packet is received from the SS radio receiving unit 15 to the packet analyzing unit 16.

An information is sent, and the packet analyzer 16 detects whether or not there is a transmission error. When the CPU 10 is notified that the reception result is normal, the CPU 10 instructs the packet analysis unit 16 to fetch the slave unit ID, and the slave unit ID and the key information transmitted in response to this instruction are taken into the CPU 10. If the acquired slave unit ID matches the ID scheduled in the reception standby state, the CPU 10 sends the acquired key information to the key information output unit 17.
[0017]Operations subsequent to the 2 transmission start signal #2 are similar. Then, when it reaches the upper limit of the connectable slave unit ID, it is again repeated from the slave unit ID = 0. According to this configuration, since the amount of key information is generally smaller than the amount of image information, if the time division of image data from the master unit to the slave unit is possible in each time slot of FIG. 5, the key information from the slave unit can be sufficiently transmitted to the master unit by time division.
[0018]
[Effect of the Invention] According to the present invention, it is possible to realize a video game machine capable of enjoying a video game for home use in a battle style even between rooms of several 10 to several 100 of meters.

Brief description of the drawings | Close

[Brief Description of the Drawings]
[Fig. 1]It is a block diagram showing the configuration example of the main phone of the

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picture transmission equipment which becomes the present invention.

[Fig. 2]It is a block diagram showing the configuration example of the cordless handset of the picture transmission equipment which becomes the present invention.

[Fig. 3]FIG. 1 is a block diagram showing an overall configuration of a video game machine of the present invention ;.

[Fig. 4]It is a frame configuration example of a transmission packet.

[Fig. 5]FIG. 4 is an explanatory diagram of packet multiplex transmission between a plurality of slave units and a master unit ;.

[Fig. 6]FIG. 4 is a diagram illustrating a procedure of packet transmission ;.

[Fig. 7]FIG. 1 is a diagram illustrating a configuration example of a conventional video game machine ;.

[Fig. 8]It is the figure showing the configuration example of a business-use video game machine.

[Explanation of letters or numerals]

10,20 CPU

11 Image Input Part

12 source coding unit

13, 26 packet creating unit

14, 27 ss radio transmission unit

15, 21 ss radio receiving unit

16 22 packet analyzer

17 key information output unit

23 source decoding unit

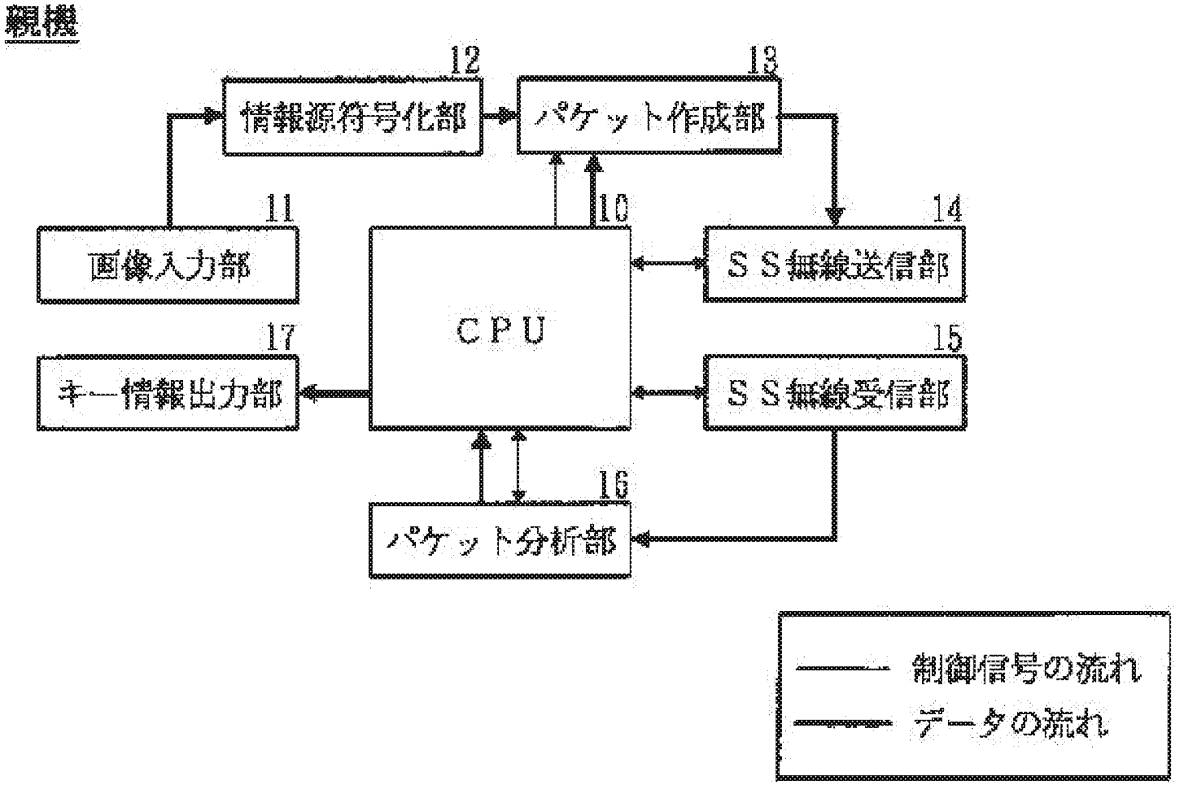
24 image output unit

25 key information input unit

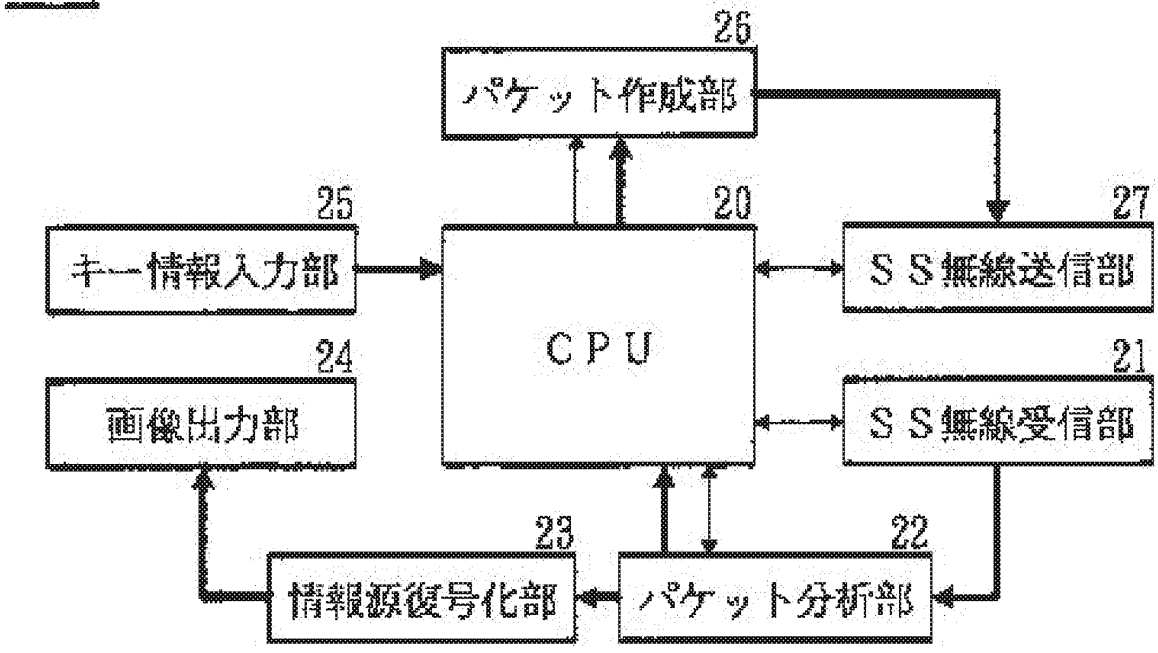
Drawings | Close

[FIG.1]

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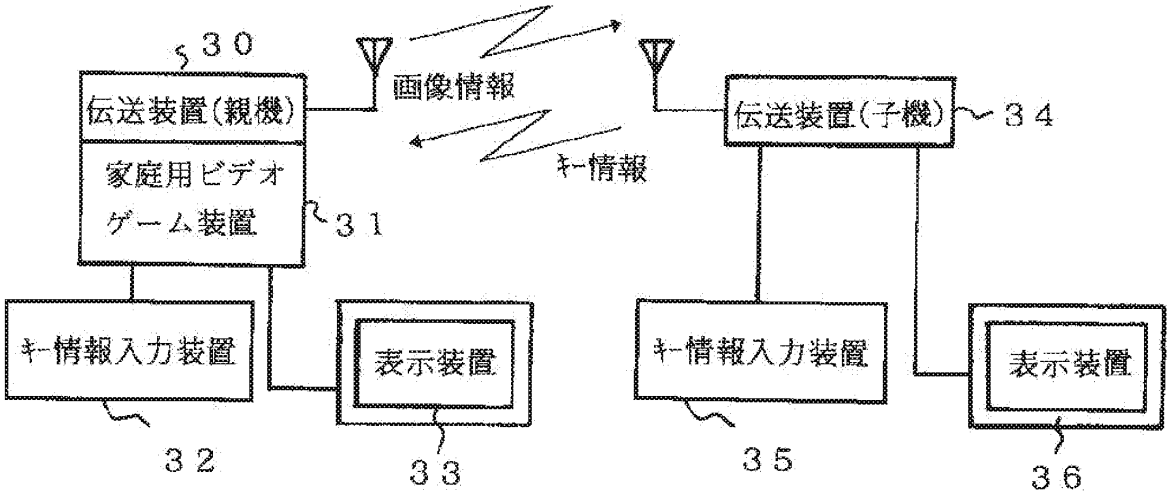


[FIG.2]



[FIG.3]

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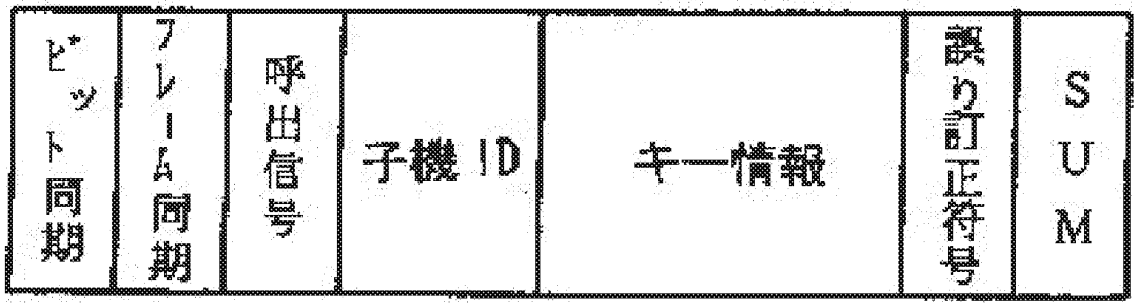
[FIG.4]

伝送パケット構成図

（a）親機→子機

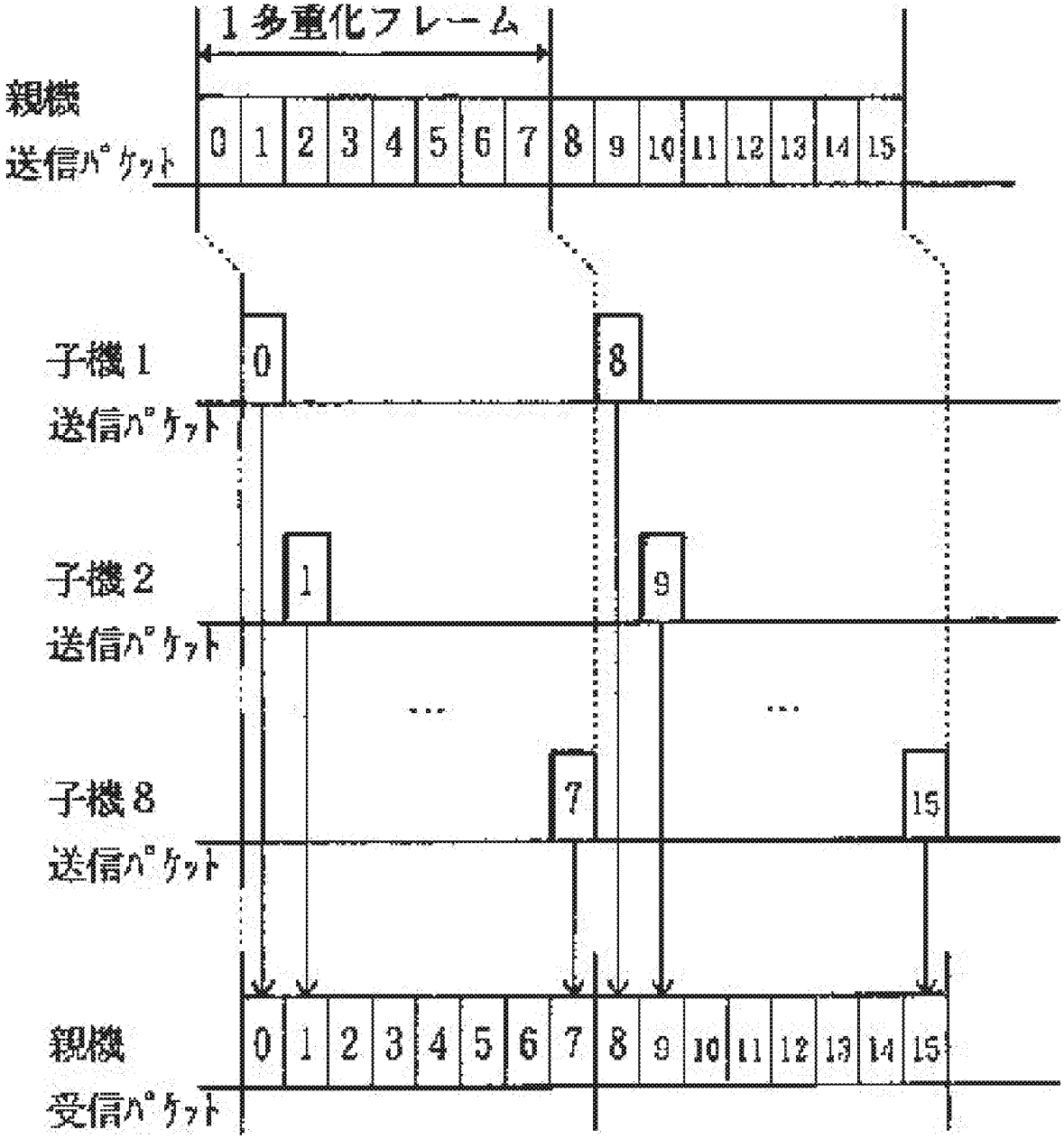


（b）子機→親機



[FIG.5]

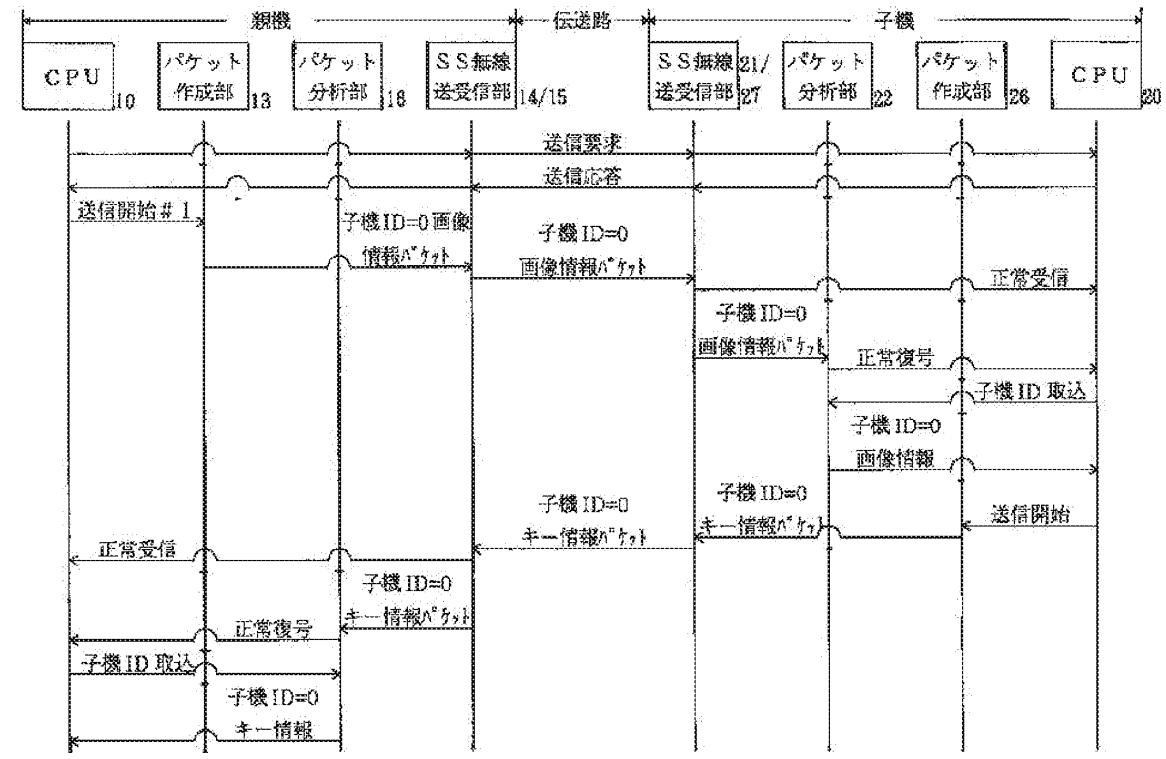
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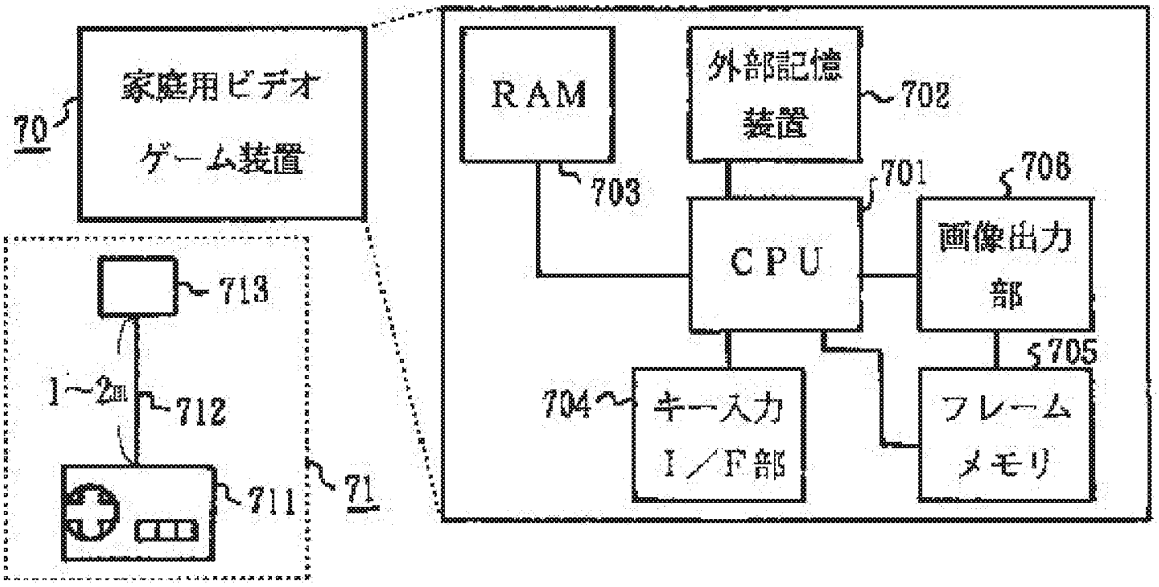
[FIG.6]

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パケット伝送シーケンス

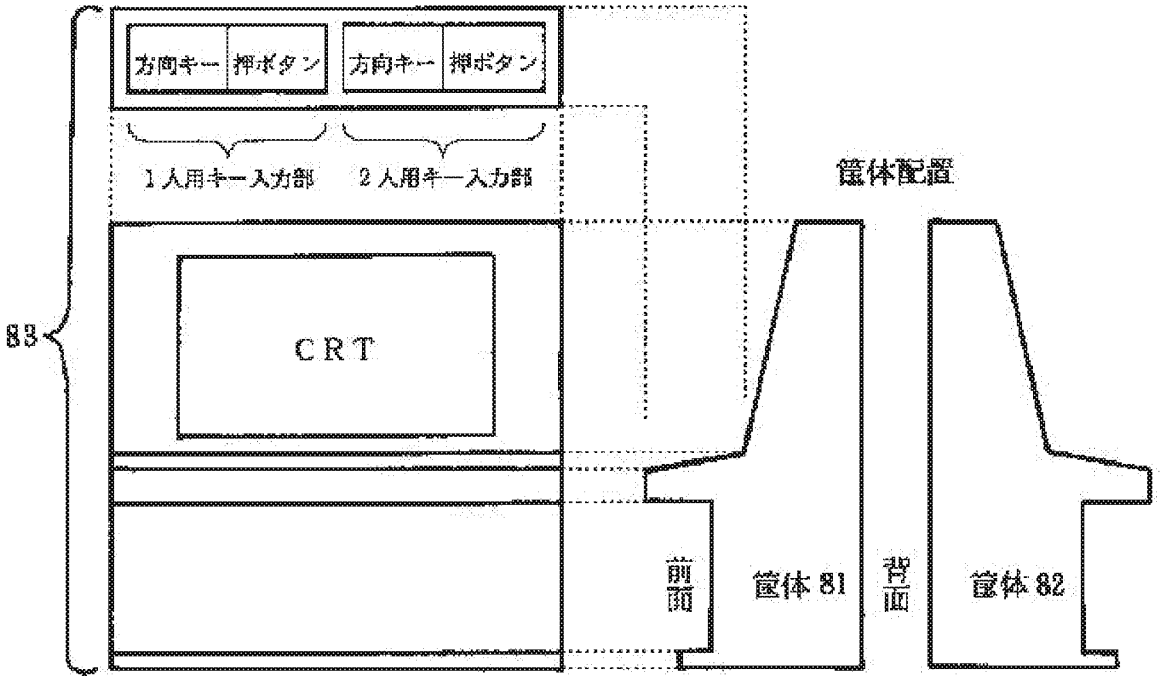


[FIG.7]



[FIG.8]

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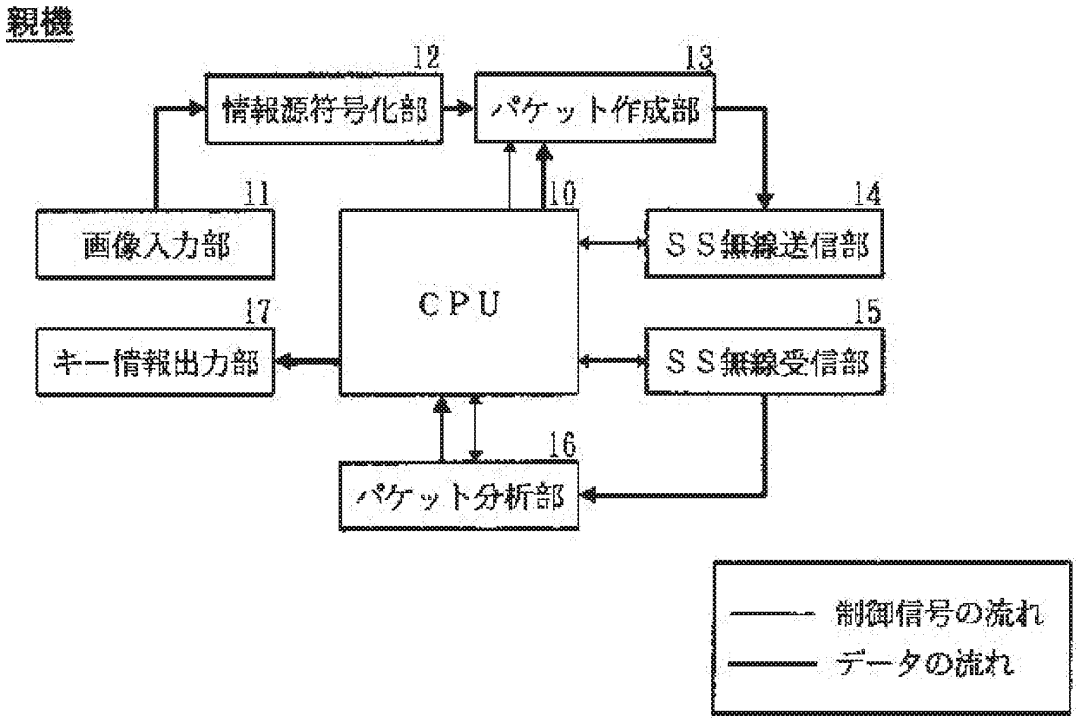


Drawings | Close

Representative drawing | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8

Enlarge and Rotate

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Representative drawing

Previous document 2 of 2 Display Next document

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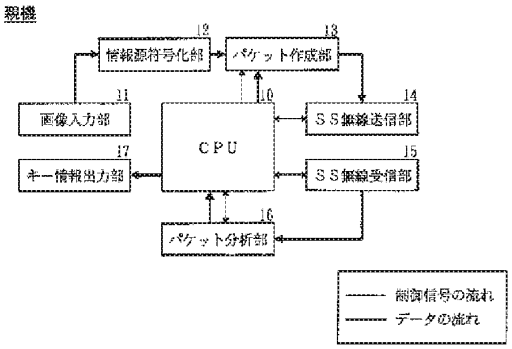
(74)代理人　弁理士　高崎　芳紘

(54)【発明の名称】　データ伝送装置、ビデオゲーム機

(57)【要約】

【課題】　離れた部屋の間でも対戦型のゲームソフトを実行できるビデオゲーム機を実現する。

【解決手段】　親機にスプレッドスペクトル方式の送信部１４、受信部１５を設け、子機も同様に構成する。親機からは各子機側で表示する画像データを情報源符号化部１２で圧縮しパケット作成部１３で各子機ＩＤを付加したパケットとして時分割多重で各子機へ送る。また子機からはキー入力情報を送信し、親機の受信部１５はこれを時分割受信してゲームに反映させる。



