100. (Previously Presented) The system of claim 92 further comprising time-stamping synchronously the audio stream with the data stream.

101. (Previously Presented) The system of claim 100 further comprising means for encoding, optionally encrypting the audio data.

102. (Currently Amended) A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a class of peripheral devices, the peripheral device comprising a connection configured to be physically coupled to a port of the processing device and a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for audio communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via a transceiver of the peripheral device;

a third software code portion for routing audio data ~~between~~ from the processing device to the peripheral device via the connection and the means for audio communication and for routing the audio data from the peripheral device to the base node over the ~~communication~~ communications network ~~via the means for audio communication and the transceiver to a base node~~, wherein the first pre-installed generic driver is used for transferring the audio data between the processing device and the peripheral device.

103. (New) The method of claim 82, wherein the audio driver is a generic audio driver.

104. (New) The method of claim 82, wherein the audio data is routed from the processing device to the peripheral device via the connector and the means for audio communication

when an actuator on the peripheral device is actuated to generate a signal for the processing device to trigger transfer of the audio data.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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First Named Inventor	Koen Simon Herman BEEL
Art Unit	2181
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

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/C.A.B/	1	Chinese Office Action in corresponding Chinese Application No. 201280074077.2, dated March 5, 2019.	X

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Signature	/Thomas Lee/	Date (YYYY-MM-DD)	2019-04-11
Name/Print	THOMAS LEE	Registration Number	66396

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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/C.A.B/	1	20110188391		2011-08-04	Sella et al.	
/C.A.B/	2	20110092198		2011-04-21	Miyata	

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/C.A.B/	1	U.S. Office Action in corresponding U.S. Application No. 15/449,048, dated April 8, 2019.	
/C.A.B/	2	European Office Action in corresponding European Application No. 12775162.6-1204, dated May 21, 2019.	

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Name/Print	THOMAS LEE	Registration Number	66396

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L1	14	"20110188391" "20110092198"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/06/23 13:15
L2	5	("20110188391" "20110092198").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/06/23 13:15

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/C.A.B/	1	European Office Action in corresponding European Application No. 12759440.6-1204, dated May 28, 2019.	

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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. /C.A.B/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. 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	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS Remove

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

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

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	European Office Action in corresponding European Application No. 12759440.6-1204, dated May 28, 2019.	

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2019-05-30
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

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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.

Electronic Acknowledgement Receipt	
EFS ID:	36151386
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/Shelly Darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	30-MAY-2019
Filing Date:	03-MAR-2015
Time Stamp:	13:35:04
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS.pdf	1035014 d2041a70e0a489ff7c802c5311e9095628ee95ff	no	4

Warnings:

Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	EP_OA_28May2019.pdf	146366 9ad6f52883bb88a9b0de42ff94eca9096605 31d5	no	5

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

Information:	
Total Files Size (in bytes):	1181380

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/08a (03-15)
Approved for use through 07/31/2016. 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	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2181
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20110188391		2011-08-04	Sella et al.	
	2	20110092198		2011-04-21	Miyata	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

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

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

NON-PATENT LITERATURE DOCUMENTS Remove

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	U.S. Office Action in corresponding U.S. Application No. 15/449,048, dated April 8, 2019.	
	2	European Office Action in corresponding European Application No. 12775162.6-1204, dated May 21, 2019.	

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

CERTIFICATION STATEMENT

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OR

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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	/Thomas Lee/	Date (YYYY-MM-DD)	2019-05-23
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The 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.

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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.

Electronic Acknowledgement Receipt

EFS ID:	36094618
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/Shelly Darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	23-MAY-2019
Filing Date:	03-MAR-2015
Time Stamp:	14:04:37
Application Type:	U.S. National Stage under 35 USC 371

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	BEEL3001C2_Final_OA_08APR19.pdf	1142039 9a3a0263ab73d92d451a95fca7348a04150619ee	no	26

Warnings:

Information:					
2	Non Patent Literature	EP_OA_21MAY2019.pdf	125735 1c55f2c8a8dbbfe8d1fa05ac23ed6d133a2fa5c5	no	5
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS.pdf	1035140 2d0bc580f01e608bfd0638734cc366b814d16c40	no	4
Warnings:					
Information:					
			Total Files Size (in bytes):	2302914	

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 14/344,836	Filing Date 03/03/2015	☐ 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	04/19/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 22	Minus	** 20	= 2		x $100 =	200
	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	200

		(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".	/ANGELA S WHITE/
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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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REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. Interview with Examiner

Applicant is gratefully appreciative of the opportunity for Applicant's counsel, Mr. Thomas Lee, to discuss the pending application with Examiner Bartels on April 3, 2019.

During the interview, Applicant through counsel discussed the Supplemental Reply filed March 15, 2019 and why Applicant considered the claims inventive over the prior art. The Examiner, however, was of the opinion that the claims were unpatentable as being obvious over the prior art, but suggested that the claims be amended to clarify the data transmission. No agreement was reached as to the patentability of the claims now on file.

In view of the Examiner's suggestions, Applicant submits amendments to the claims and arguments for formal consideration.

2. Claim Amendments

Claim 82 is amended to clarify the previously presented features as discussed with the Examiner during the interview. Claim 82 is also amended to remove the term "generic." It is respectfully submitted that no new matter is added, since support for the amendment may be found, for example, at least on page 49, line 17 to page 53, line 7 of the specification as originally filed.

Claims 92 and 102 are amended to recite similar features as recited in amended claim 82.

Claims 83-85 are amended to recite similar features as recited in amended claim 82.

Claims 86-91 and 93-101 are left unchanged.

Claims 103 and 104 are added to provide additional scopes of coverage. It is respectfully submitted that no new matter is added, since support for the claims may be

found, for example, at least in claim 82 as previously presented and on page 30, lines 4-8 and page 49, line 17 to page 53, line 7 of the specification as originally filed.

3. Supplemental Amendment

Applicant respectfully requests entry of the further amendment to the claims to further clarify the previously presented features. Applicants submit that entry of such amendments is proper under 37 C.F.R. 1.111 since a Request for Continued Examination was filed February 21, 2019, thus reopening prosecution of the application.

Accordingly, it is respectfully requested that the amendments to the claims be entered.

4. Patentability of claims over U.S. publication 2007/0033289 (*Nuyttens*) in view of U.S. publication 2009/0247006 (*Thompson*)

Reconsideration of this rejection is respectfully requested on the basis that the cited prior art fails to establish obviousness with respect to amended claims 82, 92, and 102, from which the remaining claims depend.

Specifically, the Examiner's proposed modification of the method for displaying images on a display system of *Nuyttens* in accordance with the teachings of *Thompson* fails to at least result in "routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and routing the audio data from the wireless transceiver of the peripheral device to a base node over the communication network," as recited in amended claim 82.

As the Examiner appears to admit on page 5 of the Non-Final Office Action dated February 28, 2018, *Nuyttens* fails to disclose "coupling an external peripheral device physically to a port of the processing device, the processing device having a transceiver" and "using the peripheral device to connect the processing device to a communications network via the transceiver." The Examiner attempts to resolve the missing element in *Nuyttens* by modifying the method for displaying images on a display system of *Nuyttens* in accordance with certain teachings of *Thompson* to establish that such modification

would have been obvious to result in the claimed invention. *Thompson*, however, fails to cure the deficiencies of *Nuyttens* with respect to amended claim 82. Rather, *Thompson* discloses an access point (AP) 102 that provides an adaptable access port for a variety of network configurations (e.g. wired and/or wireless; computer, telephone, television, audio, etc) (para. [0049]). Access point 102 enables the use of a single cable or multiple cables to distribute a plurality of exclusive protocols using various transmission media types (para. [0049]). For example, node 1 comprises module 104 with cartridge 106 inserted therein having HDMI and coax connections to a DVD player/recorder 204 and a set top box while node 2 is directed towards a media player, possible in the living room and a cable MODEM which facilitates internet access for example (para. [0063]). In other words, *Thompson* only discloses a gateway connected to several types of access points, but fails to disclose "routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and routing the audio data from the wireless transceiver of the peripheral device to a base node over the communication network."

That is, Applicant submits that the skilled person would have appreciated that the features recited in the claims are at least directed to, in one embodiment of the invention, coupling an external peripheral device physically to a port of the processing device, where the peripheral device comprises a wireless transceiver and a connector, the connector configured to couple to the port of the processing device, using the peripheral device to connect the processing device to a communications network via the wireless transceiver, and routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and routing the audio data from the wireless transceiver of the peripheral device to a base node over the communication network. On the other hand, the skilled person would have understood that the access points 102 of *Thompson* are connected to the gateway 200 or node 0, where the gateway 200 or node 0 has network cable connection means at cable 113 or transport cables 112 (*see* para. [0062]). The gateway 200 provides medium bridging functions for fixed medium networks and in general the packet management activities between all access

points on the network (para. [0064]). In other words, the skilled person would have understood that the invention of *Thompson* routes data in a different way than the present invention, e.g., the present invention routes audio data from the processing device to the peripheral device and the peripheral device transfers the audio data, e.g., packetized, via the wireless transceiver to a base node over the communications network.

Therefore, since neither *Nuyttens* nor *Thompson* discloses or suggests "routing audio data from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and routing the audio data from the wireless transceiver of the peripheral device to a base node over the communication network," the proposed modification of the method for displaying images on a display system of *Nuyttens* in accordance with the teachings of *Thompson* fails to result in the features now recited in amended claim 82. Rather, even assuming, but not admitting that the prior art teach certain features recited in the claims, "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 127 S. Ct. 1727, 1741 (2007).

In this case, Applicant submits that the skilled person would not have observed the necessary evidence that would have prompted the skilled person to have combined the teachings of *Nuyttens* and *Thompson* in the same way to result in the same combination of features as recited in the new invention of amended claim 82. Instead, the skilled person would have appreciated that the teachings of *Nuyttens* and *Thompson* are directed to different methods and structures for overcoming their respective prior art deficiencies. For example, *Nuyttens* is at least directed to improvements in multi-head display controllers and multi-head displays, whereas *Thompson* is directed to providing a simple and flexible

means for tapping various types of multimedia analog or digital transmission carried on any installed cable without requiring a change in the cable type, connector or enclosure. In so doing, Applicant submits that the skilled person would not have observed any evidence in the prior art references that would have prompted the skilled person to have combined the teachings of *Nuyttens* and *Thompson* in the same way to result in the same combination of features as recited in amended claim 82, at least because of the different structures and methods taught in the prior art references.

Since the proposed modification of the invention of *Nuyttens* in accordance with the teachings of *Thompson* fails to result in each and every feature recited in amended claim 82, obviousness cannot be established.

Claims 92 and 102 are allowable over the cited prior art at least for reciting similar features as recited in amended claim 82, as well as their individually recited features.

The remaining claims are allowable over the cited prior art at least based on their dependency on claims 82, 92, and 102, as well as their individually recited features.

Accordingly, withdrawal of this rejection is respectfully requested.

4. Conclusion

As a result of the amendments to the claims and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that the currently presented claims be approved and the application passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500
Facsimile: (703) 683-1080

Date: April 19, 2019

Respectfully submitted,

/Thomas Lee/

THOMAS LEE
Attorney for Applicant
Registration No. 66,396

Electronic Patent Application Fee Transmittal

Application Number:	14344836
Filing Date:	03-Mar-2015
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Filer:	Thomas Lee/Shelly Darrenkamp
Attorney Docket Number:	BEEL3004/BEU/TL

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1615	2	100	200
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt	
EFS ID:	35773438
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/Shelly Darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	19-APR-2019
Filing Date:	03-MAR-2015
Time Stamp:	10:11:45
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

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1		BEEL3004_supp_amnd_19APR19.pdf	66937 cf151b1d92489bb892c6777aa5f3adbc6c46b7a5	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Supplemental Response or Supplemental Amendment	1	2
	Claims	3	8
	Applicant Arguments/Remarks Made in an Amendment	9	14

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30476 78206e2be1eb3035d8fa556a7cdc9e945fd13e00	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	97413		

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

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New International Application Filed with the USPTO as a Receiving Office

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Application No.:	14/344,836	**Confirm. No.:**	1046
Filing Date:	March 3, 2015	**Art Unit:**	2184
First Inventor:	Koen Simon Herman BEEL	**Customer No.:**	23364
Attorney No.:	BEEL3004/BEU/TL	**Examiner:**	Christopher A. Bartels
For:	**ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS**		

SUPPLEMENTAL REPLY UNDER 37 C.F.R. § 1.111(a)(2)

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

Sir:

INTRODUCTORY COMMENTS

This reply supplements the reply filed on March 15, 2019, in view of the interview with the Examiner on April 3, 2019. A fee for two additional claims accompanies this reply.

Further in view of the following amendments and remarks, reconsideration of the application is respectfully requested.

AMENDMENT

Please amend the pending application in accordance with the following particulars.

In the Claims

The claims are amended as shown on the following pages under the heading LIST OF CURRENT CLAIMS. The list shows the status of all claims presently in the application and is intended to supersede all prior versions of the claims in the application. Any cancellation of claims is made without prejudice or disclaimer.

LIST OF CURRENT CLAIMS

1-81. (Cancelled)

82. (Currently Amended) A method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed ~~generic~~ drivers providing a ~~generic~~ communications protocol for communication between the processing device and a class of peripheral devices, the method comprising:

a) coupling an external peripheral device physically to a port of the processing device,

wherein the peripheral device ~~having~~ comprises a wireless transceiver and a connector, said connector configured to couple to the port of the processing device;

b) setting up, by means of a first pre-installed ~~generic~~ audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed ~~generic~~ driver of the operating system, a means for data communication between the peripheral device and the processing device;

c) using the peripheral device to connect the processing device to a communications network via the wireless transceiver;

d) routing audio data ~~between~~ from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and routing the audio data from the wireless transceiver of the peripheral device to a base node over the ~~communication~~ communications network ~~via the means for audio communication and the transceiver to a base node~~, wherein the first pre-installed ~~generic~~ audio driver is used for transferring the audio data between the processing device and the peripheral device.

83. (Currently Amended) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed ~~generic~~ driver is a human interface device driver.

84. (Currently Amended) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed ~~generic~~ driver is a mass storage device driver.

85. (Currently Amended) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a composite device and wherein pre-installed ~~generic~~ drivers drive different device interfaces independently.

86. (Previously Presented) The method of claim 82, wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

87. (Previously Presented) The method of claim 86 wherein the client application is a portable application.

88. (Previously Presented) The method of claim 82 wherein the peripheral device is adapted to analyze an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

89. (Previously Presented) The method of claim 88 wherein if audio is received, the peripheral device will initiate an additional TCP/IP socket connection to the base unit through the communications network.

90. (Previously Presented) The method of claim 82 further comprising time-stamping synchronously the audio with the data stream.

91. (Previously Presented) The method of claim 90 further comprising encoding, optionally encrypting the audio data.

92. (Currently Amended) A system for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a class of peripheral devices, the system comprising:

a) means for coupling an external peripheral device physically to a port of the processing device, the peripheral device ~~having~~ comprising a wireless transceiver and a connector, said connector configured to couple to the port of the processing device;

b) means for setting up, by means of a first pre-installed ~~generic~~ audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device;

c) wherein the peripheral device is configured in a way to connect the processing device to a communications network via the transceiver;

d) means for routing audio data ~~between~~ from the processing device to the wireless transceiver via the connector of the peripheral device and the means for audio communication and means for routing the audio data from the wireless transceiver of the peripheral device to a base node over the ~~communication~~ communications network ~~via the means for audio communication and the transceiver to a base node~~, wherein the first pre-installed ~~generic~~ audio driver is used for transferring the audio data between the processing device and the peripheral device.

93. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

94. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

95. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

96. (Previously Presented) The system of claim 92 wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

97. (Previously Presented) The system of claim 96 wherein the client application is a portable application.

98. (Previously Presented) The system of claim 92 wherein the peripheral device is adapted to analyse an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

99. (Previously Presented) The system of claim 98 wherein if audio is received, the peripheral device will initiate an additional connection to the base unit through the communications network.

100. (Previously Presented) The system of claim 92 further comprising time-stamping synchronously the audio stream with the data stream.

101. (Previously Presented) The system of claim 100 further comprising means for encoding, optionally encrypting the audio data.

102. (Currently Amended) A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a class of peripheral devices, the peripheral device comprising a connection configured to be physically coupled to a port of the processing device and a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for audio communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via a transceiver of the peripheral device;

a third software code portion for routing audio data ~~between~~ from the processing device to the peripheral device via the connection and the means for audio communication and for routing the audio data from the peripheral device to the base node over the ~~communication~~ communications network ~~via the means for audio communication and the transceiver to a base node~~, wherein the first pre-installed generic driver is used for transferring the audio data between the processing device and the peripheral device.

103. (New) The method of claim 82, wherein the audio driver is a generic audio driver.

104. (New) The method of claim 82, wherein the audio data is routed from the processing device to the peripheral device via the connector and the means for audio communication

when an actuator on the peripheral device is actuated to generate a signal for the processing device to trigger transfer of the audio data.

PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2181
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Chinese Office Action in corresponding Chinese Application No. 201280074077.2, dated March 5, 2019.	X

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2019-04-11
Name/Print	THOMAS LEE	Registration Number	66396

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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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.

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Electronic Acknowledgement Receipt

EFS ID:	35694776
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/Shelly Darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	11-APR-2019
Filing Date:	03-MAR-2015
Time Stamp:	13:26:04
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS.pdf	1035009 19fa5577e63486c817d2d61d6b35b794d782155a	no	4

Warnings:

Information:					
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2	Non Patent Literature	CN_OA_English_translation05 MAR19.pdf	2129383 9065d187a612727dcbd2163f61e824e4e3657b00	no	13
Warnings:					
Information:					
			Total Files Size (in bytes):	3164392	

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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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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EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	European Office Action in corresponding European Application No. 16170760.9-1216, dated April 2, 2019.	

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2019-04-04
Name/Print	THOMAS LEE	Registration Number	66396

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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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)).

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Electronic Acknowledgement Receipt

EFS ID:	35623725
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/Shelly Darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	04-APR-2019
Filing Date:	03-MAR-2015
Time Stamp:	09:59:01
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS.pdf	1035066 6167edc099a45ec126a3bbf8f4cc0b4020676659	no	4

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2	Non Patent Literature	EP_OA1_2Apr2019.pdf	198872 6b6c624b74c6e65439d11c9fd19a273dbe0f952e	no	6

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Information:		
	Total Files Size (in bytes):	1233938

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

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

New International Application Filed with the USPTO as a Receiving Office

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/344,836	Filing Date 03/03/2015	☐ 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	03/15/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 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".	/ELMIRA Y HALL/
*** 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.	

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REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. Claim Amendments

Claim 82 is amended to remove the recitation "wherein the peripheral device comprises an audio output adapter" since such feature could be confused with other features as disclosed in the specification.

Claims 92 and 102 are amended to recite similar features as recited in amended claim 82.

Claim 102 is also amended to recite "wherein the first pre-installed generic ~~audio~~ driver is used for transferring the audio data between the processing device and the peripheral device," to provide consistent claim language in the claim.

Claims 83-91 and 93-101 are left unchanged.

2. Supplemental Amendment

Applicant respectfully requests entry of the further amendment to the claims to further clarify the previously presented features. Applicants submit that entry of such amendments is proper under 37 C.F.R. 1.111 since a Request for Continued Examination was filed February 21, 2019, thus reopening prosecution of the application.

Accordingly, it is respectfully requested that the amendments to the claims be entered.

3. Patentability of claims over U.S. publication 2007/0033289 (*Nuyttens*) in view of U.S. publication 2009/0247006 (*Thompson*)

Reconsideration of this rejection is respectfully requested on the basis that the cited prior art fails to establish obviousness with respect to amended claims 82, 92, and 102, from which the remaining claims depend.

Specifically, the Examiner's proposed modification of the method for displaying images on a display system of *Nuyttens* in accordance with the teachings of *Thompson* fails to at least result in "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device," as recited in amended claim 82.

Applicant submits that the skilled person would have understood that the features recited in the claims are at least directed to, in one embodiment of the invention, using an audio interface without the need of special driver installation (page 49, line 15). For example, the peripheral device can present itself as an audio out device to the processing device such as a laptop, PDA, smartphone, table, PC, etc. it is connected to, where as soon as the peripheral device is plugged in, the user of the processing device will see an additional audio out interface displayed on the processing device display to which it can stream the audio (page 49, lines 18-22). If audio is received, the peripheral device preferably will initiate an additional TCP/IP socket connection to the base unit and the communications network (page 49, lines 27-29). The base unit is adapted to receive the audio stream packets for instance encoded in RTP and controlled with RTCP over a TCP/IP socket (page 50, lines 3-5). It will preferably then decrypt and decode the contained encoded audio stream if required, and deliver the resulting signal to the physical audio device in the base unit (page 50, lines 5-6).

As the Examiner appears to admit on page 5 of the Non-Final Office Action dated February 28, 2018, *Nuyttens* fails to disclose "coupling an external peripheral device physically to a port of the processing device, the processing device having a transceiver" and "using the peripheral device to connect the processing device to a communications network via the transceiver." The Examiner attempts to resolve the missing element in *Nuyttens* by modifying the method for displaying images on a display system of *Nuyttens* in accordance with certain teachings of *Thompson* to establish that such modification

would have been obvious to result in the claimed invention. *Thompson*, however, fails to cure the deficiencies of *Nuyttens* with respect to amended claim 82. Rather, *Thompson* discloses an access point (AP) 102 that provides an adaptable access port for a variety of network configurations (e.g. wired and/or wireless; computer, telephone, television, audio, etc) (para. [0049]). Access point 102 enables the use of a single cable or multiple cables to distribute a plurality of exclusive protocols using various transmission media types (para. [0049]). For example, node 1 comprises module 104 with cartridge 106 inserted therein having HDMI and coax connections to a DVD player/recorder 204 and a set top box while node 2 is directed towards a media player, possible in the living room and a cable MODEM which facilitates internet access for example (para. [0063]). In other words, *Thompson* only discloses a gateway connected to several types of access points, but fails to disclose "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device."

That is, Applicant submits that the skilled person would have appreciated that the features recited in the claims are at least directed to, in one embodiment of the invention, coupling an external peripheral device physically to a port of the processing device, using the peripheral device to connect the processing device to a communications network via the transceiver, and routing audio data between the processing device and the communications network via the means for audio communication and the transceiver to the base node, where the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device. On the other hand, the skilled person would have understood that the access points 102 of *Thompson* are connected to the gateway 200 or node 0, where the gateway 200 or node 0 has network cable connection means at cable 113 or transport cables 112 (*see* para. [0062]). The gateway 200 provides medium bridging functions for fixed medium networks and in general the packet management activities between all access points on the network (para. [0064]). In other words, the skilled person would have understood that the invention of

Thompson routes data in a different way than the present invention, e.g., the present invention routes audio data from the processing device to the peripheral device and the peripheral device transfers the audio data, e.g., packetized, via the transceiver to the communications network to a base node, e.g., for presenting at a base node during a meeting.

Therefore, since neither *Nuyttens* nor *Thompson* discloses or suggests "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device," the proposed modification of the method for displaying images on a display system of *Nuyttens* in accordance with the teachings of *Thompson* fails to result in the features now recited in amended claim 82. Rather, even assuming, but not admitting that the prior art teach certain features recited in the claims, "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 127 S. Ct. 1727, 1741 (2007).

In this case, Applicant submits that the skilled person would not have observed the necessary evidence that would have prompted the skilled person to have combined the teachings of *Nuyttens* and *Thompson* in the same way to result in the same combination of features as recited in the new invention of amended claim 82. Instead, the skilled person would have appreciated that the teachings of *Nuyttens* and *Thompson* are directed to different methods and structures for overcoming their respective prior art deficiencies. For example, *Nuyttens* is at least directed to improvements in multi-head display controllers and multi-head displays, whereas *Thompson* is directed to providing a simple and flexible

means for tapping various types of multimedia analog or digital transmission carried on any installed cable without requiring a change in the cable type, connector or enclosure. In so doing, Applicant submits that the skilled person would not have observed any evidence in the prior art references that would have prompted the skilled person to have combined the teachings of *Nuyttens* and *Thompson* in the same way to result in the same combination of features as recited in amended claim 82, at least because of the different structures and methods taught in the prior art references.

Since the proposed modification of the invention of *Nuyttens* in accordance with the teachings of *Thompson* fails to result in each and every feature recited in amended claim 82, obviousness cannot be established.

Claims 92 and 102 are allowable over the cited prior art at least for reciting similar features as recited in amended claim 82, as well as their individually recited features.

The remaining claims are allowable over the cited prior art at least based on their dependency on claims 82, 92, and 102, as well as their individually recited features.

Accordingly, withdrawal of this rejection is respectfully requested.

4. Conclusion

As a result of the amendments to the claims and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that the currently presented claims be approved and the application passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500
Facsimile: (703) 683-1080

Date: March 15, 2019

Respectfully submitted,

/Thomas Lee/

THOMAS LEE
Attorney for Applicant
Registration No. 66,396

Electronic Acknowledgement Receipt

EFS ID:	35441276
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	15-MAR-2019
Filing Date:	03-MAR-2015
Time Stamp:	16:54:42
Application Type:	U.S. National Stage under 35 USC 371

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		BEEL3004_supp_amnd_15MAR19.pdf	187100 c6bfbaeab06a05e4a52deaf1a67046a235c67b9c	yes	13

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Supplemental Response or Supplemental Amendment	1	2
	Claims	3	7
	Applicant Arguments/Remarks Made in an Amendment	8	13
Warnings:			
Information:			
	Total Files Size (in bytes):	187100	

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:

Application No.:	14/344,836	**Confirm. No.:**	1046
Filing Date:	March 3, 2015	**Art Unit:**	2184
First Inventor:	Koen Simon Herman BEEL	**Customer No.:**	23364
Attorney No.:	BEEL3004/BEU/TL	**Examiner:**	Christopher A. Bartels
For:	**ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS**		

SUPPLEMENTAL REPLY UNDER 37 C.F.R. § 1.111(a)(2)

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

Sir:

INTRODUCTORY COMMENTS

This reply supplements the reply filed on October 12, 2018 and Allowance dated January 18, 2019.