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【特許請求の範囲】

【請求項1】　ビデオゲーム機の親装置と1個または複数の子装置の間のデータ伝送を行うためのデータ伝送装置であって、

親装置から子装置へ送るための画像データを符号化して圧縮するための符号化手段と、

該手段から出力された符号化画像データを送り先子装置の識別コードを含むパケットとするためのパケット作成手段と、

該手段により作成されたパケットを、スプレッドスペクトル方式により各子装置へ順次サイクリックに送信するための無線送信手段と、

各子装置からスプレッドスペクトル方式により送信されてきたキー情報を受信復調するための無線受信手段と、

該受信手段により受信復調された各パケットを分析してどの子装置からのキー情報であるかを判別するためのパケット分析手段と、

を備えたところの親伝送装置を前記ビデオゲーム機の親装置に設け、

ビデオゲーム機の子装置から親装置へ送るためのキー情報を当該子装置の識別コードを含むパケットとするためのパケット作成手段と、

該手段により作成されたパケットを、スプレッドスペクトル方式により割り当てられたタイムスロットを用いて送信するための無線送信手段と、

親装置からスプレッドスペクトル方式により送信されてきた画像データを受信復調するための無線受信手段と、

該受信手段により受信復調された各パケットを分析して該当する子装置の識別コードを含んでいるかを判別するためのパケット分析手段と、

前記受信復調されたパケット内の画像データを復号化するための復号化手段と、

を備えたところの子データ伝送装置を前記ビデオゲーム機の各子装置に設けたことを特徴とするデータ伝送装置。

【請求項2】　前記親データ伝送装置及び子データ伝送装置の符号化手段は、誤り訂正符号及びサムチェック用データをパケットに付加する機能を有し、前記親データ伝送装置及び子データ伝送装置のパケット分析手段は、前記誤り訂正符号及びサムチェック用データによる誤り検出、訂正機能を有したことを特徴とする請求項1記載のデータ伝送装置。

【請求項3】　請求項1または2記載の親データ伝送装置及び子データ伝送装置をその親装置及び各子装置に備えたことを特徴とするビデオゲーム機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、スプレッドスペクトル無線伝送方式を用いたデータ伝送装置とビデオゲーム機に係わり、とくに複数のプレイヤーによる対戦式のビデオゲームを行うためのデータ伝送装置とビデオゲーム機に関する。

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【0002】

【従来の技術】図7は、従来のビデオゲーム機の構成例を示すブロック図で、半導体ROMあるいはCD-ROMで構成された外部記憶装置702には、ゲーム用のソフトウエアやデータが格納されている。ゲームをプレイするときは、このソフトウエアがRAM703に読み込まれ、CPU701により実行される。フレームメモリ705は表示する画像データを格納し、このデータが画像出力部36を介して図示を省略した表示装置に表示される。キー入力I/F部704は、プレイヤーがキー情報入力部71を操作したときそれを受け付け、CPU701へ伝える。このゲーム機が対戦プレイ可能な仕様であれば、キー情報入力部71からキー入力I/F部704を介して一定周期またはキー入力割り込みで入力情報をCPU701に取り込み、CPU701でキー入力値を解析し、フレームメモリ705上にキー入力値に対応した情報を反映し、これを画像出力部706から出力することで対戦プレイを表示装置上で実現する。

【0003】一方、業務用ビデオゲーム装置に於いては、対戦格闘というジャンルのゲームに関して、図8のように筐体81、82を背面で向い合わせにする配置で対戦プレイを行うのが一般的になりつつある。理由は筐体81の前面83に示したように、一つの表示装置に二つのキー情報入力部を備えたビデオゲーム装置を使用した隣同士での対戦プレイは、プレイする者にとって物理的に窮屈なこと、キー入力を行う対戦相手の反応が画面に反映される前に目で見えてしまうことが挙げられる。

【0004】

【発明が解決しようとする課題】図7に示した従来技術のキー情報入力部71は、入力用の方向キーや押しボタンを装備したキー入力パッド711と、ビデオゲーム装置70のキー入力I/F部704との接続コネクタ713と、キー入力パッド711、接続コネクタ713を結ぶケーブル712で構成されている。そしてキー情報入力装置71のケーブル712の届く範囲でプレイを行っている。または赤外線送受信装置をキー入力パッド及びキー入力I/F部に組み込んで、ワイヤレス環境で対戦プレイを行うことが可能である。この場合も赤外線の届く範囲内、例えばビデオゲーム機本体から数メートルの距離でプレイができる。しかしこれらいずれの場合も、対戦プレイ型のゲームの場合、2人あるいは複数のプレイヤー間の距離が十分にとれず、窮屈さや対戦相手が直接見えてしまうという問題が解決できない。また家庭用等の様々な環境、たとえばマンションの別の部屋との間でのプレイといった使い方ができない。

【0005】本発明の目的は、マンションの部屋など、とくに数10~数100メートル離れた場所でのプレイ環境での使用も可能にするスプレッドスペクトラム無線

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伝送方式を用いたデータ伝送装置と、その装置を用いたビデオゲーム機を提供するにある。

【０００６】

【課題を解決するための手段】上記の目的を達成するために、本発明においては、ビデオゲーム機の親装置と１個または複数の子装置の間のデータ伝送を行うためのデータ伝送装置であって、親装置から子装置へ送るための画像データを符号化して圧縮するための符号化手段と、該手段から出力された符号化画像データを送り先子装置の識別コードを含むパケットとするためのパケット作成手段と、該手段により作成されたパケットを、スプレッドスペクトル方式により各子装置へ順次サイクリックに送信するための無線送信手段と、各子装置からスプレッドスペクトル方式により送信されてきたキー情報を受信復調するための無線受信手段と、該受信手段により受信復調された各パケットを分析してどの子装置からのキー情報であるかを判別するためのパケット分析手段と、を備えたところの親伝送装置を前記ビデオゲーム機の親装置に設け、ビデオゲーム機の子装置から親装置へ送るためのキー情報を当該子装置の識別コードを含むパケットとするためのパケット作成手段と、該手段により作成されたパケットを、スプレッドスペクトル方式により割り当てられたタイムスロットを用いて送信するための無線送信手段と、親装置からスプレッドスペクトル方式により送信されてきた画像データを受信復調するための無線受信手段と、該受信手段により受信復調された各パケットを分析して該当する子装置の識別コードを含んでいるかを判別するためのパケット分析手段と、前記受信復調されたパケット内の画像データを復号化するための復号化手段と、を備えたところの子データ伝送装置を前記ビデオゲーム機の各子装置に設けたことを特徴とするデータ伝送装置を提供する。

【０００７】また、本発明は、前記親データ伝送装置及び子データ伝送装置の符号化手段は、誤り訂正符号及びサムチェック用データをパケットに付加する機能を有し、前記親データ伝送装置及び子データ伝送装置のパケット分析手段は、前記誤り訂正符号及びサムチェック用データによる誤り検出、訂正機能を有したことを特徴とするデータ伝送装置を提供する。

【０００８】さらに本発明は、前記の親データ伝送装置及び子データ伝送装置をその親装置及び各子装置に備えたことを特徴とするビデオゲーム機を提供する。

【０００９】

【発明の実施の形態】以下、本発明の実施の形態を説明する。図３は、本発明になるビデオゲーム機の全体構成例を示すブロック図で、ビデオゲーム装置３１には、従来と同様にキー情報入力装置３２と表示装置３３が接続されている。また、このビデオゲーム装置３１を用いて対戦するプレイヤー用には、ビデオゲーム装置３１と接続するための、スプレッドスペクトル（Spread Spectrum）方式（以下ＳＳ方式と略記する）の無線伝送によりデータを伝送するデータ伝送装置の親機３０と子機３４が用意され、子機３４にはやはりキー情報入力装置３５及び表示装置３６が接続されている。

【００１０】図１及び図２は、本発明のデータ伝送装置の親機３０及び子機３４の構成例を示すブロック図で、親機３０の画像入力部１１でビデオゲーム装置３１から出力された画像情報を入力し、情報源符号化部１２で画像情報を圧縮する。ここで使われる圧縮方式は、秒間数フレーム～３０フレームを圧縮できる方式であれば、モーションＪＰＥＧ、Ｈ．２６１、ＭＰＥＧ等どんな符号化方式でもよい。情報源符号化部１２で符号化された画像情報は、パケット作成部１３で図４（ａ）に示すようなパケットに構成される。即ち、画像符号化情報と接続可能な子機ＩＤ情報に、伝送制御用のビット同期信号とフレーム同期信号と呼出信号をヘッダとして付加し、そして、画像符号化情報と子機ＩＤ情報の保護のための誤り訂正符号と、画像符号化情報と子機ＩＤ情報と誤り訂正符号の保護のためにパケットＳＵＭ値を付加したものとする。こうして作成したパケットをＳＳ無線送信部１４から送出する。

【００１１】この送出された画像情報は、子機のＳＳ無線受信部２１で受信される。ここでは、ビット同期信号は「０」と「１」のビット情報が交互に並んでいる情報であり、フレーム同期信号は先頭２ビット以上が「０」で構成されている情報なので、交互判定を抜けたときが同期の始まりと認識して有効パケットの受信を開始する。パケット分析部２２では、フレーム同期情報後の所定の容量のデータを受信して、そのデータのＳＵＭ値を計算し、受信したデータに含まれているＳＵＭ値と照合する。これが正しければ更に、誤り訂正符号を復号化して画像符号化情報と子機ＩＤ情報を取り出す。こうして取り出された画像情報は情報源復号化部２３で復号化され、画像出力部２４から子機３４に接続された表示装置３６に出力される。

【００１２】同時に、子機ではキー情報入力部２５からキー情報を取り込んで保持する。受信した親機→子機パケットに含まれる子機ＩＤが受信した子機のＩＤと合致していれば、パケット作成部２６で図４（ｂ）に示すようなパケットを構成する。このパケットは、伝送制御用のビット同期信号とフレーム同期信号と呼出信号をヘッダとして子機ＩＤとキー情報に付加し、また子機ＩＤ及びキー情報の保護のための誤り訂正符号と、子機ＩＤ及びキー情報と誤り訂正符号の保護のためのパケットＳＵＭ値を付加したものである。このパケットはＳＳ無線送信部２７から送出される。送出されたデータは親機のＳＳ無線受信部１５で受信され、パケット分析部１６でキー情報が取り出され、ＣＰＵ１０を介して順にキー情報出力部１７に出力される。

【００１３】以上に説明した構成では、子機が１つであ

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るとしたが、親機側に接続するビデオゲーム装置で使用するソフトウエアが複数人同時プレイ可能である場合で、かつ子機が複数台存在する場合は、親機側で子機から送信されるデータを時分割で受信することで同時プレイを可能とする。図５は、このときの各パケットが送受信される状態を示すタイムチャートで、８台の子機にＩＤ＝０～７を対応させている。多重化の１フレームは８等分され、その各々を１タイムスロットとしてこの各タイムスロットに１つのパケットが割り当てられる。図中の各パケットに記入されている数字は上記のＩＤである。図４で説明したように親機側が送信する画像情報パケットに含まれる子機ＩＤにより送信可能な子機を指定し、子機ＩＤ＝ｊのときはＮ＊８＋ｊ番目のタイムスロットを使用する。ここでｊ＝０、１、・・・・７であり、Ｎは整数である。各子機は割り当てられたタイムスロットで送信し、親機側では接続可能な子機の台数分のＩＤを予め登録及び保持しておいて、順にそして繰り返し、画像情報パケットに設定することにより１対Ｍの伝送を行う（上記の例ではＭ＝８）。更に、親機では特定子機指定情報を含んだ画像情報パケット送信後、一定時間だけ指定子機からのキー情報を受け付ける。

【００１４】図７は、パケット伝送シーケンスである。まず親機のＣＰＵ１０と子機のＣＰＵ２０間で送信要求、送信応答の授受を行ってトランスポートの確立が行われる。次に、親機のＣＰＵ１０からパケット作成部１３に対して送信開始信号＃１が送られると、パケット作成部１３は１フレーム分の画像符号化データを送信を許可する子機ＩＤ＝０と共にＳＳ無線送信部１４に送る。これを受け取ったＳＳ無線送信部１４は、この画像情報パケットを通信制御を行いながら伝送路へ送信する。

【００１５】子機（ＩＤ＝０）では、この画像情報パケットを受信したＳＳ受信部２１からパケット分析部２２に受信情報が送られ、パケット分析部２２で伝送誤りの有無を検出する。この受信結果が正常であることがＣＰＵ２０に通知されると、ＣＰＵ２０は子機ＩＤの取り込みをパケット分析部２２に指示し、これに応じて伝送されてきた子機ＩＤがＣＰＵ２０に、及び画像情報が画像復号化部２３に取り込まれる。ＣＰＵ２０で、自分が持つＩＤと受信した送信許可子機ＩＤを比較して同一の値であれば、パケット作成部２６に対して送信開始信号を送る。パケット作成部２６では、１タイムスロット分のキー入力情報を自分のＩＤと共にＳＳ無線送信部２７に送る。これを受け取ったＳＳ無線送信部２７は、このキー情報パケットを通信制御を行いながら伝送路へ送信する。

【００１６】親機では、このキー情報パケットを受信したＳＳ無線受信部１５からパケット分析部１６にこの情報が送られ、パケット分析部１６で伝送誤りの有無を検出する。この受信結果が正常であることがＣＰＵ１０に通知されると、ＣＰＵ１０は子機ＩＤの取り込みをパケット分析部１６に指示し、これに応じて伝送されてきた子機ＩＤ及びキー情報がＣＰＵ１０に取り込まれる。ＣＰＵ１０で、取得した子機ＩＤと受信待機状態で予定していたＩＤが合致すれば、取得したキー情報をキー情報出力部１７に送出する。

【００１７】２番目の送信開始信号＃２以降の動作も同様である。そして、接続可能な子機ＩＤの上限まで辿り着くと再び子機ＩＤ＝０から繰り返す。この構成によると、一般に画像情報量に比べてキー情報量は少ないので、図５の各タイムスロットで親機から子機への画像データの時分割が可能であれば、子機からのキー情報は時分割により十分親機へ伝送することができる。

【００１８】

【発明の効果】本発明によれば、数１０～数１００メートル離れた部屋の間でも家庭用のビデオゲームを対戦式で楽しむことができるビデオゲーム機を実現することができる。

【図面の簡単な説明】

【図１】本発明になる画像伝送装置の親機の構成例を示すブロック図である。

【図２】本発明になる画像伝送装置の子機の構成例を示すブロック図である。

【図３】本発明のビデオゲーム機の全体構成例を示すブロック図である。

【図４】伝送パケットのフレーム構成例である。

【図５】複数子機と親機との間のパケット多重伝送の説明図である。

【図６】パケット伝送の手順を示す図である。

【図７】従来のビデオゲーム機の構成例を示す図である。

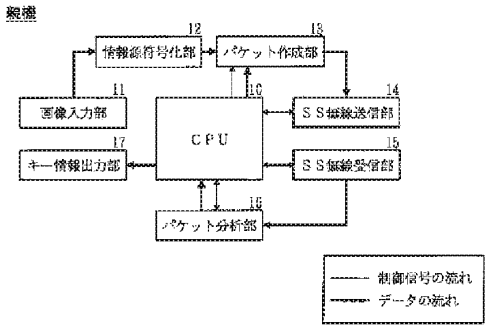
【図８】業務用ビデオゲーム機の構成例を示す図である。

【符号の説明】

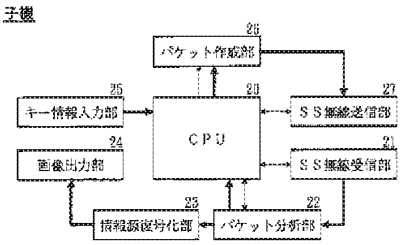
１０、２０　ＣＰＵ
１１　画像入力部
１２　情報源符号化部
１３、２６　パケット作成部
１４、２７　ＳＳ無線送信部
１５、２１　ＳＳ無線受信部
１６、２２　パケット分析部
１７　キー情報出力部
２３　情報源復号化部
２４　画像出力部
２５　キー情報入力部

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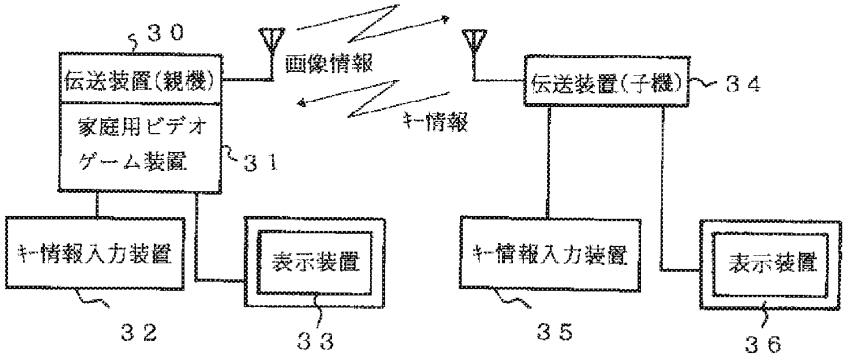
【図１】



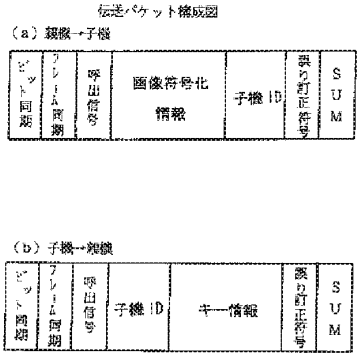
【図２】



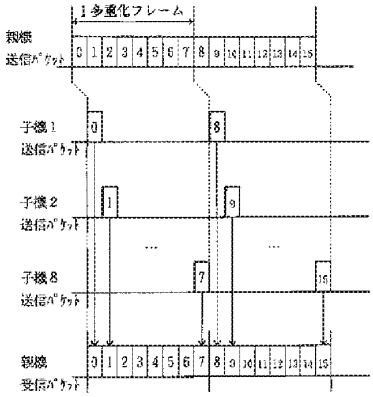
【図３】



【図４】

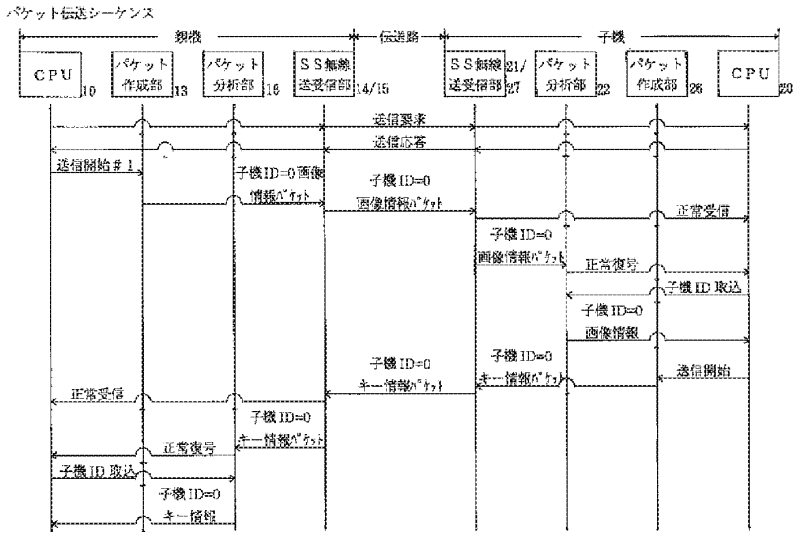


【図５】

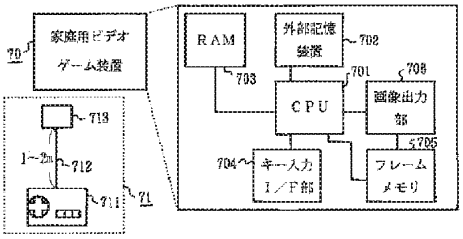


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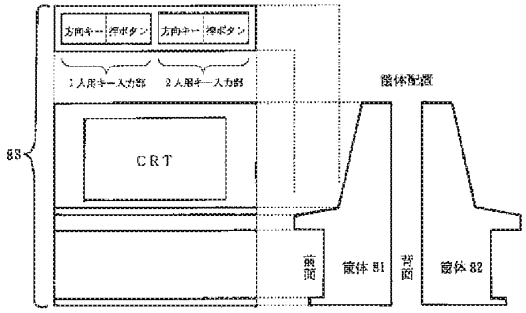
【図6】



【図7】



【図8】



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Electronic Patent Application Fee Transmittal

Application Number:	15638020
Filing Date:	29-Jun-2017
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Filer:	Joshua Chang/Janice McGahey
Attorney Docket Number:	IPTLP002C5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	39145194
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	13-APR-2020
Filing Date:	29-JUN-2017
Time Stamp:	20:36:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$240
RAM confirmation Number	E20204CK36350091
Deposit Account	506367
Authorized User	Janice McGahey
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IPTLP002C5_IDS_Transmittal_04132020_ForFiling.pdf	20989 2a002265ca10279d54423e81158efd3b04ea176c	no	2
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Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	IPTLP002C5_IDS_04132020.pdf	1037563 ea44f2ed45ddc83f831ccd4716ba5a56d1703f63	no	8
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3	Information Disclosure Statement (IDS) Form (SB08)	IPTLP002C5_IDS_AddtlPg_04132020.pdf	229549 824a1bbd6a9c59af5b8121206b460d14d8baf946	no	2
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8	Non Patent Literature	Graf_ModernDictionaryOfElectronics.pdf	2692021 b889c25261d21486de96c62ff1120208032b8653	no	10
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Information:					

35	Non Patent Literature	ExA-4520Mann_.pdf	633134 66059f50a3af13e9bf4e7f486cd51bf4f3105778	no	116
Warnings:					
Information:					
36	Non Patent Literature	ExA-5520Moriguchi_.pdf	381669 79b9c1f44e2184b3cb264b265a7fb5c91cbc3e70	no	88
Warnings:					
Information:					
37	Non Patent Literature	ExA-6520RichardsonRFPProtocol_.pdf	637325 f4c41fce0b02f091f7e67f6d854414977eabbf54	no	54
Warnings:					
Information:					
38	Non Patent Literature	ExA-7520SchmidtSLIM_.pdf	497191 64e3ff3a7cfee17b9a08032ad994240875ad6d2c	no	44
Warnings:					
Information:					
39	Non Patent Literature	ExA-8520RichardsonIEEE_.pdf	364047 8f0cb6d341140601dd6b67724e5034b5dadf20fc	no	27
Warnings:					
Information:					
40	Non Patent Literature	ExA-9520AdditionalReferences_.pdf	203564 64de0e7f2ec7448fbaff8e856402b9d544eb98e6	no	28
Warnings:					
Information:					
41	Non Patent Literature	ExB-1826Engel1999_.pdf	1006055 400307edf53a399044faac9f4d04085210e3e959	no	64
Warnings:					
Information:					

42	Non Patent Literature	ExB-2826Engel2000_.pdf	398009 73c094c55318d71ece762bf224c763107aa58ed5	no	66
Warnings:					
Information:					
43	Non Patent Literature	ExB-3826Keslin_.pdf	467285 25aa19ba81b10d09fd1ec6053dab404b44d28f34	no	70
Warnings:					
Information:					
44	Non Patent Literature	ExB-4826Mann_.pdf	463562 bb775d9cc60c76ab973e64f5426b528d3059de08	no	86
Warnings:					
Information:					
45	Non Patent Literature	ExB-5826Moriguchi_.pdf	337020 20498bf4cf6b680f231cf190cf5f27f9ae6c2e0c	no	70
Warnings:					
Information:					
46	Non Patent Literature	ExB6826RichardsonRFBProtocol_.pdf	672662 d3431e9aeec510521e6ea34ea40b409525314381	no	63
Warnings:					
Information:					
47	Non Patent Literature	ExB-7826SchmidtSLIM_.pdf	504554 3d6ba49c5afa7ef1623d8b8d6d00aaeced68b94b	no	39
Warnings:					
Information:					
48	Non Patent Literature	ExB-8826RichardsonIEEE_.pdf	359490 e6918ffba6441a3ced1ddcf8212673593b2a3578	no	25
Warnings:					
Information:					

49	Non Patent Literature	ExB-9826AdditionalReferences_.pdf	178373 3ea16e12683eb15f9a347a96f9750a9bbeefcec0	no	23
Warnings:					
Information:					
50	Non Patent Literature	ExC-1093Engel1999_.pdf	859037 7448b53b811a73c8813b1e02564d606a32a695a7	no	55
Warnings:					
Information:					
51	Non Patent Literature	ExC-2093Engel2000_.pdf	390813 d9b8d7cd47b3ef59292761422114 3e1e664f4c35	no	62
Warnings:					
Information:					
52	Non Patent Literature	ExC-3093Keslin_.pdf	379911 2abb8a4c6ca32b33b3301d1b3a4bd6be40eabc84	no	61
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53	Non Patent Literature	ExC-4093Mann_.pdf	395334 f0c75f2f8758c36d593daefd1d55f7f88029308e	no	61
Warnings:					
Information:					
54	Non Patent Literature	ExC-5093Moriguchi_.pdf	337711 ce7f310e710844035269 4818e59e7c0b2dd047c0	no	70
Warnings:					
Information:					
55	Non Patent Literature	ExC-6093RichardsonRFPProtocol_.pdf	459398 91885cc61f4a75e60ee47938bcbd285225d1f90e	no	39
Warnings:					
Information:					

56	Non Patent Literature	ExC-7093SchmidtSLIM_.pdf	394962 9f6eec27983c98f19a4513169430ad4fcb417d35	no	26
Warnings:					
Information:					
57	Non Patent Literature	ExC-8093RichardsonIEEE_.pdf	344343 76b6c78337f8d9b68d4a839dd64cbfd05975407c	no	20
Warnings:					
Information:					
58	Non Patent Literature	ExC-9093AdditionalReferences_.pdf	588553 78b4a0d46b93dc435bd017a3afa122523955cf90	no	32
Warnings:					
Information:					
59	Fee Worksheet (SB06)	fee-info.pdf	30746 15d8cb7a22671b764c6f661ca1d03aefa3dfa790	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	124245565	

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

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: KENT, Osman et al.	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, Yves
Filed: June 29, 2017	Group: 2457
TITLE: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: 5023

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

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL

Dear Sir/Madam:

This Information Disclosure Statement is submitted:

___ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; whichever occurs last)

___ under 37 CFR 1.97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $240.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

X under 37 CFR 1.97(d) together with a:
X Statement under 37 CFR 1.97(e), and
X a $240.00 fee set forth in 37 CFR 1.17(p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

X Applicant(s) submit herewith Form PTO/SB/08a Information Disclosure Statement, patents, publications or other information that may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

Pursuant to 37 C.F.R. § 1.97, the submission of this Information Disclosure Statement is not to be construed as a representation that a search has been made and is not to be construed as

an admission that the information cited in this statement is material to patentability. It is requested that the information disclosed herein be made of record in this application.