Further in view of the following amendments and remarks, reconsideration of the application is respectfully requested.

AMENDMENT

Please amend the pending application in accordance with the following particulars.

In the Claims

The claims are amended as shown on the following pages under the heading LIST OF CURRENT CLAIMS. The list shows the status of all claims presently in the application and is intended to supersede all prior versions of the claims in the application. Any cancellation of claims is made without prejudice or disclaimer.

LIST OF CURRENT CLAIMS

1-81. (Cancelled)

82. (Currently Amended) A method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a class of peripheral devices, the method comprising:

a) coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver and a connector configured to couple to the port of the processing device;

b) setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device;

c) using the peripheral device to connect the processing device to a communications network via the transceiver;

d) routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device~~,~~

~~wherein the peripheral device comprises an audio output adapter~~.

83. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

84. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

85. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

86. (Previously Presented) The method of claim 82, wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

87. (Previously Presented) The method of claim 86 wherein the client application is a portable application.

88. (Previously Presented) The method of claim 82 wherein the peripheral device is adapted to analyze an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

89. (Previously Presented) The method of claim 88 wherein if audio is received, the peripheral device will initiate an additional TCP/IP socket connection to the base unit through the communications network.

90. (Previously Presented) The method of claim 82 further comprising time-stamping synchronously the audio with the data stream.

91. (Previously Presented) The method of claim 90 further comprising encoding, optionally encrypting the audio data.

92. (Currently Amended) A system for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a class of peripheral devices, the system comprising:

a) means for coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver and a connector configured to couple to the port of the processing device;

b) means for setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device;

c) wherein the peripheral device is configured in a way to connect the processing device to a communications network via the transceiver;

d) means for routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device~~,~~

~~wherein the peripheral device comprises an audio output adapter~~.

93. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

94. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

95. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

96. (Previously Presented) The system of claim 92 wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

97. (Previously Presented) The system of claim 96 wherein the client application is a portable application.

98. (Previously Presented) The system of claim 92 wherein the peripheral device is adapted to analyse an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

99. (Previously Presented) The system of claim 98 wherein if audio is received, the peripheral device will initiate an additional connection to the base unit through the communications network.

100. (Previously Presented) The system of claim 92 further comprising time-stamping synchronously the audio stream with the data stream.

101. (Previously Presented) The system of claim 100 further comprising means for encoding, optionally encrypting the audio data.

102. (Currently Amended) A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a class of peripheral devices, the

peripheral device comprising a connection configured to be physically coupled to a port of the processing device and a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for audio communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via a transceiver of the peripheral device;

a third software code portion for routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic ~~audio~~ driver is used for transferring the audio data between the processing device and the peripheral device~~,~~

~~wherein the peripheral device comprises an audio output adapter~~.

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Mar 15 2019

This paper requesting to schedule and/or conduct an interview is appropriate because:

I have previously submitted an authorization for internet communications in a patent application. See form SB/0439.

Name(s):
Thomas Lee

S-signature:
/Thomas Lee/

Registration Number:
66396

U.S. Application Number:
14344836

Confirmation Number:
1046

E-mail Address:
tlee@baconthomas.com

Phone Number:
+1 5713177026

Proposed Time of Interview:
3-28-2019 1:30 PM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

Topic for Discussion:
103 rejections

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. 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	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2181
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Non-Final Office Action in corresponding U.S. Reexamination No. 90/014,088, dated September 25, 2018.	
	2	Final Office Action in corresponding U.S. Reexamination No. 90/014,087, dated January 22, 2019.	

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2019-02-21
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14344836
Filing Date:	03-Mar-2015
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Filer:	Thomas Lee/Shelly Darrenkamp
Attorney Docket Number:	BEEL3004/BEU/TL

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

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($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**1900**

Electronic Acknowledgement Receipt	
EFS ID:	35212852
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/Shelly Darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	21-FEB-2019
Filing Date:	03-MAR-2015
Time Stamp:	14:41:50
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1900
RAM confirmation Number	022219INTEFSW14422001
Deposit Account	
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	BEEL3002CIPREX_OA_25SEPT18.pdf	1680052 0deb4f939e73cf6d91f3d6ef54d905b9669c5696	no	44
Warnings:					
Information:					
2	Non Patent Literature	BEEL3001REX_FOA_22JAN19.pdf	832328 81f96d5aa403b5708982d88acd836f77b34d50d9	no	21
Warnings:					
Information:					
3	Request for Continued Examination (RCE)	BEEL3004_RCE.pdf	1349889 a3c192c81f8f312841c7d73d0230fab64bde57fd	no	3
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS.pdf	1035053 009e14b2596d2ace5a24a018445ca3e40a46e6d3	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
5	Fee Worksheet (SB06)	fee-info.pdf	30661 01876baf43166a6088a3e5282a75ab87b40c9c24	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	4927983		

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New Applications Under 35 U.S.C. 111

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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/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	14/344,836	Filing Date	2015-03-03	Docket Number (if applicable)	BEEL3004/BEU/TL	Art Unit	2181
First Named Inventor	Koen Simon Herman BEEL			Examiner Name	Christopher A. Bartels		

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, to any international application that does not comply with the requirements of 35 U.S.C. 371, 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 020200

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. 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	/Thomas Lee/	Date (YYYY-MM-DD)	2019-02-21
Name	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/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 14/344,836	Filing Date 03/03/2015	☐ 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 $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	02/21/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 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".	/LAMONT N MCLAUCHLIN/
*** 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.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. 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	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Scott C. Sun
	Attorney Docket Number	BEEL3004/BEU/TL

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

U.S.PATENT APPLICATION PUBLICATIONS							Remove
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	
	1						
If you wish to add additional U.S. Published Application citation information please click the Add button.							Add

FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							
If you wish to add additional Foreign Patent Document citation information please click the Add button								Add

NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Scott C. Sun
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Chinese Office Action in related Chinese Application No. 201280001542.X, dated January 2, 2019.	X

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Scott C. Sun
	Attorney Docket Number	BEEL3004/BEU/TL

CERTIFICATION STATEMENT

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

X 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.

X 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	/Thomas Lee/	Date (YYYY-MM-DD)	2019-02-12
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

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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.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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Electronic Patent Application Fee Transmittal

Application Number:	14344836
Filing Date:	03-Mar-2015
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Filer:	Thomas Lee/Shelly Darrenkamp
Attorney Docket Number:	BEEL3004/BEU/TL

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

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:	35114806
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/Shelly Darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	12-FEB-2019
Filing Date:	03-MAR-2015
Time Stamp:	10:01:37
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$240
RAM confirmation Number	021219INTEFSW10025000
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS.pdf	1035003 d06ebf52595f77692a58b145c60db529cb04383e	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	CN_OA_02JAN19.pdf	1915779 d26fcec34dbf5e642924dbf32beb2dcb6de776c1	no	11
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30461 b4aac68affa57ad6daeef45f71153a05d9b315ed	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2981243		

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

23364 7590 01/18/2019

BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314-1176

EXAMINER
BARTELS, CHRISTOPHER A.

ART UNIT	PAPER NUMBER
2184	

DATE MAILED: 01/18/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/344,836	03/03/2015	Koen Simon Herman Beel	BEEL3004/BEU/TL	1046

TITLE OF INVENTION: ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS

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	04/18/2019

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

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

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

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

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

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

23364 7590 01/18/2019
BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314-1176

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.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/344,836	03/03/2015	Koen Simon Herman Beel	BEEL3004/BEU/TL	1046

TITLE OF INVENTION: ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS

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	04/18/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
BARTELS, CHRISTOPHER A.	2184	710-010000

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/344,836	03/03/2015	Koen Simon Herman Beel	BEEL3004/BEU/TL	1046

23364 7590 01/18/2019

BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314-1176

EXAMINER	
BARTELS, CHRISTOPHER A.	
ART UNIT	**PAPER NUMBER**
2184	

DATE MAILED: 01/18/2019

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. 14/344,836	Applicant(s) Beel et al.	
	Examiner CHRISTOPHER A BARTELS	Art Unit 2184	AIA 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 07/24/2018.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

3. ☑ The allowed claim(s) is/are 82-102 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

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

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

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

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

Attachment(s)

1. ☑ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date See Continuation Sheet.
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 _____.

/C.A.B/ Examiner, Art Unit 2184	/HENRY TSAI/ Supervisory Patent Examiner, Art Unit 2184

Continuation of Attachment(s) 2. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 07/24/2018, 09/18/2018, 10/30/2018, 11/16/2018

Notice of Pre-AIA or AIA Status

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

DETAILED ACTION

This office action is in response to Terminal Disclosure filed on July 24th, 2018. Claims 82-102 are subject to allowance.

Information Disclosure Statement

1. The information disclosure statement(s) (IDS) submitted on 07/24/2018, 09/18/2018, 10/30/2018, and 11/16/2018. These submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Reasons for allowance

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

In the Remarks filed 07/24/2018, amended claim 82, last 5 lines n now recites "routing audio data between the processing device and communication… to a base node;… Wherein the peripheral device comprises an audio output adapter." ***in combination with the corresponding claimed structure is not taught by the cited prior art on record.*** Independent claim 102, last line recite limitations similar to claim 1, respectively. Therefore, claims 82-102 are allowed.

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references indicate

the current state of the art: US 20090064302 A1, US 20100066806 A1,

and WO-2010105335-A1.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER A. BARTELS whose telephone number is (571)270-3182. The examiner can normally be reached on Monday-Friday 9:00a-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Henry Tsai can be reached on 571-272-4176. 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.

/C.A.B./
Examiner
Art Unit 2184

/HENRY TSAI/
Supervisory Patent Examiner, Art Unit 2184

Notice of References Cited	Application/Control No. 14/344,836	Applicant(s)/Patent Under Reexamination Beel et al.	
	Examiner CHRISTOPHER A BARTELS	Art Unit 2184	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-20090064302-A1	03-2009	Colella; Brian A.	G06Q20/3674	726/9
*	B	US-20100066806-A1	03-2010	Lyu; Szu-Hao	H04L12/1827	348/14.08
	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	WO-2010105335-A1	09-2010	WO	KEENAN VAUGHN E	G06F9/4413
	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
	14/344,836	Beel et al.
	Examiner	Art Unit
	CHRISTOPHER A BARTELS	2184

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner
(G06F13/102, G06F3/16, G06F9/44505, H04L12/1813, H04L65/(4023 AND 4038) text search in East	11/26/2018	C.A.B.
H04M3/567 text search in East	11/26/2018	C.A.B.

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
inventor search performed in East (USPAT USOCR USPGPUB)	04/03/2017, 10/16/2017	C.A.B.
Text search performed in East (ALL DATABASES)	04/03/2017, 10/16/2017, 02/2018, 11/2018	C.A.B.

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	interference search performed in East (see handout)	11/26/2018	C.A.B.

	/C.B./ Examiner.Art Unit 2184

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/344,836	Beel et al.
	Examiner	**Art Unit**
	CHRISTOPHER A BARTELS	2184

CPC							
Symbol						**Type**	**Version**
G06F	/	13	/	102		F	2013-01-01
H04L	/	12	/	1813		I	2013-01-01
H04L	/	65	/	4038		I	2013-01-01
H04L	/	65	/	4023		I	2013-01-01
H04M	/	3	/	567		I	2013-01-01
G06F	/	3	/	16		I	2013-01-01
G06F	/	9	/	44505		I	2013-01-01

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

/CHRISTOPHER A BARTELS/ Examiner, Art Unit 2184	26 November 2018	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/HENRY TSAI/ SPE, Art Unit 2184	07 January 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20181126

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/344,836	Beel et al.
	Examiner	Art Unit
	CHRISTOPHER A BARTELS	2184

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G06F	/	13	/	10
H04L	/	12	/	18
H04L	/	29	/	06
H04L	/	29	/	06
G06F	/	3	/	16
G06F	/	9	/	445
H04M	/	3	/	56

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

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

/CHRISTOPHER A BARTELS/ Examiner, Art Unit 2184	26 November 2018	Total Claims Allowed:	
(Assistant Examiner)	(Date)	21	
/HENRY TSAI/ SPE, Art Unit 2184	07 January 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20181126

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	14/344,836	Beel et al.
	Examiner	**Art Unit**
	CHRISTOPHER A BARTELS	2184

☐ 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	82	10	91	19	100										
2	83	11	92	20	101										
3	84	12	93	21	102										
4	85	13	94												
5	86	14	95												
6	87	15	96												
7	88	16	97												
8	89	17	98												
9	90	18	99												

/CHRISTOPHER A BARTELS/ Examiner, Art Unit 2184	26 November 2018	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/HENRY TSAI/ SPE, Art Unit 2184	07 January 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20181126

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	17	("2010105335" "20100302454")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 09:48
L2	8	("2010105335" "20100302454").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 09:48
L3	0	"14725401".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 11:21
L4	2	"20150263905"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 11:21
L5	6	("20090064302" "20100066806").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 11:22
L6	30	("20100064063" "2013037979" "2008165007" "2000242257")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 11:39
L9	440	"l8" and (peripheral endpoint module speaker webcam web adj camera webcamera multimedia multi adj media) with (bus interface network select$5 switch$3).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 12:29
L10	27066	l7 and (peripheral endpoint module speaker webcam web adj camera webcamera multimedia multi adj media) with (bus interface network select$5 switch$3).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 12:30
L11	74	l10 and (mass adj storage with (driver function$5) screen near2	US-PGPUB; USPAT; USOCR;	OR	ON	2018/11/26 12:38

		scrap$4).clm.	FPRS; EPO; JPO; DERWENT; IBM_TDB			
L12	12	l10 and (mass adj storage with (driver function$5) and screen near2 scrap$4).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 12:38
S1	2	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/03/10 20:50
S2	204	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:30
S3	1	S2 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:30
S4	12070	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:33
S5	95	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/04/03 08:34
S7	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:43
S8	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:43
S9	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:47
S10	2	"20020174254"	US-PGPUB; USPAT; USOCR;	OR	ON	2017/04/03 08:57

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S11	1	(S7 S8 S9 S10) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 09:05
S12	95	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/04/03 10:57
S13	77	S12 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 10:57
S14	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 10:59
S15	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 10:59
S16	8	S12 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/04/03 11:03
S17	10	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S18	11	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S19	10	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S20	15	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S21	3	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S22	224	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55

S23	1	S22 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S24	12761	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S25	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/13 22:55
S26	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S27	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S28	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S29	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S30	1	(S26 S27 S28 S29) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S31	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/13 22:55
S32	79	S31 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55

S33	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S34	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S35	8	S31 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/13 22:55
S36	11	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S37	12	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S38	11	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S39	16	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S40	3	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S41	224	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S42	1	S41 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S43	12797	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S44	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S45	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2017/10/16 14:06

			DERWENT; IBM_TDB			
S46	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S47	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S48	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S49	1	(S45 S46 S47 S48) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S50	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S51	79	S50 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S52	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S53	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S54	8	S50 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S55	11	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S56	12	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06

S57	11	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S58	16	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S59	3	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S60	224	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S61	1	S60 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S62	12797	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S63	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S64	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S65	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S66	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S67	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S68	1	(S64 S65 S66 S67) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR;	OR	ON	2017/10/16 14:06

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S69	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S70	79	S69 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S71	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S72	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S73	8	S69 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S74	11	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S75	12	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S76	11	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S77	16	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S78	3	"14344836"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/01/16 08:58
S79	3	(US-20070033289-$ or US-20130060662-$).did. or (US-8346753-$).did.	US-PGPUB; USPAT	OR	OFF	2018/02/16 19:47
S80	1	S79 and (driver)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:47
S81	1096	(audio speaker) with (driver module) and (driver module) with	US-PGPUB; USPAT; USOCR;	OR	OFF	2018/02/16 19:49

		(generic and specific)	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S82	636	S81 and (adhoc ad adj hoc network$3 lan vpn wan) and (port peripheral)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:50
S83	522	S82 and (window microsoft operat$3 near2 system)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:50
S84	544	S82 and (window microsoft operat$3 near2 system kernel linux unix mac os adj x)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:51
S85	22	S84 not S83	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:51
S86	6	"20070033289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/20 11:18
S87	3	"14344836"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/07/18 08:52
S88	7	(US-20070033289-$ or US-20130060662-$ or US-20040125777-$ or US-20070065078-$ or US-20090247006-$ or US-20130054348-$).did. or (US-8346753-$).did.	US-PGPUB; USPAT	OR	ON	2018/07/23 15:17
S89	5	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S90	255	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S91	2	S90 and screen near2 scrap$4	US-PGPUB;	OR	ON	2018/11/26

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			07:58
S92	14620	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S93	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S94	15	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S95	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S96	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S97	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S98	1	(S94 S95 S96 S97) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S99	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S100	92	S99 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S101	2	"20020174254"	US-PGPUB;	OR	ON	2018/11/26

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			07:58
S102	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S103	12	S99 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S104	14	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S105	15	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S106	14	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S107	19	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S108	5	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S109	255	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S110	2	S109 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S111	14620	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S112	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S113	15	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2018/11/26 07:58

			IBM_TDB			
S114	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S115	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S116	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S117	1	(S113 S114 S115 S116) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S118	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S119	92	S118 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S120	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S121	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S122	12	S118 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S123	14	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S124	15	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S125	14	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB;	OR	ON	2018/11/26

			USPAT; USOCR			07:58
S126	19	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S127	5	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S128	255	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S129	2	S128 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S130	14620	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S131	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S132	15	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S133	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S134	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S135	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S136	1	(S132 S133 S134 S135) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2018/11/26 07:58

			JPO; DERWENT; IBM_TDB			
S137	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S138	92	S137 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S139	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S140	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S141	12	S137 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S142	14	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S143	15	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S144	14	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S145	19	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S146	5	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S147	255	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S148	2	S147 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58

S149	14620	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S150	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S151	15	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S152	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S153	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S154	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S155	1	(S151 S152 S153 S154) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S156	111	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S157	92	S156 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S158	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58

S159	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S160	12	S156 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/11/26 07:58
S161	14	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S162	15	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S163	14	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S164	19	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/11/26 07:58
S165	3	"14344836"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S166	3	(US-20070033289-$ or US-20130060662-$).did. or (US-8346753-$).did.	US-PGPUB; USPAT	OR	OFF	2018/11/26 07:58
S167	1	S166 and (driver)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/26 07:58
S168	1203	(audio speaker) with (driver module) and (driver module) with (generic and specific)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/26 07:58
S169	683	S168 and (adhoc ad adj hoc network$3 lan vpn wan) and (port peripheral)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/26 07:58
S170	566	S169 and (window microsoft operat$3 near2 system)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/26 07:58
S171	588	S169 and (window microsoft operat$3 near2 system kernel linux unix mac os adj x)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/26 07:58

S172	22	S171 not S170	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/26 07:58
S173	6	"20070033289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/11/26 07:58
S174	3	"14344836"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 07:58
S175	7	(US-20070033289-$ or US-20130060662-$ or US-20040125777-$ or US-20070065078-$ or US-20090247006-$ or US-20130054348-$).did. or (US-8346753-$).did.	US-PGPUB; USPAT	OR	ON	2018/11/26 07:58
S176	3	"20110180380"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 08:01
S177	7	"20100064063"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 08:06
S178	20	"8756348"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 08:16
S179	2	"8756348".PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 08:16
S180	34	"0189156" "2010105335" "20100302454"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 08:21
S181	18	"0189156"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/26 08:21

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L8	337912	(driver software process method) with (generic install$5 pre adj install$5 windows linux osx apple operat$3 near2 system).clm.	US-PGPUB; USPAT	OR	ON	2018/11/26 12:27
L13	173044	(G06F$ H04L$ H04M$).CPC. and (peripheral endpoint module speaker webcam web adj camera webcamera multimedia multi adj media) with (bus interface network select$5 switch$3).clm.	US-PGPUB; USPAT	OR	ON	2018/11/26 12:41
L14	17887	L13 AND (driver software process method) with (generic install$5 pre adj install$5 windows linux osx apple operat$3 near2 system).clm.	US-PGPUB; USPAT	OR	ON	2018/11/26 12:42
L15	12	l14 and (mass adj storage with (driver function$5) and screen near2 scrap$4).clm.	US-PGPUB; USPAT	OR	ON	2018/11/26 12:43
L16	71	l14 and (mass adj storage with (driver function$5) screen near2 scrap$4).clm.	US-PGPUB; USPAT	OR	ON	2018/11/26 12:43
L17	59	L16 NOT L15	US-PGPUB; USPAT	OR	ON	2018/11/26 12:44

11/26/2018 12:46:16 PM
C:\Users\cbartels\Documents\EAST\Workspaces\14344836inventCPCids.wsp

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	~~Scott C. Sun~~ CHRISTOPHER BARTELS
Attorney Docket Number	BEEL3004/BEU/TL

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First Named Inventor	Koen Simon Herman BEEL
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Examiner Name	CHRISTOPHER BARTELS
Attorney Docket Number	BEEL3004/BEU/TL

/C.A.B/	1	SIPO Office Action in corresponding app. CN 201280074077.2 dated August 23, 2018.	☒
/C.A.B/	2	Office Action in corresponding app. 15/449,048 dated October 12, 2018.	☐

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EXAMINER SIGNATURE

Examiner Signature	/CHRISTOPHER A BARTELS/	Date Considered	11/26/2018

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Examiner Name	Scott C. Sun
Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-10-30
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The 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.

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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 inspections or an issued patent.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	~~2181~~ 2184
Examiner Name	~~Scott C. Sun~~ CHRISTOPHER BARTELS
Attorney Docket Number	BEEL3004/BEU/TL

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/C.A.B/	1	20100064063	A1	2010-03-11	Deforche et al.	

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/C.A.B/	1	2013037979	WO	A1	2013-03-21	Barco N.V.		
/C.A.B/	2	2008165007	JP	A	2008-07-17	Brother Ind Ltd		X
/C.A.B/	3	2000242257	JP	A	2000-09-08	Canon KK		☒

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	CHRISTOPHER BARTELS
	Attorney Docket Number	BEEL3004/BEU/TL

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/C.A.B/	1	http://esupport.epson-europe.com/ViewArticle.aspx?lng=sv-SE&kbid=328038&data=bOU002FRlftu7YFtMOBp2mpSKntPq1A26Wyw&cl=1, accessed July 8, 2017.	
/C.A.B/	2	https://www.infocus.com/resources/documents/User-Guides/Liteshow-3-UserGuide.pdf, accessed October 3, 2018.	

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EXAMINER SIGNATURE

Examiner Signature	/CHRISTOPHER A BARTELS/	Date Considered	11/26/2018

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Scott C. Sun
	Attorney Docket Number	BEEL3004/BEU/TL

CERTIFICATION STATEMENT

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See attached certification statement.

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A certification statement is not submitted herewith.

SIGNATURE

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Signature	/Thomas Lee/	Date (YYYY-MM-DD)	2018-11-16
Name/Print	THOMAS LEE	Registration Number	66396

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Attorney Docket Number	BEEL3004/BEU/TL

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Attorney Docket Number	BEEL3004/BEU/TL

/C.A.B/	1	SIPO Office Action in corresponding app. CN 201280001542.X dated July 30, 2018.	X
/C.A.B/	2	EPO Office Action in corresponding app. EP 12759440.6-1204 dated August 9, 2018.	☐
/C.A.B/	3	EPO Office Action in corresponding app. EP 12775162.6-1204 dated August 9, 2018.	☐
/C.A.B/	4	Office Action in corresponding app. 14/725,401 dated September 10, 2018.	☐
/C.A.B/	5	Office Action in corresponding app. 90/014,087 dated September 4, 2018.	☐

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EXAMINER SIGNATURE

Examiner Signature	/CHRISTOPHER A BARTELS/	Date Considered	11/26/2018

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.A.B/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Scott C. Sunn
	Attorney Docket Number	BEEL3004/BEU/TL

CERTIFICATION STATEMENT

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

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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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-09-18
Name/Print	THOMAS LEE	Registration Number	66396

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2181
Examiner Name	Christopher Bartels
Attorney Docket Number	BEEL3004/BEU/TL

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	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
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	Examiner Name	Christopher Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

/C.A.B/	1	Chinese Office Action in Chinese Application Number 201280074077.2, dated January 4, 2018.	X

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Examiner Signature	/CHRISTOPHER A BARTELS/	Date Considered	02/20/2018

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Signature	/Thomas Lee/	Date (YYYY-MM-DD)	2018-02-14
Name/Print	THOMAS LEE	Registration Number	66396

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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Application Number	14344836
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First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/C.A.B/	1	20110180380	A1	2011-07-28	Lee	

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/C.A.B/	1	Intervention according to Art. 105 EPS in corresponding European patent 2756668, dated May 3, 2018.	

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EXAMINER SIGNATURE

Examiner Signature	/CHRISTOPHER A BARTELS/	Date Considered	11/26/2018

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100064063	A1	2010-03-11	Deforche et al.	

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	1	2013037979	WO	A1	2013-03-21	Barco N.V.		
	2	2008165007	JP	A	2008-07-17	Brother Ind Ltd		X
	3	2000242257	JP	A	2000-09-08	Canon KK		☒

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	1	http://esupport.epson-europe.com/ViewArticle.aspx?lng=sv-SE&kbid=328038&data=bOU002FRIftu7YFtMOBp2mpSKntPq1A26Wyw&cl=1, accessed July 8, 2017.	
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(54) **Title**: ELECTRONIC TOOL AND METHODS FOR MEETINGS

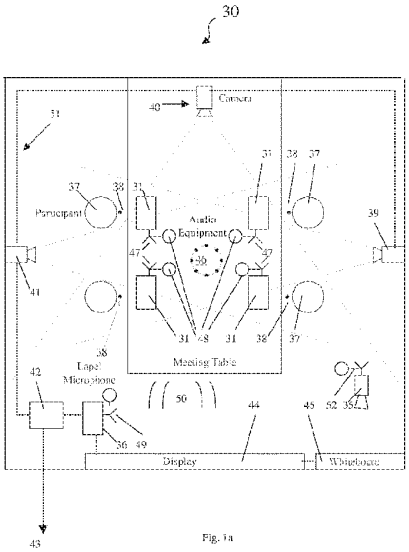


Fig. 1a

(57) **Abstract**: An electronic meeting tool and method for communicating arbitrary media content from users at a meeting is described. These can include a node configuration means adapted to operate a display node of a communications network, the display node being coupled to a first display. The node configuration means is adapted to receive user selected arbitrary media content and to control display of the user selected arbitrary media content on the first display. At least one peripheral device adapted to communicate the user selected arbitrary media content via the communications network is provided, wherein the peripheral device is a connection unit comprising: (e) a connector adapted to couple to a port of a processing device having a second display, a memory and an operating system; and (f) a transmitter for communicating with the communications network, A program is provided that is adapted to be loaded onto the processing device and to run on the operating system of the processing device, said program being adapted to obtain user selected arbitrary media content, said program leaving a zero footprint on termination. An input device is provided to allow the user to carry out a user action that triggers transfer of said user selected arbitrary media content to said transmitter through said port.

WO 2013/037979 A1

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ELECTRONIC TOOL AND METHODS FOR MEETINGS

The present invention relates to electronic tools for meetings including methods or devices for providing connection to a communications network, to networks or methods of operating the network, methods or devices for use in displaying media content as well as software for performing any of these methods.

Technical background

Tools for collaboration

Allowing *ad hoc* groups of persons to communicate with each other is one of the fundamental aspects of collaboration, problem solving, negotiation, teaching and education, etc. To assist in communication, there has been an explosion of electronic communication tools such as electronic conferencing tools, e.g. synchronous and asynchronous conferencing, online chat, Instant Messaging, audio conferencing, videoconferencing, data conferencing, application sharing, remote desktop sharing, electronic meeting systems, collaborative management (coordination) tools, project management systems, knowledge management systems, and social software systems.

One classic approach is the lecture or seminar often involving a presentation using presentation software. To a large extent the traditional single person presentation or lecture has been maintained with the audience being in a rather passive mode as far as determining, constructing, augmenting or modifying the information to be presented is concerned.

As with other business processes, meetings are going digital. Increasingly, people are using computer technology alone and in conjunction with broadband networks to support their meeting objectives prior to and during an actual meeting. For example, e-mail is used to pass around files for people to read prior to a meeting.

Collaborative workspaces in corporate networks and on the Internet offer geographically distributed collaborators a virtual repository for documents related to a project or a meeting. Electronic meeting support systems, such as interactive network-

connected white boards and videoconferencing appliances, are available for the benefit of those who share the same room as well as those who are in remote locations.

The AMIDA Final Public Report describes the overall methodology behind the development of meeting support technologies. It reports that numerous studies confirm that meetings dominate the way people work. Namely, according to a study conducted by MCI Worldcom in 2003 a business person participates in 60 meetings per month. People meet in groups for a multitude of reasons. They interact in numerous predictable and unpredictable ways and the results of their interactions are as varied as the people who participate and the projects on which they are collaborating or communicating. Studies of business processes also reveal that approximately 80% of the "workload" associated with a project or process happens in preparation for a meeting. In other words, many people view the "live" meeting as a milestone or deadline by which they can pace and measure their productivity and that of their colleagues. Unfortunately, for many information managers, being in perpetual meetings has reduced their ability to prepare adequately for the next meeting, perpetuating a vicious and negative cycle.

However, Marc Al-Hames et al. report in "Audio-Visual Processing in Meetings: Seven Questions and Current AMI Answers", that although large parts of working days are consumed by meetings and conferences, unfortunately a lot of them are neither efficient, nor especially successful. They report a study in which people were asked to select emotion terms that they thought would be frequently experienced in a meeting. The top answer – mentioned from more than two third of the participants – was "boring"; furthermore nearly one third mentioned "annoyed" as a frequently perceived emotion.

The conclusion is that despite the plethora of electronic aids to meetings, fundamental problems in handling meetings have not been solved. In fact organising and conducting meetings in a business context involves a large number of factors.

Participation

A lack of efficiency of meetings is addressed in the article "Mood indicators on

electronic meeting tools" IBM, IP.com number: IPCOM000011711D, Publication Date: March 12, 2003. This article addresses the issue that the lack of direct feedback makes meetings clumsy, inefficient and often unproductive. It proposes a "mood indicator" as well as an "I want to ask a question" indicator which allow the presenter to choose an appropriate moment to pause, change track or field a question. It is argued that interrupting a presenter in full flow can be awkward; however, sometimes it is difficult to get an opportunity to ask a question or make a comment when many different people are trying to make their voices heard. In a similar vein, US6966035 suggests displaying a "murmur frame" for a participant to express a view. To increase user participation, US 2010/0087139 discloses a system for sending a selection to another computer, and US 2006/0095376 discloses a system for secure voting. Commenting, voting or selecting requires that a central authority provides the information that is to be selected or commented or voted on. Hence, these proposals still leave a central figure such as the presenter in a dominating position and the other members of the meeting are largely an audience with limited selection or voting or participation rights.

A further problem with meetings is that someone is usually late or has to leave early. With the person arriving late one has to decide if the meeting is interrupted and a summary of the proceedings so far is given. For the person leaving early (often a senior person), subsequent discussions can go missing. If there is a notes taker, this provides a personal summary of the meeting – but not an objective one.
Presents systems do not provide an optimal solution.

Legal and security issues
A legal requirement of a meeting is that presentations, comments and submissions need to be completely reproducible – in some circumstances, e.g. in a share holders' meeting, the events in the meeting should be subject to total recall. Computer-supported collaborative work technologies, particularly those which capture human verbal and non-verbal communications (audio and video interaction) in addition to text and graphics generated during a meeting, promise to have a long term impact on how people will prepare for and behave during and following meetings. In addition, connecting to a network brings the danger of virus, malware or spyware transfer in

either direction, and there is danger of copying of confidential information.

Practical Difficulties

Scalability and ease of use

There are even more fundamental problems with using electronic tools in meetings. If two persons want to make two presentations then usually either both presentations must be placed on one machine or there is a need to swap between the presenters' machines. To bring the display content of a computer to a projector, the most common ways are to use a cable that connects the display adapter of the graphics card to the video input of the projector [method 1] or to use a software that captures the display contents and sends it over a wired or wireless network to a remote base unit connected to the projector [method 2]. This is often called "remote desktop" and is mostly used for remote administration or remote IT assistance purposes.

Less common but also practiced methods are to use a special device connected to the display adapter of the graphics card, that captures, encodes and streams the display content over a wired or wireless network [method 3].

Method 1 has several practical problems and disadvantages. In meetings where people want to contribute content from their own computers, e.g. to project images on a display, typically a video cable such as a VGA cable is used to connect each PC one at a time to the projector. This is not only not scalable but also can be and often is quite a cumbersome process that typically wastes valuable meeting time and takes the dynamism out of the meeting. Connection can be made more difficult and time consuming for example if the computer has to be rebooted for it to detect the projector or when the format of the PC differs from the format of the projector. In addition changing format can leave the computer with a new format that is not compatible with its own screen so that on reboot of the PC alone, nothing is displayed on the computer screen. Without a visible screen image the necessary re-configuration can be difficult. These issues are aggravated by a number of elements:

- The use of many different video adapters, such as VGA, DVI-A, DVI-D, DVI-I, DP, HDMI, thunderbolt,…

- Reach depends on cable length: too long leaves a tangled cable "salad" in the meeting room, too short reduces flexibility, often necessitating people to move around in the meeting room when they want to present something.
- Cable connection is either point to point or requires tedious and extensive cabling and the use of complex and expensive video switches.
- It is often difficult and time consuming to find the right display resolution and refresh rate that both the computer and the display or projector support.
- Known technical solutions are expensive and not 100% reliable.

Method 2 also has many drawbacks. If the connection is made to a corporate LAN there is a danger of virus, malware or spyware transfer in either direction, there is danger of copying of confidential information, and there is the difficulty of making the connection, e.g. entry of a user code and password, as well the administration of such passwords and user codes. In business contexts, visitors to meeting rooms typically do find technical difficulty with such means to connect to a central projector or display in the meeting room.

Additional problems can occur with firewalls and proxies. Typically a visitor to a meeting will bring a computer such as a laptop that is set up for a different corporate networking environment and hence has different or incompatible networking settings. The setting up of a firewall can be complicated and if this is not done correctly, telecommunication software that has to pass through a firewall may be blocked. In order to solve problems associated with firewalls it may be necessary to open ports or identify or even add programs in an exception list. If, besides a network (hardware) firewall and an operating system firewall, there is any software based third-party firewall like Zonealarm, CA Internet Security Suite or McAfee Firewall, then it is necessary to follow that software developer's documentation to place programs on a safe list or adding exceptions to the firewall rules. Such activity is beyond the usual user. Fussing with computer settings, or having to call for IT support wastes valuable meeting time and takes the dynamism out of the meeting.

The advantage of method 3 is that the computer does not need to use its own

processing power to bring the display content in a form that is easily transported over a network. This advantage becomes less relevant as computers grow in processing power. A drawback of method 3 is that the same problems often encountered with method 1 of connecting to the display adapter remain. Another drawback is that the special device referred to requires significant processing power, which means that this device will consume much power and will require a separate power supply, be relatively big and certainly be relatively expensive.

An alternative method in the making today is to use the well known USB interface of the computer for extracting the display content of the computer. US 2009/0198839 discloses such a pluggable cable arrangement. US 2011/0115689 discloses a similar USB solution for wireless connection to a projector. Accordingly connecting a projector to a computer using the standard USB port might become commonplace with time. However, this usually requires special drivers and even special hardware in the computer. Connecting a projector to a computer using the standard USB port hence might become commonplace – but even when that happens there will be a mix of new and legacy machines for several years.

Conclusion

The following problems remain for holding a face-to-face meeting using advanced electronic tools at the present time:

- Complexity of the networking infrastructure.
- High demands on technical expertise of users in current systems that are supposed to be designed to support everyday use by the non-expert user.
- Barriers to the use of complicated technology in meetings.
- Great variety of possible collaborative software solutions – none of which seems to solve the fundamental problems of holding successful meetings.
- Meetings being boring or annoying for members of the meeting.
- Complexity of firewalls and other security measures employed in corporate networks.
- Lack of, or restriction of participation by members of a meeting.

- Time taken to prepare presentations for meetings.
- Need to record events in the proper time sequence at meetings without burdening a meeting more than necessary.

Although some tools solve some of these problems effectively, no electronic meeting tool solves all of them.

Summary of the invention

An object of the present invention is to provide network solutions including electronic tools for meetings as well as devices for providing connection to a communications network, to methods of operating the network, methods of displaying media content as well as software for performing any of these methods or for implementing such systems. There is also a need to capture what is actually shown or said in a meeting and not merely what might have been shown or said.

An aspect the present invention provides an electronic meeting tool for communicating arbitrary media content from users at a meeting comprising:
a node configuration means adapted to operate a display node of a communications network, the display node being coupled to a first display, the node configuration means being adapted to receive user selected arbitrary media content and to control display of the user selected arbitrary media content on the first display; and
at least one peripheral device adapted to communicate the user selected arbitrary media content via the communications network, wherein the peripheral device is a connection unit comprising:

(a) a connector adapted to couple to a port of a processing device having a second display, a memory and an operating system; and
(b) a transmitter for communicating with the communications network,

a program adapted to be loaded onto the processing device and to run on the operating system of the processing device, said program being adapted to obtain user selected arbitrary media content, said program leaving a zero footprint on termination, and
an input device to allow the user to carry out a user action that triggers transfer of said user selected arbitrary media content to said transmitter through said port.

Obtaining user selected arbitrary media content is preferably not obtained by application sharing but by the process of screen scrapping. Although software packages that provide screen scraping require installation on the target device, or at least require the installation of dedicated and/or custom drivers, embodiments of the present invention use software stored on the peripheral device which allows screen scraping when run on the processing device but leaves a zero footprint when terminated. Embodiments of the present invention can screen scrape full HD videos at 20fps without requiring any installation of a program on the processing device nor requiring configuring the processing device such as a PC that they run on for the connectivity to the network hence meeting "zero footprint" requirements.

The program adapted to be loaded onto the processing device and to run on the operating system of the processing device and being adapted to obtain user selected arbitrary media content can be stored on the peripheral device. The transmitter can be a wireless transmitter or transceiver. The peripheral device can be a plug-and-play device. The program can be adapted to screen scrape content of the second display.

The input device can be physical actuator coupled to the peripheral device. The physical actuator preferably has a surface area of between 100 and 14,400 square mm. Alternatively, the input device can be a key displayed on the second display. The key displayed on the second display can be one not screen scraped by the program.

On the peripheral device a mass storage device is provided that stores the software to be run on the processing device. The mass storage device can be logically closed once the software has been read and loaded and is running from RAM in the processing device. Also provided on the peripheral device is a further device such as an HID (human interface device) to capture user input and provide user feedback. In embodiments of the present invention, the peripheral device contains multiple internal logical devices that are combined:

An HID (human interface device) used for capturing user input (e.g. following a user action such as pressing or activating a button) and providing user feedback, e.g. by an optical indicator such as a light ring around the button e.g. an LED ring,

for streaming the screen scraped video content to the network and hence to a base unit and a display,

A mass storage device used to store the application,

An audio device that acts as a virtual sound card to a client PC over USB, using a generic driver such as a UAC1 or UAC2 device driver.

Embodiments of the present invention are not limited to application sharing but make use of screen scraping which is able to capture all material in a neutral manner rather than being limited by proprietary applications. Further the screen scraper application is zero footprint on termination rather than being fully installed on the processing device. Embodiments of the present invention can provide arbitrary "full content" to the meeting room and participants can display in real-time,

The real-time content is shown on a central display rather than being broadcast to individual participants or archived.

Embodiments of the present invention "auto compose" arbitrary user data on a central display or screen so that full real-time content that is provided by multiple meeting participants who intentionally share this content in order to make the meeting more effective and efficient,

Embodiments of the present invention implement a principle of "democratic screen sharing", in which the meeting participants decide themselves on a peer-to-peer basis which content to share when and where. In particular in some embodiments a participant can obtain unilateral access to the display device, i.e. without agreement of other participants. Peer-to-peer data sharing differs from systems in which the content to be displayed is determined by a presenter or meeting director. The user determines where his content is routed to, and can do so without any software configuration on the user processing device.

Another aspect the present invention provides a method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with at least one pre-installed generic driver providing a generic communications protocol for communication between processing device and a standard class of peripheral devices, the method comprising the steps of:

a) coupling a peripheral device to the processing device, the peripheral device having a

transceiver;

b) setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;

c) coupling the processing device to a communications network via the peripheral device;

d) routing screen scraped data between the processing device and the communication network via the means for communication, wherein the generic communication protocol is used for transferring the screen scraped data between the processing device and the peripheral device.

The routing of the screen scraped data can be to a defined network node such as a display node without user entry of configuration details. Thus the routing can be dedicated to a specific network node such as a display node, base station etc. This is achieved by pairing of the peripheral device to the relevant node before the communication starts.

In accordance with embodiments of the present invention users start an application from the peripheral device such as a USB dongle, thus making the connection in a 3 step process: (1) connect, e.g. plug in the peripheral device to the processing device, (2) start the screen scraping application, (3) perform a user action such as click on a button on the peripheral device to go allow content to be displayed on the central screen or display. To achieve step 2 Autorun or AutoPlay can be used with some Windows operating systems, but there are many different variants based on the OS version and which patches have been installed. Furthermore, this mechanism is generally considered a security hazard, which is why most IT departments will disable Autorun/Autoplay. Other OS providers have disabled this function, e.g. Apple removed a similar functionality entirely from its OS/X since Snow Leopard.

In an embodiment of the present invention a very small service - also called daemon on some OS's – is provided that requires installation on the processing device such as a laptop. This service is pre-installed on the processing device. The installation is required only once on every processing device such as a laptop. The role of this is to

provide a permanently running service that continuously monitors if a peripheral device according to the present invention has been offered up for connection to the processing device. When such a peripheral device is connected, the service will detect this and start the client application software residing in the mass storage area of the peripheral device. Once the service is installed, connectivity with the peripheral device becomes a 2 step process: connect, e.g. plug in the peripheral device to the processing device, and (2) perform a user action such as click on a button on the peripheral device to allow content to be displayed on the central screen or display. The application loaded from the processing device still leaves a zero footprint on termination

Step b) can comprise presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

Alternatively or additionally step b) can comprise presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

Alternatively, or additionally step b) comprises presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

A client application can be stored on the peripheral device which when run on the processing device obtains the screen scraped data. Such a client application can be a portable application and can leave a zero footprint on termination.

In another aspect the present invention provides a peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a standard class of peripheral devices, the peripheral device comprising a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via the peripheral device, the peripheral device having a transceiver;

a third software code portion for screen scraping data from the processing device; and

a fourth software code for routing screen scraped data between the processing device and the communications network over the means for communication; wherein the first software code portion is adapted to use the generic communication protocol for transferring the screen scraped data between the processing device and the peripheral device.

The first software code portion can be adapted to present the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver. The first software code portion can be adapted to present the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver. The first software code portion can be adapted to present the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

The executable software code can comprise fifth code for providing a means for connecting to the communications network including a base node. The third code can be for providing means for capturing video frame buffers of the processing device.

The executable software code can comprise sixth code for providing a means for encoding, compressing and optionally encrypting the screen scraped data and sending the screen scraped data the communication network. The executable software code can comprise seventh code for providing a means for handling the peripheral device. The executable software code can comprise eighth code for providing means for initiating connection to the base node. The executable software code can comprise ninth code for receiving inputs from an input device on the peripheral device. The executable

software code can comprise tenth code for providing a means for sending state changes to the visual indicator on the peripheral device. The executable software code can comprise eleventh code for providing a means for presenting to the user a GUI. The executable software code can comprise twelfth code for presenting a GUI for administration of the said executable software code when executed as a portable application. The executable software code can comprise thirteenth code for providing a means for displaying and activating a key on the display of the client processing device for allowing a user to input the start the transfer of data from the processing device to the base node.

In another aspect the present invention provides a peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a standard class of peripheral devices, the peripheral device comprising a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via the peripheral device, the peripheral device having a transceiver; and

a third processing software code for routing data between the processing device and the communications network over the means for communication; wherein the first software code portion is adapted to use the generic communication protocol for transferring the data between the processing device and the peripheral device, and an input device coupled to the peripheral device, the input device being adapted to react to a user action to trigger the transfer of the data from the processing device to the peripheral device.

The first software code portion can be adapted to present the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver. The first software code portion can be

adapted to present the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver. The first software code portion can be adapted to present the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

The input device is preferably a physical actuator coupled to the peripheral device. The physical actuator preferably has a surface area of between 100 and 14,400 square mm. The input device can be for example a key for display on the display. The executable software code can comprise fourth code for providing a means for connecting to the communications network including a base node. The executable software code can comprise fifth code for providing a means for capturing video frame buffers of the processing device. The executable software code can comprise sixth code for providing a means for encoding, compressing and optionally encrypting the video frames and sending them over a secure link to the base node. The executable software code can comprise seventh code for providing a means for handling the peripheral device. The executable software code can comprise eighth code for providing a means for initiating connection to the base node. The executable software code can comprises ninth code for receive inputs from an input device on the peripheral device. The executable software code can comprise tenth code for providing a means for sending state changes to the visual indicator on the peripheral device. The executable software code can comprise eleventh code for providing a means for presenting the user a GUI. The executable software code can comprise twelfth code for presenting GUI for administration of the executable software code when executed as a portable application. The executable software code can comprise thirteenth code for providing a means for displaying and activating a key on the display of the processing device for allowing a user input to start the transfer of data from the processing device to the base node.

In another aspect of the invention a peripheral device is provided for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device

and a standard class of peripheral devices, the peripheral device comprising a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via the peripheral device, the peripheral device having a transceiver;

a third software code portion for receiving media content from the network and for displaying the media content on the display in accordance with a set of rules; wherein the first software code portion is adapted to use the generic communication protocol for transferring the media content between the peripheral device and the processing device.

The executable software code can comprise fourth code for providing a means for correctly configuring a receiver as an access point. The executable software code can comprise fifth code for providing a means for listening for output of connection units trying to connect on a specific port. The executable software code can comprise sixth code for providing a means for a GUI for administration purposes. The executable software code can comprise seventh code for providing a means for publishing its presence over the network using the zeroconf protocol. The executable software code can comprise eighth code for providing a means for accepting and installing software updates. The executable software code can comprise ninth code for providing a means for providing facilities for pairing of connection units to the processing device. The executable software code can comprise tenth code for providing a means for auto-composing of different incoming arbitrary media streams and rendering of composited image on display. The executable software code can comprise eleventh code for providing a means for receiving, decrypting and decoding incoming arbitrary media content. The executable software code can comprise twelfth code for scaling of incoming arbitrary media streams. The executable software code can comprise thirteenth code for providing a means for displaying incoming arbitrary media content in accordance with a set of rules.

The present invention also provides a method for communicating arbitrary media content from users at a meeting comprising:
operating a display node of a communications network, the display node being coupled to a first display, to receive user selected arbitrary media content and to control display of the user selected arbitrary media content on the first display; and
connecting a peripheral device to a port of a processing device and communicating the user selected arbitrary media content via the communications network,
loading a program onto the processing device and running the program on the operating system of the processing device to obtain user selected arbitrary media content, said program leaving a zero footprint on termination, and
triggering transfer of said user selected arbitrary media content to said transmitter through said port after a user action on an input device.

The present invention also provides a peripheral device comprising:
a base
a connector for connection to a plug and play port of a host processing device,
a flexible connection between the base and the connector for transferring data signals and power,
an actuator on the base for actuating a signal and for transferring the signal to the connector for transfer to the port, wherein the base has electronics comprising permanent storage for storing a portable application, a processing engine, a transceiver and a visual indicator.

The present invention also provides a method for providing communication connectivity from a processing device,
setting up a communications network between a base node of the communications network and a peripheral device coupled to the processing device;
transferring media content between the processing device and the peripheral device,
transmitting the media content from the peripheral device to the communications network,
receiving media content from the communications network at the base node and displaying the media content on a display in accordance with a set of rules.

Any of the above software code stored on a non-transitory storage medium.

Definitions

The term "unilateral electronic access to the display device" by a participant. means that the displaying process is obtained by the action of only one participant involved in the meeting, without requiring the agreement of another or the others. The term "unilateral" implies that the data for display is allowed to override or replace any data displayed on the screen by the same or another participant of the meeting.

"Plug and play" is a term used to describe the characteristic of a computer bus, or device specification, which facilitates the discovery of a hardware component in a system, without the need for physical device configuration, or user intervention in resolving resource conflicts. Plug and play devices can be added to a bus of a computing system (while running or when shut down), and the newly added device and possibly the rest of the computing system is automatically configured to make the newly added device work, both from hardware and from software perspective.

Plug and play interfaces include for example (not an exhaustive list): Firewire (IEEE-1394), PCI, Mini PCI, PCI Express, Mini PCI Express, PCMCIA, PC Card, Universal Serial Bus (USB), SDIO cards.

"Auto-configuration" is the automatic configuration of devices without manual intervention, without setting any switches or jumpers, and without any need for software configuration. An example of auto-configuring devices: USB devices. Examples of auto-configuring protocols: DHCP, Zeroconf, Bonjour.

A plug and play device has auto-configuration software by default to make it plug and play. Example: USB devices are made to be plug and play by including the correct auto-configuration software (e.g. host driver, host stack, application software). Autoconfiguration can also refer to a software alone and is not restricted to a physical device.

"Hot swapping and hot plugging" are terms used to describe the functions of replacing computer system components without shutting down the system. More specifically, hot swapping describes replacing components without significant interruption to the system, while hot plugging describes the addition of components that would expand the system without significant interruption to the operation of the system. A well-known example of this functionality is the Universal Serial Bus (USB) that allows users to add or remove peripheral components such as a mouse, keyboard, or printer. Other examples are eSATA, PCIe, FireWire, for example.

A "portable application" (portable app), sometimes also called standalone, is a computer software program designed to run without installation on the target machine. This type of application is stored on a removable storage device such as a CD, USB flash drive, flash card, or floppy disk – storing its program files, configuration information and data on the storage medium alone. It is a program that can be stored on an electronic device such as a USB flash drive, iPod, memory card, portable hard drive or other portable electronic device and runs on a computer or other processing device coupled to the electronic device without making permanent configuration changes to the host computer. All such programs have a zero-footprint, meaning all temporary files, registry entries, and any other changes to the machine exist only while the program is running.

To be considered a portable application, for purpose of this invention, a software program must:

Not require any kind of formal installation onto a computer's permanent storage device to be executed, and can be stored on a removable storage device such as USB flash drive, iPod, memory card, portable hard drive or other portable electronic storage device thus enabling it to be used on multiple computers.

Settings are stored with, and can be preferably carried around with, the software (i.e., they are written to the electronic device such as a USB drive). Settings are not stored to the registry or any other central system database of the computer.

Leaves a zero (or near-zero) "footprint" on any PC it is run on after being used. i.e., all

temporary files/registry settings should be either avoided or at least removed once the program has exited, and files created by the user can be saved directly to the same removable media as the application is stored on.

A portable application does not leave its files or settings on the host computer on which it runs. For example, the application does not write to the Windows registry or store its configuration files (such as an INI file) in the user's profile; instead, it stores its configuration files in the program's directory. Another requirement, since file paths will often differ on changing computers due to variation in Windows drive letter assignments, is the need for applications to store them in a relative format. Preferably, such a program does not require a launcher program to copy necessary settings and files to the host computer when the application starts and move them back to the application's directory when it closes as this may leave a residue on the hard drive in case of power failure.

"Electronic meeting systems" (EMS) need to be distinguished on the one hand from classic groupware, on the other from web conferencing systems. In reality, there is some overlap between minor features of products of the named categories. The main difference from groupware is the intensity of collaboration. EMS should be distinguished from systems with which it is possible to show the contents of an individual computer screen on a remote display with multiple users at the same time.

"Groupware" supports collaboration within groups where the individual contributions remain identifiable. In contrast, EMS enable the group to cooperatively produce a result for which the group is responsible as a whole. In a business process, groupware and electronic meeting systems complement each other: Groupware supports teams when researching and creating documents in the run up to an EMS session or when implementing the results of such a session.

"Web conferencing systems" and "electronic meeting systems" complement each other in the online meeting or workshop: EMS extends the web conferencing system by providing interactive tools for producing and documenting group results. On the other hand, "web conferencing systems" complement EMS with the screen sharing and

voice conferencing functionality required in synchronous online meetings and not present in EMS.