The Commissioner is hereby authorized to charge any required fees, including those for any deficiency, or credit any overpayment to Applicant's Deposit Account No: 50-6367, (**Order No. IPTLP002C5**).

Respectfully submitted,

Dated: April 13, 2020

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

Kwan & Olynick LLP
2000 Hearst Street, Ste. 305
Berkeley, CA 94709
510-900-9501
jchang@kwanip.com

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Sony v. IPL, IPR2021-00237
Page 219 of 494

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 15/638,020	Filing Date 06/29/2017	☐ 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 $80 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $420 =	
☐ 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	04/13/2020	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 $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/MARQUITA D JONES/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 04/03/2020

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER
DALENCOURT, YVES

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
04/03/2020	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):

docket@kwanip.com
eofficeaction@appcoll.com
lsmith@kwanip.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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

In re Application of	:	
Kent et al.	:	
Application No. 15/638,020	:	DECISION ON PETITION
Filed: June 29, 2017	:	
For: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	:	

This is a Notice regarding the request for acceptance of a fee deficiency submission under 37 CFR 1.28(c) filed February 24, 2020.

The Office no longer investigates or rejects original or reissue applications under 37 CFR 1.56. 1098 Off. Gaz. Pat. Office 502 (January 3, 1989). Therefore, nothing in this Notice is intended to imply that an investigation was done.

The fee deficiency submission under 37 CFR 1.28(c) is **ACCEPTED**. Accordingly, status as a small entity has been removed and any future fee(s) submitted must be paid at the undiscounted rate.

Inquiries related to this communication should be directed to Felicia Jenkins at (571) 272-0986.

/JOANNE L BURKE/
Lead Paralegal Specialist, OPET



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C47345

Sale Accounting Date:03/23/2020

Sale Item Reference Number	Effective Date
15638020	02/24/2020

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20203MB36598152	1461	1.28(C) SUBMISSIONS - APPLIC FILE FEE	$1,180.00	Deposit Account

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Osman KENT	Attorney Docket No: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, YVES
Filed: June 29, 2017	Art Unit: 2457
Title: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No: 5023

RESPONSE TO DECISION ON PETITION/
AMENDED DEFICIENCY PAYMENT ITEMIZATION

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

Dear Sir/Madam:

This document is provided as a response to the Notice of Decision on Petition dated January 24, 2020, a response to which is due February 24, 2020. Applicant respectfully requests that the Office enter the following amended Deficiency Payment/Notification of Loss of Small Entity Status Under 37 C.F.R. 1.28 (c) & (d). This document amends applicant's fee deficiency submission filed July 22, 2019 by providing the further itemization requested to fully meet the itemization requirements of requirement (C) of 37 CFR 1.28 (c)(2)(ii). This further itemization includes further subdivisions to the items in the original submission so that the deficiency owed amount for each fee is clearly listed (see column 5 of the table below). No FEES are believed to be owed with this submission since applicant was charged the deficiency amount of $1,180 at the time of the July 22, 2019 filing.

In the above referenced application/patent, small entity status was established in good faith, and payment of fees as a small entity were made in good faith. However, it was later

IPL EX2004
Sony v. IPL, IPR2021-00237
Page 224 of 494

discovered that such status as a small entity was established in error, or that through error the Office was not notified of a loss of entitlement to small entity status as required by 37 CFR 1.27(g)(2). In order to have the small entity status error excused under 37 CFR 1.28(c), Applicant hereby: 1) separately submits this paper per paragraph (c)(1) of this section; 2) submits an itemization of the deficiency payment per paragraph (c)(2) of this section; and 3) submits the deficiency payment per paragraph (c)(2) of this section.

Under 37 CFR 1.28(d), the deficiency payment submission under paragraph (c) of this section hereby operates under 37 CFR 1.27 (g)(2) as a notification of loss of entitlement to small entity status. Deficiency payment of **$1,180** was previously paid with Deposit Account No. **50-6367** (Order No. **IPTLP002C5**) with the filing of the Deficiency Payment/Notification of Loss of Small Entity Status Under 37 C.F.R. 1.28 (c) & (d) on July 22, 2019 (attached herewith).

	Type of fee erroneously paid as Small Entity	Current fee for Large Entity (Last Revised on January 1, 2020)	Small Entity fee paid and date when paid	Deficiency amount owed
Item 1	[37 CFR 1.16(a); Basic Filing Fee]	[FC 1011 $300; Filing fee]	[FC 4011 $70; Electronic Basic Filing fee paid September 12, 2017]	$230
Item 2	[37 CFR 1.16(k); Utility Search Fee]	[FC 1111 $660; Search fee]	[FC 2111 $300 Search fee paid September 12, 2017]	$360
Item 3	[37 CFR 1.16(o);Utility Examination Fee]	[FC 1311 $760; Examination fee]	[FC 2311 $360; Examination fee paid September 12, 2017]	$400
Item 4	[37 CFR 1.16(f); Surcharge for late filing inventor's oath]	[FC 1051 $160 Surcharge for late filing inventor's oath]	[FC 2051 $70; Surcharge for late filing, inventor's oath Paid September 12, 2017]	$90

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Item 5	37 CFR 1.17(a)(1); Extension for response within first month	$200 (Extension for response within first month)	$100 [Paid December 28, 2018 (FC2251)]	$100
Total deficiency payment owed				**Total =$1,180** (paid on July 22, 2019)

No fees are believed to be due with this submission. Should the Office have any questions or require any additional information, please do not hesitate to contact the undersigned at the telephone number set out below.

Attachment: Deficiency Payment/Notification of Loss of Small Entity Status Under 37 C.F.R. 1.28 (c) & (d) filed July 22, 2019

Dated: February 24, 2020

Respectfully submitted,
/joshua chang/

Joshua Chang
Reg. 70,831

Kwan & Olynick LLP
2000 Hearst Street, Ste. 305
Berkeley, CA 94709
510-900-9501
jchang@kwanip.com

IPL EX2004
Sony v. IPL, IPR2021-00237
Page 226 of 494

Electronic Acknowledgement Receipt

EFS ID:	38670843
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	24-FEB-2020
Filing Date:	29-JUN-2017
Time Stamp:	17:39:02
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	IPTLP002C5_Loss_of_Small_Entity_Status_Deficiency_Payment_Receipt_07252019.pdf	86201 b7ee63c1abc3cb9720747d1f5152113ce8543ec0	no	4
Warnings:					

Information:					
2	Petition for review by the Office of Petitions	IPTLP002C5_Resp_Petition_Decision_01242020_ForFiling.pdf	25660 0553bae20558a0f03cbb70bf34776111c7772a0c	no	3
Warnings:					
Information:					
			Total Files Size (in bytes):	111861	

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

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07/25/2019 DALLEN 00000023 506367 15638020

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JUL 22 2019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Osman KENT	Attorney Docket No: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, YVES
Filed: June 29, 2017	Art Unit: 2457
Title: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No: 5023

DEFICIENCY PAYMENT / NOTIFICATION OF LOSS OF SMALL ENTITY STATUS UNDER 37 C.F.R. 1.28 (c) & (d)

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

Dear Sir/Madam:

In the above referenced application/patent, small entity status was established in good faith, and payment of fees as a small entity were made in good faith. However, it was later discovered that such status as a small entity was established in error, or that through error the Office was not notified of a loss of entitlement to small entity status as required by 37 CFR 1.27(g)(2). In order to have the small entity status error excused under 37 CFR 1.28(c), Applicant hereby: 1) separately submits this paper per paragraph (c)(1) of this section; 2) submits an itemization of the deficiency payment per paragraph (c)(2) of this section; and 3) submits the deficiency payment per paragraph (c)(2) of this section.

Under 37 CFR 1.28(d), the deficiency payment submission under paragraph (c) of this section hereby operates under 37 CFR 1.27 (g)(2) as a notification of loss of entitlement to small entity status.

PAGE 1/15 * RCVD AT 7/22/2019 10:34:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-003/18 * DNIS:2738300 * CSID:408-228-3739 * ANI:4082283739 * DURATION (mm-ss):05-08

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JUL 22 2019

	Type of fee erroneously paid as Small Entity	Current fee for Large Entity	Small Entity fee paid and date when paid	Deficiency amount owed
Item 1	[37 CFR 1.16(a);Basic Filing Fee] [37 CFR 1.16(k); Utility Search Fee] [37 CFR 1.16(o);Utility Examination Fee] [37 CFR 1.16(f); Surcharge for late filing inventor's oath]	[FC 1011 $300; Filing fee] [FC 1111 $660; Search fee] [FC 1311 $760; Examination fee] [FC 1051 $160 Surcharge for late filing inventor's oath] Total for item 1 above = $1,880	Paid September 12, 2017 [FC 4011 $70; Electronic Basic Filing SE [FC 2111 $300 Search fee] [FC 2311 $360; Examination fee] [FC 2051 $70; Surcharge for late filing, inventor's oath] Total for item 1 above = $800	$1,080
Item 2	37 CFR 1.17(a)(1)	$200 (Extension for response within first month)	$100 [Paid December 28, 2018 (FC2251)]	$100
Total deficiency payment owed				Total =$1,180

The deficiency payment of **$1,180** is to be charged to Deposit Account No. **50-6367** (Order No. **IPTLP002C5**).

Should the Office have any questions or require any additional information, please do not hesitate to contact the undersigned at the telephone number set out below.

PAGE 2/15 * RCVD AT 7/22/2019 10:34:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-003/18 * DNIS:2738300 * CSID:408-228-3739 * ANI:4082283739 * DURATION (mm-ss):05-08

IPL EX2004
Sony v. IPL, IPR2021-00237
Page 231 of 494

Dated: July 22, 2019

Respectfully submitted,
/joshua chang/

Joshua Chang
Reg. 70,831

Kwan & Olynick LLP
2000 Hearst Street, Ste. 305
Berkeley, CA 94709
510-900-9501
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PAGE 3/15 * RCVD AT 7/22/2019 10:34:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-003/18 * DNIS:2738300 * CSID:408-228-3739 * ANI:4082283739 * DURATION (mm-ss):05-08

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.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 02/12/2020

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER	
DALENCOURT, YVES	

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
02/12/2020	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):

docket@kwanip.com
eofficeaction@appcoll.com
lsmith@kwanip.com

Office Action Summary	**Application No.** 15/638,020	**Applicant(s)** Kent et al.	
	Examiner YVES DALENCOURT	**Art Unit** 2457	**AIA (FITF) 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 01/27/2020.

☐ 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) 21-37 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) 21-37 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: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

This office action is responsive to amendment filed on 01/27/2020.

Response to Amendment

The Examiner has acknowledged the amended claims 21, 28 - 29, 34, and the submission of new claim 37.

Response to Arguments

Applicant's arguments, see amendment, filed 01/27/2020, with respect to claims 21 - 37 have been fully considered and are persuasive. The rejection of 21 - 37 has been withdrawn. **However, upon further consideration, the double patenting rejection is still maintained.**

Conclusion

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.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8AM-5:30PM.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

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

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	YVES DALENCOURT	2457

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

CLAIMS

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

CLAIM		DATE								
Final	Original	09/02/2018	03/18/2019	09/23/2019	02/06/2020					
	1	✓	✓	-	-					
	2	✓	✓	-	-					
	3	✓	✓	-	-					
	4	✓	✓	-	-					
	5	✓	✓	-	-					
	6	✓	✓	-	-					
	7	✓	✓	-	-					
	8	✓	✓	-	-					
	9	✓	✓	-	-					
	10	✓	✓	-	-					
	11	✓	✓	-	-					
	12	✓	✓	-	-					
	13	✓	✓	-	-					
	14	✓	✓	-	-					
	15	✓	✓	-	-					
	16	✓	✓	-	-					
	17	✓	✓	-	-					
	18	✓	✓	-	-					
	19	✓	✓	-	-					
	20	✓	✓	-	-					
	21			✓	✓					
	22			✓	✓					
	23			✓	✓					
	24			✓	✓					
	25			✓	✓					
	26			✓	✓					
	27			✓	✓					
	28			✓	✓					
	29			✓	✓					
	30			✓	✓					
	31			✓	✓					
	32			✓	✓					
	33			✓	✓					
	34			✓	✓					
	35			✓	✓					
	36				✓					
	37				✓					

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

CPC - Searched*		
Symbol	Date	Examiner
H04L65/607; H04N21/23412,	09/02/2018	YD

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
WEST/CPC (text searched)	09/02/2018	YD
WEST/CPC (updated text search)	03/18/2019	YD
WEST/CPC (updated text search)	09/20/2019	YD
WEST/CPC (updated text search)	02/05/2020	YD

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

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WEST Search History for Application 15638020

Creation Date: 2020020618:14

Prior Art Searches

Query	DB	Hits	Op.	Plur.	Thes.	Date
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	54534	OR	YES		09-02-2018
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	66399	OR	YES		09-02-2018
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	19	OR	YES		09-02-2018
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
		2	OR	YES		09-02-2018

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(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17231	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1463	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1199	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	142	OR	YES		09-02-2018
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB,	48	OR	YES		09-02-2018

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	DWPI, TDBD					
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	14	OR	YES		09-02-2018
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
		0	OR	YES		09-02-2018

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@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	139	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	96	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-02-2018

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20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-02-2018
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-02-2018
(H04L65/605).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	5172	OR	YES		09-02-2018
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
(H04L65/607).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7555	OR	YES		09-02-2018
(H04N21/23412).CPC.	PGPB, USPT, EPAB, JPAB,	1542	OR	YES		09-02-2018

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	DWPI, TDBD					
(H04N21/234318).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1850	OR	YES		09-02-2018
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		03-18-2019
		58377	OR	YES		03-18-2019

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displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	71067	OR	YES		03-18-2019
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB,	71067	OR	YES		03-18-2019

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	DWPI, TDBD					
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	20	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		03-18-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3135	OR	YES		09-23-2019
(interactive adj7 software adj7 application) and receiv$3 adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	87	OR	YES		09-23-2019
		15788	OR	YES		09-23-2019

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(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(generat$3 or form$3) adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7721	OR	YES		09-23-2019
((generat$3 or form$3) adj7 updat$3 adj7 image$1) and compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	107	OR	YES		09-23-2019
((generat$3 or form$3) adj7 updat$3 adj7 image$1 and compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7	OR	YES		09-23-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-23-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	62358	OR	YES		09-23-2019
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	76051	OR	YES		09-23-2019
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB,	1	OR	YES		09-23-2019

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	DWPI, TDBD					
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	21	OR	YES		09-23-2019
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	20084	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1651	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1370	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	220	OR	YES		09-23-2019
		1	OR	YES		09-23-2019

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(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	189	OR	YES		09-23-2019
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	59	OR	YES		09-23-2019
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17	OR	YES		09-23-2019
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	895	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or	PGPB, USPT, EPAB, JPAB,	895	OR	YES		09-23-2019

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real-time)	DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	895	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	220	OR	YES		09-23-2019
@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB,	152	OR	YES		09-23-2019

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	DWPI, TDBD					
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	102	OR	YES		09-23-2019
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		09-23-2019
20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-23-2019
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-23-2019
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-23-2019
((((((H04L65/605))))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6103	OR	YES		09-23-2019
6377257.PN.		3	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
((((((**H04L65/607**)))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8985	OR	YES		09-23-2019
((((((**H04N21/23412**)))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1663	OR	YES		09-23-2019
((((((**H04N21/234318**)))))).**CPC.**	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1974	OR	YES		09-23-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3135	OR	YES		09-23-2019
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	15788	OR	YES		09-23-2019
((updat$3 or modif$3 or chang$3) adj7 software adj7 application) and (interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	160	OR	YES		09-23-2019
(updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB,	497807	OR	YES		09-23-2019

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	DWPI, TDBD					
((updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	46	OR	YES		09-23-2019
compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	434	OR	YES		09-23-2019
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3439	OR	YES		09-23-2019
(compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		09-23-2019
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
8667093.pn.		3	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
8131826.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
7587520.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
asymmetric adj7 bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2247	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and (interactive adj7 software adj7 application and receiv$3 adj7 input adj7 signal$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(transmit$3 or send$3) adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB,	72744	OR	YES		09-23-2019

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	DWPI, TDBD					
((transmit$3 or send$3) adj7 input adj7 signal$1) and (asymmetric adj7 bandwidth)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	28	OR	YES		09-23-2019
((transmit$3 or send$3) adj7 input adj7 signal$1 and asymmetric adj7 bandwidth) and client and server	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	9	OR	YES		09-23-2019
6603470.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(6603470.pn.) and transmnit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(6603470.pn.) and transmit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(6603470.pn. and transmit) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
6929549.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(6929549.pn.) and bandwidth		0	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
kent.in.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	26709	OR	YES		09-23-2019
(kent.in.) and asymmetric	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	771	OR	YES		09-23-2019
(kent.in. and asymmetric) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		09-23-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3307	OR	YES		02-06-2020
(interactive adj7 software adj7 application) and receiv$3 adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	95	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	16402	OR	YES		02-06-2020
(generat$3 or form$3) adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB,	8015	OR	YES		02-06-2020

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	DWPI, TDBD					
((generat$3 or form$3) adj7 updat$3 adj7 image$1) and compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	109	OR	YES		02-06-2020
((generat$3 or form$3) adj7 updat$3 adj7 image$1 and compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7	OR	YES		02-06-2020
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	65297	OR	YES		02-06-2020
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	79717	OR	YES		02-06-2020
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	22	OR	YES		02-06-2020
		1	OR	YES		02-06-2020

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(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	21164	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1708	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1422	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	227	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
6377257.uref.	PGPB, USPT, EPAB, JPAB,	210	OR	YES		02-06-2020

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	DWPI, TDBD					
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	63	OR	YES		02-06-2020
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17	OR	YES		02-06-2020
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	923	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	923	OR	YES		02-06-2020
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	923	OR	YES		02-06-2020
		227	OR	YES		02-06-2020

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(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	155	OR	YES		02-06-2020
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	104	OR	YES		02-06-2020

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(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		02-06-2020
20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		02-06-2020
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		02-06-2020
(((((((H04L65/605))))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6483	OR	YES		02-06-2020
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
(((((((H04L65/607))))))).CPC.	PGPB, USPT, EPAB, JPAB,	9581	OR	YES		02-06-2020

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	DWPI, TDBD					
(((((((H04N21/23412)))))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1766	OR	YES		02-06-2020
(((((((H04N21/234318)))))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2045	OR	YES		02-06-2020
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3307	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	16402	OR	YES		02-06-2020
((updat$3 or modif$3 or chang$3) adj7 software adj7 application) and (interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	165	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	512215	OR	YES		02-06-2020
((updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	49	OR	YES		02-06-2020
compress$3 adj7 updat$3 adj7 image$1		440	OR	YES		02-06-2020

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3494	OR	YES		02-06-2020
(compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		02-06-2020
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
8667093.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
8131826.pn.	PGPB, USPT, EPAB, JPAB,	2	OR	YES		02-06-2020

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	DWPI, TDBD					
7587520.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
asymmetric adj7 bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2313	OR	YES		02-06-2020
(asymmetric adj7 bandwidth) and (interactive adj7 software adj7 application and receiv$3 adj7 input adj7 signal$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(asymmetric adj7 bandwidth) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		02-06-2020
(asymmetric adj7 bandwidth) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(transmit$3 or send$3) adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	74853	OR	YES		02-06-2020
((transmit$3 or send$3) adj7 input adj7 signal$1) and (asymmetric adj7 bandwidth)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	29	OR	YES		02-06-2020
		9	OR	YES		02-06-2020

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((transmit$3 or send$3) adj7 input adj7 signal$1 and asymmetric adj7 bandwidth) and client and server	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
6603470.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		02-06-2020
(6603470.pn.) and transmnit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(6603470.pn.) and transmit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
(6603470.pn. and transmit) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		02-06-2020
6929549.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020
(6929549.pn.) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
kent.in.	PGPB, USPT, EPAB, JPAB,	27109	OR	YES		02-06-2020

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	DWPI, TDBD					
(kent.in.) and asymmetric	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	790	OR	YES		02-06-2020
(kent.in. and asymmetric) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		02-06-2020
(updat$3 or modif$3 or chang$3) adj7 game adj7 state$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6664	OR	YES		02-06-2020
((updat$3 or modif$3 or chang$3) adj7 game adj7 state$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		02-06-2020
9959037.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		02-06-2020
(9959037.pn.) and update$3 adj7 software	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		02-06-2020
(9959037.pn.) and updat$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		02-06-2020

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Page 267 of 494

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: KENT, Osman et al.	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, Yves
Filed: June 29, 2017	Group: 2457
TITLE: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: 5023

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on January 27, 2020.
Signed: /Janice McGahey/
Janice McGahey

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

AMENDMENT AFTER NON-FINAL

Dear Commissioner:

Applicants respectfully request that the Examiner enter the following amendments in response to the Non-Final Office Action dated September 27, 2019, a response to which is due January 27, 2020 with a one-month extension. Please enter the following amendments and consider the following remarks:

Amendments to the Claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-20 (Cancelled)

21. (Currently amended) A method of hosting an interactive software application comprising:

running at a server the interactive software application;

receiving at the server user input signals from a client device, wherein the user input signals are used to control updating of the state of the interactive software application;

generating at least one updated image at the server in response to updating the state of the interactive software application; and

compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a compressed frame that can be decompressed and displayed as an updated image at the client device.

22. (Currently Amended) The method as recited in claim 21 wherein ~~the~~ a first bandwidth for transmitting the user input data between the client device and the server and ~~the~~ a second bandwidth for sending the compressed updated image from the server to the client device are asymmetric.

23. (Previously Presented) The method as recited in claim 21 wherein the server is configured for bidirectional communications with a plurality of client devices, the bidirectional communication including receiving at the server user input signals and transmitting the compressed updated image.

24. (Previously Presented) The method as recited in claim 21 wherein the server is configured to receive user input data and transmit compressed updated images with a plurality of client devices.

25. (Previously Presented) The method as recited in claim 21 wherein at least two of the plurality of client devices include different device platforms.

26. (Previously Presented) The method as recited in claim 21 wherein the client device is a mobile device.

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27. (Previously Presented) The method as recited in claim 21 wherein the interactive software application is an interactive game that is configured to run at the server, which is in bidirectional communication with a plurality of client devices, and wherein said updating the software application includes updating the game state of the interactive game.

28. (Currently Amended) An image display system, comprising:

a server having a processor and memory configured to execute an interactive software application and further configured for:

receiving at the server user input signals from a client device, wherein the user input signals are used to control updating the interactive software application;

generating at least one updated image at the server in response to updating the interactive software application running on the server by the user input signals; and

compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a frame and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.

29. (Currently Amended) The image display system of claim 28, wherein the user input signals are generated at the client device to update the state of the interactive software application from the state that initiated the current display ~~currently displayed~~ at the client device.

30. (Previously Presented) The image display system of claim 28 wherein the server is configured to communicate user input data and compressed updated images with a plurality of client devices.

31. (Previously Presented) The image display system of claim 28 wherein the interactive software application is a game and wherein the client device is a mobile device.

32. (Previously Presented) The image display system of claim 30 wherein the interactive software application is a game and wherein at least one of the plurality of client devices is a mobile device.

33. (Previously Presented) A method of displaying interactive video, comprising:

receiving at a server user input control signals from a client device, wherein the user input control signals are used to control an image in a sequence of images generated from the running of a software gaming application on the server;

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generating a modified image at the server in response to the user input control signals; and

transmitting the modified image to the client device for display as compressed data, wherein the transmitting step comprises compressing the at least one modified image and sending the compressed modified image to the client device once the modified image is generated, and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.

34. (Currently Amended) The method as recited in claim 33 wherein ~~the~~ a first bandwidth allocation to receiving user input control signals at the server and ~~that~~ a second bandwidth allocated to transmitting the modified image to the client device is asymmetric with the ~~greater~~ second bandwidth allocated to transmitting the modified image from the server being greater than the first bandwidth.

35. (Previously Presented) The method as recited in claim 33 wherein the server is configured to communicate user input data and compressed modified images with a plurality of client devices.

36. (Previously Presented) The method as recited in claim 35 wherein at least two of the plurality of client devices include different platforms.

37. (New) The method as recited in claim 21 wherein the interactive software application is a game running on the server and wherein updating of the state of the interactive software application includes changing the game state.

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REMARKS

This amendment responds to the Office Action mailed on September 27, 2019. In the Office Action, the Examiner rejected the claims under non-statutory double patenting; rejected claims 22 and 34 under 35 USC 112, second paragraph (pre-AIA); and claims 25 and 34 under 35 USC 112(b) or 35 USC 112, second paragraph (pre-AIA) as indefinite. The Examiner further rejected claims 21, 23-33, and 35-36 under pre AIA 35 USC 102(e) as being anticipated by Yamada (US 6,929,549). Dependent claims 22 and 34 were rejected as being unpatentable over Yamada and Takagi (US 6,272,148).

Applicant has amended claims 21, 22, 28, 29, and 34 for clarity purposes. New claim 37 has been added. Support for these amendments may be found throughout the specification including, but not limited to, the original claims and FIGS. 1 and 2A, 2B, and 2D. No new matter has been added.

In the Office Action the Examiner rejected the claims on the grounds of non-statutory double patenting. Should it be deemed necessary at the close of prosecution, Applicant will timely file all necessary terminal disclaimers to obviate the rejection.

Section 112 Rejections

The Examiner rejected claim 34 on insufficient antecedent basis grounds. Claim 34 was also rejected as unclear. Applicant submits that the amendments to claims 22 and 34 designating a first bandwidth and a second bandwidth remove the antecedent basis concerns and overcome the rejections. In the Office Action the Examiner rejected claim 25, indicating that the term "platforms" renders the claim indefinite. Applicant respectfully disagrees that the use of the term renders the claim indefinite. Throughout the specification and including FIG. 1, a plurality of client devices is shown. In particular one having ordinary skill in the art at the time of the invention would recognize that the different devices such as, for example, PDA 18 and mobile phone 20 operate on different platforms. As the specification makes clear, the client devices may be running on different versions of a software platform, or may have different hardware and/or software platforms. *See e.g.* '520 patent specification at 2:31-41 (noting that some client devices may not have sufficient resources to generate complex images, while other client devices my include resources to do so); 5:3-21 (comparing set-top box clients, PDA clients and cellular telephone clients). Withdrawal of the rejection is respectfully requested.

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Sections 102, 103 Rejections

On page 6 of the Office Action the Examiner has indicated that Yamada teaches all of the limitations of claim 21, and by extension uses the same analysis in rejecting claims 28-36. Applicant respectfully submits that Yamada does not teach or suggest all of the limitations of independent claims. For example, with respect to claim 21 Yamada does not teach or suggest "compressing the at least one updated image and transmitting the compressed updated image to the client device " much less transmitting the "updated image as a compressed frame". First, there is absolutely no mention of a "frame" in Yamada. Second, there is nothing to suggest that Yamada first generates a frame of image data and then compresses that frame prior to transmitting it to a remote client device.

Yamada (US 6,929,549) generally describes a gaming system that uses a hard drive located on a STB, the hard drive used for storage of the game software received from an external source by the STB, but delegates to the game machine (such as controller 1 in FIG. 1) responsibilities for execution of the game.

> "The game software information stored in the information storage unit of the server device is supplied to the game executing device via the digital communication line in response to the request issued by the game executing device. **In the game executing device, a game image is generated** in accordance with the supplied information and the resultant image is output over the digital communication line to supply it to the display device. " (Col. 3, lines 20-27) (emphasis added).

Yamada clearly teaches that the game software information stored on the hard disk of the STB is used by the game machine 1 to execute a game. This local execution of the game fails to meet the limitations of claim 21which further includes the limitation that the server runs the interactive software application.

In similar fashion claims 28 and 33, in contrast to the teachings of Yamada, require respectively the server to execute the software application or to modify an image in response to input control signals. For at least these reasons Applicant submits that neither Yamada nor the combination of Yamada and Takeguchi teach or suggest all of the limitations of the independent claims. Therefore, Applicant respectfully requests that the 35 USC 102 and 103 rejections be withdrawn.

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CONCLUSION

The arguments presented in the remarks section of this current or future amendment/response are believed to provide an adequate response for asserting the allowability of all of the presently pending claims in this present application. To the extent that the applicant has not addressed some issues raised by the Examiner in the Office Action, applicant believes that such unaddressed issues do not require a response at the time since allowability of the claims has been asserted by the application based upon other grounds. However, applicant's lack of response to any of the issues raised by the Examiner does not constitute an admission by the applicant as to the accuracy of the Examiner's assertions with respect to such issues. Applicant specifically reserves the right to respond to such issues at a later time during the prosecution of the present application, should such a need arise.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No IPTLP002C5).

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

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Electronic Patent Application Fee Transmittal

Application Number:	15638020
Filing Date:	29-Jun-2017
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Filer:	Joshua Chang/Janice McGahey
Attorney Docket Number:	IPTLP002C5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
		Total in USD ($)		**200**

Electronic Acknowledgement Receipt	
EFS ID:	38413364
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	27-JAN-2020
Filing Date:	29-JUN-2017
Time Stamp:	22:19:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$200
RAM confirmation Number	E20201QM20175942
Deposit Account	506367
Authorized User	Janice McGahey
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPTLP002C5_NFOA_09-27-19_ResponseDraft3_Clean_ForFiling.pdf	47607 fff65163c77f9b32052c462d2a0d9768b7c148e0	yes	7
	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	7	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30876 2a4d9b80798c3a3e458799ed496faeea3b14f5e3	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	78483		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 01/24/2020

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER
DALENCOURT, YVES

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
01/24/2020	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):

docket@kwanip.com
eofficeaction@appcoll.com
lsmith@kwanip.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
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In re Application of	:	
Kent et al.	:	
Application No. 15/638,020	:	DECISION ON PETITION
Filed: June 29, 2017	:	
For: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	:	

This is a Notice regarding the request for acceptance of a fee deficiency submission under 37 CFR 1.28(c) filed July 22, 2019.

The Office no longer investigates or rejects original or reissue applications under 37 CFR 1.56. 1098 Off. Gaz. Pat. Office 502 (January 3, 1989). Therefore, nothing in this Notice is intended to imply that an investigation was done.

The fee deficiency submission under 37 CFR 1.28(c) is **NOT ACCEPTED**.

Applicant should note that 37 CFR 1.28(c) states in part: If status as a small entity is established in good faith, and fees as a small entity are paid in good faith, in any application or patent, and it is later discovered that such status as a small entity was established in error, or that through error the Office was not notified of a loss of entitlement to small entity status as required by § 1.27(g)(2), the error will be excused upon compliance with the separate submission and itemization. *See* 37 CFR 1.28(c)(2)(ii).

The itemization must include the following information:

> (A) Each particular type of fee that was erroneously paid as a small entity, (e.g., basic statutory filing fee, two-month extension of time fee) along with the current fee amount for a non-small entity;
>
> (B) The small entity fee actually paid, and when. This will permit the Office to differentiate, for example, between two one-month extension of time fees erroneously paid as a small entity but on different dates;

(C) The deficiency owed amount (for each fee erroneously paid); and

(D) The total deficiency payment owed, which is the sum or total of the individual deficiency owed amounts set forth in paragraph (c)(2)(ii) of this section.

Petitioner has met requirements A-B and D. However, the instant request does not fully comply with the requirements (C) as listed above. The deficiency owed amount for each fee is not listed. As a result, a proper itemization was not submitted. Therefore, the request cannot be accepted at this time.

Applicant should submit the itemization within **ONE (1) MONTH** from the mail date of this Notice. This time limit is non-extendable. Failure to timely respond may result in the return of the fee deficiency paper, at the option of the Office.

Further correspondence with respect to this matter should be addressed as follows:

By mail: Mail Stop PETITION
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

By FAX: (571) 273-8300
ATTN: Office of Petitions

By hand: U. S. Patent and Trademark Office
Customer Service Window, Mail Stop Petitions
Randolph Building
401 Dulany Street
Alexandria, VA 22314

By internet: EFS-Web[1]

Telephone inquiries regarding this decision should be directed to Felicia Jenkins at (571) 272-0986.

/JOANNE L BURKE/
Lead Paralegal Specialist, OPET

[1] www.uspto.gov/ebc/efs_help.html (for help using EFS-Web call the Patent Electronic Business Center at (866) 217-9197).

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.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 09/27/2019

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER	
DALENCOURT, YVES	

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
09/27/2019	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):

docket@kwanip.com
eofficeaction@appcoll.com
lsmith@kwanip.com

Office Action Summary	**Application No.** 15/638,020	**Applicant(s)** Kent et al.	
	Examiner YVES DALENCOURT	**Art Unit** 2457	**AIA (FITF) 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 08/22/2010.

☐ 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) 21-35 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) 21-35 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: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

This office action is responsive to request for continued examination (RCE) filed on 08/22/2019.

Continued Examination Under 37 CFR 1.114

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 08/22/2019 has been entered.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the 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. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

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

Claims 21 - 36 of US Application No. 15/638,020 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 - 21 of U.S. Patent No. 8,667,093. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 - 21 of the U.S. Patent mentioned above, contain every element of claims 21 - 36 of the instant application and thus anticipate the claims of the instant application. Claims 21 - 36 of the instant application are therefore not patently distinct from claims 1 - 21 of the U.S. Patent No. 8,667,093 and as such are unpatentable over obvious-type double patenting.

"A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or anticipated by, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness-type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus). " ELI LILLY AND COMPANY v BARR LABORATORIES, INC., United States Court of Appeals for the Federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22 and 34 recite the limitation "the bandwidth" in line 1.

Claim 34 recite the limitation “the greater bandwidth”. There is insufficient antecedent basis for this limitation in the claim.

Claims 25, 34 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

The term "platforms" in claim 25 is a relative term which renders the claim indefinite. The term "platforms" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Regarding claim 34, the limitation of “wherein the bandwidth allocation to receiving user input control signals at the server and that allocated to transmitting the modified image … form the server” is not clear. It is not clear to what exactly Applicant means by such limitation.

Claim Rejections - 35 USC § 102

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:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21, 23 – 33, and 35 – 36 are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Akihiro Yamada (US 6,929,549; hereinafter Yamada).

Regarding claim 21, Yamada discloses a method of hosting an interactive software application (abstract) comprising:

running at a server the interactive software application (col. 15, lines 51 - 55);

receiving at the server user input signals from a client device, wherein the user input signals are used to control updating of the software application (col. 15, lines 51 - 55);

generating at least one updated image at the server in response to updating the software application (col. 16, lines 1 - 6); and

compressing the at least one updated image and transmitting the compressed updated image to the client device (col. 3, line 63 through 4, line 3; col. 19, lines 33 – 49; *Yamada discloses that the image information acquisition means of the display device is capable of acquiring data-compressed image information transmitted from the server device over the digital communication line and also image information generated, data-compressed*), wherein the server transmits the updated image as a compressed frame that can be decompressed and displayed as an updated image at the client device (col. 3, lines 46 -62; col. 16, lines 7 – 9; col. 19, lines 33 -49; *Yamada discloses that image synthesizing means for synthesizing an image from the image represented by the image information which has been received from the server device and then decompressed by the decompression means and the image represented by the image information which has been generated by the game executing device and then decompressed by the decompression means*).

Claim Rejections - 35 USC § 103

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, 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.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

Claims 22 and 34 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Akihiro Yamada (US 6,603,470; hereinafter Yamada) in view of Takagi et al (US 6,272,148; hereinafter Takagi).

Regarding claim 22, Yamada discloses the method as recited in claim 21 wherein the bandwidth for transmitting the user input data between the client device and the server and the bandwidth for sending the compressed updated image from the server to the client device (col. 16, lines 15 – 20;*Yamada discloses that while image data and audio data are transmitted in the asynchronous mode defined in the IEEE-1394 standard in terms of the digital interface*), but fails to specifically disclose that the transmitted bandwidths are asymmetric.

Takagi, in an analogous art, discloses that the bandwidths for transmitting data between a client and server are asymmetric (col. 1, lines 40 - 59).

Thus, it would have been obvious to one of ordinary skill in the art to modify the teaching of Yamada by having the bandwidths for transmission between a client and server being asymmetric as evidenced by Takagi for the purpose of omitting mounting a wide bandwidth radio transmitter on a client terminal so that there is an advantage that a client terminal can be formed in a compact size.

Regarding claim 23, Yamada discloses the method as recited in claim 21 wherein the server is configured for bidirectional communications with a plurality of client devices, the bidirectional communication including receiving at the server user input signals and transmitting the compressed updated image (col. 3, lines 46 – 62; col.7, lines 41 – 46; *Yamada discloses that information can be transmitted/received not only between the game machine 1 and the television receiver 3 and between the STB 2*

and the television receiver 3 but also between the game machine 1 and the STB 2 via the digital bus 4).

Regarding claim 24, Yamada discloses the method as recited in claim 21 wherein the server is configured to receive user input data and transmit compressed updated images with a plurality of client devices (col. 7, lines 8 – 19; col. 12, line 63 through col. 13, line 7).

Regarding claim 25, Yamada discloses the method as recited in claim 21 wherein at least two of the plurality of client devices include different device platforms (col. 8, lines 47 – 62; col. 24, lines 36 - 44).

Regarding claim 26, Yamada discloses the method as recited in claim 21 wherein the client device is a mobile device (2, fig. 1; col. 7, lines 8 – 19).

Regarding claim 27, Yamada discloses the method as recited in claim 21 wherein the interactive software application is an interactive game that is configured to run at the server (col. 1, lines 46 – 51), which is in bidirectional communication with a plurality of client devices, and wherein said updating the software application includes updating the game state of the interactive game (col. 15, lines 51 – 55; col. 23, line 64 through col. 24, line 6).

Claims 28 – 36 incorporate substantively all the limitations of claims 21 – 27 with minor modifications in the claimed language. The reasons for rejecting claims 21 – 27 apply in claims 28 – 36. Therefore, claims 28 – 36 are rejected for the same reasons.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8AM-5:30PM.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. 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.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Notice of References Cited	Application/Control No. 15/638,020	Applicant(s)/Patent Under Reexamination Kent et al.	
	Examiner YVES DALENCOURT	Art Unit 2457	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6929549-B1	08-2005	Yamada; Akihiro	A63F13/12	463/42
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

CPC - Searched*		
Symbol	Date	Examiner
H04L65/607; H04N21/23412,	09/02/2018	YD

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
WEST/CPC (text searched)	09/02/2018	YD
WEST/CPC (updated text search)	03/18/2019	YD
WEST/CPC (updated text search)	09/20/2019	YD

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

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

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

CLAIMS

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

CLAIM		DATE								
Final	Original	09/02/2018	03/18/2019	09/23/2019						
	1	✓	✓	-						
	2	✓	✓	-						
	3	✓	✓	-						
	4	✓	✓	-						
	5	✓	✓	-						
	6	✓	✓	-						
	7	✓	✓	-						
	8	✓	✓	-						
	9	✓	✓	-						
	10	✓	✓	-						
	11	✓	✓	-						
	12	✓	✓	-						
	13	✓	✓	-						
	14	✓	✓	-						
	15	✓	✓	-						
	16	✓	✓	-						
	17	✓	✓	-						
	18	✓	✓	-						
	19	✓	✓	-						
	20	✓	✓	-						
	21			✓						
	22			✓						
	23			✓						
	24			✓						
	25			✓						
	26			✓						
	27			✓						
	28			✓						
	29			✓						
	30			✓						
	31			✓						
	32			✓						
	33			✓						
	34			✓						
	35			✓						

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WEST Search History for Application 15638020

Creation Date: 2019092318:12

Prior Art Searches

Query	DB	Hits	Op.	Plur.	Thes.	Date
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	54534	OR	YES		09-02-2018
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	66399	OR	YES		09-02-2018
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	19	OR	YES		09-02-2018
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
		2	OR	YES		09-02-2018

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(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17231	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1463	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1199	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	142	OR	YES		09-02-2018
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB,	48	OR	YES		09-02-2018

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	DWPI, TDBD					
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	14	OR	YES		09-02-2018
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018

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@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	139	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	96	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-02-2018

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20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-02-2018
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-02-2018
(H04L65/605).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	5172	OR	YES		09-02-2018
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
(H04L65/607).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7555	OR	YES		09-02-2018
(H04N21/23412).CPC.	PGPB, USPT, EPAB, JPAB,	1542	OR	YES		09-02-2018

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	DWPI, TDBD					
(H04N21/234318).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1850	OR	YES		09-02-2018
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		03-18-2019
		58377	OR	YES		03-18-2019

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displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	71067	OR	YES		03-18-2019
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB,	71067	OR	YES		03-18-2019

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	DWPI, TDBD					
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	20	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		03-18-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3135	OR	YES		09-23-2019
(interactive adj7 software adj7 application) and receiv$3 adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	87	OR	YES		09-23-2019
		15788	OR	YES		09-23-2019

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(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(generat$3 or form$3) adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7721	OR	YES		09-23-2019
((generat$3 or form$3) adj7 updat$3 adj7 image$1) and compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	107	OR	YES		09-23-2019
((generat$3 or form$3) adj7 updat$3 adj7 image$1 and compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7	OR	YES		09-23-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-23-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	62358	OR	YES		09-23-2019
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	76051	OR	YES		09-23-2019
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB,	1	OR	YES		09-23-2019

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	DWPI, TDBD					
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	21	OR	YES		09-23-2019
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	20084	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1651	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1370	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	220	OR	YES		09-23-2019
		1	OR	YES		09-23-2019

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(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	189	OR	YES		09-23-2019
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	59	OR	YES		09-23-2019
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17	OR	YES		09-23-2019
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	895	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or	PGPB, USPT, EPAB, JPAB,	895	OR	YES		09-23-2019

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real-time)	DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	895	OR	YES		09-23-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	220	OR	YES		09-23-2019
@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB,	152	OR	YES		09-23-2019

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	JPAB, DWPI, TDBD					
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	102	OR	YES		09-23-2019
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		09-23-2019
20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-23-2019
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-23-2019
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-23-2019
((((((H04L65/605)))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6103	OR	YES		09-23-2019

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6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-23-2019
((((((H04L65/607)))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8985	OR	YES		09-23-2019
((((((H04N21/23412)))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1663	OR	YES		09-23-2019
((((((H04N21/234318)))))).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1974	OR	YES		09-23-2019
interactive adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3135	OR	YES		09-23-2019
(updat$3 or modif$3 or chang$3) adj7 software adj7 application	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	15788	OR	YES		09-23-2019
((updat$3 or modif$3 or chang$3) adj7 software adj7 application) and (interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	160	OR	YES		09-23-2019
(updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB,	497807	OR	YES		09-23-2019

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	DWPI, TDBD					
((updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	46	OR	YES		09-23-2019
compress$3 adj7 updat$3 adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	434	OR	YES		09-23-2019
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3439	OR	YES		09-23-2019
(compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 image$1 and (updat$3 or modif$3 or chang$3) adj7 software adj7 application and interactive adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(compress$3 adj7 updat$3 adj7 image$1) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	13	OR	YES		09-23-2019
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
8667093.pn.		3	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
8131826.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
7587520.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
asymmetric adj7 bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2247	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and (interactive adj7 software adj7 application and receiv$3 adj7 input adj7 signal$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		09-23-2019
(asymmetric adj7 bandwidth) and ((updat$3 or modif$3 or chang$3) adj7 software adj7 application)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(transmit$3 or send$3) adj7 input adj7 signal$1	PGPB, USPT, EPAB, JPAB,	72744	OR	YES		09-23-2019

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	DWPI, TDBD					
((transmit$3 or send$3) adj7 input adj7 signal$1) and (asymmetric adj7 bandwidth)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	28	OR	YES		09-23-2019
((transmit$3 or send$3) adj7 input adj7 signal$1 and asymmetric adj7 bandwidth) and client and server	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	9	OR	YES		09-23-2019
6603470.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(6603470.pn.) and transmnit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-23-2019
(6603470.pn.) and transmit	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
(6603470.pn. and transmit) and bandwidth	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-23-2019
6929549.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-23-2019
(6929549.pn.) and bandwidth		0	OR	YES		09-23-2019

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
kent.in.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	26709	OR	YES		09-23-2019
(kent.in.) and asymmetric	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	771	OR	YES		09-23-2019
(kent.in. and asymmetric) and (compress$3 adj7 (updat$3 or modif$3 or chang$3) adj7 image$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	12	OR	YES		09-23-2019

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

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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

Application Number	15/638,020	Filing Date	2017-06-29	Docket Number (if applicable)	IPTLP002C5	Art Unit	2457
First Named Inventor	Osman KENT			Examiner Name	DALENCOURT, YVES		

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 506367

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/joshua chang/	Date (YYYY-MM-DD)	2019-08-22
Name	Joshua Chang	Registration Number	70831

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.

Electronic Patent Application Fee Transmittal

Application Number:	15638020
Filing Date:	29-Jun-2017
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Filer:	Joshua Chang/Janice McGahey
Attorney Docket Number:	IPTLP002C5

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	1252	1	600	600
Miscellaneous:				
RCE- 1ST REQUEST	1801	1	1300	1300
		Total in USD ($)		**1900**

Electronic Acknowledgement Receipt

EFS ID:	36957230
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	22-AUG-2019
Filing Date:	29-JUN-2017
Time Stamp:	21:07:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1900
RAM confirmation Number	E20198LL07583912
Deposit Account	506367
Authorized User	Janice McGahey
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPTLP002C5_FOA_03-22-19_ResponseRS_ForFiling.pdf	36959 5afce83810103071bfc08c254706dfb95ee00d3d	yes	5
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	5	
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	IPTLP002C5_RCE_08222019.pdf	1349935 d6c77b61508674dd612429bc8998b1a0f23a989b	no	3
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32571 d99eda5ed88e6ae1eb736cf7f59ec76fddc02ccd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1419465		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: KENT, Osman et al.	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, Yves
Filed: June 29, 2017	Group: 2457
TITLE: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: 5023

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on August 22, 2019.
Signed: /Janice McGahey/
Janice McGahey

Mail Stop A/F
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER FINAL

(submitted with an RCE herewith)

Dear Commissioner:

Applicants respectfully request that the Examiner enter the following amendments in response to the Final Office Action dated March 22, 2019, a response to which is due August 22, 2019, with a two-month extension. This amendment is being filed concurrently with a Request for Continuing Examination (RCE).

Amendments to the Claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

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This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-20 (Cancelled)

21. (New) A method of hosting an interactive software application comprising:

running at a server the interactive software application;

receiving at the server user input signals from a client device, wherein the user input signals are used to control updating of the software application;

generating at least one updated image at the server in response to updating the software application; and

compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a compressed frame that can be decompressed and displayed as an updated image at the client device.

22. (New) The method as recited in claim 21 wherein the bandwidth for transmitting the user input data between the client device and the server and the bandwidth for sending the compressed updated image from the server to the client device are asymmetric.

23. (New) The method as recited in claim 21 wherein the server is configured for bidirectional communications with a plurality of client devices, the bidirectional communication including receiving at the server user input signals and transmitting the compressed updated image.

24. (New) The method as recited in claim 21 wherein the server is configured to receive user input data and transmit compressed updated images with a plurality of client devices.

25. (New) The method as recited in claim 21 wherein at least two of the plurality of client devices include different device platforms.

26. (New) The method as recited in claim 21 wherein the client device is a mobile device.

27. (New) The method as recited in claim 21 wherein the interactive software application is an interactive game that is configured to run at the server, which is in bidirectional communication with a plurality of client devices, and wherein said updating the software application includes updating the game state of the interactive game.

28. (New) An image display system, comprising:

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a server having a processor and memory configured to execute an interactive software application and further configured for:

receiving at the server user input signals from a client device, wherein the user input signals are used to control updating the software application;

generating at least one updated image at the server in response to updating the software application running on the server the user input signals; and

compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a frame and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.

29. (New) The image display system of claim 28, wherein the user input signals are generated at the client device to update the state of the application currently displayed at the client device.

30. (New) The image display system of claim 28 wherein the server is configured to communicate user input data and compressed updated images with a plurality of client devices.

31. (New) The image display system of claim 28 wherein the interactive software application is a game and wherein the client device is a mobile device.

32. (New) The image display system of claim 30 wherein the interactive software application is a game and wherein at least one of the plurality of client devices is a mobile device.

33. (New) A method of displaying interactive video, comprising:

receiving at a server user input control signals from a client device, wherein the user input control signals are used to control an image in a sequence of images generated from the running of a software gaming application on the server;

generating a modified image at the server in response to the user input control signals; and

transmitting the modified image to the client device for display as compressed data, wherein the transmitting step comprises compressing the at least one modified image and sending the compressed modified image to the client device once the modified image is generated, and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.

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34. (New) The method as recited in claim 33 wherein the bandwidth allocation to receiving user input control signals at the server and that allocated to transmitting the modified image to the client device is asymmetric with the greater bandwidth allocated to transmitting the modified image from the server.

35. (New) The method as recited in claim 33 wherein the server is configured to communicate user input data and compressed modified images with a plurality of client devices.

36. (New) The method as recited in claim 35 wherein at least two of the plurality of client devices include different platforms.

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REMARKS

Applicant requests of cancellation of claims 1-20. Claims 1-20 were rejected based on a nonstatutory double patenting rejection. Claims 1-20 have now been cancelled and new claims 21-36 added. No new matter has been added. Support for new claims 21-36 may be found throughout the specification including, but not limited to, the original claims 1-20 and FIGS. 1 and 2A, 2B, and 2D, and further paragraphs [0011], [0028], and [0035]. In light of the amendments, applicants believe that nonstatutory double patenting rejection is no longer applicable.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No IPTLP002C5).

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/638,020	Filing Date 06/29/2017	☐ 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 $80 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $420 =	
☐ 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	08/22/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/JACQUELYN L WILLIAMS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/638,020	06/29/2017	Osman Kent	IPTLP002C5

CONFIRMATION NO. 5023

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

POA ACCEPTANCE LETTER

OC000000109953847

Date Mailed: 07/29/2019

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/24/2019.

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

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

/cnguyen/

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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
15/638,020	06/29/2017	2457	800	IPTLP002C5	1	1

CONFIRMATION NO. 5023

CORRECTED FILING RECEIPT

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

OC000000109953901

Date Mailed: 07/29/2019

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

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

Inventor(s)

Osman Kent, Surrey, UNITED KINGDOM;
David R. Baldwin, Surrey, UNITED KINGDOM;
Nicholas J.N. Murphy, Surrey, UNITED KINGDOM;

Applicant(s)

Intellectual Pixels Limited, Surrey, UNITED KINGDOM;

Assignment For Published Patent Application

Intellectual Pixels Limited, Surrey, UNITED KINGDOM

Power of Attorney: The patent practitioners associated with Customer Number 19694

Domestic Priority data as claimed by applicant

This application is a CON of 14/192,789 02/27/2014 PAT 9699238
which is a CON of 13/296,776 11/15/2011 PAT 8667093
which is a CON of 12/538,347 08/10/2009 PAT 8131826
which is a CON of 10/037,688 01/04/2002 PAT 7587520
which claims benefit of 60/263,854 01/24/2001

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 07/10/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/638,020**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

Preliminary Class

463

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

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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.