"Data conferencing" refers to a communication session among two or more participants sharing computer data in real time. Interaction and presentation devices such as a screen, keyboard, mouse, camera, etc. can be shared. It is a term used to distinguish from video conferencing and audio conferencing. The data can include screen, documents, graphics, drawings and applications that can be seen by the participants of the meeting.

"Application sharing" is an element of remote access, falling under the collaborative software umbrella, that enables two or more users to access a shared application or document from their respective computers simultaneously in real time. Generally, the shared application or document will be running on a host computer, and remote access to the shared content will be provided to other users by the host user. Application sharing should be distinguished from systems in which collaboration on the applications between different users is not possible but the contents of individual computer screens can be projected onto a remote display with multiple users at the same time.

The term "arbitrary media content" refers to the fact that a user may generate, create or select any media content that is appropriate to display. This differs from client voting on, or selecting of media content that is displayed by another in a meeting or presentation. This term refers to client oriented, distributed rights and privileges for the display of content rather than a central presenter providing content which is presented to the members of the meeting.

"Screen scraping" in our sense refers to reading the video frame buffers and processing them, rather than just rendering them on a display. Screen scraping for presentations is described in US2002/0196378 to Slobodin et al which is included herein by reference.

"Auto composition" or "auto layout" refers to the automatic nature in which multiple

graphics/video sources are rendered on a central display, without user intervention and in a way that a user would intuitively expect it to happen.

"Wireless" and "wireless communication network" can be any network that does not use cable links between nodes, e.g. uses RF, optical or InfraRed for communication purposes, such as IrDA, diffuse infra-red, WLAN, WiMax, WiFi, WiFi Direct, Bluetooth or any other wireless communication network known to the person skilled in the art such as optical networks like LiFi.

"Computer" generally refers to a processing device, i.e. having a processing engine capable of various types of digital processing, such as rendering graphics images for display. A computer can be in the form of a work station, a personal computer, a lap-top, a palm top, a PDA, a smartphone, a tablet etc. Generally a computer has memory such as volatile RAM. Non-volatile memory such as a hard disc, optical disk or solid state memory can be included in the computer or can be a peripheral device. Currently most computers are electronic but the term "computer" also include optics based computing devices.

The term "pre-installed generic driver" is intended to mean a driver which is installed on a processing device such as a computer as a standard driver, e.g. is installed with the installation of the operating system. Such a driver is standard for the operating system and can drive a standard class of peripheral devices coupled to or connected to the processing device. The installation of a specific driver for such a peripheral device is not required. Such a generic driver can be a human interface driver (HID) or a mass storage device driver, which has predetermined software components configured for driving mass storage, a CD-ROM, a keyboard etc. or combinations of these. Such devices can be readable and writable computer peripheral memory devices such as USB memory sticks, flash memories, external hard drives, or more.

Brief Descriptions of the drawings

Fig. 1a shows a meeting room that can be used with embodiments of the present invention. Fig. 1b shows a combination of a client processing device, a connection

unit, a base node and a display in accordance with an embodiment of the present invention.

Fig 2 shows a screen display in accordance with an embodiment of the present invention.

Figs. 3 to 5 show a base node and a peripheral device and a client processing device in accordance with embodiments of the present invention.

Fig 6 shows a display in accordance with an embodiment of the present invention.

Fig. 7 shows a peripheral device in accordance with an embodiment of the present invention.

Fig. 8 shows a client processing device in accordance with an embodiment of the present invention.

Fig. 9 shows a further client processing device in accordance with an embodiment of the present invention.

Fig. 10 shows an embodiment of a peripheral device in accordance with an embodiment of the present invention.

Detailed Description of the Embodiments of the present Invention

The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting.

Furthermore, the terms first, second, third and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. The terms are interchangeable under appropriate circumstances and the embodiments of the invention can operate in other sequences than described or illustrated herein.

Moreover, the terms top, bottom, over, under and the like in the description and the claims are used for descriptive purposes and not necessarily for describing relative positions. The terms so used are interchangeable under appropriate circumstances and the embodiments of the invention described herein can operate in other orientations than described or illustrated herein.

The term "comprising", used in the claims, should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. It needs to be interpreted as specifying the presence of the stated features, integers, steps or components as referred to, but does not preclude the presence or addition of one or more other features, integers, steps or components, or groups thereof. Thus, the scope of the expression "a device comprising means A and B" should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.

Similarly, it is to be noticed that the term "coupled", also used in the description or claims, should not be interpreted as being restricted to direct connections only. Thus, the scope of the expression "a device A coupled to a device B" should not be limited to devices or systems wherein an output of device A is directly connected to an input of device B. It means that there exists a path between an output of A and an input of B which may be a path including other devices or means.

Elements or parts of the described devices may comprise logic encoded in media for performing any kind of information processing. Logic may comprise software encoded in a disk or other computer-readable medium and/or instructions encoded in an application specific integrated circuit (ASIC), field programmable gate array (FPGA), or other processor or hardware.

References to software can encompass any type of programs in any language executable directly or indirectly by a processor.

References to logic, hardware, processor or circuitry can encompass any kind of logic or analog circuitry, integrated to any degree, and not limited to general purpose processors, digital signal processors, ASICs, FPGAs, discrete components or transistor logic gates and so on.

Embodiments of the present invention provide solutions to three major problems with meetings:

a) the time taken to prepare for a meeting. This is mainly achieved by allowing "on-the-fly" presentation of any displayable information. This information does not have to be linked into any particular presentation software, nor to be compatible with any such presentation software,

b) the time taken to conduct the meeting using electronic meeting tools. This is achieved by reducing the time to connect computers to the display or projection system.

c) the time taken to reflect and review and document the meeting afterwards. This is achieved by providing the possibility of recording the course of the meeting in the same time sequence that it was carried out as well as be able to store all data presented and who presented it.

Fig. 1a is a schematic representation of a generic meeting room 30 with a meeting table that can be used with embodiments of the present invention. Participants 37 having some form of processing device 31 such as a laptop computer, a tablet, a PDA etc. Each of the processing devices 31 can be a host device and has a first connection unit 47 to which it is coupled. The first connection unit 47 provides access to a network 50 which in this case is a wireless network, but could be a wired network. The network can be a sheared resource network. Each connection unit 47 may be coupled to an input device 48 which will be described in more detail later. A user 37 will typically at a distance from the processing device 37 which is ergonomically satisfactory. This ergonomic boundary is typically an area of about 1000 sq cm to 4000 sq cm. This ergonomic boundary will typically have the user as one side of the boundary and the comfortable reach of the arms will determine an area on the left and right of the processing device which falls within the ergonomic boundary and the far edge of the boundary of the processing device (normally delimited by a display screen) will determine the other side of the ergonomic boundary. The area defined by the ergonomic boundary will overlap or include the processing device 31 itself. The processing device will also have an outer physical boundary. The input device 48 is preferably arranged to operate outside the boundary of the processing device 31 but within the ergonomic boundary. Preferably the input device is arranged to function when it is flat on the table. The input device preferably has an size of activation area of between 1 and 144 square cm.

In other embodiments of the present invention a wireless memory card can be provided to enable a second Wi-Fi link on a processing device such as a laptop or tablet. The wireless memory card stores data and media and fits into the laptop just like a regular SDHC card. The wireless memory card preferably has built-in Wi-Fi that effortlessly transfers data, photos and videos to another device or computer. For instance an Eye-Fi card (www.eye.fi) can be used to enable the latter,

Preferably the network 50 is a local area network, (e.g. a shared resources network) i.e. preferably local to the meeting room for security reasons but the network 50 may have access to other local or wide area networks such as 51 or to a larger corporate network or the internet 43, for example via a router 42. Another node of the network 50 is the base or display node 36. This node 36 may optionally be a wireless access point. The base node 36 may also be a processing device or host computer and may be coupled to a second connection unit 49 that provides access to the network 50 thus linking all of the processing devices 31, 36 together. The connection unit may have an input device as described above. Alternatively, network connections installed on the base node 36 can be used. Audio equipment 46 may be provided, e.g. a telephone that allows other members of the meeting to call in from remote destinations.

The display node 36 is coupled to and adapted to allow display of media on some kind of display 44. The display node is in embodiments of the present invention a base node of the communications network 50. The display 44 may be a projector and/or screen, the projector being coupled to the base node 36. A whiteboard 45 can optionally be provided that can be optionally coupled to the display 44 and/or the base node 36, e.g. when the whiteboard can record electronically what is written on it. Optionally, a camera 35 may be provided to record the entries on the whiteboard 45. The camera 35 may have a third connection unit 52 for connecting the camera 35 to the network 50 so that the data from the whiteboard can be recorded and stored or transmitted to other networks via router 42. The connection unit 52 may have an input device 53 as described above for the connection unit 47.

Optional equipment can be cameras 39, 40, 41 for recording the progress of the

meeting. These cameras can be linked by a network 51, e.g. a cable network to the router 42 and/or the base node 36. Another optional item is a microphone or microphones 38 that can be used to transfer audio, e.g. to the processing devices 31 and to loud speakers (not shown) attached to the base node 36 or part of the display 44.

Any or all of the outputs of the processing devices 31, the cameras, the whiteboard, etc. can be recorded and stored digitally, e.g. in node 36 or elsewhere to provide a complete record with correct time sequence.

Summarising the above, the present invention provides an electronic meeting tool for communicating arbitrary media content between different users 37 (with their own processing devices 31, e.g. PC, mobile phone, or tablet) and one display or projector or multiple displays or projectors 44 in the meeting room 30.

Referring to Figs. 1a and 1b embodiments of the present invention comprise a base or display node 36 being a processing device, e.g. a host computer adapted to receive user selected arbitrary media content, the base node 36 being coupled to a central display 44 which can be a fixed format display and/or a projector or similar. The arbitrary media content can be provided from any of the user processing devices 31. The base node 36 can be adapted to display the received user selected arbitrary media content in accordance with a set of rules, e.g. FIFO, automatically, on request or approval, forced to display, in accordance with a priority etc. Optionally the base node 36 is adapted to force display of the received user selected arbitrary media content, i.e. to allow participation in the meeting by an individual user displaying own selected content on display 44 independently of the person who is nominally responsible for giving a presentation or chairing the meeting. Forcing the display can also be considered as a rule. The phrase "unilateral electronic access to the display device" defines this kind of rule as "unilateral" means that the displaying process is obtained by the action of only one participant involved in the meeting, without requiring the agreement of another or the others. The term "unilateral" implies that the data for display is allowed to override or replace any data displayed on the screen by the same or another participant of the meeting. The meeting tool can also be adapted to allow a

priority setting. This means that a user can set a priority setting for the media to be displayed. A priority of "1" for example can be interpreted by the base node as a forced display, a priority "2" can be interpreted by the base node as display as soon as possible, priority "3" can be interpreted by the base node as place in queue and display as the time comes etc. Setting and using priorities for display are also considered to be working to rules. To execute the rules, the base node 36 may have a decision module. The base node 36 may be a host computer having a processing engine such as a microprocessor and a memory. Preferably, the base node 36 is adapted to treat media content passed to the base node 36 from any or all of the connection units 47 in an equal manner. The base node 36 may be adapted to auto compose the media content on the central display 44 connected to it, e.g. from one or more processing devices 31.

An independent aspect of the present invention is at least one connection unit 47, (optionally 49 for receiving or camera connection unit 52) adapted to communicate the user selected arbitrary media content to said base node 36. Preferably the connection units 47 and/or optionally 49 are physical plug-and-play devices. An example of a connection unit is shown schematically in Fig. 10.

The connection unit 47 (or optionally connection unit 52) may be integrated into a user processing device 31, e.g. as an internal peripheral device or may preferably be an external peripheral device comprising a connector adapted to couple to a port of a user processing device 31. The processing device 31 may have a client display, a processing engine such as a microprocessor, a memory and an operating system. The optional connection unit 49 may integrated into the base node 36, e.g. as an internal peripheral device or may be an external peripheral device comprising a connector adapted to couple to a port of the base node 36. The connection unit 49 may be fully integrated into the base node 36, e.g. is an internal network interface of the base node 36. The base node 36 may have a processing engine such as a microprocessor, a memory and an operating system.

In alternative embodiments of the present invention, the peripheral device can be coupled wirelessly to the processing device, and paired with the processing device such as a tablet or laptop through Near-Field Communication (NFC). In other

embodiments of the present invention, the pairing of the peripheral device can be performed additionally by providing means for receiving biometric data such as a microphone (voice) or a camera (face or iris) or a finger swipe (fingerprint) to the peripheral device. Then the peripheral device can be personalized, or paired, by means of voice or face recognition, respectively. The term voice recognition refers to finding the identity of "who" is speaking, rather than what they are saying. Recognizing the speaker by voice recognition can simplify the task of translating speech in systems that have been trained on specific person's voices or it can be used to authenticate or verify the identity of a speaker as part of a security process. "Voice recognition" means "recognizing by voice", something humans do all the time over the phone. As soon as someone familiar says "hello" the listener can identify them by the sound of their voice alone.

The user processing devices 31, the connection units 47, (optionally 49, 52) and the base node 36 co-operate to form a communication network 50 for linking between at least one of the plurality of processing devices 31, 36, 35 and the central display device 44. The communication network 50 is adapted to receive arbitrary media content from at least one of the plurality of processing devices 31 and to transmit the arbitrary media content of at least one of the plurality of processing devices to the central display device 44.

In some embodiments the storage means of the peripheral device can be adapted to record or share information. For instance, the peripheral device can be adapted to further comprise a private communication channel (e.g. to enable chatting), which can communication with a private communication channel of another participant of the meeting.

An independent aspect of the present invention is a portable application 60 adapted to be loaded onto a client processing device 31 and to be run on the operating system of the client processing device 31. The portable application 60 runs as a process on the client processing device 31 that is adapted to deliver an arbitrary media content from the client processing device 31 to the communication network 50 in response to a user action applied to an input device 48, the process leaving a zero footprint on the

processing device 31 on termination. The network 50 can be a shared resource network. Optionally the portable application 60 is stored on each connection unit 47 and optionally 49. Preferably the portable application 60 is adapted to "screen scrape" content of the client display of the client processing device 31. Optionally the portable application 60 when run on a processing device 31 is adapted to "screen scrape" content of the client display of this client processing device 31 and to transmit it via a connection unit 47. Optionally the portable application 60 when run on the processing device is adapted to "screen scrape" content of the client display of the client processing device 31 and to transmit it via a network interface of the processing device 31, for example if the connection unit 47 has no transmitter or it is not functioning.

The connection unit 47 for communicating with said base node 36 has a network interface e.g. comprising a transmitter 62. The transmitter 62 is preferably a transceiver. Optionally the transmitter/receiver can be a wireless transmitter/receiver.

The base node 36 for communicating with the connection unit 47 has a receiver 63 which can be included in the connection unit 49 or integrated into the base node 36. The receiver is preferably a transceiver. Optionally the transmitter/receiver can be a wireless transmitter/receiver.

The input device 48 allows a user interaction with the connection unit 47. Preferably the input device 48 is physical actuator coupled to the connection unit 47. The user action applied to the input device 48 generates a signal that can trigger transfer of data from the processing device 31 (to which the connection unit 47 is coupled) to the network 50. Preferably the input device 48 has an activating surface that is between 100 and 14,400 square mm. Optionally the input device 48 can be a key displayed on the client display 1 of a client processing device 31. This key can be activated, e.g. by use of a pointing device such as a mouse trigger transfer of data from the processing device 31 to the network 50.

The connection unit 47 is preferably provided with a visual indicator 61, e.g. for allowing user feedback from the connection unit 47 of the status of any activity.

The system also can include a server program 64 adapted to be loaded onto the base node 36, said program 64 being adapted to receive arbitrary media content from one or a plurality of client processing devices 31 through said connection units 47, (optionally 49), and to show this plurality of arbitrary media content streams on one or a plurality of displays 44. The server program 64 may be adapted to allow display in accordance with one or more rules, e.g. FIFO, automatically, on request, forced, in accordance with a priority etc. The forcing rule can be described as "unilateral electronic access to the display device" as "unilateral" means that the displaying process is obtained by the action of only one participant involved in the meeting, without requiring the agreement of another or the others. The term "unilateral" implies that the data for display is allowed to override or replace any data displayed on the screen by the same or another participant of the meeting. To execute the rules, the server program 64 may have a decision module.

Preferably, the server program 64 is adapted to treat media content passed to it from any or all of the connection units 47, 52 in an equal manner. The server program 64 may be adapted to auto compose the media content on the central display 44.

The server program 64 may be a portable application adapted to be loaded onto the base node 36 and to be run on the operating system of the base node 36. The portable application 64 runs a process on the base node 36 that is adapted to display an arbitrary media content received from the client processing device 31 via the communication network 50, the process leaving a zero footprint on the base node 36 on termination. Optionally the portable application 64 is stored on each connection unit 49 and optionally 47 and can be installed therefrom.

Meetings in which visual information is presented on a display or projector commonly suffer from a monopoly effect: one single presenter determines the display contents and thereby has a disproportionate power to influence the meeting dynamics and thereby its outcome. Embodiments of the present invention solve this problem by allowing multiple individuals to simultaneously show their information. The present invention provides according to some embodiments a method to override all currently displayed material. In a sense the method of the present invention transforms visual

communication into something akin to talking, i.e. full-duplex and with the option to shout and interrupt.

The system may also include a central display device 44 and optionally a whiteboard 45 or other display means such as a printer. The display 44 being adapted to receive user selected arbitrary media content, and may be adapted to allow display of the received user selected arbitrary media content in accordance with one or more rules, e.g. FIFO, automatic, forced, on request or approval, in accordance with a priority etc. The forcing rule can be described as "unilateral electronic access to the display device" as "unilateral" means that the displaying process is obtained by the action of only one participant involved in the meeting, without requiring the agreement of another or the others. The term "unilateral" implies that the data for display is allowed to override or replace any data displayed on the screen by the same or another participant of the meeting.

Optionally, one of the connection units 47 can be adapted to be a master connection unit. Such a master connection unit may be adapted to instruct the base node when media content from a client processing device 31 may be displayed or which of the processing devices may be allowed to send content for display.

In embodiments of the present invention, at least one portable application is used, e.g. for the client software on a client processing device 31 or optionally on the base node 36. In these embodiments, one of the pre-installed generic drivers of the operating system on the relevant computer device 31, 36 is exploited for setting up communication from the computer device 31, 36 to the network 50 via the connection unit 47, (optionally 49). The generic driver is used in connection with the connection unit 47, (optionally 49) operating as a peripheral device but the use can go beyond that of the standard class of peripheral devices for which the generic driver is intended. In some embodiments the connection unit 47, (optionally 49) operated as a peripheral device communicates with the relevant processing device 31, 36 by using a generic communication protocol provided by the pre-installed generic driver. Pre-installed USB drivers are examples. Preferably the setting up of the communication of network 50 using connection unit 47, (optionally 49) does not alter or affect the networking

capability of the relevant processing device 31, 36. For example, if a browser is started on the client processing device 31, this browser can use the standard network interfaces on the processing device 31. This means that transfer of data via the connection unit 47 (optionally 49) is independent of transfer of data over the network interfaces of processing device 31 or 36. This has the advantage that each user can carry out processing such as searching on the internet to gather data independently of the transfer of data to be displayed during a meeting, or receive emails etc.

The use of a portable application has the advantage that any modification to settings in the register or generally in the operating system can be avoided, so that upon any form of termination, e.g. disconnecting the electronic device, system crash, no trace is left. This is generally termed "zero footprint".

The present invention has the advantage of scalability. It can provide a display system for use by a plurality of users in meetings. Every user in the meeting thus can have a client processing device 31 for coupling to a connection unit 47. A first user action connects the client processing device 31 to the base node 36, e.g. by inserting a connection unit 47 into the relevant interface connector on the processing device 31, e.g. a USB interface. A second user action comprising activating a button or key on the input device (e.g. by depressing it) then starts the process of transmitting arbitrary media content from the client processing device 31 to the base node 36. This process preferably includes screen scraping data from the processing device. Using screen scraping avoids special programs being installed on the base node 36 to carry out graphical commands sent from the processing device 31. When the base node 36 receives the plurality of arbitrary media content, it can allow auto composition of this media content on the central display connected to it.

In some embodiments, the button or key can be virtual button which is displayed on the screen instead of a button or key on the input device, which for instance can be the peripheral device. Preferably, when the process of transmitting arbitrary media content has been activated, the screen scraping data from the processing device does not scrape the virtual button. The latter can be enable for instance by positioning the virtual button on a second layer which is not scraped.

The present invention will now be described further with reference to certain more specific embodiments.

The present invention in some embodiments provides a system and/or a method to which in one aspect can override all currently displayed material when arbitrary material is presented on a display device from more than one source processing devices such as a laptop, PDA, smartphone, computer, tablet etc . The present invention in one aspect controls the display of visual communication and information by a method akin to talking, i.e. full-duplex and with the option to interrupt or to obtain unilateral electronic access to a display device.

One embodiment the present invention can be implemented through a connectable peripheral device e.g. a USB compatible device, such that when the peripheral device is connected to a processing device that is used to provide arbitrary information such as text, video, pictures etc., each individual user with a processing device can to gain access to the display, e.g. screen. By being present at the meeting a user can pair the peripheral device to a processing device by inserting the peripheral device. The user can also pair the peripheral device to a base node or base unit that controls the display in the meeting room and which is connectable to the peripheral device via a communications network such as a wired or wireless communications network. The network is a shared resources communications network as different devices and participants can transmit data over the network. To achieve this, the peripheral device has a transceiver capable of transmitting the arbitrary data from the processing device to the display via the base node. In one option the information displayed on the local display of the processing device is screen scraped and transmitted. To allow this the peripheral device can include a portable application that is able to execute on the processing device leaving a zero-footprint on termination. Although a physically connectable peripheral device is convenient, the peripheral device could also be coupled to the processing device via a wireless connection, e.g. via the Bluetooth protocol.

For meetings with remote participants it is not possible to rely on the same hardware

connectable peripheral device to provide access from a remote location to the display in the meeting room directly. Typically, at home or in a hotel, the participant only has a phone and internet access on a laptop or some other kind of portable computing device. Remote participants lack context (e.g. non-verbal communications) and have less than ideal audio/video connections and consequently suffer from a power-asymmetry. Typically, remote participants also have no way of 'pushing' their contents on screen, since the meeting is controlled by a meeting organiser or director who orchestrates the sequence of presentations.

One of the key advantages of the present invention is to provide remote collaboration while maintaining a kind of 'situational awareness'. This means that what you see has a straightforward relationship with your internal mental map. This allows keeping track of multiple information flows and being able to correlate that quickly with any other information, e.g. with a search carried out on the local computing device.

In another aspect of the present invention confusion and frustration is avoided by:

1. retaining aspect ratio of any image that is sent from any location to the display in the meeting room or displays in meeting rooms (e.g. a long thing remains a long thing)
2. not overlapping images and/or windows on any of the display devices in the meeting rooms (e.g. you never have to guess or remember what's hidden)
3. showing the same arrangement of images on each screen (everyone sees the same things and can refer to them), this means that the topological arrangement of images on each screen of multiple screens is the same,
4. maximizing the use of screen real-estate (e.g. the images presented do not have borders containing no useful information), while preferably no allowing overlapping of the images
5. allowing local manipulation of zoom and pan but allowing to return to the default layout of item 3 above
6. arranging the images on each display taking into account the local display characteristics, such as any of resolution, pixel density, aspect ratio,
7. optionally also allowing an ongoing audio connection to be heard by all

participants, e.g. that verbal communications will be used to alter the contents of the screen.

With reference to Fig. 2, the base node software (6) running on a base node 36 can be adapted to display on the central display a splash screen (21) showing its readiness to receive arbitrary media content over its receiver. This splash screen (21) can also show instructions on how to use the system, as well as the configuration parameters (see later) to reach the base node 36. These configuration parameters are also shown in a transparent canvas at the bottom of the central display (22).

A client processing device 31 that wants to have its arbitrary media content displayed on the central display connected to the base node 36 is connected to a connection unit 47. The portable application 60 will be executed on the client processing device 31 as a host device. A first user interaction creates a connection between the portable application 60 and the base node 36 using the transmitter in the connection unit 47 and the receiver in the base node 36. This user action can be a connection of the connection unit 47 to the processing device 31. A second user interaction, this time on the input device 48, activates screen scraping by the portable application of the arbitrary media content from the client processing device display, which is then sent over the connector unit 47 to the base node.

The base node 36 receives the plurality of arbitrary media content coming from one or more connection units 47, and auto composes this media content for rendering on the central display.

The visual indicator 61 on the connection unit 47 indicates to the user and to other participants in the meeting that media content is being sent by that connection unit 47 to the base node 36 for display.

Repeating the second user interaction on the input device 48 of a connection unit 47 decouples the media content from that connection unit 47 from the base node 36. The base node 36 removes that media content from the composed image on the central display and recomposes the remaining content on the central display.

The content on the central display/projector is auto arranged as shown in figure 2. When user 1 adds content, his/her display will be scaled to fill the available central display canvas as much as possible, but without affecting the aspect ratio. When user 2 adds in, his content is added to the side of the first image. When user 3 adds his content, the arrangement is a suitable one such as triangle wise. Adding user 4, the image becomes a 2 by 2 tiling, which is the maximum available. When an additional user attempts to add content, he will be blocked. When a user initiates action to remove his/her content, his/her media content is removed from the central display and one moves backward in the composition sequence shown in figure 2.

Base node software

The base node software has one or more of the following features:

- First code for providing a means or a method step for correctly configuring the receiver of the base node.
- Second code for providing a means or a method step for listening for output of connection units trying to connect on a specific port.
- Optionally, third code for providing a means or a method step for a GUI for administration purposes, offered for example over a web interface.
- Optionally, fourth code for providing a means or a method step for publishing its presence over the network using the zeroconf protocol.
- Optionally, fifth code for providing a means or a method step for accepting and installing software updates of the base node as well as for the portable application software for the connection units.
- Sixth code for providing a means or a method step for providing facilities for pairing of connection units to the base node.
- Seventh code for providing a means or a method step for auto-composing of different incoming arbitrary media streams and rendering of composited image on display or projector screen.
- Eighth code for providing a means or a method step for receiving, decrypting and decoding incoming arbitrary media content.
- Optionally ninth code for providing a means or a method step for scaling of incoming arbitrary media streams

- Optionally tenth code for providing a means for displaying incoming arbitrary media content in accordance with a set of one or more rules.