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Doc Code: PA.
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
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POWER OF ATTORNEY BY APPLICANT

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

Application Number	Filing Date

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

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 19694

OR

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

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

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OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name	
Address	
City	State / Zip
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Telephone	Email

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

INTELLECTUAL PIXELS LIMITED

☐ Inventor or Joint Inventor (title not required below)

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

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

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

SIGNATURE of Applicant for Patent

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

Signature		Date (Optional)	
Name	OSMAN KENT		
Title	DIRECTOR		

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

☑ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

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
	Osman		Kent	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Surrey	Country of Residence [i]	UK

Mailing Address of Inventor:

Address 1	Knavesmire, St. Leonard's Road		
Address 2	Thames Ditton		
City	Surrey	**State/Province**	
Postal Code		**Country** [i]	UK

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	David	R.	Baldwin	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Surrey	Country of Residence [i]	UK

Mailing Address of Inventor:

Address 1	Briarside, Gower Road		
Address 2	Weybridge		
City	Surrey	**State/Province**	
Postal Code	KT13 OH	**Country** [i]	UK

Inventor 3 Remove

Legal Name

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Nicholas	J.N.	Murphy	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Surrey	Country of Residence [i]	UK

Mailing Address of Inventor:

Address 1	Long Hill House. Long Hill		
Address 2	The Sands		
City	Surrey	**State/Province**	
Postal Code	GU101NQ	**Country** [i]	UK

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	19694		
Email Address	docket@kwanip.com	Add Email	Remove Email

Application Information:

Title of the Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER		
Attorney Docket Number	IPTLP002C5	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	**Suggested Figure for Publication (if any)**	

Filing By Reference:

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

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

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

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

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	19694		

Domestic Benefit/National Stage Information:

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

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
ThisApplication	Continuation of	14192789	2014-02-27

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14192789	Continuation of	13296776	2011-11-15	8667093	2014-03-04

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13296776	Continuation of	12538347	2009-08-10	8131826	2012-03-06

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12538347	Continuation of	10037688	2002-01-04	7587520	2009-09-08

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
10037688	Claims benefit of provisional	60263854	2001-01-24
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 priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

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

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

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

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

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

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

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

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

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Applicant Information:

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

Applicant 1

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	Intellectual Pixels Limited

Mailing Address Information For Applicant:

Address 1	~~La Motte Chambers, La Motte Street~~ 4 Windlebrook Park, Longcross Road		
Address 2	~~St. Helier~~ Chertsey		
City	~~Channel Islands~~ Surrey	**State/Province**	
Country	~~JE~~ UK	Postal Code	~~JE1 1BJ~~ KT16 0DN
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

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

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Intellectual Pixels Limited

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	~~La Motte Chambers, La Motte Street~~ 4 Windlebrook Park, Longcross Road		
Address 2	~~St. Helier~~ Chertsey		
City	~~Channel Islands~~ Surrey	**State/Province**	
Country i	~~JE~~ UK	Postal Code	~~JE1 1BJ~~ KT16 0DN
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

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

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

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

Signature	/Joshua W. Chang/			Date (YYYY-MM-DD)	2019-07-24
First Name	Joshua W.	Last Name	Wang	Registration Number	70831

Additional Signature may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	15/638,020
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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 CooperationTreaty.

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.

Electronic Acknowledgement Receipt

EFS ID:	36683356
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	24-JUL-2019
Filing Date:	29-JUN-2017
Time Stamp:	21:57:48
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	Assignee showing of ownership per 37 CFR 3.73	3DL271US7_IPTLP002C5_Statement373.pdf	247319 00bf5943279982c2f9fbab65246389fe22408963	no	3

Warnings:

Information:					
2	Transmittal Letter	IPTLP002C5_POA_TRANS_PRINTED_7-24-19.pdf	130380 f623c8b22500a3d755dffc2ec8c2febc4d50e99e	no	1
Warnings:					
Information:					
3	Power of Attorney	IPTL_UK_Kwan_POA_Jul2019_7-24-19.pdf	2522939 16a39ec4e57e22ac30a99efafd8b32f6f986194 2	no	1
Warnings:					
Information:					
4	Application Data Sheet	IPTLP002C5_ADS_corrected_7-24-19.pdf	1920298 682913d764f60e873382c4f73da18999b40117c6	no	9
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
		Total Files Size (in bytes):	4820936		

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

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/96 (11-18)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: INTELLECTUAL PIXELS LIMITED

Application No./Patent No.: 15/638,020 Filed/Issue Date: June 29, 2017

Titled: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

INTELLECTUAL PIXELS LIMITED, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ■ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

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_____, Frame_____, or a copy* is attached.

OR

B. ■ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: BALDWIN, David & MURPHY, Nicholas J.N. To: 3DLABS INC., LTD.

The document was recorded in the United States Patent and Trademark Office at
Reel 012666, Frame 0932, or a copy* is attached.

2. From: KENT,Osman, BALDWIN,David R.,& MURPHY, Nicholas J. N. To: 3DLABS INC. LTD.

The document was recorded in the United States Patent and Trademark Office at
Reel 016652, Frame 0921, or a copy* is attached.

3. From: 3DLABS INC. LTD. To: CREATIVE TECHNOLOGY LTD.

The document was recorded in the United States Patent and Trademark Office at
Reel 026443, Frame 0959, or a copy* is attached.

1 Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ *As required by 37 CFR 3.73(b)(1)(i), if a copy/copies is/are attached, 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.]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Joshua Chang/	July 24, 2019
Signature	Date
Joshua Chang	70,831
Printed or Typed Name	Title or Registration Number

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 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. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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.

4. From: CREATIVE TECHNOLOGY LTD. to INTELLECTUAL PIXELS LIMITED

The document was recorded in the United States Patent and Trademark Office at Reel 033283, Frame 0307, or a copy* is attached.

5. From: CREATIVE TECHNOLOGY LTD. to INTELLECTUAL PIXELS LIMITED

The document was recorded in the United States Patent and Trademark Office at Reel 035703, Frame 0190, or a copy* is attached.

6. From: INTELLECTUAL PIXELS LTD to INTELLECTUAL PIXELS LIMITED

The document was recorded in the United States Patent and Trademark Office at Reel 049824, Frame 0682, or a copy* is attached.

PTO/AIA/82A (07-12)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	15/638,020
Filing Date	June 29, 2017
First Named Inventor	Osman KENT
Title	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
Art Unit	2457
Examiner Name	DALENCOURT, YVES
Attorney Docket Number	IPTLP002C5

SIGNATURE of Applicant or Patent Practitioner

Signature	/Joshua W. Chang/	Date	July 24, 2019
Name	Joshua W. Chang	Telephone	
Registration Number	70,831		

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

▩ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
15/638,020	06/29/2017	Intellectual Pixels Limited	IPTLP002C5	92179

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 07/22/2019 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

X Applicant changing to regular undiscounted fee status.

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

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/Joshua W. Chang/
Name:	Joshua W. Chang
Registration Number:	70831

United States Patent and Trademark Office

- Sales Receipt -

07/25/2019 DALLEN 00000023 506367 15638020

01 FC:1599 1180.00 DA

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JUL 22 2019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Osman KENT	Attorney Docket No: IPTLP002C5
Application No.: 15/638,020	Examiner: DALENCOURT, YVES
Filed: June 29, 2017	Art Unit: 2457
Title: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No: 5023

DEFICIENCY PAYMENT / NOTIFICATION OF LOSS OF SMALL ENTITY STATUS UNDER 37 C.F.R. 1.28 (c) & (d)

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

Dear Sir/Madam:

In the above referenced application/patent, small entity status was established in good faith, and payment of fees as a small entity were made in good faith. However, it was later discovered that such status as a small entity was established in error, or that through error the Office was not notified of a loss of entitlement to small entity status as required by 37 CFR 1.27(g)(2). In order to have the small entity status error excused under 37 CFR 1.28(c), Applicant hereby: 1) separately submits this paper per paragraph (c)(1) of this section; 2) submits an itemization of the deficiency payment per paragraph (c)(2) of this section; and 3) submits the deficiency payment per paragraph (c)(2) of this section.

Under 37 CFR 1.28(d), the deficiency payment submission under paragraph (c) of this section hereby operates under 37 CFR 1.27 (g)(2) as a notification of loss of entitlement to small entity status.

PAGE 1/15 * RCVD AT 7/22/2019 10:34:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-003/18 * DNIS:2738300 * CSID:408-228-3739 * ANI:4082283739 * DURATION (mm-ss):05-08

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	Type of fee erroneously paid as Small Entity	Current fee for Large Entity	Small Entity fee paid and date when paid	Deficiency amount owed
Item 1	[37 CFR 1.16(a);Basic Filing Fee] [37 CFR 1.16(k); Utility Search Fee] [37 CFR 1.16(o);Utility Examination Fee] [37 CFR 1.16(f); Surcharge for late filing inventor's oath]	[FC 1011 $300; Filing fee] [FC 1111 $660; Search fee] [FC 1311 $760; Examination fee] [FC 1051 $160 Surcharge for late filing inventor's oath] Total for item 1 above = $1,880	Paid September 12, 2017 [FC 4011 $70; Electronic Basic Filing SE [FC 2111 $300 Search fee] [FC 2311 $360; Examination fee] [FC 2051 $70; Surcharge for late filing, inventor's oath] Total for item 1 above = $800	$1,080
Item 2	37 CFR 1.17(a)(1)	$200 (Extension for response within first month)	$100 [Paid December 28, 2018 (FC2251)]	$100
Total deficiency payment owed				Total =$1,180

2019 JUL 24 AM 5:22

The deficiency payment of **$1,180** is to be charged to Deposit Account No. **50-6367** (Order No. **IPTLP002C5**).

Should the Office have any questions or require any additional information, please do not hesitate to contact the undersigned at the telephone number set out below.

PAGE 2/15 * RCVD AT 7/22/2019 10:34:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-003/18 * DNIS:2738300 * CSID:408-228-3739 * ANI:4082283739 * DURATION (mm-ss):05-08

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Dated: July 22, 2019

Respectfully submitted,
/joshua chang/

Joshua Chang
Reg. 70,831

Kwan & Olynick LLP
2000 Hearst Street, Ste. 305
Berkeley, CA 94709
510-900-9501
jchang@kwanip.com

PAGE 3/15 * RCVD AT 7/22/2019 10:34:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-003/18 * DNIS:2738300 * CSID:408-228-3739 * ANI:4082283739 * DURATION (mm-ss):05-08

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.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 03/22/2019

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER
DALENCOURT, YVES

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
03/22/2019	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):

docket@kwanip.com
eofficeaction@appcoll.com
lsmith@kwanip.com

Office Action Summary	**Application No.** 15/638,020	**Applicant(s)** Kent et al.	
	Examiner YVES DALENCOURT	**Art Unit** 2457	**AIA (FITF) 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 12/28/2018.

☐ 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: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

This office action is responsive to amendment filed on 12/28/2018.

Response to Amendment

The Examiner has acknowledged the amended claims 1, 6, and 15.

Response to Arguments

Applicant's arguments, see amendment filed on 12/28/2018, with respect to claims 1 - 20 have been fully considered and are persuasive. The rejection of claims 1 – 20 under 35 U.S.C. 102 and 103 has been withdrawn. **However, the nonstatutory double patenting rejection is still maintained**.

Conclusion

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.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8AM-5:30PM.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. 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.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

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

CLAIMS

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

CLAIM		DATE								
Final	Original	09/02/2018	03/18/2019							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
	20	✓	✓							

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

CPC - Searched*		
Symbol	Date	Examiner
H04L65/607; H04N21/23412,	09/02/2018	YD

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
WEST/CPC (text searched)	09/02/2018	YD
WEST/CPC (updated text search)	03/18/2019	YD

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

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WEST Search History for Application 15638020

Creation Date: 2019031813:54

Prior Art Searches

Query	DB	Hits	Op.	Plur.	Thes.	Date
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	54534	OR	YES		09-02-2018
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	66399	OR	YES		09-02-2018
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	19	OR	YES		09-02-2018
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
		2	OR	YES		09-02-2018

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(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17231	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1463	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1199	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	142	OR	YES		09-02-2018
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB,	48	OR	YES		09-02-2018

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	DWPI, TDBD					
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	14	OR	YES		09-02-2018
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
		0	OR	YES		09-02-2018

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@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	139	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	96	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-02-2018

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20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-02-2018
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-02-2018
(H04L65/605).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	5172	OR	YES		09-02-2018
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
(H04L65/607).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7555	OR	YES		09-02-2018
(H04N21/23412).CPC.	PGPB, USPT, EPAB, JPAB,	1542	OR	YES		09-02-2018

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	DWPI, TDBD					
(H04N21/234318).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1850	OR	YES		09-02-2018
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
play$3 adj7 interactive adj7 game$1 and generat$3 3d adj7 image$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		03-18-2019
		58377	OR	YES		03-18-2019

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displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	71067	OR	YES		03-18-2019
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB,	71067	OR	YES		03-18-2019

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	DWPI, TDBD					
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	20	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		03-18-2019
(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		03-18-2019
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	n/a	OR	YES		03-18-2019

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: KENT, et al.	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: Yves Dalencourt
Filed: 29-JUNE-2017	Group: 2457
Title: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: 5023

CERTIFICATE OF EFS-WEB TRANSMISSION

I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on December 28, 2018.

Signed: /Janice McGahey/

Janice McGahey

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

Dear Commissioner:

It is respectfully submitted that the Examiner enters the following amendments in response to the Non Final Office Action dated September 7, 2018, a response to which is due December 7, 2018.

Amendments to the Claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

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This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method comprising:

sending image-modifying data corresponding to a generated image from a client device;

receiving, from a server, 3-dimensional graphics comprising a compressed modified image based on the image-modifying data; and

displaying said 3-dimensional graphics at the client device, wherein said client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing on said 3-dimensional graphics, and wherein said client device is separate from said server.

2. (Previously Presented) The method of claim 1, wherein said receiving is performed across at least one of an Internet, a WAN, a LAN, an Ethernet, or wireless communication.

3. (Previously Presented) The method of claim 1, further comprising sending user input control signals to the server, which generates the 3-dimensional graphics accordingly.

4. (Previously Presented) The method of claim 3, wherein said sent user input control signals are sent after a specified elapsed time.

5. (Previously Presented) The method of claim 3, wherein said user input control signals are generated by a game input device.

6. (Currently Amended) A method comprising:

receiving, at a server, image-modifying data corresponding to a generated image from a client device;

generating, at the server, at least one image portion of a 3-dimensional graphic comprising a compressed modified image based on the image-modifying data; and

sending to the client device the at least one image portion for display at the client device, wherein said client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing on the at least one image portion, and wherein said client device is separate from said server.

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7. (Previously Presented) The method of claim 6, wherein said sending the at least one image portion is performed across at least one of an Internet, a WAN, a LAN, an Ethernet, or wireless communication.

8. (Previously Presented) The method of claim 6, further comprising receiving, at the server, input control signals generated by a user input device.

9. (Previously Presented) The method of claim 6, wherein the at least one image portion is compressed before sending to the client device.

10. (Previously Presented) The method of claim 9, wherein the at least one image portion is decompressed at the client device before being displayed.

11. (Previously Presented) The method of claim 6, wherein said at least one image portion comprises one or more frames.

12. (Previously Presented) The method of claim 6, wherein said at least one image portion comprises an amount of images generated during a specified elapsed time.

13. (Previously Presented) The method of claim 6, further comprising receiving, at the server, input control signals from the client device.

14. (Previously Presented) The method of claim 6, wherein said client device does not have sufficient processing power to both run a client-device-only version of a game application and display graphics corresponding to said version of said application at an acceptable frame rate.

15. (Currently Amended) A system comprising a processor and memory, the memory storing instructions for the processor to execute a method comprising:

receiving, at a server, image-modifying data corresponding to a generated image from a client device;

generating a compressed stream of images corresponding to 3-dimensional graphics, the compressed stream of images comprising a compressed modified image based on the image-modifying data; and

sending said compressed stream of images to the client device for display at the client device, wherein the client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing, and wherein said client device is separate from said server.

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16. (Previously Presented) The system of claim 15, wherein said sending is performed across at least one of the Internet, a WAN, a LAN, an Ethernet, or wireless communication.

17. (Previously Presented) The system of claim 15, wherein the method further comprises receiving game control signals generated by a user input device.

18. (Previously Presented) The system of claim 17, wherein said game control signals are sent after a specified elapsed time.

19. (Previously Presented) The system of claim 15, wherein said compressed stream of images is decompressed at the client device before display.

20. (Previously Presented) The system of claim 15, wherein said client device does not have sufficient processing power to both run a client-device-only version of a game application and display graphics corresponding to said version of said game application at an acceptable frame rate.

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REMARKS

This amendment responds to the Non Final Office action mailed September 7, 2018 (hereinafter, "the Office Action"). In the Office Action the Examiner:

- rejected the claims under non-statutory double patenting;
- rejected claims 1-4, 6-13, 15-16, and 19 under 35 U.S.C. 102 as being anticipated by Borrel (US 6377257); and
- rejected various dependent claims under 35 U.S.C. 103 as being unpatentable over Borrel and various other references.

After entry of the amendment, the pending claims are: 1-20.

AMENDMENTS TO THE CLAIMS

Claims 1, 6, and 15 have been amended to recite: "and wherein said client device is separate from said server." Support for these amendments can be found throughout the application.

INTERVIEW SUMMARY

Applicant thanks Examiner Yves Dalencourt for his comments during a telephonic interview on December 12, 2018 with Applicant's representative. In the interview, the Examiner and Applicant's representative discussed the claims, the previously filed amendments, and the prior art references. Applicant's representative agreed to amend the claims to place the claims in condition for allowance. No other agreement was reached.

DOUBLE PATENTING REJECTIONS

In the Office Action, the Examiner rejected the claims on the grounds of non-statutory double patenting. Should it be deemed necessary at the close of prosecution, Applicant will timely file all necessary terminal disclaimers to obviate the rejection.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C. 102 AND 103

In the Office Action, the Examiner rejected the independent claims under 35 U.S.C. 102 as being anticipated by Borrel. However, Applicant has subsequently amended the claims as

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presented above. Applicant submits that Borrel does not teach or suggest the amended feature. In addition, none of the other cited references account for the deficiencies of Borrel. Therefore, Applicant respectfully requests that the 35 U.S.C. 102 and 103 rejection of the claims be withdrawn.

CONCLUSION

Applicant believes that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicant, the Examiner is encouraged to contact the Undersigned using the information provided below.

Applicant hereby petitions for an extension of time that may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-6367 (Order No IPTLP002C5).

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

Kwan & Olynick LLP
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Electronic Patent Application Fee Transmittal

Application Number:	15638020
Filing Date:	29-Jun-2017
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Filer:	Joshua Chang/Janice McGahey
Attorney Docket Number:	IPTLP002C5

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	2251	1	100	100
Miscellaneous:				
		Total in USD ($)		**100**

Electronic Acknowledgement Receipt	
EFS ID:	34705305
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Janice McGahey
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	28-DEC-2018
Filing Date:	29-JUN-2017
Time Stamp:	10:49:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$100
RAM confirmation Number	122818INTEFSW10493502
Deposit Account	506367
Authorized User	Janice McGahey
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.19 (Document supply fees)	

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPTLP002C5_OA_09-07-18_Response.pdf	222199 10ad4ecd2e06a765188f0f5a5e2ad54b5764be80	yes	6

	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	6

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30737 873910728834135a1fc2f6da2ec9a8af84965fa0	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	252936		

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
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 15/638,020	Filing Date 06/29/2017	☐ 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 $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ 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	12/28/2018	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/NICHELE D PETERSON/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 12/18/2018

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER	
DALENCOURT, YVES	

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
12/18/2018	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):

alundy@kwanip.com
docket@kwanip.com
lsmith@kwanip.com

Applicant-Initiated Interview Summary	**Application No.** 15/638,020	**Applicant(s)** Kent et al.	
	Examiner YVES DALENCOURT	**Art Unit** 2457	**AIA Status** No

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

(1) YVES DALENCOURT. (3) _____.

(2) Joshua W. Chang. (4) _____.

Date of Interview: 12 December 2018.

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

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

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

Claim(s) discussed: _____.

Identification of prior art discussed: _____.

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...)

We discussed the 102 and 103 rejection in view of the prior art applied. Applicant's representative will further amend the claims in order to put them in condition for allowance. The Examiner will update his search upon receiving a formal amendment..

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

/YVES DALENCOURT/ Primary Examiner, Art Unit 2457	

Summary of Record of Interview Requirements

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

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

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

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

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

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

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

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

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

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

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

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

Examiner to Check for Accuracy

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

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 09/07/2018

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER	
DALENCOURT, YVES	

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
09/07/2018	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):

alundy@kwanip.com
docket@kwanip.com
lsmith@kwanip.com

Office Action Summary	**Application No.** 15/638,020	**Applicant(s)** Kent et al.	
	Examiner YVES DALENCOURT	**Art Unit** 2457	**AIA 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 _____.

☐ 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 06/29/2017.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

This office action is responsive to communication filed on 06/29/2017.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the 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. See MPEP §

717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

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

Claims 1 - 20 of US Application No. 15/638,020 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 - 20 of U.S. Patent No. 9,699,238. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 - 20 of the U.S. Patent mentioned above, contain every element of claims 1 - 20 of the instant application and thus anticipate the claims of the instant application. Claims 1 - 20 of the instant application are therefore not patently distinct from claims 1 - 20 of the U.S. Patent No. 9,699,238 and as such are unpatentable over obvious-type double patenting.

Claims 1 - 20 of US Application No. 15/638,020 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 - 21 of U.S. Patent No. 8,667,093. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 - 21 of the U.S. Patent mentioned above, contain every element of claims 1 - 20 of the instant application and thus anticipate the claims of the instant application. Claims 1 - 20 of the instant application are therefore not patently distinct from claims 1 - 21 of the U.S. Patent No. 8,667,093 and as such are unpatentable over obvious-type double patenting.

Claims 1 - 20 of US Application No. 15/638,020 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 - 20 of U.S. Patent No. 9,106,605. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 - 20 of the U.S. Patent mentioned above, contain every element of claims 1 - 20 of the instant application and thus anticipate the claims of the instant application. Claims 1 - 20 of the instant application are therefore not patently distinct from claims 1 - 20 of the U.S. Patent No. 9,106,605 and as such are unpatentable over obvious-type double patenting.

"A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or anticipated by, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness-type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus). " ELI LILLY AND COMPANY v BARR

LABORATORIES, INC., United States Court of Appeals for the Federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

Claim Rejections - 35 USC § 102

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:

> A person shall be entitled to a patent unless –
>
> (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 – 4, 6 – 13, 15 – 16, and 19 are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Borrel et al (US 6,377,257; hereinafter Borrel).

Regarding claim 1, Borrel discloses a method comprising:

sending image-modifying data corresponding to a generated image from a client device (col. 5, line 62 through col. 6, line 2; *Borrel discloses that the z-buffer, or depth map, information generated by the server is compared to the z-buffer information generated by the client to decide, for each pixel in the final image, whether to use the client-rendered pixel or the server-rendered pixel*);

receiving, from a server, 3-dimensional graphics comprising a compressed modified image (col. 5, line 62 through col. 6, line 2; *Borrel discloses that the z-buffer information is transmitted in compressed form*) based on the image-modifying data (col. 2, line 58 through col. 3, line 5; *Borrel discloses that the geometry server 210 within server 205 contains the 3d geometry 211 and the scene parameters 212. In response to client feedback 204, the server 205 retrieves the model from storage 206 and delivers the 3d geometry 213 to the client 202 over the network 203*); and

displaying said 3-dimensional graphics at the client device (col. 2, line 58 through col. 3, line 5; *Borrel discloses that once the model has been received by the client, the client 3d browser 208 renders it in client rendering engine 207 and displays it on the display 209*), wherein said client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing on said 3-dimensional graphics (col. 2, lines 58 – 63; col. 3, lines 37 – 49; col. 10, lines 40 – 61; *Borrel discloses that at the opposite end of the spectrum are server-side rendering methods, as generally shown in FIG. 3, which place the burden of rendering a model entirely on the server and the images generated are subsequently transmitted to clients*).

Regarding claim 2, Borrel discloses method of claim 1, wherein said receiving is performed across at least one of an Internet, a WAN, a LAN, an Ethernet, or wireless communication (col. 1, lines 30 – 34; col. 10, lines 30 - 39).

Regarding claim 3, Borrel discloses the method of claim 1, further comprising sending user input control signals to the server, which generates the 3-dimensional graphics accordingly (col. 2, lines 1 - 12).

Regarding claim 4, Borrel discloses the method of claim 3, wherein said sent user input control signals are sent after a specified elapsed time (col. 10, lines 30 - 61).

Claim Rejections - 35 USC § 103

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.

Claims 5, 17, and 18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Borrel et al (US 6,377,257; hereinafter Borrel) as applied to claim 3 above, and further in view of Akihiro Yamada (US 6,929,549; hereinafter Yamada).

Regarding claim 5, Borrel discloses all the limitations in claim 3, but fails to specifically disclose that user input control signals are generated by a game input device.

However, Yamada discloses an analogous game machine system with server device, which shows that user input control signals are generated by a game input device (col. 12, lines 12 – 15; col. 15, lines 51 – 55; col. 16, lines 1 - 6).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Borrel by generating user input control signal by a game device as evidenced by Yamada for the purpose of allowing user to enjoy various different games at home.

Claims 6 – 8 and 12 - 13 incorporate all the limitations of claims 1 – 5 with minor modifications in the claimed language. The reasons for rejecting claims 1 – 5 apply in claims 6 – 8 and 12 - 13. Therefore, claims 6 – 8 and 12 - 13 are rejected for the same reasons.

Regarding claim 9, Borrel discloses the method of claim 6, wherein the at least one image portion is compressed before sending to the client device (col. 3, lines 49 – 54; col. 10, lines 40 – 54; col. 11, lines 53 - 62).

Regarding claim 10, Borrel discloses the method of claim 9, wherein the at least one image portion is decompressed at the client device before being displayed (col. 3, lines 49 – 54; col. 10, lines 40 – 54; col. 11, lines 53 - 62).

Regarding claim 11, Borrel discloses the method of claim 6, wherein said at least one image portion comprises one or more frames (col. 3, lines 49 – 54; col. 10, lines 40 – 54; col. 11, lines 53 - 62).

Claims 14 and 20 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Borrel et al (US 6,377,257; hereinafter Borrel) as applied to claim 3 above, and further in view of Lee et al (US 6,658,167; hereinafter Lee).

Regarding claim 14, Borrel discloses all the limitations in claim 6, but fails to specifically disclose said client device does not have sufficient processing power to both run a client-device-only version of a game application and display graphics corresponding to said version of said application at an acceptable frame rate.

However, Lee shows (col. 3, lines 9 - 17; col. 7, lines 1 - 38; Lee provides information about the intended use of data for a client application. The data here will be

sent to a PDA. Information transmitted about the characteristics of the PDA environment can be used to optimize data transmission. For example, PDA typically has a lot of restricted viewing capabilities compared to computer monitors. For examples, PDA monitors typically have a limited number of colors from which they can display, they are usually LCD displays instead of CRT displays and they have low contrast).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Borrel by modifying transmitted data to a receiving device due to its lack of processing capabilities as evidenced by Lee for the purpose of optimizing the data for its intended client application use.

Claims 15 - 20 incorporate all the limitations of claims 1 – 14 with minor modifications in the claimed language. The reasons for rejecting claims 1 – 14 apply in claims 15 - 20. Therefore, claims 15 - 20 are rejected for the same reasons.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8AM-5:30PM.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. 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.

YVES . DALENCOURT
Examiner
Art Unit 2457

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Notice of References Cited	Application/Control No. 15/638,020	Applicant(s)/Patent Under Reexamination Kent et al.	
	Examiner YVES DALENCOURT	Art Unit 2457	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-9699238-B2	07-2017	Kent; Osman	G06T9/00	1/1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

CPC - Searched*		
Symbol	Date	Examiner
H04L65/607; H04N21/23412,	09/02/2018	YD

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
WEST/CPC (text searched)	09/02/2018	YD

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

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/638,020	Kent et al.
	Examiner	Art Unit
	YVES DALENCOURT	2457

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

CLAIMS

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

CLAIM		DATE								
Final	Original	09/02/2018								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								

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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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	~~NEW~~ 15/638.020
	Filing Date	~~HEREWITH~~ 06/29/2017
	First Named Inventor	Osman Kent
	Art Unit	~~UNASSIGNED~~ 2457
	Examiner Name	~~UNASSIGNED~~ /Y. Dalencourt/
	Attorney Docket Number	IPTLP002C5US

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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
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

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	Art Unit	UNASSIGNED 2457
	Examiner Name	~~UNASSIGNED~~ Dalencourt
	Attorney Docket Number	IPTLP002C5US

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		6438575		2002-08-20	Khan, Umair A., et al.	
		6603470		2003-08-05	Deering, Michael F.	
		6628282		2003-09-30	Hertzmann, Aaron et al.	
		6658167		2003-12-02	Lee, Daniel T., et al.	
		6929549		2005-08-16	Yamada, Akihiro	
		7587520		2009-09-08	Osman, Ken et al.	
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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	Examiner Name	~~UNASSIGNED~~ Y. Dalencourt
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	Attorney Docket Number	IPTLP002C5US

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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

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	Examiner Name	~~UNASSIGNED~~ D. Dalencourt
	Attorney Docket Number	IPTLP002C5US

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	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

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		"The G-cluster Game Portfolio", G-Cluster LTD., Printouts from WorldWide Web. gcluster.com, 2002, 23 pgs	
		AGRAWALA, MANEESH et al., "Model-Based Motion Estimation for Synthetic Animations", AMC Multimedia 95- Electronic Proceedings; November 5-9, WorldWide Web-Graphics.Stanford.edu/papers/model based, 1995, 1-18	
		BHARADVAJ, HARINI et al., "An Active Transcoding Proxy to Support Mobile Web Access", Department of Computer Engineering & Computer Science. University of Missouri-Columbia, October 1998, 20-23	
		GUENTER, BRIAN K. et al., "Motion Compensated Compression of Computer Animation Frames", 7 pgs	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	~~NEW~~ 15/638,020
	Filing Date	~~HEREWITH~~ 06/29/2017
	First Named Inventor	Osman Kent
	Art Unit	~~2457~~ UNASSIGNED
	Examiner Name	~~UNASSIGNED~~ Y. Dalencourt
	Attorney Docket Number	IPTLP002C5US

		WALLACH, DAN S. et al., "Accelerated MPEG Compression of Dynamic Polygonal Scenes", Computer Graphics (Poc. Siggraph 1994), 3 pgs	

EXAMINER SIGNATURE			
Examiner Signature	/YVES DALENCOURT/	Date Considered	09/02/2018

*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. /Y.D/

WEST Search History for Application 15638020

Creation Date: 2018090222:20

Prior Art Searches

Query	DB	Hits	Op.	Plur.	Thes.	Date
20110060427	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	54534	OR	YES		09-02-2018
(output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	66399	OR	YES		09-02-2018
((output$3 or displ$3) adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	19	OR	YES		09-02-2018
(displ$3 or output$3) adj7 complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
		2	OR	YES		09-02-2018

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(displ$3 or output$3) adj7 complex adj7 interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	17231	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1463	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1199	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and complex near interactive near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
6377257.uref.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	142	OR	YES		09-02-2018
(6377257.uref.) and interactive	PGPB, USPT, EPAB, JPAB,	48	OR	YES		09-02-2018

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	DWPI, TDBD					
(6377257.uref. and interactive) and complex adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1	OR	YES		09-02-2018
(6377257.uref. and interactive) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	14	OR	YES		09-02-2018
(6377257.uref. and interactive and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	8	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time)) and video adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time)) and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	793	OR	YES		09-02-2018
(displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D)) and complex near game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	193	OR	YES		09-02-2018
		0	OR	YES		09-02-2018

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@pd<19991130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD					
@pd<20001130 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<2000123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
@pd<20010123 and (displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and interactive adj7 game$1 and (realtime or real near time or real-time) and video adj7 game$1 and (realtime or real near time or real-time) and displ$3 adj7 (3-dimensional adj7 graphic$1 or 3D) and complex near game$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	0	OR	YES		09-02-2018
displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	139	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D)) and (realtime or real near time or real-time)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	96	OR	YES		09-02-2018
(displ$3 adj7 complex adj7 (3-dimensional adj7 graphic$1 or 3D) and (realtime or real near time or real-time)) and interactive adj7 game$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	11	OR	YES		09-02-2018

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20030032479	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018
7400322.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	6	OR	YES		09-02-2018
20040029636	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
20050001845	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	4	OR	YES		09-02-2018
(H04L65/605).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	5172	OR	YES		09-02-2018
6377257.PN.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	3	OR	YES		09-02-2018
(H04L65/607).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	7555	OR	YES		09-02-2018
(H04N21/23412).CPC.	PGPB, USPT, EPAB, JPAB,	1542	OR	YES		09-02-2018

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	DWPI, TDBD					
(H04N21/234318).CPC.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	1850	OR	YES		09-02-2018
9699238.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	2	OR	YES		09-02-2018

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/638,020	06/29/2017	Osman Kent	IPTLP002C5	5023

19694 7590 04/02/2018

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

EXAMINER	
LEICHLITER, CHASE E	

ART UNIT	PAPER NUMBER
3714	

NOTIFICATION DATE	DELIVERY MODE
04/02/2018	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):

docket@kwanip.com
alundy@kwanip.com
lsmith@kwanip.com

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KWAN & OLYNICK LLP
2000 HEARST AVENUE, SUITE 305
BERKELEY CA 94709

In re Application of: Kent et al.

	:	DECISION ON
Application No. 15/638,020	:	REQUEST FOR DEFERRAL
Filed: June 29, 2017	:	OF EXAMINATION
Title: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	:	

This is a decision on the request for deferral of examination under 37 CFR 1.103(d), filed September 12, 2017.

The request is **denied**.

A grantable request to defer examination under 37 CFR 1.103(d)[1] cannot extend deferral of examination beyond three years from the earliest filing date for which a benefit is claimed under title 35, United States Code. The instant application was filed June 29, 2017 and claims benefit of 60/263854 filed January 24, 2001. Pursuant to 37 CFR 1.103(d), deferral of examination for the instant application cannot extend beyond January 24, 2004. Since that date has already past, the deferral request is denied.

[1] Deferral of examination. On request of the applicant, the Office may grant a deferral of examination under the conditions specified in this paragraph for a period not extending beyond three years from the earliest filing date for which a benefit is claimed under title 35, United States Code. A request for deferral of examination under this paragraph must include the publication fee set forth in § 1.18(d) and the processing fee set forth in § 1.17(i)(. A request for deferral of examination under this paragraph will not be granted unless:
(1) The application is an original utility or plant application filed under § 1.53(b) or resulting from entry of an international application into the national stage after compliance with § 1.495;
(2) The applicant has not filed a nonpublication request under § 1.213(a), or has filed a request under § 1.213(b) to rescind a previously filed nonpublication request;
(3) The application is in condition for publication as provided in § 1.211(c); and
(4) The Office has not issued either an Office action under 35 U.S.C. 132 or a notice of allowance under 35 U.S.C. 151.

Telephone inquiries concerning this decision should be directed to Boyer Ashley, Quality Assurance Specialist at 571-272-4502. The application will be forwarded to the Technology Center Art Unit 3714 for action in its regular turn.

/Boyer D. Ashley/

Boyer D. Ashley
Quality Assurance Specialist
Technology Center 3700

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/638,020	06/29/2017	Osman Kent	IPTLP002C5

CONFIRMATION NO. 5023

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

PUBLICATION NOTICE

OC000000096245279

Title:IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

Publication No.US-2017-0366599-A1
Publication Date:12/21/2017

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

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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
15/638,020	06/29/2017	2611	800	IPTLP002C5	1	1

CONFIRMATION NO. 5023

UPDATED FILING RECEIPT

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

OC000000094060895

Date Mailed: 09/15/2017

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)

Osman Kent, Surrey, UNITED KINGDOM;
David R. Baldwin, Surrey, UNITED KINGDOM;
Nicholas J.N. Murphy, Surrey, UNITED KINGDOM;

Applicant(s)

Intellectual Pixels Limited, Channel Islands, JERSEY;

Assignment For Published Patent Application

Intellectual Pixels Limited, Channel Islands, JERSEY

Power of Attorney: The patent practitioners associated with Customer Number 19694

Domestic Priority data as claimed by applicant

This application is a CON of 14/192,789 02/27/2014 PAT 9699238
which is a CON of 13/296,776 11/15/2011 PAT 8667093
which is a CON of 12/538,347 08/10/2009 PAT 8131826
which is a CON of 10/037,688 01/04/2002 PAT 7587520
which claims benefit of 60/263,854 01/24/2001

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 07/10/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/638,020**

Projected Publication Date: 12/21/2017

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

Preliminary Class

345

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.

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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

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

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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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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/638,020

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))	1 minus 20=	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 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	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
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.

Doc Code: M856
Document Description: Letter Requesting Suspension of Action

PTO/SB/37 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE
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Request for Deferral of Examination 37 CFR 1.103(d)

Application Number	15/638,020	Art Unit	2611
Filing Date	29-JUN-2017	Examiner Name	UNASSIGNED
First Named Inventor	Osman Kent	Attorney Docket Number	IPTLP002C5

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

I hereby request deferral of examination under 37 CFR 1.103(d) for the above-identified (non-reissue) utility or plant application filed under 37 CFR 1.53(b) for a period of 36 months (maximum 3 years), from the earliest filing date for which a benefit is claimed. Deferral of examination under 37 CFR 1.103(d) is suspension of action. As a result, any patent term adjustment may be reduced. See 37 CFR 1.704(c)(1).

***Note**: The request will not be granted unless the application is in condition for publication as provided in 37 CFR 1.211(c) and the Office has not issued either an Office action under 35 U.S.C. 132 or a notice of allowance under 35 U.S.C. 151.*

If applicant previously filed a nonpublication request under 37 CFR 1.213(a):

☐ I hereby rescind under 37 CFR 1.213(b) the previous filed request that the above-identified application not be published under 35 U.S.C. 122(b).

***Note**: Application will be scheduled for publication at 18 months from the earliest claimed filing date for which a benefit is claimed.*

Fees

a. ☐ The Director is hereby authorized to charge the following fees, or credit any overpayment, to Deposit Account No._____

i. ☐ Processing fee set forth in 37 CFR 1.17(i) for request for deferral of examination.

ii. ☐ Publication fee set forth in 37 CFR 1.18(d).

iii. ☐ Other _____

b. ☐ Check in the amount of $_____ is enclosed.

c. ☑ Payment by credit card (*Form PTO-2038 enclosed*).

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

***Note**: The publication fee set forth in 37CFR 1.18(d) and the processing fee in 37 CFR 1.17(i) for deferral of examination are required when the request of deferral of examination is filed.*

Signature	/Joshua W. Chang/	Date	2017-09-12
Name (Print/Typed)	Joshua W. Chang	Registration Number	70,831

***Note**: Signature of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms for more than one signature, see below*.*

☐ *Total of_____ forms are submitted.

This collection of information is required by 37 CFR 1.103(d). 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. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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.

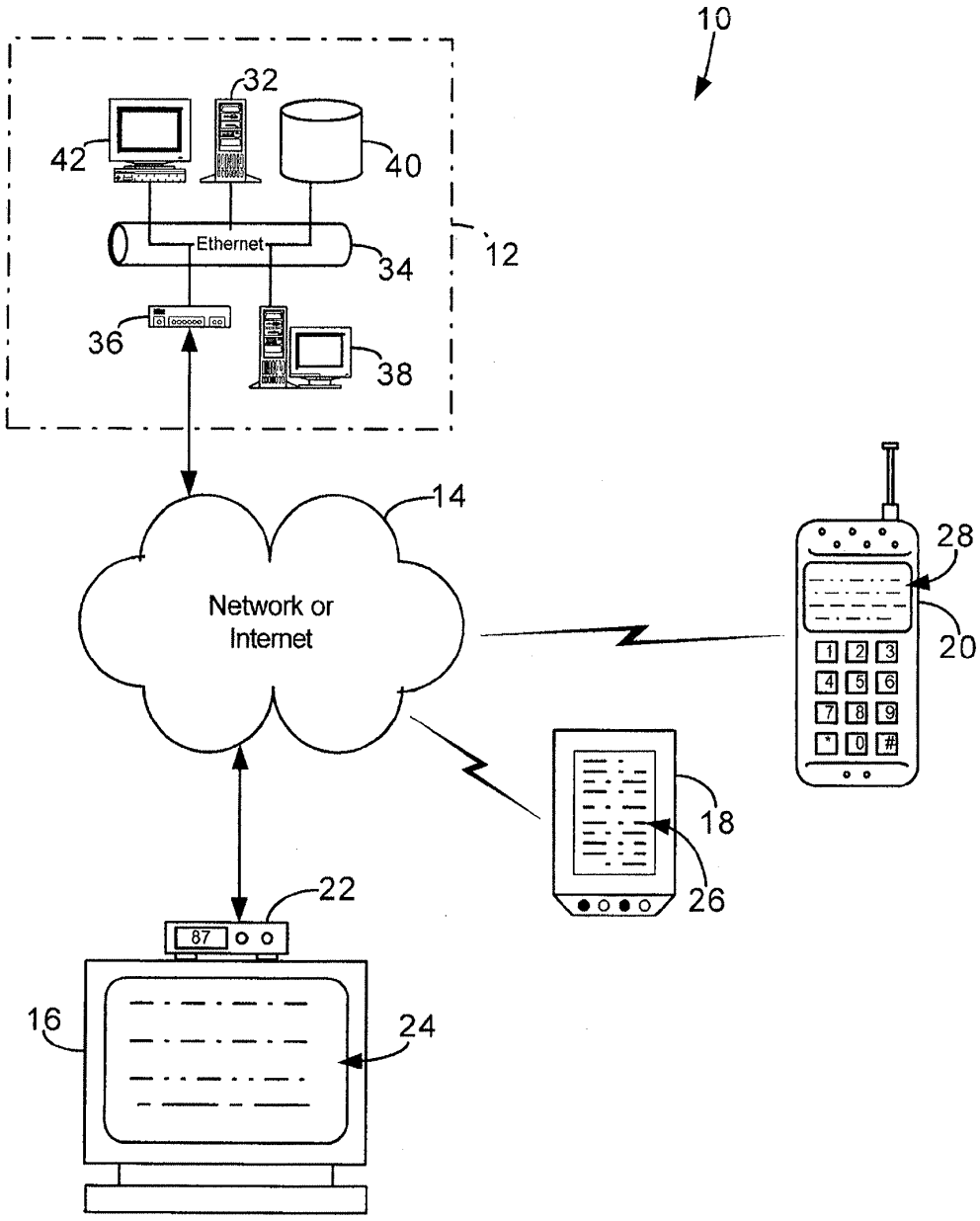

10
32
42
40
Ethernet
34
12
36
38
14
Network or
Internet
28
20
18
26
22
87
16
24

Fig. 1

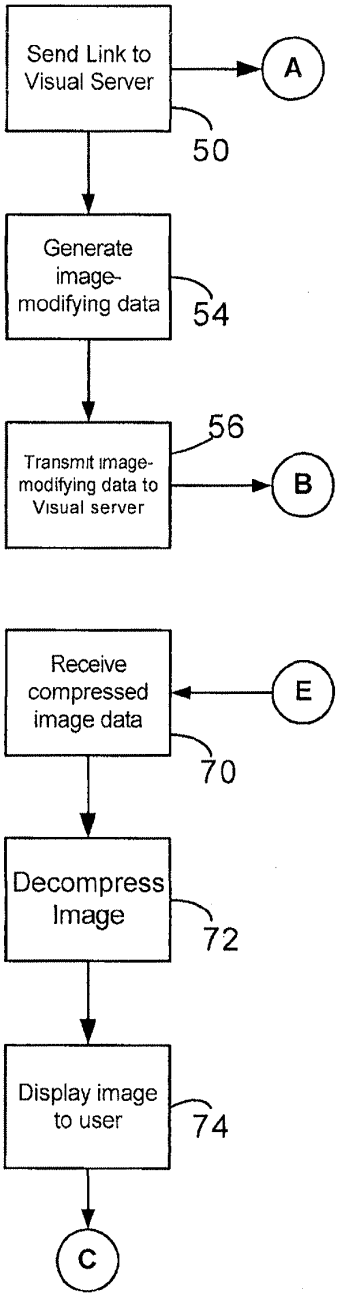

Send Link to Visual Server
A
50
Generate image-modifying data
54
Transmit image-modifying data to Visual server
56
B
Receive compressed image data
E
70
Decompress Image
72
Display image to user
74
C

Fig. 2A

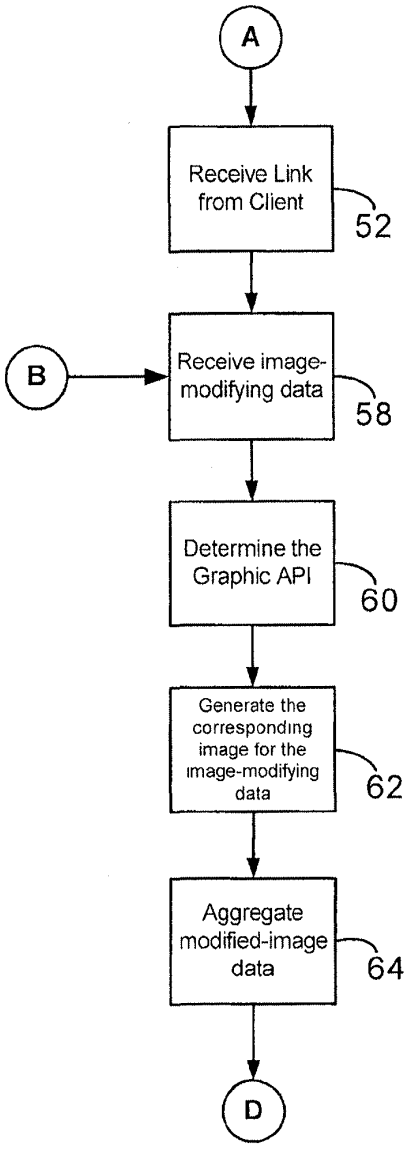

A
Receive Link from Client
52
B
Receive image-modifying data
58
Determine the Graphic API
60
Generate the corresponding image for the image-modifying data
62
Aggregate modified-image data
64
D

Fig. 2B

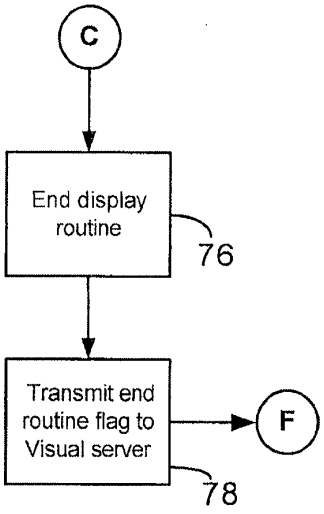

C
End display routine
76
Transmit end routine flag to Visual server
F
78

Fig. 2C

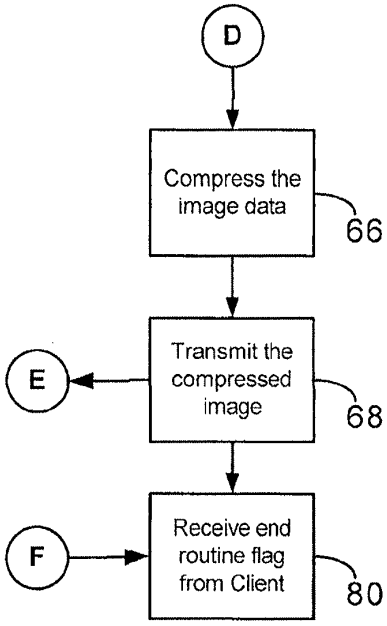

D
Compress the image data
66
Transmit the compressed image
E
68
Receive end routine flag from Client
F
80

Fig. 2D

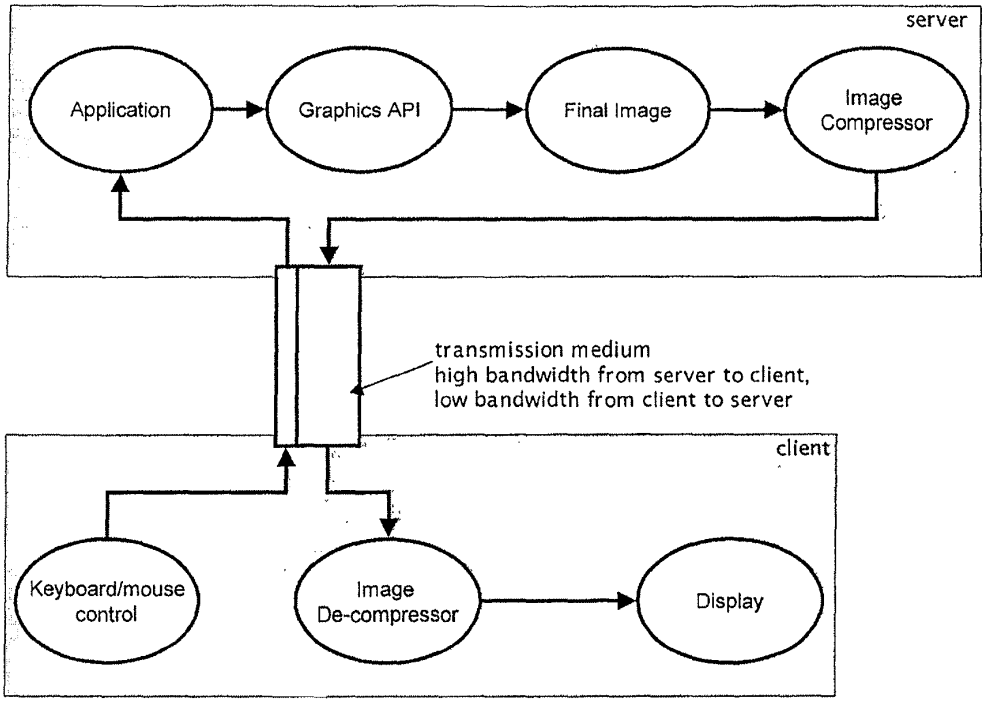

server
Application
Graphics API
Final Image
Image Compressor
transmission medium
high bandwidth from server to client,
low bandwidth from client to server
client
Keyboard/mouse control
Image De-compressor
Display

Fig. 3

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Osman Kent	Attorney Docket No.: IPTLP002C5
Application No.: 15/638,020	Examiner: UNASSIGNED
Filed: 29-JUNE-2017	Group: 2611
Title: Systems and Methods for Reducing Noise in Video Streams	Confirmation No.: 5023

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on September 12, 2017.
Signed: _____/Leslie Russell/_____
Leslie Russell

RESPONSE TO MISSING PARTS

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

Dear Sir:

In response to the Notice to File Missing parts mailed July 11, 2017, please find corrected drawings and please enter the following amendments.

Amendments to the Drawings are reflected in the listing of claims which begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begin on page 3 of this paper.

Remarks/Arguments begin on page 6 of this paper.

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AMENDMENTS TO THE DRAWINGS

Replacement drawings are being submitted in compliance with 37 CFR 1.84 and 37 CFR 1.121(d); No new matter has been added.

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AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Currently Amended) A method comprising:

sending image-modifying data corresponding to a generated image from a client device;

receiving, from a server, 3-dimensional graphics comprising a compressed modified image based on the image-modifying data; and

displaying said 3-dimensional graphics at the client device ~~such that complex interactive games can be displayed at the client device in real-time~~, wherein said client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing on said 3-dimensional graphics~~, and wherein said client device is separate from said server~~.

2. (New) The method of claim 1, wherein said receiving is performed across at least one of an Internet, a WAN, a LAN, an Ethernet, or wireless communication.

3. (New) The method of claim 1, further comprising sending user input control signals to the server, which generates the 3-dimensional graphics accordingly.

4. (New) The method of claim 3, wherein said sent user input control signals are sent after a specified elapsed time.

5. (New) The method of claim 3, wherein said user input control signals are generated by a game input device.

6. (New) A method comprising:

receiving, at a server, image-modifying data corresponding to a generated image from a client device;

generating, at the server, at least one image portion of a 3-dimensional graphic comprising a compressed modified image based on the image-modifying data; and

sending to the client device the at least one image portion for display at the client device, wherein said client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing on the at least one image portion.

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Page 429 of 494

7. (New) The method of claim 6, wherein said sending the at least one image portion is performed across at least one of an Internet, a WAN, a LAN, an Ethernet, or wireless communication.

8. (New) The method of claim 6, further comprising receiving, at the server, input control signals generated by a user input device.

9. (New) The method of claim 6, wherein the at least one image portion is compressed before sending to the client device.