Any of the above code may be stored on a non-transitory machine readable storage medium such as an optical disk, a magnetic disk, magnetic tape, solid state memory, USB mass storage device etc.

Portable application for the client processing device

The portable application comprises an algorithm for screen scraping. Screen scraping algorithms include VNC and RDP or similar. The algorithm may include a combination of algorithms such as VNC and RDP that are optimized for different content, e.g. static text or video. The portable application has one or more of the following features:

- Eleventh code for providing a means or a method step for connecting to a network including the base node.
- Twelfth code for providing a means or a method step for capturing video frame buffers of the client processing device, i.e. computer (C), also called screen scraping.
- Thirteenth code for providing a means or a method step for encoding, compressing and optionally encrypting these video frames and sending them over a secure link to the base node. Only changed areas such as rectangles or triangles of the screen (or any other suitable geometrical shape) need to be transferred, and different types of rectangles or triangles are encoded in different ways (e.g. RLE, JPEG,...) to optimise performance.
- Fourteenth code for providing a means or a method step for handling the connection unit.
- Fifteenth code for providing a means or a method step for initiating connection to base node.
- Sixteenth code for receive inputs from the input device on the connection unit.
- Seventeenth code for providing a means or a method step for sending state changes to the visual indicator on the connection unit.
- Optionally, eighteenth code for providing a means or a method step for

presenting the user a GUI (18).

- Optionally, nineteenth code for presenting GUI for administration of the portable application.
- Optionally, twentieth code for providing a means or a method step for displaying and activating a key on the display of the client processing device for allowing a user input to start the transfer of data from the client device to the base node.

Embodiments of the present invention provide a frame grabber. A frame grabber, known in the prior art, is an electronic device that captures individual, digital still frames from an analog video signal or a digital video stream. It is usually employed as a component of a computer vision system, in which video frames are captured in digital form and then displayed, stored or transmitted in raw or compressed digital form. In recent years, connections via USB, Ethernet and IEEE 1394 ("FireWire") interfaces have become prevalent. The frame grabber of the present invention, enables HDMI or Display Port capture instead via USB. The frame grabber preferably functions as follows:

- Connect to the base unit using a TCP/IP socket interface.
- Capture the video frame buffers of the computer,
- Encode, compress and encrypt these video frames and stream them over a secure link to the base unit. Only changed rectangles of the screen are transferred, and different types of rectangles are encoded in different ways (e.g. RLE, JPEG,...)
- Present the user a GUI

Any of the above code may be stored on a non-transitory machine readable storage medium such as an optical disk, a magnetic disk, magnetic tape, solid state memory, nand Flash, etc.

In this embodiment the portable application stored on the connection unit, and is executed in an execution context on the client processing device. The portable application does not need to be copied to or installed on the computer. It can be executed directly from the connection unit. It will only be copied temporarily into an execution context on the client processing device. There are also no changes in

configuration required or settings in the client processing device. This means that nothing will remain on the client processing device when the connection unit is removed. It also implies that the portable application will run on client processing devices where the user does not have the necessary access rights to install software.

The portable application is designed in such a way that

- No specific drivers need to be installed on the client processing device.
- Pre-installed drivers are used, e.g. for classes of peripheral devices.
- It is independent from vendor specific graphics hardware.
- It runs on at least one and preferably on a variety of different client processing devices, including Windows, Mac OS/X, Linux, Android, iOS and many others.

Advantages

The present application has one or more of the following advantages:

- No need for a master role in the meeting
- Standard plug and play connectivity of connection units to base node
- Simple and well known user actions are employed
- Own networking facilities of client processing devices not blocked
- No configuration changes on the client processing device
- Input devices are easily accessible; e.g. large size
- Program updates of portable application and server program can be performed locally
- Portable applications are used, no installation, multi-platform, no vendor specifics
- Particular implementation of screen scraping done by portable application avoids vendor specific graphics devices
- Standard drivers are used so no need to install extra drivers
- No configuration changes on the client processing devices
- Zero footprint applications on client processing devices – nothing to clear up or adjust or reset
- Own networking facilities of client processing devices not blocked

- No configuration changes on the user computers
- Low virus, malware and spyware risk

The portable application may be stored on a non-transitory machine readable storage medium such as an optical disk, a magnetic disk, magnetic tape, solid state memory, nand Flash etc.

Second Embodiment

In the second embodiment, referring to Figs. 2 to 5, the base node is a separate physical processing device called base unit (B), comprising permanent storage, memory, a processing engine, a wireless access point (4), a plug and play interface such as a USB port (11), a graphics display output adapter (5) like VGA/DP/DVI/HDMI, and optionally an audio output adapter (27). An input device having an actuator such as a button 13 and a visual indicator 14 are optional.

The connection unit is a physical device in the form of an external peripheral device (shown in the drawings as a "dongle" D) comprising permanent storage storing the portable application (7) and configuration parameters (12), memory, a processing engine (e.g. CPU, FPGA), a wireless transmitter such as WiFi (3) or other wireless transmitters such as LiFi, a plug and play interface such as a USB interface (2), a button as input device (9), an LED ring as visual indicator (10). The portable application is stored on the peripheral device (7).

The client processing device is host device, for example a computer or laptop comprising a display, a plug and play interface such as a USB port (2), memory, and a processing engine such as a microprocessor.

The system thus comprises

- an external peripheral device (D) that has a plug and play interface such as a USB interface (2) on one end and a communications interface such as a wireless interface configured as client (3) on the other end.
- a base unit (B) that has a communications interface such as a wireless interface

configured as access point on one end (4) and a video card adapter (5) like VGA, DVI, DP or HDMI on the other end.

- a portable application (7) stored on the peripheral device (D) but executed on the client processing device (C)
- a base node software (6) stored and executed on the base unit (B)

The external peripheral device (D) also preferably has any one or any combination of:

- a large button as actuator for the input device (9) allowing user interaction with the peripheral device. The button preferably has an actuation surface area of between 100 and 14,400 square mm.
- visual indication such as a LED (10) allowing user feedback from the peripheral device. The user feedback can be in the form of a light ring.

An advantage of embodiments of the present invention is to provide data transfer to the peripheral device via a peripheral interface such as a USB interface on any processing device such as a computer in a manner that is largely operating system independent and without leaving a footprint (Zero-Footprint). Installation of drivers and/or applications onto such a processing device as a computer is not necessary wherever pre-installed generic drivers are present. Administrator rights on the processing device such as a computer are preferably not necessary. To avoid the need for administrator rights, embodiments of the present invention use other peripheral device pre-installed drivers such as USB class drivers supported without any extra installation. Embodiments of the present invention route at least screen scraped data presented by client software running on the processing device for transfer to a communications network via a peripheral device such as a USB device. This bypasses any network interface of the processing device C (and hence many firewalls) but only for the specific client software. Other applications are not affected and can make use of the standard network interfaces, i.e. packets from/to the TCP/IP stack are transferred to a network device as normal. The client software is launched from the peripheral device such as a USB composite device or storage device as a portable application, which can avoid that any traces are left on the host OS.

Basic usage scenario of the second embodiment

The base node software (6) displays on the projector a splash screen – (21) in figure 5 - showing its readiness to receive arbitrary media content over its receiver (4). This splash screen (21) also shows instructions on how to use the system, as well as the configuration parameters (see later) to reach the base node. These configuration parameters can also be shown in a transparent canvas at the bottom of the central display (22).

To avoid user interaction for the configuration of the connection between peripheral device and base unit, a pairing process is used. This pairing process provides the peripheral device, i.e. the connection unit with networks parameters needed to set up the local network. As an example, the peripheral device can be briefly plugged into the USB port (11) of the base unit (B). The base unit then optionally does a software validity check, optionally does a software update of the portable application stored on the peripheral device, and writes the connection parameters on the peripheral device (D) required for the peripheral device and base unit to find each other to the permanent storage (8). For example, when using WiFi, this could be the SSID, WEP/WPA2 keys and IP address and port number of the base unit's receiver, as well as the port number used by the base node software, but not all of these are necessarily needed to be exchanged.

A client processing device that wants to have its arbitrary media content displayed on the central display connected to the base node (5) connects a peripheral device (D) to its USB port via (2). The peripheral device presents itself to the computer over interface (2) as a composite device comprising a mass storage device and a keypad. This has the major advantage that no specific driver is required, since all these devices are natively supported in every personal computer system that has a USB port. If autorun is enabled, then the computer will automatically execute the client software (7) stored in mass storage (8) on the peripheral device. The first user interaction mentioned in the general case is then just the connection of the peripheral device to the USB port. If security measures disabled auto-run, the user needs to explore the mass storage on the mass storage of the peripheral device and start the portable application

manually.

The portable application will use the wireless, e.g. WiFi or LiFi interface of the peripheral device (3) to connect to the correct base node. To know the right base unit to connect to, the configuration parameters needed to make this connection are stored in the database (12) on the mass storage device (8) during the pairing process described earlier.

Once the connection is made, the peripheral device goes into connected mode. This means that there is now at least one channel from the peripheral device to the base unit. The content is not shown yet. The LED (10) on the peripheral device now turns white to give a visual indication of this new state.

When the user at the computer (C) wants to show her content, she presses the button (9). When the button was previously in state "connected" (see figure 6), it will check the state of the base unit (P). If the base unit is not in state "full", the peripheral device will send the screen scraped arbitrary media content to the base unit (B), which will add the media content to the composition on the central display. The peripheral device LED (10) now turns red to indicate "showing" state (figure 6).

The button (9) acts as a toggle. When the user presses the button again, that computer displays content will be removed from the projector. The LED (10) goes back to white.

Use of the auto-run feature is optional if possible and enabled on the computer (C) to start the client software (7) as soon as the peripheral device is plugged in. On Windows for example, this means mounting the peripheral device as a mass storage device and using the autorun.inf file stored on the peripheral device.

In many cases however, this auto-run feature will be disabled for security reasons. In that case, we will, if possible and enabled on the computer (C), use the auto-play feature to show the logo of the connected peripheral device on the desktop of the computer. The user then needs to double click on that logo to start the client software.

If the auto-play feature as described above is also not possible or enabled, the user must browse to the file system of the connected peripheral device and start the application manually. This means double clicking the client.exe file on Windows, client.app on Mac OS/X or tapping the appropriate application icon on a tablet or any mobile device with touch screen.

Third Embodiment: Portable application stored on standard solid state memory such as a USB stick.

In the third embodiment, the portable application is stored on a solid state memory such as a regular USB memory stick (figure 7).

With a solid state memory such as a regular USB memory stick, there is no input device, visual indicator or transmitter of the kinds described above for the connection unit. This means that the system needs to:

- Use the transmitter/receiver from the client processing device.
- Use as input device a key or button on the client processing device like a physical key on the keyboard, a special mouse press, a button area on a touch screen, a button displayed on the screen to be clicked on with a mouse pointer.
- Present the visual indicator on the client processing device's display.

The client processing device then looks like figure 8.

This embodiment provides a peripheral interface such as the USB interface on any processing device acting as a host device such as a computer in a manner that is largely operating system independent. Installation of drivers and/or applications onto such a processing device as a computer is not necessary wherever pre-installed generic drivers are present. Administrator rights on the processing device such as a computer are preferably not necessary. To avoid the need for administrator rights, this embodiment uses other peripheral device pre-installed drivers such as USB class drivers supported without any extra installation. This embodiment of the present invention routes at least screen scraped data presented by client software running on the processing device for transfer to a communications network via a network connection of the processing device. The client

software is launched from the peripheral device such as the USB device as a portable application.

The first user operation then comprises:

- plugging in the solid state device such as a USB memory stick,
- starting the portable application (if autorun is disabled)
- configuring the transmitter, such as the wired or wireless network interface, on the client processing device to connect to the correct base node, using the configuration parameters (22) shown on the central display
- triggering the connection of the portable application with the base node, for example by interacting with an element on the GUI (18) of the portable application presented on the display of the client processing device.

Presenting visual feedback on user actions is in this embodiment also done using elements in the GUI of the display of the client operating device.

In this embodiment, the advantage of zero footprint is partly realized by the portable application in the sense that no software is installed on or copied to the client operating device, but there is a configuration change needed to connect the transmitter of the client operating device with the base node, which needs to be undone afterwards.

Optionally, the portable application can make the configuration changes to the transmitter for the user in the background.

Advantages lost in this embodiment

- Partial loss of zero footprint nature of portable application
- More complex first user interaction
- More expertise required from user
- GUI needed on client operating device display, which is possibly also shown on central display
- Need to find free key on client operating device when using physical key for second user action
- Network interface is blocked from other uses by portable application

Optionally, the last point can be avoided by using the base unit as a gateway to the network that the client operating device wanted to connect to through its own interface.

Advantages are:

- tight control of user connectivity to corporate network through settings on the base unit
- keep network connectivity intact even when transmitter is now also used for display purposes

Disadvantage is a higher vulnerability of the system because the display connection is now possible a doorway into the corporate network.

What remains as advantages are

- the availability of a physical medium to distribute the portable application to users
- no need to install or copy software to client operating device
- easy way to maintain software updates on the connection units (here: memory sticks) via the base unit
- possibility to write configuration data on the connection unit by the base unit, for example in the form of a configuration profile that can be read and used by the client operating device

Fourth Embodiment: Software only client installed on the client processing device.

This embodiment is similar to the third embodiment, with as only difference that the software is copied on the client operating device (figure 9). In this case, no plug and play port such as a USB port is required on the client operating device.

This embodiment will typically be used for tablet PC's and mobile devices. In that case

- there is often no USB port available
- application distribution is easy and widely accepted through application stores

Fifth embodiment: Base node software OEM'ed to projector or display equipment

In this embodiment, the base node is not realized as a separate physical box, but integrated

into the processing unit inside a display or projector. All other details are as previously described.

Sixth embodiment

In this embodiment, the base node is not realized as a separate physical box, but integrated into the codec of a video conferencing equipment. All other details are as previously described.

Seventh embodiment: Remote meeting participant

In this embodiment, one or multiple client operating devices are not in the direct vicinity of the base node but on a remote location.

To accommodate this case, the following adaptations are needed:

- further compression and or scaling of the arbitrary media content to allow use of low bandwidth connection
- possibility to communicate connection parameters of the base node to a remote user
- connectivity of the base node to the WAN network to which the remote user is connected

All other details are as previously described.

Eighth embodiment: multiple base nodes

In this embodiment, multiple base nodes are used. This can be done for different purposes:

- connectivity of multiple central displays
- extension of real estate of central display
- connectivity of base nodes in different remote locations

This provides the advantage that one can present on multiple base units from a single peripheral device. This is useful for a number of cases:

- personal peripheral device: user can have a personal peripheral device that is paired with

multiple meeting rooms that he regularly uses
- use in meeting room with multiple base units each controlling a different display in the same meeting room

The proposal uses a special variant of the peripheral device called a multi base peripheral device. The multi base peripheral device is equipped with a rotating wheel around the circular central "show me" button. This could be a mechanical rotating multi-position switch or something like the touch wheel on the iPod classic.

The pairing of this multi-base variant of the peripheral device:
- the rotation wheel is put in the position of the corresponding base unit.
- the peripheral device is paired to the base node in the regular way
- the configuration parameters are stored in a permanent storage location; every position of the rotating wheel has a corresponding set of connection parameters (e.g. different rows in a table) each corresponding with a particular base

The connection of the peripheral device is as follows:
- multi-base peripheral device X is plugged into a PC
- rotation wheel on peripheral device X is put in position A
- peripheral device X reads configuration parameters in position A of its internal memory
- peripheral device X connects to base node A
- base node A indicates connection of multi-base peripheral device X on central display screen
- rotation wheel on peripheral device X is put in position B
- peripheral device X reads configuration parameters in position B of its internal memory
- peripheral device X connects to base node B
- base node B indicates connection of multi-base peripheral device X on screen
- continue until correct base is selected with rotation wheel
- click the peripheral device input device e.g. button to show content on central display of base node
- rotating the wheel always first clicks away content from the base of the last position

Ninth embodiment

Fig. 10 shows a peripheral device 47 in accordance with an independent embodiment of the present invention including an input device. This embodiment can be used with any of the embodiments described above.

The peripheral device is configured as a connection unit and is a physical device in the form of a connector for a plug and play interface of a user processing device as a host computer such as a USB connection, a flexible data and power connection connected to the connector and a base, the base having an actuator, e.g. a button configured to be an input device with the functions as described above.

The base and/or the actuator is preferably large in size, e.g. having a surface area between 100 and 14,400 square mm. The base can be square, rectangular, round, hexagonal, oval, polygonal in shape or any other ergonomically suitable shape. The actuator is preferably round but can be square, rectangular, hexagonal, oval, polygonal in shape etc. there can be more than one actuator on one base.

The length of the flexible data and power connection, e.g. cable is preferably adapted to place the peripheral device (when in its connected in its operating position), especially the base and the actuator, in the region between the boundary of the connected user processing device and the ergonomic boundary as defined above. In addition the flexible data and power connection should be adapted so that the base lies flat on the meeting table independent of the orientation of the connector needed to insert the connector into the plug and play interface.

The base preferably includes electronics such as having permanent storage for storing the portable application and the network configuration parameters, memory, a processing engine (e.g. CPU, FPGA), a wireless transmitter/receiver such as for WiFi or LiFi, a plug and play interface such as a USB interface, a LED ring as visual indicator. The visual indicator can be used for the LiFi interface. The portable application can be stored on the peripheral device, i.e. in the base. The visual indicator is for allowing user feedback from the connection unit of the status of any activity.

- Some examples for activation of the actuator which can be used with any of the embodiments of the present invention:

- Sound activated (hand clap, voice recognition, computer sound, music, ...)
- Remote controlled via wireless connected device (IR, Bluetooth, WiFi, ...)
- Light activated
- Pressure activated, e.g. depression with a finger or hand.
- Touch activated
- Proximity ('near-touch' on the actuator or bringing the actuator close to some object
- Biometric reader such as Fingerprint reader, Iris scanner, DNA analyser
- Keypad, e.g. for entering Keycode e.g. a password

Alternative embodiments

In the above embodiments, once the connection is made between the connection device and a host computer, the peripheral device goes into connected mode. This means that there is at least one channel from the peripheral device to the base node. In accordance with any of the embodiments of the present invention a plurality of channels can be set up between the connection device and the base node. These channels may be logical channels.

Some examples for such a multichannel arrangement may include the first and one or more of the additional channels:

- First channel is for the Scraped image stream (XDS)
- Second channel is for GPU commands (OpenGL, DirectX)
- Third channel is for Mouse pointer coordinates (absolute, relative)
- Fourth channel is for Mouse pointer icons
- Fifth channel is for Image data files (JPEG, PNG, GIF, ...)
- Sixth channel is for Multimedia data files or streams (MPEG2, MPEG4, OGG, H.26x, ...)
- Seventh channel is for Audio data files or streams (MP3, MP4, AAC, WMA, ...)
- Eighth channel is for text or Document data files (DOC, DOCX, PPT, PPTX, ODT, ODS, PDF, ...)
- Ninth channel is for transmission of a priority value 1,2, 3... as described above.

In the above embodiments, a particular method of pairing the peripheral device with the base node has been described. Any of the embodiments of the present invention may include other pairing mechanisms of which some examples are given below.

- Some examples for pairing
  - Plug in the peripheral device, to a generic peripheral device port such as a USB port of the base node or other USB enabled device. Pairing info is transmitted over the generic peripheral interface such as USB.
  - The Signal strength of the wireless channel to the base node is used to identify which base nod is to be used
  - The Signal strength of the wireless channel or any other channel. Example is an NFC/RFID transmitter can be provided underneath the meeting room table. Putting the user processing device such as a laptop and the peripheral device plugged in on this table automatically pairs the peripheral device with the base of this meeting room
  - Manual pairing (e.g. by entering IP address, hostname, wireless ID (like SSID on WiFi)).

What is claimed is

1. An electronic meeting tool for communicating arbitrary media content from users at a meeting comprising:

a node configuration means adapted to operate a display node of a communications network, the display node being coupled to a first display, the node configuration means being adapted to receive user selected arbitrary media content and to control display of the user selected arbitrary media content on the first display; and

at least one peripheral device adapted to communicate the user selected arbitrary media content via the communications network, wherein the peripheral device is a connection unit comprising:

(c) a connector adapted to couple to a port of a processing device having a second display, a memory and an operating system; and

(d) a transmitter for communicating with the communications network,

a program adapted to be loaded onto the processing device and to run on the operating system of the processing device, said program being adapted to obtain user selected arbitrary media content, said program leaving a zero footprint on termination, and

an input device to allow the user to carry out a user action that triggers transfer of said user selected arbitrary media content to said transmitter through said port.

2. The electronic meeting tool of claim 1 wherein the program is stored on the peripheral device.

3. The electronic meeting tool of any previous claim wherein the transmitter is a wireless transmitter or transceiver.

4. The electronic meeting tool of any previous claim wherein the peripheral device is a plug-and-play device.

5. The electronic meeting tool of any previous claim wherein the program is adapted to screen scrape content of the second display.

6. The electronic meeting tool of any previous claim wherein the input device is physical actuator coupled to the peripheral device.

7. The electronic meeting tool of claim 6 wherein the physical actuator has a surface area of between 100 and 14,400 square mm.

8. The electronic meeting tool of any previous claim wherein the input device is a key displayed on the second display.

9. The electronic meeting tool of claim 8 wherein the key displayed on the second display is not screen scraped by the program.

10. A method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with at least one pre-installed generic driver providing a generic communications protocol for communication between processing device and a standard class of peripheral devices, the method comprising the steps of:
a) coupling a peripheral device to the processing device, the peripheral device having a transceiver;
b) setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;
c) coupling the processing device to a communications network via the peripheral device;
d) routing screen scraped data between the processing device and the communication network via the means for communication, wherein the generic communication protocol is used for transferring the screen scraped data between the processing device and the peripheral device.

11. The method of claim 10 wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

12. The method of claim 10 wherein Step b) comprises presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

13. The method of claim 10 wherein Step b) comprises presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

14. The method of any of claims 10 to 13 wherein a client application is stored on the peripheral device which when run on the processing device obtains the screen scraped data.

15. The method of claim 14 wherein the client application is a portable application.

16. A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a standard class of peripheral devices, the peripheral device comprising a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:
a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;
a second software code portion for connecting the processing device to a communications network via the peripheral device, the peripheral device having a transceiver;
a third software code portion for screen scraping data from the processing device; and
a fourth software code for routing screen scraped data between the processing device and the communications network over the means for communication; wherein the first software code portion is adapted to use the generic communication protocol for transferring the screen scraped data between the processing device and the peripheral device.

17. The peripheral device of claim 16, wherein the first software code portion is adapted to present the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

18. The peripheral device of claim 16, wherein the first software code portion is adapted to

present the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

19. The peripheral device of claim 16, wherein the first software code portion is adapted to present the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

20. The peripheral device of any of the claims 16 to 19 wherein said executable software code comprises fifth code for providing a means for connecting to the communications network including a base node.

21. The peripheral device of any of the claims 16 to 20 wherein said executable software code comprises sixth code for providing means for capturing video frame buffers of the processing device.

22. The peripheral device of any of the claims 156to 21 wherein said executable software code comprises seventh code for providing a means for encoding, compressing and optionally encrypting the screen scraped data and sending the screen scraped data the communication network.

23. The peripheral device of any of the claims 16 to 21 wherein said executable software code comprises eighth code for providing a means for handling the peripheral device.

24. The peripheral device of any of the claims 20 to 23 wherein said executable software code comprises ninth code for providing means for initiating connection to the base node.

25. The peripheral device of any of the claims 16 to 24 wherein said executable software code comprises tenth code for receiving inputs from an input device on the peripheral device.

26. The peripheral device of any of the claims 16 to 25 wherein said executable software code comprises eleventh code for providing a means for sending state changes to the visual indicator on the peripheral device.

27. The peripheral device of any of the claims 16 to 26 wherein said executable software code comprises Twelfth code for providing a means for presenting to the user a GUI.

28. The peripheral device of any of the claims 16 to 27 wherein said executable software code comprises thirteenth code for presenting a GUI for administration of the said executable software code when executed as a portable application.

29. The peripheral device of any of the claims 16 to 28 wherein said executable software code comprises fourteenth code for providing a means for displaying and activating a key on the display of the client processing device for allowing a user to input the start the transfer of data from the processing device to the base node.

30. A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a standard class of peripheral devices, the peripheral device comprising a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:
a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;
a second software code portion for connecting the processing device to a communications network via the peripheral device, the peripheral device having a transceiver; and
a third processing software code for routing data between the processing device and the communications network over the means for communication; wherein the first software code portion is adapted to use the generic communication protocol for transferring the data between the processing device and the peripheral device, and
an input device coupled to the peripheral device, the input device being adapted to react to a user action to trigger the transfer of the data from the processing device to the peripheral device.

31. The peripheral device of claim 30, wherein the first software code portion is adapted to present the peripheral device to the processing device as a human interface device and

wherein the pre-installed generic driver is a human interface device driver.

32. The peripheral device of claim 30, wherein the first software code portion is adapted to present the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

33. The peripheral device of claim 30, wherein the first software code portion is adapted to present the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

34. The peripheral device of any of the claims 30 to 33 wherein the input device is physical actuator coupled to the peripheral device.

35. The peripheral device of claim 34 wherein the physical actuator has a surface area of between 100 and 14,400 square mm.

36. The peripheral device of any of the claims 30 to 35 wherein the input device is a key for display on the display.

37. The peripheral device of any of the claims 30 to 36 wherein said executable software code comprises fourth code for providing a means for connecting to the communications network including a base node.

38. The peripheral device of any of the claims 30 to 36 wherein said executable software code comprises fifth code for providing a means for capturing video frame buffers of the processing device.

39. The peripheral device of claim 38 wherein said executable software code comprises sixth code for providing a means for encoding, compressing and optionally encrypting the video frames and sending them over a secure link to the base node.

40. The peripheral device of any of the claims 30 to 39 wherein said executable software code comprises seventh code for providing a means for handling the peripheral device.