10. (New) The method of claim 9, wherein the at least one image portion is decompressed at the client device before being displayed.

11. (New) The method of claim 6, wherein said at least one image portion comprises one or more frames.

12. (New) The method of claim 6, wherein said at least one image portion comprises an amount of images generated during a specified elapsed time.

13. (New) The method of claim 6, further comprising receiving, at the server, input control signals from the client device.

14. (New) The method of claim 6, wherein said client device does not have sufficient processing power to both run a client-device-only version of a game application and display graphics corresponding to said version of said application at an acceptable frame rate.

15. (New) A system comprising a processor and memory, the memory storing instructions for the processor to execute a method comprising:

receiving, at a server, image-modifying data corresponding to a generated image from a client device;

generating a compressed stream of images corresponding to 3-dimensional graphics, the compressed stream of images comprising a compressed modified image based on the image-modifying data; and

sending said compressed stream of images to the client device for display at the client device, wherein the client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing.

16. (New) The system of claim 15, wherein said sending is performed across at least one of the Internet, a WAN, a LAN, an Ethernet, or wireless communication.

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17. (New) The system of claim 15, wherein the method further comprises receiving game control signals generated by a user input device.

18. (New) The system of claim 17, wherein said game control signals are sent after a specified elapsed time.

19. (New) The system of claim 15, wherein said compressed stream of images is decompressed at the client device before display.

20. (New) The system of claim 15, wherein said client device does not have sufficient processing power to both run a client-device-only version of a game application and display graphics corresponding to said version of said game application at an acceptable frame rate.

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Page 431 of 494

REMARKS

Claims 1 has been amended and claims 2-20 are new. No new matter has been added. Accordingly, claims 1-20 are pending.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. If the Examiner has any questions or concerns for the Applicants, the Examiner is encouraged to contact the Undersigned using the information provided below.

Respectfully submitted,

/Joshua W. Chang/

Joshua W. Chang
Reg. 70,831

Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709
(510) 900-9501

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Sony v. IPL, IPR2021-00237
Page 432 of 494

Electronic Patent Application Fee Transmittal

Application Number:	15638020
Filing Date:	29-Jun-2017
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Filer:	Joshua Chang/Leslie Russell
Attorney Docket Number:	IPTLP002C5

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	70	70
UTILITY SEARCH FEE	2111	1	300	300
UTILITY EXAMINATION FEE	2311	1	360	360
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	70	70
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**800**

Electronic Acknowledgement Receipt	
EFS ID:	30331097
Application Number:	15638020
International Application Number:	
Confirmation Number:	5023
Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
First Named Inventor/Applicant Name:	Osman Kent
Customer Number:	19694
Filer:	Joshua Chang/Leslie Russell
Filer Authorized By:	Joshua Chang
Attorney Docket Number:	IPTLP002C5
Receipt Date:	12-SEP-2017
Filing Date:	29-JUN-2017
Time Stamp:	20:51:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$800
RAM confirmation Number	091317INTEFSW20525900
Deposit Account	506367
Authorized User	Leslie Russell
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Letter Requesting Suspension of Action	IPTLP002C5_deferral.pdf	158776 25a09a8f2dc5627314093d573c4bd4fe0adf6040	no	2
Warnings:					
Information:					
2	Drawings-only black and white line drawings	IPTLP002C5_Drawings_Corrected.pdf	2105897 a5b805aa82990f137c6f743617ee98422ae87778	no	4
Warnings:					
Information:					
3	Applicant Response to Pre-Exam Formalities Notice	IPTLP002C5_Resp_Missing_Parts.pdf	81782 c7b28790d88ecedea3841cfb49fa3c20e773c2bd	no	6
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	37105 59237e51711f6359017a44f36f77d057e932caf0	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2383560		

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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/638,020

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))	1 minus 20=	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 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	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
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.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/638,020	06/29/2017	2611	0.00	IPTLP002C5	1	1

CONFIRMATION NO. 5023

FILING RECEIPT

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

OC000000092882375

Date Mailed: 07/12/2017

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)

Osman Kent, Surrey, UNITED KINGDOM;
David R. Baldwin, Surrey, UNITED KINGDOM;
Nicholas J.N. Murphy, Surrey, UNITED KINGDOM;

Applicant(s)

Intellectual Pixels Limited, Channel Islands, JERSEY;

Assignment For Published Patent Application

Intellectual Pixels Limited, Channel Islands, JERSEY

Power of Attorney: The patent practitioners associated with Customer Number 19694

Domestic Priority data as claimed by applicant

This application is a CON of 14/192,789 02/27/2014 PAT 9699238
which is a CON of 13/296,776 11/15/2011 PAT 8667093
which is a CON of 12/538,347 08/10/2009 PAT 8131826
which is a CON of 10/037,688 01/04/2002 PAT 7587520
which claims benefit of 60/263,854 01/24/2001

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 07/10/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/638,020**

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

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

Preliminary Class

345

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

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

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

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/638,020	06/29/2017	Osman Kent	IPTLP002C5

CONFIRMATION NO. 5023

19694
Kwan & Olynick LLP
2000 Hearst Avenue, Suite 305
Berkeley, CA 94709

FORMALITIES LETTER

OC000000092662376

Date Mailed: 07/12/2017

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

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

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - The drawings must be reasonably free from erasures and must be free from alterations, overwriting, interlineations, folds, and copy marks. See Figure(s) 3.

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.

- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification

of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **70** basic filing fee.
- $ **70** surcharge.
- $ **300** search fee.
- $ **360** examination fee.
- $(**0**) previous unapplied payment amount.
- $ **800** TOTAL FEE BALANCE DUE.

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

Replies should be mailed to:

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

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

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

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

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

/tgebre/

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

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

Application Number	NEW
Filing Date	HEREWITH
First Named Inventor	Osman Kent
Title	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
Art Unit	UNASSIGNED
Examiner Name	UNASSIGNED
Attorney Docket Number	IPTLP002C5

SIGNATURE of Applicant or Patent Practitioner

Signature	/Joshua W. Chang/	Date (Optional)	
Name	Joshua W. Chang/	Registration Number	70,831
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

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

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	10/037,688 and 12/538,347
Filing Date	01/04/2002 and 08/10/2009
First Named Inventor	Osman Kent
Title	Image Display System with Visual Server
Art Unit	2457
Examiner Name	Dalencourt, Yves
Attorney Docket Number	IPTLP001 and IPTLP001C1

SIGNATURE of Applicant or Patent Practitioner

Signature	/Joshua W. Chang/	Date	04/11/2017
Name	Joshua W. Chang	Telephone	510-900-9501 ext 706
Registration Number	70,831		

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

☒ *Total of 2 forms are submitted.

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Doc Code: PA..
Document Description: Power of Attorney

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POWER OF ATTORNEY BY APPLICANT

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

Application Number	Filing Date

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

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 19694

OR

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

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

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

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

INTELLECTUAL PIXELS LIMITED

☐ Inventor or Joint Inventor (title not required below)

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

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

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

SIGNATURE of Applicant for Patent

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

Signature	[signature] Hoang Cuong	Date (Optional)	April 2nd, 2015
Name	DANIEL WEBB	CLERK OF COURT	
Title	AUTHORISED SIGNATORIES, RBC CORPORATE SERVICES (JERSEY) LIMITED, DIRECTOR		

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

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Title of Invention	Image Display System with Visual Server

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 14/192,789 filed on 02/27/2014.

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: Osman Kent Date (Optional): _____

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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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Title of Invention	Image Display System with Visual Server

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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.

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LEGAL NAME OF INVENTOR

Inventor: David R. Baldwin Date (Optional): 18 FEB 2014

Signature: D. Baldwin

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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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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.

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LEGAL NAME OF INVENTOR

Inventor: Nicholas J.N. Murphy Date (Optional) : _____

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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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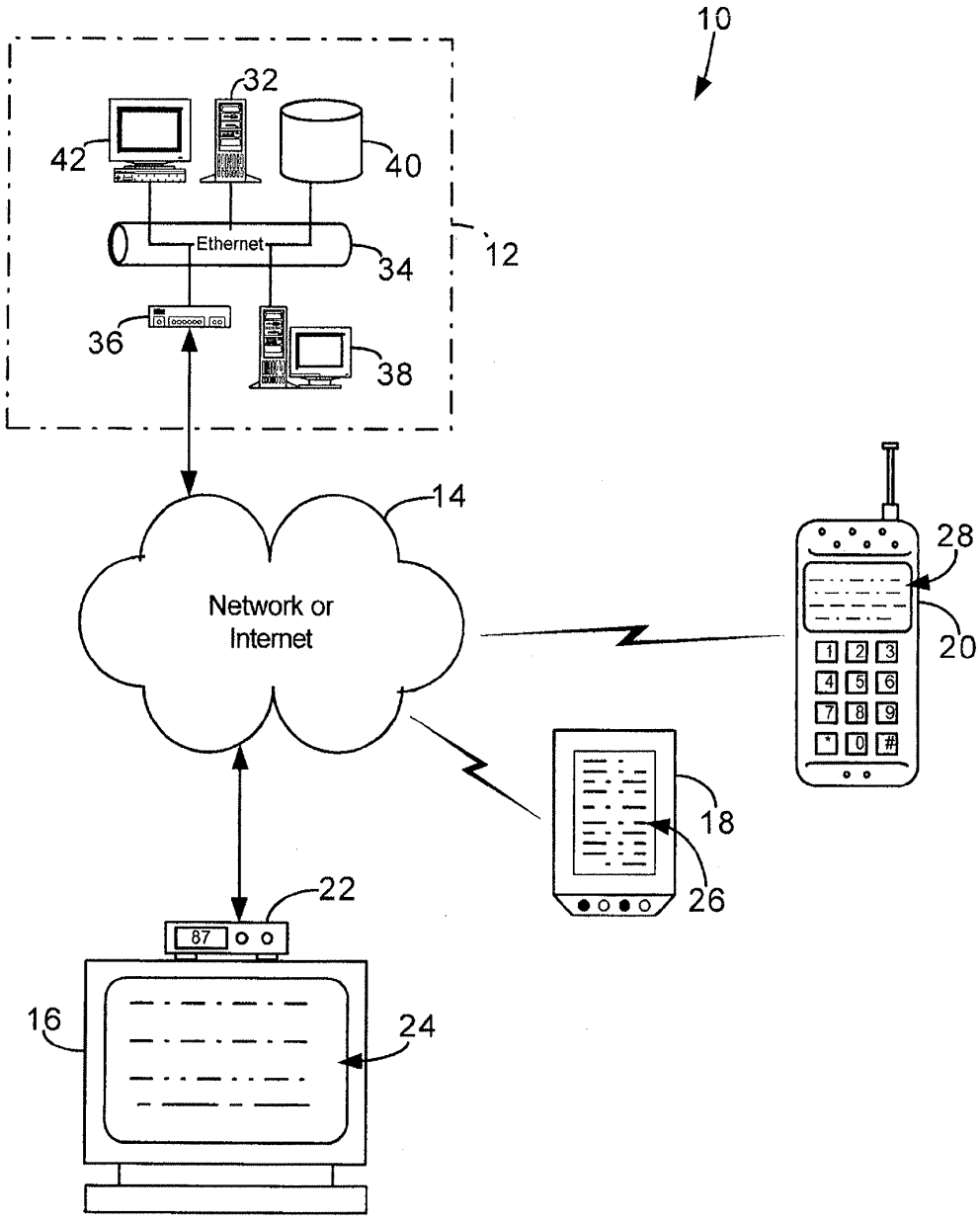

10
32
42
40
Ethernet
34
12
36
38
14
Network or
Internet
28
20
18
26
22
87
16
24

Fig. 1

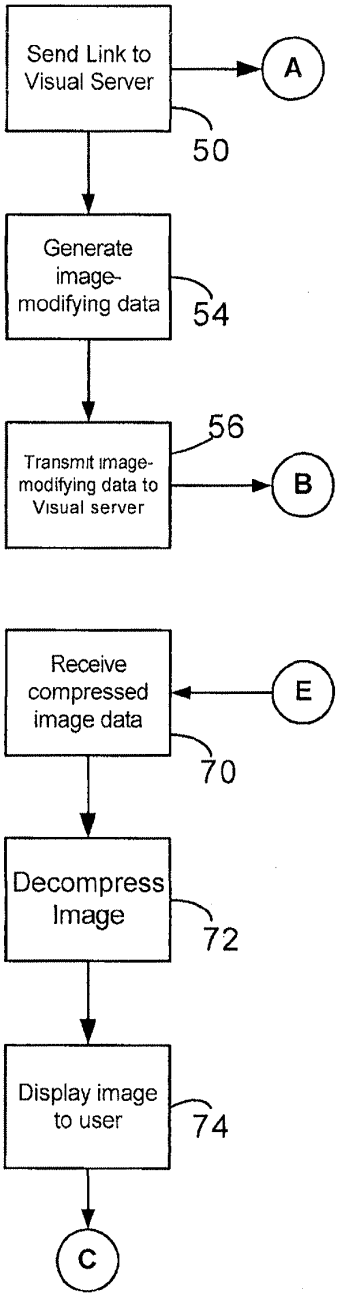

Send Link to Visual Server
A
50
Generate image-modifying data
54
Transmit image-modifying data to Visual server
56
B
Receive compressed image data
E
70
Decompress Image
72
Display image to user
74
C

Fig. 2A

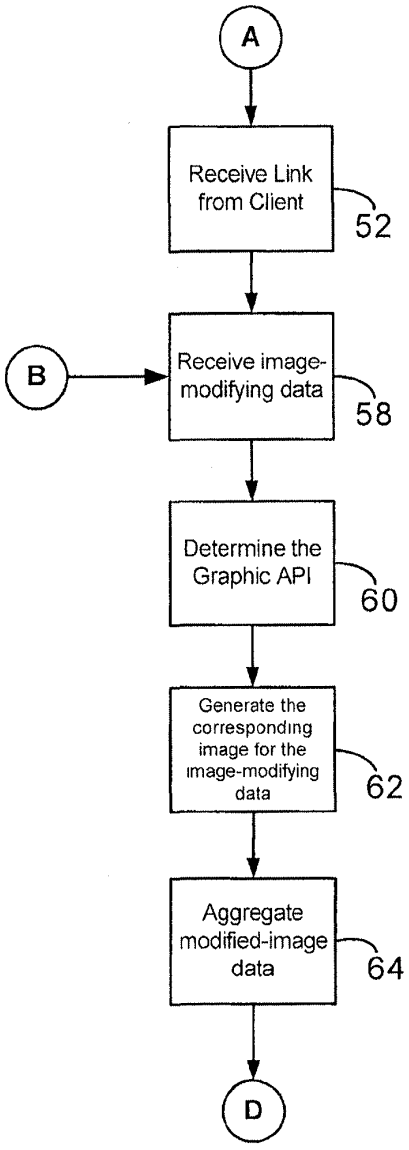

A
Receive Link from Client
52
B
Receive image-modifying data
58
Determine the Graphic API
60
Generate the corresponding image for the image-modifying data
62
Aggregate modified-image data
64
D

Fig. 2B

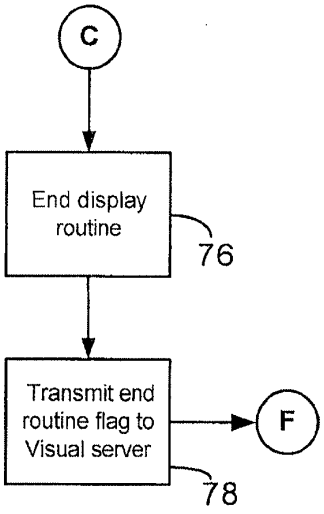

C
End display routine
76
Transmit end routine flag to Visual server
F
78

Fig. 2C

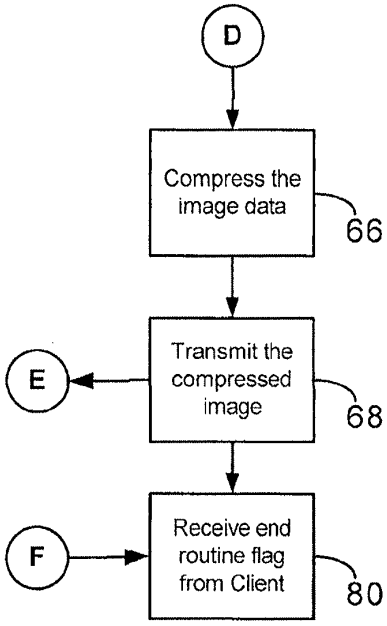

D
Compress the image data
66
Transmit the compressed image
E
68
Receive end routine flag from Client
F
80

Fig. 2D

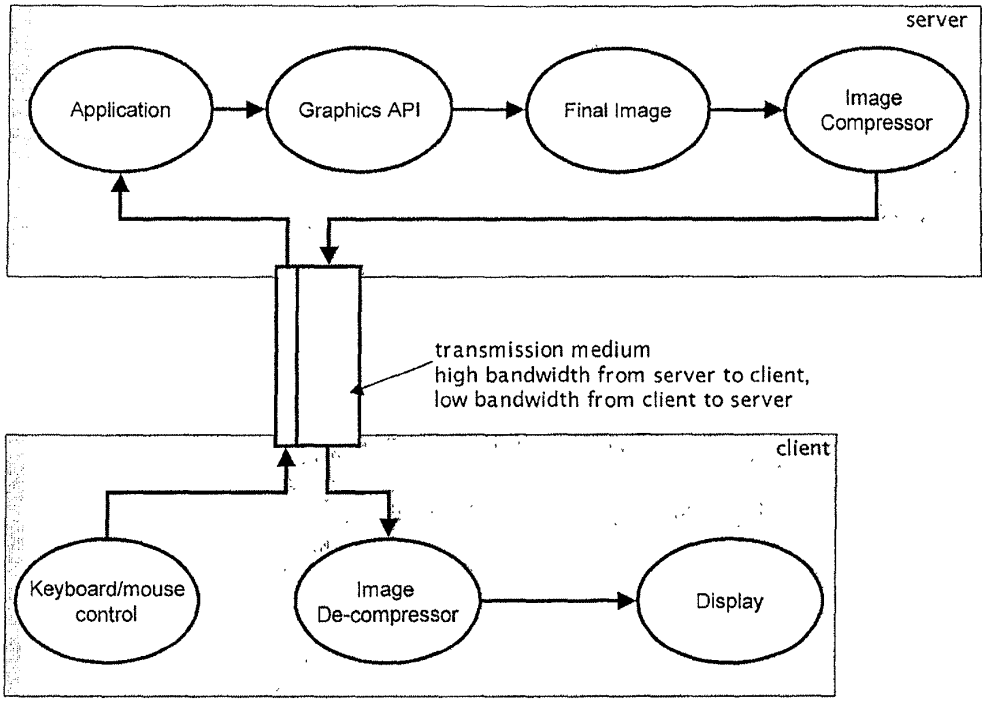

server
Application
Graphics API
Final Image
Image Compressor
transmission medium
high bandwidth from server to client,
low bandwidth from client to server
client
Keyboard/mouse control
Image De-compressor
Display

Fig. 3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Osman Kent	Attorney Docket No.: IPTLP002C5
Application No.: NEW	Examiner: UNASSIGNED
Filed: HEREWITH	Group: UNASSIGNED
Title: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	Confirmation No.: UNASSIGNED

CERTIFICATE OF EFS-WEB TRANSMISSION
I hereby certify that this correspondence is being transmitted electronically through EFS-WEB to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on June 29, 2017.

Signed: /Leslie Russell/
Leslie Russell

INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)

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

Dear Sir:

The reference(s) identified in the attached Information Disclosure Statement (copies of non-U.S. references are attached) may be material to examination of the above-identified patent application. Applicants identify the reference(s) in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make the identified reference(s) of official record in this application. The above-identified application is a continuation of prior application U.S. Patent Application No. 14/192,789. This prior application is being relied upon for an earlier filing date under 35 U.S.C. § 120. Because the listed reference(s) were either cited by the PTO, or submitted to the PTO in the prior application, under 37 CFR § 1.98(d) Applicants submit that copies need not be provided.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that the reference(s) indeed constitutes prior art.

IPL EX2004
Sony v. IPL, IPR2021-00237
Page 455 of 494

This Information Disclosure Statement is: (i) filed within three (3) months of the filing date of the above-referenced application, (ii) believed to be filed before the mailing date of a first Office Action on the merits, or (iii) believed to be filed before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114.

Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-6367.

Respectfully submitted,
Kwan & Olynick LLP

/Joshua W. Chang/
Joshua W. Chang
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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	NEW
	Filing Date	HEREWITH
	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

U.S.PATENTS AND PUBLICATIONS						
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
		5550962		1996-08-27	Nakamura, Shouji et al.	
		5742289		1998-04-21	Naylor, Bruce F., et al.	
		5790792		1998-08-04	Dudgeon, Michael et al.	
		5801711		1998-09-01	Koss, Louise A., et al.	
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		6057852		2000- 05-02	Krech, Jr., Alan S.	
		6094453		2000-07-25	Gosselin, Todd N., et al.	
		6205582		2001-03-20	Hoarty, W. L.	
		6344852		2002-02-05	Zhu, Ming B.	
		6377257		2002-04-23	Borrel, Paul et al.	
		6384821		2002- 05-07	Borrel, Paul et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

		20020082082	A1	2002-06-27	Stamper, Christopher T., et al.	
		6438575		2002-08-20	Khan, Umair A., et al.	
		6603470		2003-08-05	Deering, Michael F.	
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		7587520		2009-09-08	Osman, Ken et al.	
		20100201696	A1	2010-08-12	Kent, Osman et al.	
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	Filing Date	HEREWITH
	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

		20140040358	A1	2014-02-06	Kent, Osman		
		8667093		2014-03-04	Osman, Kent et al.		
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		9106605		2015-08-11	Osman, Kent et al.		
		9699238		2017-07-04	Kent, Osman et al.		

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
		0077739	WO	A1	2000-12-21	Deering, Michael et al.		

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
		"Application Serial No. 10/037,688, Advisory Action mailed 05-10-07", 3 pgs	

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	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

		"Application Serial No. 10/037,688, Examiner Interview Summary mailed 11-28-07", 3 pgs	
		"Application Serial No. 10/037,688, Final Office Action mailed 01-19-07", 9 pgs	
		"Application Serial No. 10/037,688, Non Final Office Action mailed 04-21-05", 12 pgs	
		"Application Serial No. 10/037,688, Non Final Office Action mailed 05-09-06", 9 pgs	
		"Application Serial No. 10/037,688, Non Final Office Action mailed 08-10-07", 8 pgs	
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	Filing Date	HEREWITH
	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

		"Application Serial No. 12/538,347, Examiner Interview Summary mailed 05-11-11", 2 pgs	
		"Application Serial No. 12/538,347, Non Final Office Action mailed 07-21-11", 6 pgs	
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		"Application Serial No. 12/538,347, Notice of Allowance mailed 10-26-11", 5 pgs	
		"Application Serial No. 13/282,200, Non Final Office Action mailed 12-26-12", 13 pgs	
		"Application Serial No. 13/282,200, Notice of Allowance mailed 06-13-13", 10 pgs	
		"Application Serial No. 13/296,776, Examiner Interview Summary mailed 09-18-13", 3 pgs	
		"Application Serial No. 13/296,776, Non Final Office Action mailed 05-15-13", 11 pgs	

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	Application Number	NEW
	Filing Date	HEREWITH
	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

		"Application Serial No. 13/296,776, Non Final Office Action mailed 12-19-12", 10 pgs	
		, "Application Serial No. 13/296,776, Notice of Allowance mailed 10-30-13", 7 pgs	
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		"Application Serial No. 14/052,659, Non Final Office Action mailed 12-02-14", 6 pgs	
		"Application Serial No. 14/052,659, Notice of Allowance mailed 06-23-15", 5 pgs	
		"Application Serial No. 14/192,789, Advisory Action mailed 12-01-16", 4 pages	
		"Application Serial No. 14/192,789, Examiner Interview Summary mailed 05-24-16", 3 pages	
		"Application Serial No. 14/192,789, Examiner Interview Summary mailed 12-01-16", 1 page	

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	Application Number	NEW
	Filing Date	HEREWITH
	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

		"Application Serial No. 14/192,789, Final Office Action mailed 08-04-16", 11 pages	
		"Application Serial No. 14/192,789, Non Final Office Action mailed 01-29-16", 13 pgs	
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		"The G-cluster Game Portfolio", G-Cluster LTD., Printouts from WorldWide Web. gcluster.com, 2002, 23 pgs	
		AGRAWALA, MANEESH et al., "Model-Based Motion Estimation for Synthetic Animations", AMC Multimedia 95- Electronic Proceedings; November 5-9, WorldWide Web-Graphics.Stanford.edu/papers/model based, 1995, 1-18	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	NEW
	Filing Date	HEREWITH
	First Named Inventor	Osman Kent
	Art Unit	UNASSIGNED
	Examiner Name	UNASSIGNED
	Attorney Docket Number	IPTLP002C5US

		WALLACH, DAN S. et al., "Accelerated MPEG Compression of Dynamic Polygonal Scenes", Computer Graphics (Poc. Siggraph 1994), 3 pgs	

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

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

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

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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Osman Kent

Application No./Patent No.: NEW Filed/Issue Date: HEREWITH

Titled: IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

Intellectual Pixels Limited , a Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

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 035703 , Frame 0190 , or for which a copy therefore is attached.

OR

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: _____

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Reel _____ , Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

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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.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(b)(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.