41. The peripheral device of claim 39 or 40 wherein said executable software code comprises eighth code for providing a means for initiating connection to the base node.

42. The peripheral device of any of the claims 30 to 41 wherein said executable software code comprises ninth code for receive inputs from an input device on the peripheral device.

43. The peripheral device of any of the claims 30 to 42 wherein said executable software code comprises tenth code for providing a means for sending state changes to the visual indicator on the peripheral device.

44. The peripheral device of any of the claims 30 to 43 wherein said executable software code comprises eleventh code for providing a means for presenting the user a GUI.

45. The peripheral device of any of the claims 30 to 44 wherein said executable software code comprises twelfth code for presenting GUI for administration of the executable software code when executed as a portable application.

46. The peripheral device of any of the claims 37 to 45 wherein said executable software code comprises thirteenth code for providing a means for displaying and activating a key on the display of the processing device for allowing a user input to start the transfer of data from the processing device to the base node.

47. A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a standard class of peripheral devices, the peripheral device comprising a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via the peripheral device, the peripheral device having a transceiver;

a third software code portion for receiving media content from the network and for displaying the media content on the display in accordance with a set of rules; wherein the first software code portion is adapted to use the generic communication protocol for transferring the media content between the peripheral device and the processing device.

48. The peripheral device of claim 47 wherein said executable software code comprises fourth code for providing a means for correctly configuring a receiver as an access point.

49. The peripheral device of claim 47 or 48 wherein said executable software code comprises fifth code for providing a means for listening for output of connection units trying to connect on a specific port.

50. The peripheral device of any of the claims 47 to 49 wherein said executable software code comprises sixth code for providing a means for a GUI for administration purposes.

51. The peripheral device of any of the claims 47 to 50 wherein said executable software code comprises seventh code for providing a means for publishing its presence over the network using the zeroconf protocol.

52. The peripheral device of any of the claims 47 or 51 wherein said executable software code comprises eighth code for providing a means for accepting and installing software updates.

53. The peripheral device of any of the claims 47 or 52 wherein said executable software code comprises ninth code for providing a means for providing facilities for pairing of connection units to the processing device.

54. The peripheral device of any of the claims 47 or 53 wherein said executable software code comprises tenth code for providing a means for auto-composing of different incoming arbitrary media streams and rendering of composited image on display.

55. The peripheral device of any of the claims 47 or 54 wherein said executable software code comprises eleventh code for providing a means for receiving, decrypting and decoding incoming arbitrary media content.

56. The peripheral device of any of the claims 47 or 55 wherein said executable software code comprises twelfth code for scaling of incoming arbitrary media streams.

57. The peripheral device of any of the claims 47 or 56 wherein said executable software code comprises thirteenth code for providing a means for displaying incoming arbitrary media content in accordance with a set of rules.

58. A method for communicating arbitrary media content from users at a meeting comprising:
operating a display node of a communications network, the display node being coupled to a first display, to receive user selected arbitrary media content and to control display of the user selected arbitrary media content on the first display; and
connecting a peripheral device to a port of a processing device and communicating the user selected arbitrary media content via the communications network,
loading a program onto the processing device and running the program on the operating system of the processing device to obtain user selected arbitrary media content, said program leaving a zero footprint on termination, and
triggering transfer of said user selected arbitrary media content to said transmitter through said port after a user action on an input device.

59. A peripheral device comprising:
a base
a connector for connection to a plug and play port of a host processing device,
a flexible connection between the base and the connector for transferring data signals and power,
an actuator on the base for actuating a signal and for transferring the signal to the connector for transfer to the port, wherein the base has electronics comprising permanent storage for storing a portable application, a processing engine, a transceiver and a visual indicator.

60. A method for providing communication connectivity from a processing device,
setting up a communications network between a base node of the communications network and a peripheral device coupled to the processing device;

transferring media content between the processing device and the peripheral device, transmitting the media content from the peripheral device to the communications network, receiving media content from the communications network at the base node and displaying the media content on a display in accordance with a set of rules.

5

61. Any of the above software code stored on a non-transitory storage medium.

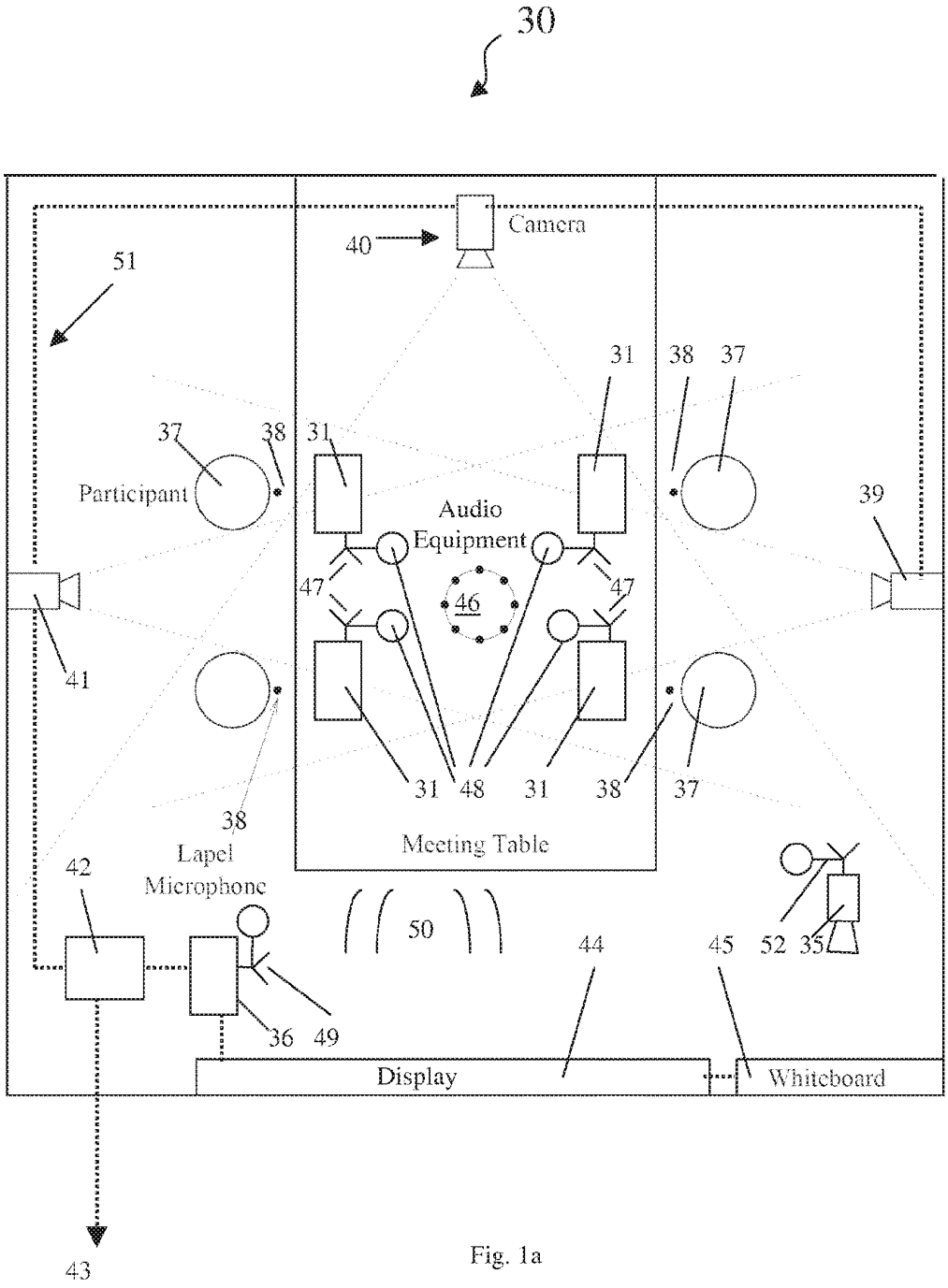

30
Camera
40
51
31
38
37
37
38
31
Participant
Audio
Equipment
39
47
46
47
41
31
48
31
38
37
38
Lapel
Microphone
Meeting Table
42
50
44
45
52
35
36
49
Display
Whiteboard
43

Fig. 1a

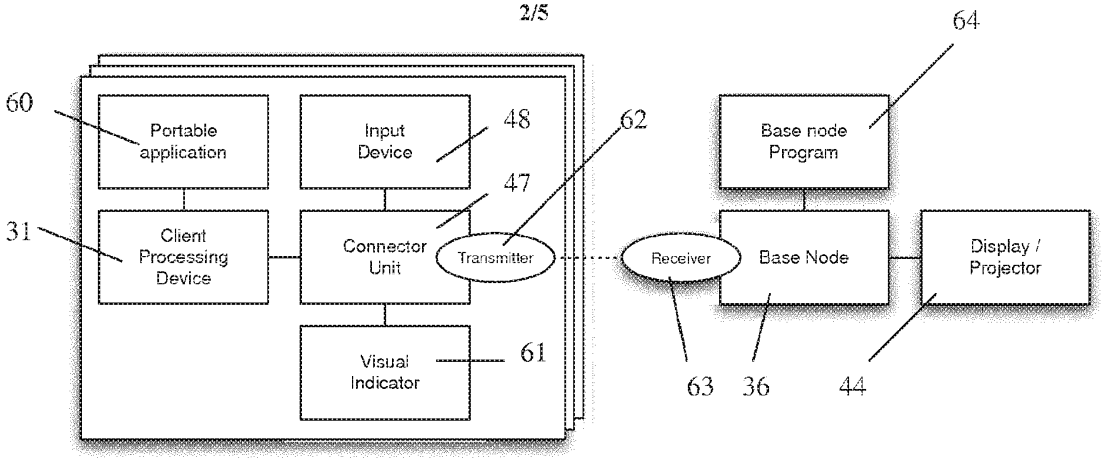

60
Portable application
Input Device
48
62
64
Base node Program
47
31
Client Processing Device
Connector Unit
Transmitter
Receiver
Base Node
Display / Projector
Visual Indicator
61
63
36
44

Fig. 1b

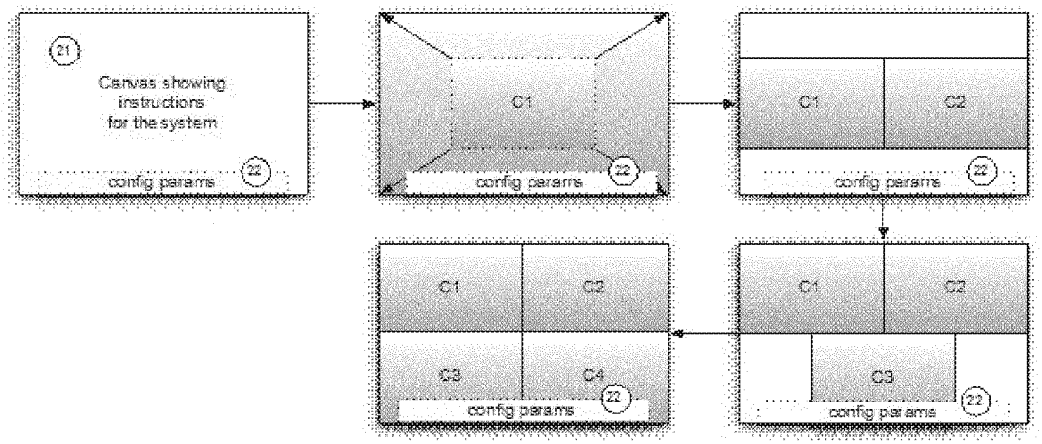

21
Canvas showing instructions for the system
config params
22
C1
C2
C3
C4

Fig. 2

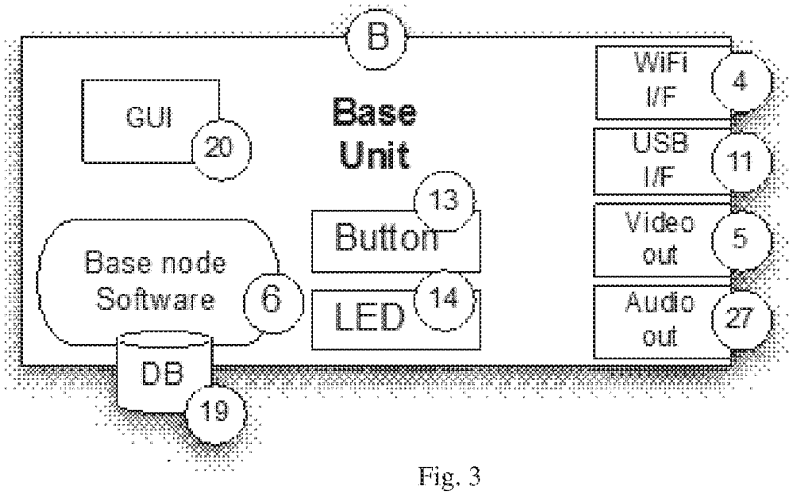


Fig. 3

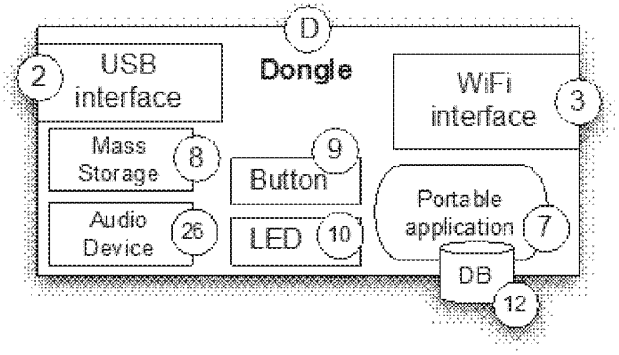


Fig. 4

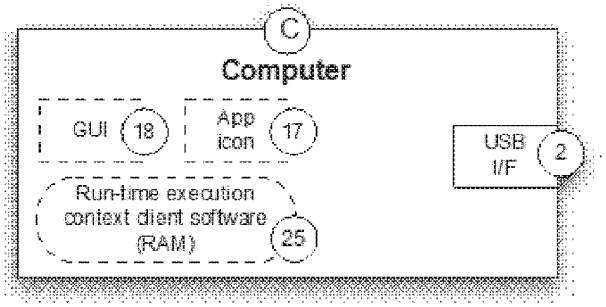


Fig. 5

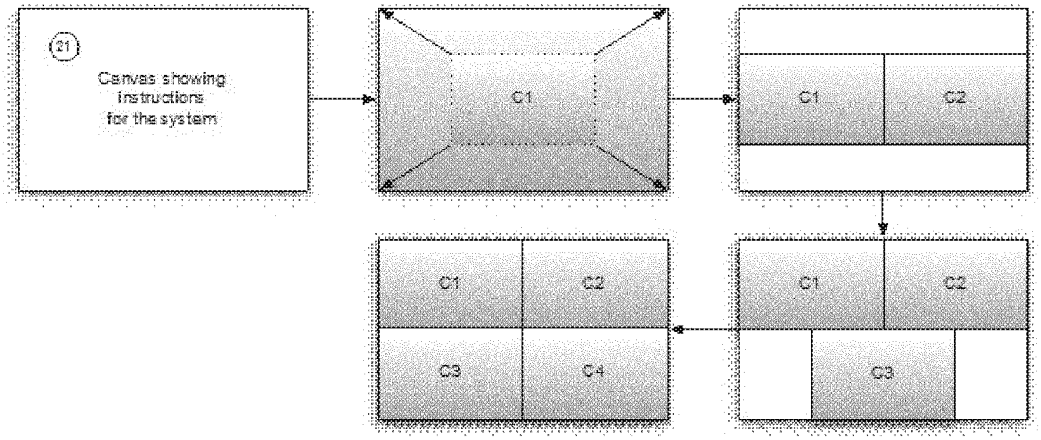


Fig. 6

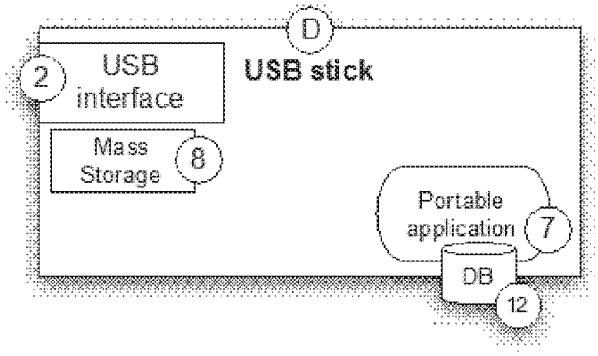


Fig.7

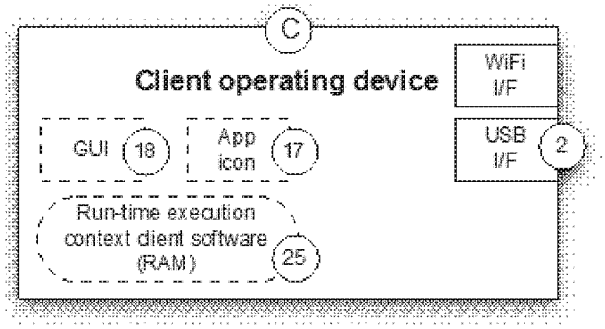


Fig. 8

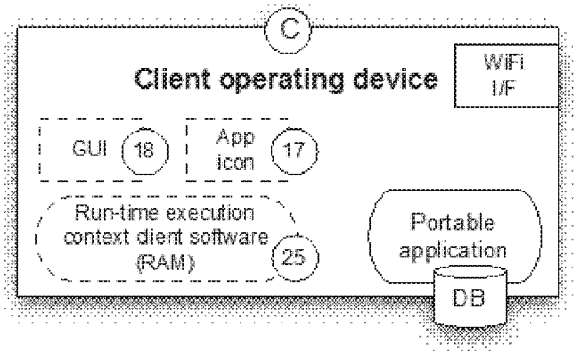

C
Client operating device
WiFi I/F
GUI
18
App icon
17
Run-time execution context client software (RAM)
25
Portable application
DB

Fig. 9

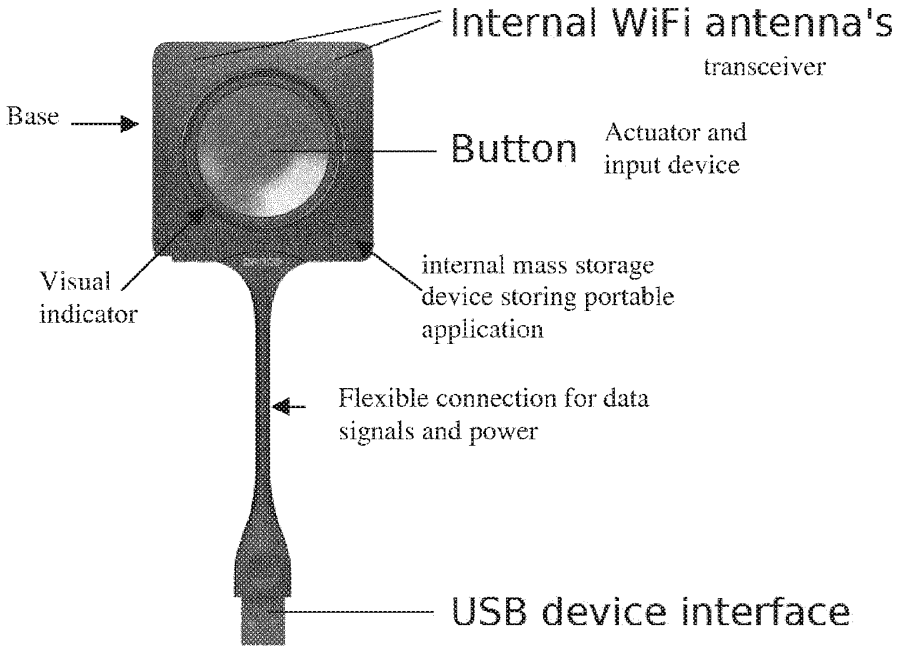

Internal WiFi antenna's
transceiver
Base
Button
Actuator and input device
Visual indicator
internal mass storage device storing portable application
Flexible connection for data signals and power
USB device interface

Fig. 10

JP 2008-165007 A

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(71)Applicant BROTHER IND LTD
(72)Inventor UCHIDA KATSURA, AMANO KATSUHIRO
(54)REMOTE OPERATION DEVICE OF REMOTELY CONTROLLING IMAGE PROJECTION DEVICE, AND IMAGE PROJECTION SYSTEM

(57)Abstract
[Problem to be solved] To facilitate communication connection work between a computer apparatus and an image projection device.
[Solution] An image projection system includes: a remote operation device 2 for remotely controlling the operation of the image projection device 3 which receives an image data transmitted by wireless communication from the computer apparatus 4 and projects an image corresponding to the image data; and a wireless device 1 capable of communication connection to either of the computer unit 4 or the remote operation device 2, wherein the remote operation device 2 generates a wireless setup information necessary for the wireless communication of the image projection device 3 and the computer apparatus 4, writes wireless setup information into the wireless device 1 with a predetermined timing, notifies the wireless setup information to the computer apparatus 4 through the wireless device 1 and, moreover, notifies the wireless setup information to the image projection device 3 by means of infrared ray communication.

[Representative diagram] FIG. 3

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H04N 5/00	(2006.01)	H04N	5/00	A	5C056

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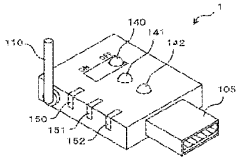
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5C056 AA05　BA10　DA11

(54)【発明の名称】画像投影装置を遠隔制御する遠隔操作装置及び画像投影システム

(57)【要約】
【課題】コンピュータ装置と画像投影装置との通信接続作業を容易にすること。
【解決手段】コンピュータ装置４から無線通信により送信される画像データを受信し、画像データに応じた画像を投影する画像投影装置３の動作を遠隔制御する遠隔操作装置２と、コンピュータ装置４及び遠隔操作装置２のいずれにも通信接続可能なデバイス１とを設け、遠隔操作装置２に画像投影装置３とコンピュータ装置４の無線通信に必要な無線設定情報を生成し、所定のタイミングで無線設定情報をデバイス１に書き込んで、デバイス１を介してコンピュータ装置４に無線設定情報を通知し、一方、無線設定情報を画像投影装置３へ赤外線通信により通知する。
【選択図】図３



【特許請求の範囲】
【請求項１】
外部のコンピュータ装置から無線通信により送信される画像データを受信する無線部を有し、前記画像データに応じた画像を投影する画像投影装置と、この画像投影装置の動作を遠隔制御する遠隔操作装置と、前記コンピュータ装置及び前記遠隔操作装置のいずれにも通信接続可能なデバイスとを備えた画像投影システムにおいて、
前記遠隔操作装置は、
前記画像投影装置と前記コンピュータ装置間の無線通信に必要な無線設定情報を生成する無線設定情報生成手段と、
所定のタイミングで前記無線設定情報を前記デバイスに書き込む無線設定情報書込手段と、
前記デバイスに書き込んだ無線設定情報を前記画像投影装置へ通知する通知手段と、を有し、
前記デバイスは、
前記遠隔操作装置によって書き込まれた前記無線設定情報を前記コンピュータ装置へ出力する制御部を有する
ことを特徴とする画像投影システム。
【請求項２】
前記遠隔操作装置は、
前記デバイスと接続するコネクタを有し、
前記無線設定情報書込手段は、
前記無線設定情報を前記コネクタを介して前記デバイスに書き込む
ことを特徴とする請求項１に記載の画像投影システム。
【請求項３】
前記無線設定情報生成手段は、
前記コネクタに前記デバイスが接続されたとき、前記無線設定情報を更新する
ことを特徴とする請求項２に記載の画像投影システム。
【請求項４】
前記所定のタイミングは、前記コネクタに前記デバイスが接続されたことを検出したときであることを特徴とする請求項２又は請求項３に記載の画像投影システム。
【請求項５】
前記遠隔操作装置は、ワイヤレス信号を送信するワイヤレス送信部を有し、前記デバイスは前記遠隔操作装置からのワイヤレス信号を受信するワイヤレス受信部を有しており、
前記無線設定情報書込手段は、
前記デバイスへワイヤレス信号により前記無線設定情報を送信することによって、前記デバイスへの前記無線設定情報の書き込みを行う
ことを特徴とする請求項１に記載の画像投影システム。
【請求項６】
前記遠隔操作装置は、
前記画像投影装置の起動指示及び／又は停止指示を行うための起動制御指示部を有し、
前記無線設定情報生成手段は、
前記起動制御指示部が操作されたとき、前記無線設定情報を更新する
ことを特徴とする請求項１～５のいずれか１項に記載の画像投影システム。
【請求項７】
前記所定のタイミングは、前記起動制御指示部が操作されたときである
ことを特徴とする請求項６に記載の画像投影システム。
【請求項８】
前記デバイスは、
前記コンピュータ装置に接続するコネクタと、
前記コネクタを前記コンピュータ装置に接続したときに、前記遠隔操作装置から書き込

まれた前記無線設定情報に基づいた設定により前記画像投影装置の無線部と通信を行う無線通信部と、

画像データを前記無線通信部を介して前記画像投影装置へ送信する画像送信手段としての機能を前記コンピュータ装置に実行させるプログラムを格納するプログラム格納部と、を有する

ことを特徴とする請求項１～７のいずれか１項に記載の画像投影システム。

【請求項９】

前記無線設定情報には、前記無線通信部を機能させる有効時間を含み

前記画像送信手段は、前記有効時間が経過したと判定すると、前記無線通信部の機能を停止する

ことを特徴とする請求項８に記載の画像投影システム。

【請求項１０】

前記画像投影装置は、

前記遠隔操作装置からのワイヤレス信号を受信するワイヤレス受信部と、

前記遠隔操作装置から前記ワイヤレス受信部を介して前記無線設定情報を受信すると、前記無線部を動作状態にし、その後前記無線部を介して前記コンピュータ装置と無線通信中か否かを判定し、前記コンピュータ装置と無線通信中ではないと判定した状態が一定状態継続したとき、前記無線部を非動作状態にする制御部と、

ことを特徴とする請求項１～９のいずれか１項に記載の画像投影システム。

【請求項１１】

前記遠隔操作装置は、

前記無線設定情報書込手段によって同一の前記無線設定情報を前記デバイスに書き込むことができる書き込み回数を設定する書き込み回数設定手段を有し、

前記無線設定情報生成手段は、前記無線設定情報書込手段によって前記無線設定情報が前記書き込み回数を超えたとき、前記無線設定情報の更新を行う

ことを特徴とする請求項１～１０のいずれか１項に記載の画像投影システム。

【請求項１２】

前記遠隔操作装置は、

前記無線設定情報生成手段による前記無線設定情報の更新を抑制する更新抑制手段を有し、

前記無線設定情報生成手段は、前記更新抑制手段が操作されたことを検出すると、前記無線設定情報の更新を行わない

ことを特徴とする請求項１～１１のいずれか１項に記載の画像投影システム。

【請求項１３】

外部のコンピュータ装置から無線通信により送信される画像データを受信する無線部を有し、前記画像データに応じた画像を投影する画像投影装置と、この画像投影装置の動作を遠隔制御する遠隔操作装置と、前記コンピュータ装置及び前記遠隔操作装置のいずれにも接続可能なデバイスとを備えた画像投影システムにおける前記遠隔操作装置において、

前記画像投影装置と前記コンピュータ装置間の無線通信に必要な無線設定情報を生成する無線設定情報生成手段と、

所定のタイミングで前記無線設定情報を前記デバイスに書き込む無線設定情報書込手段と、

前記デバイスに書き込んだ無線設定情報を前記画像投影装置へ通知する通知手段と、を有することを特徴とする遠隔操作装置。

【発明の詳細な説明】

【技術分野】

【０００１】

本発明は、画像投影装置を遠隔制御する遠隔操作装置及びこの遠隔操作装置を備えた画像投影システムに関する。

【背景技術】

【０００２】
従来より、コンピュータ装置等から画像データを入力して液晶表示素子に当該画像を表示し、光を照射して投影スクリーン上に拡大投影するプロジェクタなどの画像投影装置が広く使用されている。また、ＤＭＤ（Ｄｉｇｉｔａｌ　Ｍｉｃｒｏｍｉｒｒｏｒ　Ｄｅｖｉｃｅ）素子を用いて画像データに基づいた画像を投影する画像投影装置もある。
【０００３】
この画像投影装置は、会議における小規模のプレゼンテーションや、多数の聴衆を集めて自分の研究成果を発表する大規模のプレゼンテーション等において、多様に使用されている。このようなプレゼンテーションは、プレゼンテーターの手前にコンピュータ装置を配置し、このコンピュータ装置の表示部に表示している画像に応じた画像データを、コンピュータ装置からケーブルを介して画像投影装置へ送信し、画像投影装置が画像データに基づいた画像を拡大投射することによって行われる。
【０００４】
ところで、画像投影装置で画像を投影するためには、上述のようにコンピュータ装置と画像投影装置とをケーブルによって接続する必要がある。そのため、ケーブルの準備や接続の作業が発生し煩雑になる。しかも、プレゼンテーターのコンピュータ装置と画像投影装置との距離に応じたケーブルを用意する必要がある。
【０００５】
そこで、近年、ＩＥＥＥ８０２．１１ａ／ｂ／ｇなどの無線ＬＡＮ（Ｌｏｃａｌ　Ａｒｅａ　Ｎｅｔｗｏｒｋ）に対応した画像投影装置が提供されてきており、コンピュータ装置から画像投影装置への画像データの送信を無線通信によって行うことによって、利便性を向上させている。
【０００６】
ところで、コンピュータ装置を無線ＬＡＮ対応の画像投影装置に無線接続するためには、コンピュータ装置と画像投影装置のそれぞれについて無線通信の設定を行う必要がある。しかし、無線通信の設定にはある程度の知識を要し、容易に設定することができない場合も多い。そこで、この無線通信の設定の作業性を向上させるものが提案されている。
【０００７】
例えば、特許文献１では、画像投影装置において、ＷＥＰ（Ｗｉｒｅｄ　Ｅｑｕｉｐｍｅｎｔ　Ｐｒｉｖａｃｙ）キーなどの無線通信の設定情報をスクリーンに投影し、コンピュータ装置の利用者がスクリーンに投影された設定情報を見ながら、コンピュータ装置へ入力することによって、コンピュータ装置と画像投影装置との無線接続を確立する技術が提案されている。
【０００８】
また、特許文献２では、ＵＳＢコネクタを備えた情報記憶媒体によって、コンピュータ装置に設定されている無線通信の設定情報をＵＳＢコネクタを介して読み取り、その後、情報記憶媒体をＵＳＢコネクタを介して画像投影装置に接続することにより、コンピュータ装置から読み取った無線通信の設定情報を画像投影装置に設定する技術が提案されている。
【０００９】
また、特許文献３では、画像投影装置における無線通信の設定情報と同一の情報を記憶すると共にドライバプログラムを記憶したＵＳＢメモリと、無線接続モジュールとを画像投影装置と同梱して販売し、コンピュータ装置にＵＳＢメモリを接続して、無線通信の設定情報とドライバプログラムとをコンピュータ装置に自動的に収納し、その後無線接続モジュールを接続することによって、画像投影装置とコンピュータ装置との無線接続を確立する技術が提案されている。
【特許文献１】特開２００３　０６９９２３号公報
【特許文献２】特開２００５－２０２７５４号公報
【特許文献３】特開２００５－２８５０９１号公報
【発明の開示】

【発明が解決しようとする課題】

【００１０】

しかしながら、特許文献１に記載の技術では、画像投影装置における無線通信の設定情報を視覚的に把握することができるものの、コンピュータ装置への無線通信の設定情報は手動で行わなければならず、ある程度の知識と時間が必要である。

【００１１】

また、特許文献２に記載の技術では、無線通信の設定情報を手動で入力する必要がない点で利点があるが、コンピュータ装置に設定されている無線通信の設定情報を画像投影装置に設定することになることから、例えば、会議などで画像投影装置に投影させる画像を出力するコンピュータ装置を切り替えなければならないときには、切り替え先のコンピュータ装置にＵＳＢコネクタを備えた情報記憶媒体を接続した後、さらに、画像投影装置に接続する必要があり、設定作業が煩雑となって時間がかかってしまう。しかも、コンピュータ装置に、予めＷＥＰキーなどの暗号情報の設定やアクセスポイントとしての設定などを手動で行わなければならず、特許文献１の記載の技術と同様に、ある程度の知識と時間が必要である。

【００１２】

また、特許文献３に記載の技術では、画像投影装置における無線通信の設定情報と同一の情報を記憶したＵＳＢメモリをコンピュータ装置に接続することにより、コンピュータ装置に無線通信の設定を自動で行うことができる点で特許文献１及び特許文献２に比べて優れているが、画像投影装置における無線通信の設定情報は、固定であることから、一旦無線通信の設定情報が漏洩してしまうと、画像投影装置とコンピュータ装置との無線通信を傍受されてしまう恐れがあり、セキュリティ上問題がある。例えば、画像投影装置を複数グループで共用する場合など、第１のグループが使った後でも無線通信の設定情報は第１のグループのコンピュータ装置に残っているので、次の第２のグループが画像投影装置を使用開始しても、第１のグループから継続して無線通信が可能となり、セキュリティ上問題があった。

【課題を解決するための手段】

【００１３】

そこで、本発明はかかる課題を解決するために、請求項１に記載の発明は、外部のコンピュータ装置から無線通信により送信される画像データを受信する無線部を有し、前記画像データに応じた画像を投影する画像投影装置と、この画像投影装置の動作を遠隔制御する遠隔操作装置と、前記コンピュータ装置及び前記遠隔操作装置のいずれにも通信接続可能なデバイスとを備えた画像投影システムにおいて、前記遠隔操作装置は、前記画像投影装置と前記コンピュータ装置間の無線通信に必要な無線設定情報を生成する無線設定情報生成手段と、所定のタイミングで前記無線設定情報を前記デバイスに書き込む無線設定情報書込手段と、前記デバイスに書き込んだ無線設定情報を前記画像投影装置へ通知する通知手段とを有し、前記デバイスは、前記遠隔操作装置によって書き込まれた前記無線設定情報を前記コンピュータ装置へ出力する制御部を有することを特徴とする。

【００１４】

また、請求項２に記載の発明は、請求項１に記載の発明において、前記遠隔操作装置は、前記デバイスと接続するコネクタを有し、前記無線設定情報書込手段は、前記無線設定情報を前記コネクタを介して前記デバイスに書き込むことを特徴とする。

【００１５】

また、請求項３に記載の発明は、請求項２に記載の発明において、前記無線設定情報生成手段は、前記コネクタに前記デバイスが接続されたとき、前記無線設定情報を更新することを特徴とする。

【００１６】

また、請求項４に記載の発明は、請求項２又は請求項３に記載の発明において、前記所定のタイミングは、前記コネクタに前記デバイスが接続されたことを検出したときであることを特徴とする。

【００１７】
また、請求項５に記載の発明は、請求項１に記載の発明において、前記遠隔操作装置はワイヤレス信号を送信するワイヤレス送信部を有し、前記デバイスは前記遠隔操作装置からのワイヤレス信号を受信するワイヤレス受信部を有しており、前記無線設定情報書込手段は、前記デバイスへワイヤレス信号により前記無線設定情報を送信することによって、前記デバイスへの前記無線設定情報の書き込みを行うことを特徴とする。
【００１８】
また、請求項６に記載の発明は、請求項１～５のいずれか１項に記載の発明において、前記遠隔操作装置は、前記画像投影装置の起動指示及び／又は停止指示を行うための起動制御指示部を有し、前記無線設定情報生成手段は、前記起動制御指示部が操作されたとき、前記無線設定情報を更新することを特徴とする。
【００１９】
また、請求項７に記載の発明は、請求項６に記載の発明において、前記所定のタイミングは、前記起動制御指示部が操作されたときであることを特徴とする。
【００２０】
また、請求項８に記載の発明は、請求項１～７のいずれか１項に記載の発明において、前記デバイスは、前記コンピュータ装置に接続するコネクタと、前記コネクタを前記コンピュータ装置に接続したときに、前記遠隔操作装置から書き込まれた前記無線設定情報に基づいた設定により前記画像投影装置の無線部と通信を行う無線通信部と、画像データを前記無線通信部を介して前記画像投影装置へ送信する画像送信手段としての機能を前記コンピュータ装置に実行させるプログラムを格納するプログラム格納部とを有することを特徴とする。
【００２１】
また、請求項９に記載の発明は、請求項８に記載の発明において、前記無線設定情報には、前記無線通信部を機能させる有効時間を含み、前記画像送信手段は、前記有効時間が経過したと判定すると、前記無線通信部の機能を停止することを特徴とする。
【００２２】
また、請求項１０に記載の発明は、請求項１～９のいずれか１項に記載の発明において、前記画像投影装置は、前記遠隔操作装置からのワイヤレス信号を受信するワイヤレス受信部と、前記遠隔操作装置から前記ワイヤレス受信部を介して前記無線設定情報を受信すると、前記無線部を動作状態にし、その後前記無線部を介して前記コンピュータ装置と無線通信中か否かを判定し、前記コンピュータ装置と無線通信中ではないと判定した状態が一定状態継続したとき、前記無線部を非動作状態にする制御部とことを特徴とする。
【００２３】
また、請求項１１に記載の発明は、請求項１～１０のいずれか１項に記載の発明において、前記遠隔操作装置は、前記無線設定情報書込手段によって同一の前記無線設定情報を前記デバイスに書き込むことができる書き込み回数を設定する書き込み回数設定手段を有し、前記無線設定情報生成手段は、前記無線設定情報書込手段によって前記無線設定情報が前記書き込み回数を超えたとき、前記無線設定情報の更新を行うことを特徴とする。
【００２４】
また、請求項１２に記載の発明は、請求項１～１１のいずれか１項に記載の発明において、前記遠隔操作装置は、前記無線設定情報生成手段による前記無線設定情報の更新を抑制する更新抑制手段を有し、前記無線設定情報生成手段は、前記更新抑制手段が操作されたことを検出すると、前記無線設定情報の更新を行わないことを特徴とする。
【００２５】
また、請求項１３に記載の発明は、外部のコンピュータ装置から無線通信により送信される画像データを受信する無線部を有し、前記画像データに応じた画像を投影する画像投影装置と、この画像投影装置の動作を遠隔制御する遠隔操作装置と、前記コンピュータ装置及び前記遠隔操作装置のいずれにも接続可能なデバイスとを備えた画像投影システムにおける前記遠隔操作装置において、前記画像投影装置と前記コンピュータ間の無線通信に

必要な無線設定情報を生成する無線設定情報生成手段と、所定のタイミングで前記無線設定情報を前記デバイスに書き込む無線設定情報書込手段と、前記デバイスに書き込んだ無線設定情報を前記画像投影装置へ通知する通知手段とを有することを特徴とする。

【発明の効果】

【００２６】

請求項１，１３に記載の発明における遠隔操作装置は、前記画像投影装置と前記コンピュータ間の無線通信に必要な無線設定情報を生成する無線設定情報生成手段と、所定のタイミングで前記無線設定情報を前記デバイスに書き込む無線設定情報書込手段と、前記デバイスに書き込んだ無線設定情報を前記画像投影装置へ通知する通知手段とを備えたので、遠隔操作装置によって設定された無線通信の設定情報に基づいて、画像投影装置とコンピュータ装置との間の通信を行うことができ、機密性の高い無線デバイス或いは画像投影システムを提供することが可能となる。しかも、遠隔操作装置で無線設定情報を生成しており、遠隔操作装置からデバイスと画像投影装置とへ無線設定情報の送信を同時に行うことができるため、無線設定情報の設定時間を短縮することができる。

【００２７】

また、請求項２に記載の発明によれば、デバイスへの無線設定情報の書き込みをコネクタを介して行うため、確実に無線設定情報の書き込みを行うことができる。

【００２８】

また、請求項３に記載の発明によれば、コネクタにデバイスが接続されたとき、無線設定情報を更新するので、例えば、プレゼンテーションなどの会議に画像投影装置を使用され、不特定多数の参加者のコンピュータ装置が用いられる場合であっても、以前に画像投影装置を使用したコンピュータ装置から誤って画像データが送信され、画像投影装置から送信されることを回避することができる。

【００２９】

また、請求項４に記載の発明によれば、所定のタイミングを、コネクタにデバイスが接続されたことを検出したときとしたので、無線設定情報の書き込みを確実に行うことができる。

【００３０】

また、請求項５に記載の発明によれば、デバイスへの無線設定情報の書き込みを赤外線信号などのワイヤレス信号を用いて行うため、無線設定情報の書き込みを容易に行うことができる。従って、画像投影装置が複数ある場合にその切替設定が容易となる。

【００３１】

また、請求項６に記載の発明によれば、起動制御指示部が操作されたとき、すなわち、画像投影装置の起動指示又は停止指示が行われたときに、無線設定情報を更新するので、画像投影装置が使用される毎に無線設定情報の更新が可能となる。従って、プレゼンテーションなどの会議に画像投影装置を使用され、不特定多数の参加者のコンピュータ装置が用いられる場合であっても、以前に画像投影装置を使用したコンピュータ装置から誤って画像データが送信され、画像投影装置から送信されることを回避することができる。

【００３２】

また、請求項７に記載の発明によれば、起動制御指示部が操作されたとき、デバイスへの無線設定情報の書き込みを行うので、画像投影装置の起動とデバイスへの無線設定の書き込みを同時に行うことができ、画像投影装置においてコンピュータ装置から送信される画像データをより迅速に投影することができることになる。

【００３３】

また、請求項８に記載の発明によれば、デバイスをコンピュータ装置へ接続することにより、このコンピュータ装置が画像投影装置に画像データを無線通信部を介して送信する画像送信手段として機能することになり、デバイスを用いての無線通信設定を容易に行うことができる。

【００３４】

また、請求項９に記載の発明によれば、無線設定情報には、無線通信部を機能させる有

効時間を含むので、無線設定情報の更新が行われない場合であっても、コンピュータ装置と無線部との意図しない通信を回避することができると共に、無線部を停止することにより消費電力を低減することができる。

【００３５】

また、請求項１０に記載の発明によれば、画像投影装置は、コンピュータ装置と無線通信中ではないと判定した状態が一定状態継続したとき、所定期間以上コンピュータ装置と画像投影装置との通信がないので、一つのプレゼンテーションが終了したと判定することができる。従って、プレゼンテーション毎に暗号キーを変更することができる。

【００３６】

また、請求項１１に記載の発明によれば、同一の無線設定情報をデバイスに書き込むことができる書き込み回数を設定することができるので、複数のコンピュータ装置から画像投影装置へ画像データを送信することが可能となり、会議に応じた適切な画像投影システムを提供することが可能となる。

【００３７】

また、請求項１２に記載の発明によれば、遠隔操作装置に配置された更新抑制手段の操作により無線設定情報の更新を抑制することができるので、同一の無線設定情報をデバイスに書き込むことができ、複数のコンピュータ装置から画像投影装置へ画像データを送信することが可能となり、会議に応じた適切な画像投影システムを提供することが可能となる。

【発明を実施するための最良の形態】

【００３８】

（画像投影システムＳの概要）

以下、本発明の実施の形態について、図面を参照しながら説明する。図１は本実施形態における画像投影システムＳの全体構成図、図２は本実施形態における画像投影システムＳにおける概略動作を説明するための図、図３は無線デバイスの外観図、図４は本実施形態における遠隔操作装置の外観図である。

【００３９】

図１に示すように、本実施形態における画像投影システムＳは、無線デバイス１（デバイスの一例に相当）と、この無線デバイス１と通信接続可能であり、後述の画像投影装置３の動作を遠隔制御する遠隔操作装置２と、外部から入力される画像データに応じた画像をスクリーンに投影する画像投影装置３と、この画像投影装置３へ画像データを送信するパーソナルコンピュータ４（以下、「コンピュータ装置４」とする。）とを備えている。無線デバイス１は、コンピュータ装置４の無線部としての機能とメモリとしての機能を有するＵＳＢドングルである。コンピュータ装置４は、無線デバイス１における後述のＵＳＢコネクタ１０５（図３参照）を接続することによって、無線デバイス１を無線部として機能させ、無線デバイス１を介して画像投影装置３に画像データを送信する。画像投影装置３は、コンピュータ装置４から無線デバイス１を介して無線通信により送信される画像データを受信して、この画像データに応じた画像をスクリーンに投影する。

【００４０】

ここで、無線デバイス１と画像投影装置３との間の無線通信は、ＩＥＥＥ８０２．１１ａ／ｂ／ｇなどの無線ＬＡＮ（Local Area Network）規格を満たすことができるように、無線デバイス１及び画像投影装置３は、それぞれ無線ＬＡＮ規格に準拠した無線部を有している。

【００４１】

無線ＬＡＮにおいては、上述のように無線通信を行うための設定を予め行わなければならい。設定しなければならない無線通信の設定情報（以下、「無線設定情報」とする。）としては、ネットワーク名であるＳＳＩＤ（Extended Service Set Identifier）や暗号キーであるＷＥＰ（Wired Equipment Privacy）キーなどがあり、ある程度知識がなければ設定することができず、その作業も煩雑である。

【００４２】

そこで、本実施形態における画像投影システムＳにおいては、無線デバイス１に無線設定情報を記憶させる無線設定情報記憶部を設けており、これにより無線設定情報の設定を自動的に行うこととしている。しかも、所定のタイミングで暗号キーなどを変更するようにしており、秘匿性を向上させている。

【００４３】

ここで、画像投影システムＳにおける無線通信の設定手順を簡単に説明する。図２は、本実施形態における無線通信の設定手順を説明するための図である。

【００４４】

図２（ａ）に示すように、無線デバイス１のＵＳＢコネクタ１０５を遠隔操作装置２のＵＳＢコネクタ２０１に接続する。遠隔操作装置２は、無線デバイス１がＵＳＢコネクタ２０１を介して接続されたことを検出すると、無線デバイス１において画像投影装置３の無線部との通信に必要な無線設定情報をＵＳＢコネクタ２０１を介して無線デバイス１の無線設定情報記憶部に書き込む。このとき、無線デバイス１の書き込み中ランプ１５０（図３参照）が点滅し、利用者には無線設定情報を書き込み中であることが知らせられる。また、無線デバイス１へ書き込む無線設定情報は遠隔操作装置２において生成される。

【００４５】

遠隔操作装置２が無線デバイス１へ無線設定情報を書き込むタイミングは、無線デバイス１のＵＳＢコネクタ１０５が遠隔操作装置２のＵＳＢコネクタ２０１に接続されたときのほか、遠隔操作装置２に設けられた後述の起動制御ボタン２３１（図４参照）が操作されたときなどとすることができる。なお、起動制御ボタン２３１は、画像投影装置３の起動指示と停止指示を行うためのボタンであり、遠隔操作装置２は起動制御ボタン２３１が操作される毎に画像投影装置３への起動指示と停止指示とを交互に繰り返す。但し、起動指示を行う起動制御ボタンと停止指示を行う停止制御ボタンとを遠隔操作装置２にそれぞれ設けるようにしてもよい。

【００４６】

なお、無線デバイス１が特定のデバイスでないときには、無線設定情報の書き込みは行われない。これは、接続されたデバイスがどのようなデバイスであっても書き込むことにすると、粗悪な無線デバイス１の不正規品（コピー品など）によって画像投影システムＳの動作が不安定となることを回避するためであり、専用のデバイスのみを無線デバイスとして用いることができるようにしている。接続されたデバイスが、専用の無線デバイス１であるか否かは、画像投影装置３が、そのデバイスに付与されている識別情報をデバイスから読み込み、例えば、この識別情報のうちメーカを示す部が特定の情報であることを検出することによって判断することができる。

【００４７】

無線デバイス１への無線設定情報の書き込みが終了すると、書き込み中ランプ１５０の点滅が終了するので、図２（ｂ）に示すように、無線デバイス１のＵＳＢコネクタ１０５を遠隔操作装置２から取り外して、今度はコンピュータ装置４のＵＳＢコネクタ４０１に接続する。

【００４８】

コンピュータ装置４のＵＳＢコネクタ４０１に無線デバイス１のＵＳＢコネクタ１０５が接続されると、コンピュータ装置４は無線デバイス１のプログラム格納部に格納されたデバイスドライバプログラム（以下、「デバイスドライバ」と略す。）、無線設定アプリケーションプログラム（以下、「無線設定アプリケーション」と略す。）及び画像転送アプリケーションプログラム（以下、「画像転送アプリケーション」と略す。）をインストールする。コンピュータ装置４の制御部は、無線設定アプリケーションの実行により、無線デバイス１に対して遠隔操作装置２によって書き込まれた無線設定情報の出力を要求する。無線デバイス１の制御部は、無線デバイス１の無線設定情報記憶部から無線設定情報を取り出し、この無線設定情報をＵＳＢコネクタ１０５を介してコンピュータ装置４へ出力する。コンピュータ装置４は、無線デバイス１から出力された無線設定情報を取得し、この無線設定情報をデバイスドライバを用いて無線デバイス１の無線通信部に設定する。

無線デバイス１は、このように無線通信部により設定された無線設定情報、言い換えれば遠隔操作装置２によって書き込まれた無線設定情報に基づいて画像投影装置３の無線部と通信を行うことが可能となる。また、コンピュータ装置４の制御部は、画像転送アプリケーションの実行により、画像投影装置３に画像データを無線通信部を介して送信する画像送信手段として機能することになる。

【００４９】

一方、遠隔操作装置２は、無線デバイス１に書き込んだ無線設定情報を画像投影装置３へ赤外線通信によって通知する。画像投影装置３は、遠隔操作装置２から通知された無線設定情報を赤外線受光部３１０で受信し、自装置の無線部に設定する。このように遠隔操作装置２と画像投影装置３との間の通信を赤外線で行うようにしているために、第三者からの盗聴を防止することができる。なお、ここでは、遠隔操作装置２と画像投影装置３との通信を赤外線通信としているが、ワイヤレス信号を用いたワイヤレス通信であれば、電波信号を用いた電波通信であってもよい。すなわち、遠隔操作装置２はワイヤレス信号を送信するワイヤレス送信部を有し、画像投影装置３は遠隔操作装置２からのワイヤレス信号を受信するワイヤレス受信部を有している。本実施形態においては、ワイヤレス通信の一例として、赤外線通信を例に挙げて説明する。

【００５０】

遠隔操作装置２から画像投影装置３へ無線設定情報を通知するタイミングは、後述の情報送信ボタン２３７（図４参照）が操作されたときのほか、無線デバイス１のＵＳＢコネクタ１０５が遠隔操作装置２のＵＳＢコネクタ２０１から取り外されたとき、遠隔操作装置２に設けられた起動制御ボタン２３１が操作されたときなどとすることができる。

【００５１】

このように遠隔操作装置２は、無線設定情報を無線デバイス１を介してコンピュータ装置４へ書き込みを行うと共に、赤外線通信などのワイヤレス通信によって画像投影装置３へ通知するので、利用者は容易に画像投影装置３及び無線デバイス１の無線設定情報を合わせることができ、機密性を高めつつも、無線デバイス１を接続したコンピュータ装置４と画像投影装置３との間で無線通信が可能となる。

【００５２】

その後、図２（ｃ）に示すように、コンピュータ装置４の画像転送アプリケーションの実行によりコンピュータ装置４から無線デバイス１を介して、画像投影装置３へ画像データが送信され、画像投影装置３ではその画像データに基づいた画像をスクリーンに投影する。

【００５３】

また、遠隔操作装置２によって無線デバイス１に設定される無線設定情報には、無線デバイス１の無線部（後述の無線通信部１０７）を機能させる有効時間が含まれる。コンピュータ装置４の画像転送アプリケーションは、この有効時間を読み取ることにより、無線デバイス１の無線部による無線通信を行うことができる時間を制限する。すなわち、画像転送アプリケーションは、この有効時間が経過したと判定すると、無線通信部の機能を停止する。

【００５４】

コンピュータ装置４の画像転送アプリケーションは、画像投影装置３から送信される時刻情報を受信する機能を有しており、この時間情報と無線デバイス１から読み出した有効時間とに基づき、有効時間が経過したか否かを判定する。有効時間が経過したと判定した場合には、無線デバイス１の無線通信部の機能を停止する。