/Joshua W. Chang/ 2016-06-29

Signature Date

Joshua W. Chang USPTO Reg. No. 70,831

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 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. 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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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.
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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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

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
	Osman		Kent	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Surrey	Country of Residence [i]	UK

Mailing Address of Inventor:

Address 1	Knavesmire, St. Leonard's Road		
Address 2	Thames Ditton		
City	Surrey	**State/Province**	
Postal Code		**Country** [i]	UK

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	David	R.	Baldwin	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Surrey	Country of Residence [i]	UK

Mailing Address of Inventor:

Address 1	Briarside, Gower Road		
Address 2	Weybridge		
City	Surrey	**State/Province**	
Postal Code	KT13 OH	**Country** [i]	UK

Inventor 3 Remove

Legal Name

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Nicholas	J.N.	Murphy	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Surrey	Country of Residence [i]	UK

Mailing Address of Inventor:

Address 1	Long Hill House. Long Hill		
Address 2	The Sands		
City	Surrey	**State/Province**	
Postal Code	GU101NQ	**Country** [i]	UK

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	19694		
Email Address	docket@kwanip.com	Add Email	Remove Email

Application Information:

Title of the Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER		
Attorney Docket Number	IPTLP002C5	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	**Suggested Figure for Publication (if any)**	

Filing By Reference:

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

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

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).
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Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	19694		

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

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
ThisApplication	Continuation of	14192789	2014-02-27

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14192789	Continuation of	13296776	2011-11-15	8667093	2014-03-04

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13296776	Continuation of	12538347	2009-08-10	8131826	2012-03-06

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12538347	Continuation of	10037688	2002-01-04	7587520	2009-09-08

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
10037688	Claims benefit of provisional	60263854	2001-01-24
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This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPTLP002C5
	Application Number	
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

Applicant Information:

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

Applicant 1

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	Intellectual Pixels Limited

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Email Address			

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Assignee Information including Non-Applicant Assignee Information:

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If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Intellectual Pixels Limited

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	La Motte Chambers, La Motte Street		
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City	Channel Islands	**State/Province**	
Country i	JE	Postal Code	JE1 1BJ
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See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Joshua W. Chang/			Date (YYYY-MM-DD)	2017-06-29
First Name	Joshua W.	Last Name	Wang	Registration Number	70831

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	Application Number	
Title of Invention	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER	

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IMAGE DISPLAY SYSTEM WITH VISUAL SERVER

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation of U.S. Application 14/192,789, filed February 27, 2014, and titled "IMAGE DISPLAY SYSTEM WITH VISUAL SERVER", which is a continuation of U.S. Application No. 13/296,776, filed November 15, 2011, and titled "IMAGE DISPLAY SYSTEM WITH VISUAL SERVER", now issued as U.S. Patent 8,667,093, which is a continuation of U.S. Application No. 12/538,347, filed August 10, 2009, and titled "IMAGE DISPLAY SYSTEM WITH VISUAL SERVER", now issued as U.S. Patent 8,131,826, which is a continuation of U.S. Application No. 10/037,688, filed January 4, 2002, and titled "IMAGE DISPLAY SYSTEM WITH VISUAL SERVER", now issued as U.S. Patent 7,587,520, which claims priority to U.S. Provisional Application No. 60/263,854, filed January 24, 2001 and titled "VISUAL SERVER", all of which are incorporated by this reference in their entireties for all purposes.

BACKGROUND OF THE INVENTION

1. *Field of the Invention*

[0002] The present invention generally relates to computer systems. More particularly, the present invention relates to computer graphics and a graphical image display system that use a visual server to generate and transmit images to a client.

2. *Description of the Related Art*

[0003] Computer generated images are created in a series of several steps: modeling, or describing the objects in mathematical terms; animation, or describing how the objects move over time; and rendering, or determined which of the images defined by the modeling and animation programs are visible on the screen for every frame, assigning color to those images, and drawing them. Of these, rendering is the most difficult as it is the most processing intensive action. Because the generation of images is both processing and memory intensive, a client computer often relies upon other processors and memories, such as a server, to assist in generating the data to render new images. In the existing network model, storage and caching of content and applications can occur on a centralized server, but the actual software applications execute on a system in the client user space. The network thus allows the server to supply image

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processing resources beyond the constraints of a remote terminal, while taking advantage of client resources for certain tasks. Several existing systems utilize the client-server model to process and render images at a client display with the assistance of server resources.

[0004] In methods of client-server graphics that employ image transmission, the server unit requires a relatively high bandwidth connection even if real-time image compression and decompression is employed. Even in geometric replication methods, such as VRML, which generally have a lower bandwidth requirement, the image processing does not decrease the storage or processing requirements of the client. In these systems, the client must be capable of 30 rendering the complete replicated database in real time, and the server does not provide true image generation services. Rather, the server functions primarily as a database server. For example, in a client-server method based on a hybrid image transmission and geometry transmission approach, the server unit maintains a low level-of-detail database and a high level of detail database. For each frame of a real-time image stream, images are generated from both the low level-of-detail and high level-of-detail database. The difference between the two images is computed using known methods of image processing. The client unit contains only a low level-of-detail geometric database and renders this database for each frame, and the difference image computed on the sever is compressed and transmitted to the client in real-time which decompresses and composites it together with the image generated by the client from the low level-of-detail database. The result is a high level-of-detail, high quality image that requires a relatively low transmission bandwidth to transmit the relatively low information difference image. Such method also requires relatively limited client storage and processing capabilities. While this method can decrease the computational load of the client and reduce the communication costs, it requires both real-time image compression and decompression and further requires that special image compositing be added to the pipeline. In addition, the entire low level-of-detail database must be stored and processed by the client.

[0005] Another known method of client-server image processing is transmitting a transformed and compressed low level-of-detail representation of the geometric database in screen-space representation from the client to the server. The low level-of-detail geometric primitives are transmitted for every frame, and such action increases the required connection bandwidth. Only

the primitives that are actually visible for each frame need to be transmitted in this approach. Moreover, since primitives visible in a current frame are likely to be visible in a subsequent frame, the repeated transmission of primitives that have been transformed to image-space representation is an inefficient use of available bandwidth. Any processing to identify repetitive primitives requires further client resources, which hampers the image displaying process.

[0006] A further approach to distributed client-server image generation is based on demand-driven geometry transmission to the client. In this method, the server determines and periodically updates a list of potentially visible primitives for each client using a spherical clipping volume around a viewpoint. The result is then compared to a list of primitives previously transmitted to the corresponding client and only those potentially visible primitives that have not been previously transmitted are sent to the client. However, this method reduces communication cost by limiting transmission to those primitives that have become potentially visible. The client replaces primitives in the client display list when they are no longer included in the spherical clipping volume, and thus, the storage and computing requirements of the client are limited to only those primitives in the potentially visible set. However, as this method uses a limited inclusion volume, a major disadvantage is that distant primitives can be arbitrarily excluded from the potentially visible data set. Further, the use of a spherical inclusion volume results in the inclusion and transmission of a large number of geometric primitives that are not visible in the current frame and are unlikely to be visible in upcoming frames, an example being primitives in the inclusion sphere behind the viewpoint. As a result, the demand-driven geometry transmission makes inefficient use of available transmission bandwidth and available client storage and computing resources, and the client resources are taxed because the client must compute removal of primitives by clipping to the inclusion volume, and implement display list replacement and compaction protocols.

[0007] Client graphic image display processing capabilities are even further taxed in the display of 3-dimesional images. In existing clients, the implementation of a system delivering 3D graphics requires graphics hardware at the client, which presents several problems. The additional hardware increases the cost of the client hardware as the graphics hardware must be incorporated and integrated therewith. Further, the software and hardware used to generate 3D

images is in constant flux, and the system must be continually upgraded, creating an additional expense and a logistical burden for the client. Moreover, the remote hardware impedes the central maintenance and coordination of configurations of client software, which is an important capability and critical to the product viability of many applications.

[0008] Some clients use separate 3D hardware component to assist in processing the images, but with the constant change of graphics languages and protocols, the hardware becomes obsolete rather quickly, which adversely impacts the value of the client. Furthermore, the use of programmable graphics hardware within the client system is difficult because the client resources are inherently static and limited.

[0009] Therefore, for reasons of cost, size, and power consumption, sophisticated three dimensional graphics are not available on common consumer client devices such as personal digital assistants (PDAs) mobile telephones and set-top boxes used to decode cable and satellite television signals. Consequently, it would be advantageous to display complex three dimensional graphics, such as those used by games, on these consumer client devices.

[0010] Accordingly, it is to the provision of such an improved system and method of displaying images on a client consumer device utilizing the resources of a visual server that the present invention is primarily directed.

SUMMARY OF THE INVENTION

[0011] The present invention is an image display system and method of displaying images on a client through the use of the resources of a remote visual server. The Visual Server runs standard software, such as games, that are the same as versions running on standard personal computers. The Visual Server has certain support software modified to enable control of the application from the client and the delivery of the result of 3D drawing to the client. One or more clients can access the visual server, or an array of servers, wherein each of the clients includes an image display. The system includes a visual server having image data processing capabilities wherein the server selectively receives image-modifying data from one or

more clients corresponding to a generated image, and the server generates a modified image based on the image-modifying data, and then transmits the modified image as compressed data back to the client.

[0012] The clients are in selective communication with the visual server, and each client selectively generates image-modifying data corresponding to the image resident on the image display of that specific client. The client selectively transmits the image-modifying data to the visual server, and the client then receives, as compressed data from the visual server, an image, or data representing an image, which is a modification of the previous image on the client altered in accord with the previously transmitted image-modifying data. The client includes the processing ability to uncompress the compressed image data from the visual server, and display the image defined by the decompressed data on the client image display.

[0013] The visual server and the one or more clients are in selective digital or analog communication preferably across a network, such as an Ethernet, WAN, LAN, or the Internet. Alternately, the visual server and one or more clients are in selective wireless communication, either point-to-point or relayed.

[0014] In generating the image-modifying data at the client and processing the image-modifying data at the visual server, the typical data processing segment is a frame. Alternately, the image-modifying data can be generated and transmitted from the client, and the modified image data sent from the visual server to the client after predetermined duration has elapsed.

[0015] The present invention further includes a method of displaying an image on a client in selective communication with a visual server wherein the method includes the steps of generating image-modifying data at the client wherein the image-modifying data corresponds to a generated image, transmitting the image-modifying data from the client to the visual server, receiving at the visual server image-modifying data from the client, generating at the visual server a modified image based upon the image-modifying data received from the client, transmitting the modified image from the visual server to the client as compressed data, receiving at the client as compressed data from the visual server an image modified by the

transmitted image-modifying data, uncompressing the compressed image data at the client, and displaying the decompressed image on the client image display. The method alternately further includes the step of transmitting a link or other flag to the visual server from the client prior to the step of transmitting the image-modifying data from the client to the visual server in order to notify the visual server that image-modifying data is about to be transmitted from the client.

[0016] In the preferred embodiment, the steps of transmitting the image-modifying data from the client to the visual server and transmitting the modified image from the visual server to the client as compressed data are performed across a network, such as the Internet or other WAN, LAN, or Ethernet. Alternately, the steps of transmitting the image-modifying data from the client to the visual server and transmitting the modified image from the visual server to the client as compressed data are performed through wireless communication.

[0017] In one embodiment of the system, the step of transmitting the modified image from the visual server to the client as compressed data is transmitting the modified image from the visual server to the client as a compressed data comprising a frame, and accordingly, the step of transmitting the image-modifying data from the client to the visual server is transmitting the image-modifying data from the client to the visual server as data sufficient to generate an image frame. In another embodiment, the step of transmitting the modified image from the visual server to the client as compressed data is transmitting the modified image to the client after predetermined duration of generating an image based upon the transmitted image-modifying data has occurred, and accordingly, the step of transmitting the image-modifying data from the client to the visual server is transmitting the image-modifying data from the client to the visual server after a predetermined duration of generating image-modifying data.

[0018] The present invention therefore provides a commercial advantage in that the client can interactively generate complex graphical images to a user without the need for significant client resources. The system can be implemented with existing networking and communication technology between the client and the visual server, and the image data can be transmitted with known data compression protocols. Further, the visual server and its associated components are readily updateable and maintainable without having to directly access the individual client

applications utilizing the image generating capabilities of the visual server.

[0019] Other objects, features, and advantages of the present invention will become apparent after review of the hereinafter set forth Brief Description of the Drawings, Detailed Description of the Invention, and the Claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Fig. 1 is a representational diagram of the image display system with a visual server and associated components in selective communication with a plurality of clients across a network.

[0021] Fig. 2A is a flowchart illustrating the preferred process executed on the client in selective communication with the visual server to facilitate image generation.

[0022] Fig. 2B is a flowchart illustrating the preferred process executed on the visual server in receiving image-modifying data from the client, and then generating and transmitting a modified image to the client.

[0023] Fig. 2C is a continuation of the flowchart of Fig. 2A.

[0024] Fig. 2D is a continuation of the flowchart of Fig. 2B.

[0025] Fig. 3 shows a schematic of data and procedural flow in an inventive embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[0026] With reference to the figures in which like numerals represent like elements throughout, Fig. 1 is representational diagram of the image display system 10 with a visual server 12 and associated components in selective communication with a plurality of clients across a network 14, such as the Internet. The client components are shown as a television 16 having a set-top box 22 in communication with the network 14, and the set-top box 22 can selectively provide image data to the display 24 of the television 16. Set-top box 22 is similar to the type of boxes generally extant, except that the set-top box 22 in the present system must be able to receive and

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decompress compressed image data from the visual server 12. The same capability must be present in any client device in order to have the advantages of using the present system 1 0 for image data processing. Another exemplary clients are PDA 18, such as a Palm Pilot or a Handspring Visor, which has a display screen 26, and cellular telephone 20, which includes a display screen 28. The PDA 18 and cellular telephone 20 are shown here as communicating with the network 14 via a wireless connection, such as an infrared, radio frequency, or microwave transmission. However, PDA 18 and cellular telephone 20 can be in direct wireless communication with the visual server 12 solely though wireless communication.

[0027] The visual server 12 is shown here as a cluster of devices, including a server 32, which are in communication through an Ethernet 34, and a hub 36 links the Ethernet 34 to the Internet or other network 14. Thus, while the present inventive system 1 0 can be implemented with only a server, such as server 32, in communication with the network 14, the visual server 12 here includes additional components that can facilitate the image processing at the visual server 12. An additional server 38 can support the visual server, as well as a database 40 for storing the image related information such as the specific graphical application programming interface that the client 16,18,20 requires for the modified image, such as Open GL or Direct3D. Additional computers, such as computer 42, can be connected to the server 32 or to the Ethernet 34 to support the image processing, and provide server maintenance and upgrades. Accordingly, the visual server 12 configuration is readily scalable as would be apparent to one of skill in the art.

[0028] The communication between the visual server 12 and client preferably occur over a high bandwidth connection such that 1Mbps or greater data can be sent across the network. However, the client bandwidth can be asymmetric, with the high-bandwidth reserved for visual server 12 to client 16,18,20 communication, an example being a DSL. With the use of an asymmetric connection, the lesser volume of image-modifying data can be transmitted on the lower bandwidth link from the client 16,18,20 to the visual server 12, and the more significant compressed image data can travel across the high bandwidth portion of the connection from the visual server 12 to the client 16,18,20 for decompression and display. Through the use of adequate bandwidth, substantial image data can be transmitted from the visual server 12 to the client 16,18,20, approaching real-time speeds which can allow multimedia applications to be

displayed on the clients 16,18,20, such as games and other graphic-intensive applications.

[0029] In operation of the image display system I 0, the visual server 12 selectively receives image-modifying data from the client 16,18,20 corresponding to a generated image, such as that generated by a game being played on the client, or a multimedia application being executed on the client. The visual server 12 then generates a modified image based upon the image-modifying data, compresses the image or image data with a specific "codec" (compression/decompression) algorithm, and transmits the modified image as compressed data back to the client 16, 18,20. The visual server 12 can either generate a full image modified with the image-modifying data from the client and then compress the generated image, or the visual server 12 can solely generate the data in a specified format for the modified image and have that 30 data compressed and transmitted. Thus, in the system 1 0, the visual server 12 can generate only the data necessary to render an image at the client, and does not need to fully produce an image at the visual server prior to compression.

[0030] The client 16,18,20 selectively generates image-modifying data and transmits the image-modifying data to the visual server 12 and awaits the image data from the visual server 12 for the next requested image. Once the client receives the modified image as compressed data from the visual server 12, the client 16,18,20 then decompresses the compressed image data and displays the decompressed image on the client image display 24,26,28. The modified image data can be compressed at the visual server 12 in any compression standard, such as MPEG, JPEG, H.261, or other industry standard codecs, and streaming formats such as Windows Media .ASF standard, Real .RM standard, Apple .MOV standard. The client 16,18,20 includes the requisite hardware and software to decompress the modified image.

[0031] If the system 10 is displaying a series of images on the client 16, 18,20, such as in multimedia animation, the visual server 12 transmits the modified image to the client 16,18,20 as a frame, and preferably but not necessarily, the client 16,18,20 transmits the image-modifying data to the visual server 12 as data sufficient to generate an image frame. Otherwise, the visual server 12 can transmit the modified image to the client 16,18,20 in an arbitrary predetermined manner, such as after predetermined duration of generating an image based upon the transmitted

image-modifying data has occurred, or after a predetermined amount of data has been received from the client 16, 18,20. The client 16,18,20 can likewise transmits the image-modifying data to the visual server 12 in an arbitrary manner, such as after a predetermined duration of generating image-modifying data has occurred, or a specific amount of image-modifying data is ready to be sent.

[0032] In the art currently, when the client 16,18,20 is active, the client 16,18,20 is in communication with networks and can be supported by a one or more servers. Consequently, the visual server 12 is able to utilize existing architectures with the higher bandwidth, asymmetric or other, to handle complex visual processing for the client 16, 18,2, or the ultimate recipient of the processed data. The visual server 1 2 can also run standard software application, such as games, that are the same as versions running on standard personal computers, with the visual server 12 providing the computing power of the PC to the data generated at the client 16,18,20 for purposes of image modification.

[0033] It can be seen that the visual server 12 has, either in software or hardware, an image processor that selectively receives image-modifying data corresponding to a generated image from the client 16,18,20, and the image processor generates a modified image based upon the image-modifying data and then transmits the modified image as compressed data to the client 16,18,20. Further, each client 16,18,20 can have, either embodied in hardware or software, in additional to the image display 24,26,28 for displaying an image to a user of the client 16, 18,20, an image-modifying data generator that generates image-modifying data, and image-modifying data transmitter for transmitting the image-modifying data to the visual server 12, and a modified image data receiver for receiving as compressed data from the visual server 12 an image modified based the transmitted image-modifying data from the client 16,18,20, and the modified image data receiver decompresses the compressed image data.

[0034] Figs 2A-2D illustrate the process thread of the image display system 10, with Figs. 2A and 2C representing the client platform, and Figs. 2B and 2D representing the visual server 12 platform. The thread preferably begins with the step of sending a link to the visual server, step 50, which indicates that the client 16,18,20 is about to send image-modifying data to the visual

server. The link can be a flag at the beginning of a frame or packet, or can be separate from the frame or packet. The visual server 12 receives the link from the client, as shown at step 52, and then can make any necessary resource allocations for use in the image-modification process. The step of sending a link is not necessary if the visual server 12 is able to have sufficient tum around processing on frames and packets send without advanced warning from the client 16,18,20. Then the client 16,18,20 generates image-modifying data, as shown at step 54, and transmits the image-modifying data to the visual server 12, as shown at step 56.

[0035] The thread then continues at the visual server 12 which receives the image-modifying data from the client 16, 18,20, as shown at step 58, where the image-modifying data corresponds to an image in a graphics API recognizable to the visual server 12. Thus, if a link was sent to the visual server 12 from the client 16,18,20 (steps 50 and 52), the visual server can determine the appropriate graphics API in anticipation of receipt of the image-modifying data. The visual server 12 otherwise determines the graphic API, as shown at step 60, based upon the image-modifying data receiving, and then generates the corresponding modified image based upon the image-modifying data received from the client 16, 18,20, as shown at step 62. If the image data requires aggregation to complete the image, then the visual server 12 aggregates the data, as shown at step 64, and if not, once the modified image, or data comprising the modified image is generated, the visual server 12 compresses the image data in a predetermined format, such as MPEG, as shown at step 66, and then transmits the modified image from the visual server 12 to the client 16,18,20 as compressed data, as shown at step 68.

[0036] The thread then continues at the client 16,18,20, with the client receiving the compressed data from the visual serverl2, as shown at step 70, where the compressed data is an image modified based the transmitted image-modifying data, and the client 16,18,20 decompresses the compressed image data, as shown at step 72. The client 16,18,20 then displays the decompressed image on the client image display, such as displays 24,26,28. The client then ends the particular display routine of the thread, as shown at step 76, and can begin to generate new image modifying data. The client 16,18,20 alternately process new image-modifying tying data while the current image is being displayed. Further, as embodied here, the client 16,18,20 transmits an end routine flag to the visual server, as shown at step 78, to indicate that the client

successfully received and displayed the frame. The visual server 12 then receives the end routine flag, as shown at step 80, which allows the visual server 12 to deallocate the resources set aside for the specific image processing requested initially by the client 16,18,20 at step 50. The step of transmitting an end routing flag from the client (step 78) and the receipt of the flag at the visual server 12 (step 80) are not required, but do assist in the visual server 12 management of resources. Other methods of client-server interaction through packet and frame-relay networks as would be known to those of skill in the art can be used to control interaction between the clients 16,18,20 and visual server 12 in the present system 10.

[0037] If the client 16,18,20 and visual server 12 data transfers occur through the use of frames, the step of transmitting the modified image from the visual server 12 to the client 16,18,20 as compressed data is transmitting the modified image from the visual server 12 to the client 16,18,20 as a compressed data comprising a frame. Likewise, the step of transmitting the image-modifying data from the client 16,18,20 to the visual server 12 is preferably transmitting the image-modifying data from the client16, 18,20 to the visual server 12 as data sufficient to generate an image frame. Alternately, if the client and visual server 12 transfer data based upon an arbitrary method such as elapse of a predetermined duration, then the step of transmitting the modified image from the visual server 12 to the client 16,18,20 as compressed data is transmitting the modified image to the client 16,18,20 after predetermined duration of generating an image based upon the transmitted image-modifying data has occurred at the visual server 12. In such embodiment, the step of transmitting the image-modifying data from the client 16,18,20 to the visual server 12 is transmitting the image-modifying data from the client 16,18,20 to the visual server 12 after a predetermined duration of the client generating image-modifying data.

[0038] While there has been shown a preferred and alternate embodiments of the present invention, it is to be understood that certain changes may be made in the forms and arrangement of the elements and steps of the method without departing from the underlying spirit and scope of the invention as is set forth in the claims.

[0039] For reasons of cost, size, and power consumption, sophisticated three dimensional graphics are not available on devices such as mobile telephones

and the set-top boxes used to decode cable and satellite television signals. There is, however, a need to display complex three dimensional graphics, specifically those used by games, on these devices.

[0040] We have solved this problem by recognizing that another common element of these devices is connectivity; when the device is active it is connected to a service provider and hence already follows the model of a client device supported by a server device. Extending this analogy we have developed the concept of a Visual Server that handles all complex visual processing, and a client (the telephone or set-top box) that receives the processed data.

[0041] The Visual Server runs standard software, such as games, that are the same as versions running on standard personal computers. The Visual Server has certain support software modified to enable control of the application from the client and the delivery of the result of 3D drawing to the client.

[0042] The application running on the Visual Server sends drawing commands to one of the industry standard application programming interfaces such as Direct3D or OpenGL. When the drawing is complete the resulting image is compressed and transmitted to the client using a protocol such as MPEG4. The transmission of the compressed image usually occurs on completion of a frame; in the event that there is no distinct end to a frame the transmission occurs after a specified elapsed time.

[0043] The use of an industry standard image compression protocol such as MPEG allows us to make use of facilities that are already present in most clients. Set-top boxes already need to decode MPEG data in order to display digital television; mobile telephones will soon need to support MPEG protocols for video conferencing or television display.

[0044] The main advantages of this invention are:

1. The ability to display complex 3D graphics on a device lacking necessary hardware.
2. The avoidance of costly components in the client device and taking advantage of necessary functions already present in it.
3. The ability to provide access to industry standard software on a device which is unable to execute that software.
4. The ability to upgrade performance and features needed by applications at the server without modifying the more numerous clients.
5. The avoidance of installing numerous applications on each client with the consequential support problems; the client software can be installed when shipped from the factory.

CLAIMS

1. A method comprising:

sending image-modifying data corresponding to a generated image from a client device;

receiving, from a server, 3-dimensional graphics comprising a compressed modified image based on the image-modifying data; and

displaying said 3-dimensional graphics at the client device such that complex interactive games can be displayed at the client device in real-time, wherein said client device decompresses the compressed modified image but does not perform 3-dimensional graphics processing on said 3-dimensional graphics, and wherein said client device is separate from said server.

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ABSTRACT OF THE DISCLOSURE

An image display system with one or more client computers in selective communication with a visual server having image processing capabilities. The client computer generates image-modifying data corresponding to a generated image, and transmits the data to the visual server. The visual server receives the image-modifying data, generates a modified image based upon the image-modifying data, and transmits the modified image as compressed data to the client. The client decompresses the modified image data and displays the modified image. In the system, the visual server and client can provide a sequential display of modified frames on client to support animation with complex 3-dimensional graphics.

Electronic Acknowledgement Receipt

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Title of Invention:	IMAGE DISPLAY SYSTEM WITH VISUAL SERVER
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	IPTLP002C5_POA.pdf	9077120 e15745607331aae2460fabbfa687bf168507a696	no	3
Warnings:					

Information:					
2	Oath or Declaration filed	IPTLP002C5_Declarations_Signed.pdf	1910343 ee70ee51b375ca5398250075df3af1c6dc0385a1	no	3
Warnings:					
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3	Drawings-only black and white line drawings	IPTLP002C5_Drawings.pdf	2097168 201315bc46e452d753e16a20fabe3358784cdd0c	no	4
Warnings:					
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4	Transmittal Letter	IPTLP002C5_IDS_Trans.pdf	69396 5821a0e36d164903137b9908dd57d988a58537e7	no	2
Warnings:					
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5	Information Disclosure Statement (IDS) Form (SB08)	IPTLP002C5_1449.pdf	112508 5cc7805d9ead9c5aba9bff7dc21ee5f264178d4f	no	8
Warnings:					
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6	Assignee showing of ownership per 37 CFR 3.73	IPTLP002C5_373.pdf	110967 bc4592697fba52b8f925f27a54b38c6e04e908b1	no	2
Warnings:					
Information:					
7	Application Data Sheet	IPTLP002C5_ADS.pdf	108634 7d7ebc2adfe58346a356d885f4c701c79ee5e0af	no	9
Warnings:					
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8		IPTLP002C5_Application_final.pdf	143138 ff2c941ca53f00b78c160817f7380b7291d98e21	yes	16

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