【００５５】

また、画像投影装置３は、遠隔操作装置２からの赤外線信号によって無線設定情報を受信すると、自装置の無線部を動作状態にし、その後無線部を介してコンピュータ装置４と無線通信中か否かを判定し、コンピュータ装置４と無線通信中ではないと判定した状態が一定状態継続したとき、自装置の無線部を非動作状態にする。なお、画像投影装置３がコンピュータ装置４と無線通信中であるとは、コンピュータ装置４から画像投影装置３へ画

像データを送信している状態のみではなく、コンピュータ装置４と画像投影装置３との無線リンクが確立している状態も含む。

【００５６】

ところで、遠隔操作装置２が無線デバイス１に書き込む無線設定情報が常に一定では、セキュリティ上好ましくない。また、無線デバイス１を外し忘れたコンピュータ装置４から意図しない画像データが画像投影装置３に送信されてしまう恐れがある。そこで、遠隔操作装置２は無線設定情報のうち少なくとも暗号キーを更新する。

【００５７】

すなわち、遠隔操作装置２は無線設定情報を更新することができるように構成されており、無線デバイス１を接続したコンピュータ装置４と画像投影装置３との間の無線通信の機密性を高めることができる。遠隔操作装置２が無線設定情報を更新するタイミングは、無線デバイス１が遠隔操作装置２に接続されたときのほか、遠隔操作装置２に設けられた起動制御ボタン２３１が操作されたときなどがとすることができる。

【００５８】

ところで、複数のコンピュータ装置４から画像投影装置３へ画像データを送信するような場合、複数の無線デバイス１に無線設定情報を書き込む必要があるが、無線デバイス１が遠隔操作装置２に接続されたときに無線設定情報が更新されてしまうと、複数の無線デバイス１に異なる無線設定情報が書き込まれることになる。

【００５９】

そこで、遠隔操作装置２において、同一の無線設定情報をデバイスに書き込むことができる回数を設定できるようにしている。このように回数を設定する方法として、遠隔操作装置２においては、更新ボタン２３２の連続操作回数でこの書き込み回数を設定する方法や、更新ボタン２３２ではなく、十字キー２３３などを用いて書き込み回数を設定する方法などがある。

【００６０】

（各装置の構成及び動作の説明）

以上のように構成される画像投影システムＳについて、その構成及び動作についてさらに詳細に説明する。以下、本発明の実施の形態における無線デバイス１、遠隔操作装置２、画像投影装置３及びコンピュータ装置４のそれぞれの具体的構成及び動作を説明する。

【００６１】

（無線デバイス１について）

まず、無線デバイス１の構成及び動作について説明する。図５は無線デバイス１のブロック図、図６は無線デバイス１の機能ブロック図、図７はメモリコントローラ機能部のブロック図である。

【００６２】

無線デバイス１は、図５に示すように、ＣＰＵ（Central Processing Unit）１０１、ＲＡＭ(Random Access Memory)１０２、ＲＯＭ(Read Only Memory)１０３、フラッシュメモリ１０４、ＵＳＢコネクタ１０５、ＵＳＢ接続回路１０６、無線通信部１０７、操作部１０８、報知部１０９などから構成されており、持ち運び可能にコンパクトに設計されている。

【００６３】

ＣＰＵ１０１は、ＲＯＭ１０３に格納された制御プログラムを読み出して実行することによって、無線デバイス１の制御部として機能する。また、ＲＯＭ１０３には、識別情報（例えば、ＭＡＣアドレス）が格納されており、ＣＰＵ１０１の制御により、ＵＳＢコネクタ１０５を介して、遠隔操作装置２やコンピュータ装置４へこの識別情報を送信することができる。

【００６４】

ＲＡＭ１０２は、ＣＰＵ１０１によってワーキングメモリなどとして使用される。また、フラッシュメモリ１０４は、無線設定情報などを格納する無線設定情報記憶部等として機能する。

【００６５】
ここで、無線設定情報には、図８に示すように、無線ＬＡＮ規格種別（バンド）、ネットワークモード、ネットワーク名（ＥＳＳＩＤ）、無線チャンネル、認証レベル、暗号化レベル、データ暗号化方式、暗号キー、ＩＰアドレス、サブネットマスク、ＤＮＳのアドレス、有効時間などが含まれる。ネットワークモードには、アクセスポイントを必要とするインフラストラクチャーモードとアクセスポイントを必要としないアドホックモードがあるが、ここでは、無線デバイス１と画像投影装置３間で直接無線通信ができるようにアドホックモードに設定される。
【００６６】
ＵＳＢコネクタ１０５は、汎用のＵＳＢコネクタであり、遠隔操作装置２及びコンピュータ装置４のＵＳＢコネクタ２０１，４０１に接続することができる。ＵＳＢコネクタ１０５を遠隔操作装置２のＵＳＢコネクタ２０１又はコンピュータ装置４のＵＳＢコネクタ４０１に接続したときに、ＣＰＵ１０１は、これらの装置とのデータの送受信をＵＳＢ接続回路１０６を介して行う。ＵＳＢ接続回路１０６は、ＵＳＢ規格に準じてデータの送受信を行うためのインターフェース回路である。
【００６７】
このＵＳＢコネクタ１０５が遠隔操作装置２に接続されたとき、フラッシュメモリ１０４に遠隔操作装置２から無線設定情報を書き込み可能となるように、ＣＰＵ１０１によって制御される。また、ＵＳＢコネクタ１０５がコンピュータ装置４に接続されたとき、フラッシュメモリ１０４に書き込まれた無線設定情報をコンピュータ装置４により読み出し可能となるように、ＣＰＵ１０１により制御される。
【００６８】
無線通信部１０７は、アンテナ１１０と、ＲＦ部１１１と、ベースバンド部１１２とを有しており、無線ＬＡＮ規格に基づいてデータの送受信を行うことができる。なお、ＲＦ部１１１とベースバンド部１１２とはＷＬＡＮ（Wireless Local Area Network）チップにより構成される。
【００６９】
無線通信部１０７は、コンピュータ装置４にＵＳＢコネクタ１０５を接続したときに、遠隔操作装置２から書き込まれた無線設定情報に基づいた設定により画像投影装置３の無線部と通信を行う。ここで、遠隔操作装置２から書き込まれた無線設定情報はまずコンピュータ装置４に読み込まれ、このように読み込んだ無線設定情報をコンピュータ装置４から無線デバイス１へ送信して、無線通信部１０７をその無線設定情報に従って無線通信を行わせるようにする方式や、ＣＰＵ１０１が遠隔操作装置２から無線設定情報を読み込んで無線通信部１０７をその無線設定情報に従って無線通信を行わせる方式などがあり、ここでは、前者の方式を例に挙げて説明する。前者の方式では、ＣＰＵ１０１は、遠隔操作装置２によって書き込まれた無線設定情報をコンピュータ装置４へ出力する出力手段等として機能する。
【００７０】
操作部１０８は、画像転送停止スイッチ１４０、通信時間延長ボタン１４１やリセットボタン１４２（図３参照）などを有しており、これらのボタンが操作されると、ＣＰＵ１０１がその操作を検出し、検出した操作に応じた処理を行う。
【００７１】
画像転送停止スイッチ１４０は、画像投影装置３への画像データの送信動作の停止を指示するための画像送信停止操作部としてのスライドスイッチであり、画像停止ＯＮモードと、画像停止ＯＦＦモードとを切り替える切替スイッチである。コンピュータ装置４にＵＳＢコネクタ１０５を介して接続されている状態で、この画像転送停止スイッチ１４０が画像停止ＯＮモード側へ操作されたとき、ＣＰＵ１０１は、その旨の情報をコンピュータ装置４に通知する。コンピュータ装置４のＣＰＵ４０５は、その情報を受信すると、画像転送アプリケーションの実行により、画像投影装置３に特定画像（ここでは、黒画面画像）を投影させるための要求を無線通信部１０７を介して画像投影装置３へ送信する。

【００７２】
なお、コンピュータ装置４にＵＳＢコネクタ１０５を介して接続されている状態で、この画像転送停止スイッチ１４０が画像停止ＯＮモード側へ操作されたとき、ＣＰＵ１０１は、コンピュータ装置４から入力されるデータを画像投影装置３へ送信せずに、画像投影装置３に特定画像を投影させるための要求を無線通信部１０７を介して画像投影装置３へ送信するようにしてもよい。
【００７３】
通信時間延長ボタン１４１は、フラッシュメモリ１０４に記憶された無線設定情報のうち有効時間を変更するための操作ボタン（有効時間延長手段の一例に相当）であり、押しボタン式のスイッチである。コンピュータ装置４にＵＳＢコネクタ１０５を介して接続されている状態で、この通信時間延長ボタン１４１が操作されたとき、ＣＰＵ１０１は、画像投影装置３と無線通信するための有効時間を延長する処理を行う。この処理は、ＣＰＵ１０１によって、通信時間延長ボタン１４１が画像停止ＯＮモード側へ操作されたことをコンピュータ装置４へ通知し、このコンピュータ装置４が無線デバイス１から取り出した有効時間を延長することによって行う。つまり、コンピュータ装置４は、画像投影装置３との無線通信を行うに当たり、無線デバイス１のフラッシュメモリ１０４に書き込まれた有効時間を読み出しておき、コンピュータ装置４の記憶部に記憶しておく。このように記憶した有効時間を経過したか否かを判定する。また、この記憶した有効時間を変更することによって有効時間を延長する。
【００７４】
なお、ＣＰＵ１０１によってフラッシュメモリ１０４に記憶した無線設定情報のうち有効時間を取り出し、この有効時間に延長時間（例えば、１時間）を加算し、フラッシュメモリ１０４に記憶した有効時間を上書きすることによって有効時間の延長を行うようにしてもよい。この場合、コンピュータ装置４のＣＰＵ４０５は、有効時間が経過したかの判定を行う毎に、無線デバイス１から有効時間を読み出すことになる。
【００７５】
報知部１０９は、書き込み中ランプＬＥＤ１５０、画像転送中ランプ１５１、アラームランプ１５２（図３参照）などを有しており、ＣＰＵ１０１は、状況に応じてこれらのランプを点灯或いは点滅させる。例えば、無線設定情報がフラッシュメモリ１０４に書き込まれ中であるときには書き込み中ランプＬＥＤ１５０を点滅させる。また、コンピュータ装置４から画像投影装置３へ画像データを送信中であるときには画像転送中ランプ１５１を点滅させる。また、無線デバイス１が異常状態のときにはアラームランプ１５２を点滅させる。なお、これらのランプは、ＬＥＤなどによって構成される。
【００７６】
ここで、図６に無線デバイス１の機能ブロック図を示す。図５に示すように、無線デバイス１は、ＵＳＢインターフェース機能部１２０と、メモリコントローラ機能部１２１と、ＵＳＢハブ機能部１２２と、無線通信機能部１２３とを有している。
【００７７】
ＵＳＢインターフェース機能部１２０は、図５におけるＵＳＢコネクタ１０５及びＵＳＢ接続回路１０６に対応し、画像投影装置３やコンピュータ装置４との間でＵＳＢ規格に基づいてデータの送受信を行う。
【００７８】
メモリコントローラ機能部１２１は、図５におけるＣＰＵ１０１及びフラッシュメモリ１０４に対応し、フラッシュメモリ１０４を、無線設定情報を記憶するＵＳＢメモリとして機能させるリムーバル認識部１２４と、フラッシュメモリ１０４を、画像転送プログラムをコンピュータ装置４へ転送するためのＣＤ－ＲＯＭとして機能させるＣＤ－ＲＯＭ認識部１２５とを備えており、ＵＳＢハブ機能部１２２によって無線デバイス１を画像投影装置３やコンピュータ装置４にＵＳＢメモリ及びＣＤ－ＲＯＭとしてそれぞれ認識させるようにしている。
【００７９】

無線通信機能部１２３は、図５における無線通信部１０７に対応し、無線デバイス１のＵＳＢコネクタ１０５をコンピュータ装置４に接続したときに、コンピュータ装置４にインストールされたドライバソフトによって制御される。

【００８０】

メモリコントローラ機能部１２１は、図７に示すように、リムーバル認識部１２４及びＣＤ－ＲＯＭ認識部１２５を有する他、物理メモリ部（フラッシュメモリ１０４の一部）には、無線設定アプリケーションや画像転送アプリケーションなどの複数のアプリケーションプログラム１３０と、デバイスドライバ１３１と、インストーラプログラム１３２と、無線設定情報１３３とが記憶される。なお、物理メモリ部としてのフラッシュメモリ１０４は、一つのフラッシュメモリで構成しても複数のフラッシュメモリで構成してもよい。

【００８１】

画像転送アプリケーションは、コンピュータ装置４にインストールされることにより、コンピュータ装置４に、無線デバイス１を制御して、コンピュータ装置４からの画像データを画像投影装置３へ送信する画像送信手段として機能させるものである。また、この無線設定アプリケーションは、コンピュータ装置４にインストールされることにより、コンピュータ装置４に、無線設定情報などを無線デバイス１に設定する機能を実行させる。

【００８２】

また、デバイスドライバ１３１は、コンピュータ装置４にインストールされることにより、コンピュータ装置４に、無線デバイス１の無線通信部１０７を制御する機能を実行させるものである。

【００８３】

インストーラプログラム１３２は、コンピュータ装置４によって実行されることにより、画像転送アプリケーションやデバイスドライバ１３１をコンピュータ装置４にインストールするものである。

【００８４】

（遠隔操作装置２について）

次に、遠隔操作装置２の構成及び動作について説明する。図９は遠隔操作装置２のブロック図である。

【００８５】

遠隔操作装置２は、図９に示すように、ＵＳＢコネクタ２０１と、このＵＳＢコネクタ２０１を介して他の装置とＵＳＢ規格に基づく通信を行うＵＳＢホストコントローラ２０２と、画像投影装置３へ赤外線信号を送信する赤外線送信部２０３（ワイヤレス送信部の一例に相当）と、この赤外線送信部２０３を制御する赤外線制御部２０４と、利用者により操作される操作ボタン２０５と、この操作ボタン２０５が利用者によって操作されたことを後述のＣＰＵに通知する入力インターフェース２０６と、各種情報を表示する表示部２０７と、ワーキングメモリ等として用いられるメモリ２０８と、現時刻等を計時する計時手段である時計回路２０９と、遠隔操作装置２全体を制御するＣＰＵ２１０と、遠隔操作装置２用の制御プログラムを記憶するプログラム記憶部としての機能や無線通信部１０７を介して画像投影装置３との通信必要な無線設定情報を記憶する無線設定情報記憶部としての機能を有する２次記憶装置２１１と、を備えており、ＵＳＢホストコントローラ２０２、赤外線制御部２０４、入力インターフェース２０６、表示部２０７、メモリ２０８、時計回路２０９、ＣＰＵ２１０及び２次記憶装置２１１はバス２１６によって接続されている。

【００８６】

ＣＰＵ２１０は、２次記憶装置２１１に格納された制御プログラムを読み出して実行することによって、遠隔操作装置２の制御部として機能する。ここでは、説明の便宜上、２次記憶装置２１１を単一の記憶手段として説明しているが、複数個のメモリ（ＲＯＭやＲＡＭなど）によって構成することができる。

【００８７】

ここで、ＣＰＵ２１０は、遠隔操作装置２の制御部として、コンピュータ装置４に接続された無線デバイス１と画像投影装置３と間の無線通信に必要な無線設定情報を生成する無線設定情報生成手段、所定のタイミングで無線設定情報を無線デバイス１に書き込む無線設定情報書込手段として機能する。ここで、無線設定情報を生成（更新を含む）及び書き込みを行う契機となるタイミングは、（ａ）ＣＰＵ２１０がＵＳＢコネクタ２０１に無線デバイス１のＵＳＢコネクタ１０５が接続されたことを検出したとき、（ｂ）ＣＰＵ２１０が遠隔操作装置２に設けられた起動制御ボタン２３１が操作されたことを検出したとき、或いは（ｃ）ＣＰＵ２１０が遠隔操作装置２に設けられた更新ボタン２３２が操作されたときことを検出したときがあり、いずれを選択するのかは利用者による左右矢印キー２３４，２３５、決定キー２３６などの操作による２次記憶装置２１１への設定によって決定される。なお、（ｂ）及び（ｃ）の両方のタイミングで動作させるように設定することもできるものとする。また、無線設定情報の生成を行う契機となるタイミングを、上記（ａ）のタイミングに代えて、ＣＰＵ２１０がＵＳＢコネクタ２０１から無線デバイス１のＵＳＢコネクタ１０５が抜かれたことを検出したときとしてもよい。

【００８８】

また、ＣＰＵ２１０は、遠隔操作装置２の制御部として、無線デバイス１に書き込んだ無線設定情報を画像投影装置３へ通知する通知手段として機能する。無線設定情報を通知するタイミングとしては、（ａ）ＣＰＵ２１０が無線設定情報を更新したとき、（ｂ）ＣＰＵ２１０が遠隔操作装置２に設けられた情報送信ボタン２３７が操作されたことを検出したときなどがあり、いずれを選択するのかは利用者による左右矢印キー２３４，２３５、決定キー２３６などの操作による２次記憶装置２１１への設定によって決定される。なお、ＣＰＵ２１０は、無線設定情報の通知の際に、現時刻情報を通知する。画像投影装置３の制御部３０３は遠隔操作装置２から通知される現時刻情報に基づいて、時計回路３０５を調整する。

【００８９】

また、ＣＰＵ２１０は、遠隔操作装置２の制御部として、同一の無線設定情報を無線デバイス１に書き込むことができる書き込み回数を設定するために、操作ボタン２０５と共に書き込み回数設定手段として機能する。すなわち、無線設定情報書込手段によって無線設定情報が設定された書き込み回数を超えて書き込まれるまでは、無線設定情報の更新を行わず、設定された書き込み回数を超えたときに無線設定情報の更新を行うように制御する。例えば、ＣＰＵ２１０は、遠隔操作装置２の更新ボタンを操作している状態で無線デバイス１のＵＳＢコネクタ１０５が遠隔操作装置２のＵＳＢコネクタ２０１に接続されたときには、無線デバイス１への書き込み回数を１つ増やすようにする（図１０参照）。また、ＣＰＵ２１０は、設定された書き込み回数分の無線設定情報の更新を行ったとき、表示部２０７への警告表示や警告音出力部（図示せず）からの警告を行い、その後所定時間以内に後述の維持ボタン２３８が操作されないときに無線設定情報の更新を行う更新判定手段としての機能をも有している。

【００９０】

ここで、無線設定情報には、上述したように、無線ＬＡＮ規格種別、ネットワークモード、ネットワーク名、無線チャンネル、認証レベル、暗号化レベル、データ暗号化方式、暗号キー、ＩＰアドレス、サブネットマスク、ＤＮＳのアドレス、有効時間などが含まれる。

【００９１】

ＵＳＢコネクタ２０１には、無線デバイス１のＵＳＢコネクタ１０５を接続することができる。ＣＰＵ２１０は、無線デバイス１のＵＳＢコネクタ１０５がＵＳＢコネクタ２０１に接続されているか否かをＵＳＢホストコントローラ２０２を介して検出し、接続されている場合には、無線デバイス１とのデータの送受信を行う。

【００９２】

操作ボタン２０５は、図４に示すように、画像投影装置３において利用者が操作可能な箇所、すなわちハウジングの外壁面の適所に設けられており、利用者がこの操作ボタン２

０５を操作することによって、その操作内容に応じた制御をＣＰＵ２１０が実行する。操作ボタン２０５には、上述した起動制御ボタン２３１（起動制御指示部の一例に相当）、更新ボタン２３２（更新操作部の一例に相当）、十字キー２３３、左矢印キー２３４、右矢印キー２３５、決定キー２３６、画像投影装置３へ無線設定情報を送信するための情報送信ボタン２３７、無線設定情報の更新を抑制するため更新抑制手段としての維持ボタン２３８、無線デバイス１へ無線設定情報の書き込みを行うための無線情報設定ボタン２３９などが配置されている。

【００９３】

ここで、遠隔操作装置２における無線設定情報の処理動作について、図１０～図１２のフローチャートを参照して具体的に説明する。図１０は遠隔操作装置２における無線設定情報の処理のフローチャート、図１１は遠隔操作装置２における無線設定情報の更新処理のフローチャート、図１２は遠隔操作装置２における無線設定情報の書き込み処理のフローチャートである。

【００９４】

まず、図１０を参照して、遠隔操作装置２における無線情報設定の処理の基本的な動作の一例について説明する。この動作は、遠隔操作装置２において、無線デバイス１のＵＳＢコネクタ１０５がＵＳＢコネクタ２０１に接続されたときに無線設定情報の更新と無線設定情報の書き込みを行うように設定されており、また、情報送信ボタン２３７が操作されたときに無線設定情報を画像投影装置３へ通知するように設定されているときの動作例である。

【００９５】

図１０に示すように、遠隔操作装置２のＣＰＵ２１０は、ＵＳＢデバイスが接続されたか否かを検出する（ステップＳ１００）。すなわち、ＣＰＵ２１０は、ＵＳＢデバイスのＵＳＢコネクタがＵＳＢコネクタ２０１に挿入されたか否かを検出する。この処理において、ＵＳＢデバイスの接続を検出すると（ステップＳ１００：ＹＥＳ）、ＣＰＵ２１０は、ステップＳ１０１の処理に移行する。

【００９６】

ステップＳ１０１において、ＣＰＵ２１０は、ＵＳＢデバイスの識別情報を取得する。すなわち、ＣＰＵ２１０は、ＵＳＢコネクタ２０１を介してＵＳＢデバイスへ識別情報の送信要求を行い、この要求に応じてＵＳＢデバイスから送信される識別情報を取得する。ここでは、識別情報として、ＵＳＢデバイスに割り当てられたＭＡＣアドレスを例に挙げて説明する。

【００９７】

次に、ＣＰＵ２１０は、挿入されているＵＳＢデバイスの識別情報が無線デバイス１が保有する識別情報であるか否かを判定する（ステップＳ１０２）。ここで、識別情報であるＭＡＣアドレスは、上位２４ビットがベンダーＩＤとなっており、下位２４ビットがベンダー毎に割り当てるシリアル番号となっている。ＣＰＵ２１０は、ＵＳＢデバイスのＭＡＣアドレスが所定のベンダーＩＤであり、かつ所定のシリアル番号となっているか否かを判定することにより、ＵＳＢデバイスのＭＡＣアドレスが無線デバイス１のＭＡＣアドレスであるか否かを判定する。

【００９８】

この処理において、挿入されたＵＳＢデバイスが無線デバイス１であると判定すると（ステップＳ１０２：ＹＥＳ）、ＣＰＵ２１０は、処理をステップＳ１０３に移行する。一方、挿入されたＵＳＢデバイスが無線デバイス１ではないと判定すると（ステップＳ１０２：ＮＯ）、ＣＰＵ２１０は処理をステップＳ１００に移行する。

【００９９】

ステップＳ１０３において、ＣＰＵ２１０は、無線デバイス１が接続されてから所定時間内に維持ボタン２３８が操作されたか否かを検出する。そして、維持ボタン２３８が操作されていないと判定すると（ステップＳ１０３：ＮＯ）、ＣＰＵ２１０は、２次記憶装置２１１に記憶している無線設定情報を更新する（ステップＳ１０４）。この処理は、図

１１のフローチャートに示す処理であり、後述する。

【０１００】

ステップＳ１０４の処理が終了したとき、又はステップＳ１０３において維持ボタン２３８が操作されたと判定したとき（ステップＳ１０３：ＹＥＳ）、ＣＰＵ２１０は、無線設定情報を無線デバイス１に書き込む処理を行う（ステップＳ１０５）。この処理は、図１２のフローチャートに示す処理であり、後述する。

【０１０１】

次に、ＣＰＵ２１０は、情報送信ボタン２３７が操作されたか否かを検出する（ステップＳ１０６）。ＣＰＵ２１０は、この情報送信ボタン２３７が操作されるまで、この処理を繰り返し、情報送信ボタン２３７が操作されたとき（ステップＳ１０６：ＹＥＳ）、赤外線送信部２０３から無線デバイス１へ無線設定情報を赤外線によって送信する（ステップＳ１０７）。

【０１０２】

ステップＳ１０７の処理が終了すると、ＣＰＵ２１０は、遠隔操作装置２の電源がオフであるか否かを判断する（ステップＳ１０８）。ＣＰＵ２１０は、遠隔操作装置２の電源がオフであると判定した場合には（ステップＳ１０８：ＹＥＳ）、本処理を終了する一方、電源がオフではないと判定した場合には（ステップＳ１０８：ＮＯ）、ステップＳ１００から繰り返し処理を実行することとなる。

【０１０３】

このように、ＣＰＵ２１０は、無線デバイス１に書き込んだ無線設定情報を画像投影装置３へ通知する通知手段として機能する。

【０１０４】

次に、ステップＳ１０４における無線設定情報の更新処理の詳細を図１１のフローチャートを参照して具体的に説明する。

【０１０５】

無線設定情報の更新処理を開始すると、ＣＰＵ２１０はまず、２次記憶装置２１１に記憶している無線設定情報のうち暗号キーをクリアし（ステップＳ１１０）、その後、無線設定情報のうち暗号キーを生成して（ステップＳ１１１）、ステップＳ１１２に処理を移行する。

【０１０６】

ステップＳ１１２において、ＣＰＵ２１０は、無線設定情報を２次記憶装置２１１から読み出す。ここで読み出す無線設定情報は、図８に示したように、ネットワークモード、ネットワーク名（暗号キーと有効時間を除く）などがある。ＣＰＵ２１０は、このように読み出した情報にステップＳ１０８で生成した暗号キーを加えた新たな無線設定情報を生成し、２次記憶装置２１１に記憶することによって、無線設定情報の更新を行う（ステップＳ１１３）。なお、ここでは暗号キーを更新することによって無線設定情報の更新を行うこととしたが、暗号キーに加えてその他の暗号情報（暗号レベル、データ暗号化）の更新を行ってもよい。また、これらに加え、バンド情報（ＩＥＥＥ８０２．１１ａ／ｂ／ｇ）や無線チャンネルの更新を行ってもよい。

【０１０７】

このように、ＣＰＵ２１０は、画像投影装置３とコンピュータ装置４間の無線通信に必要な無線設定情報を生成する無線設定情報生成手段として機能する。

【０１０８】

次に、ステップＳ１０５における無線設定情報の書き込み処理の詳細を図１２のフローチャートを参照して具体的に説明する。

【０１０９】

無線設定情報のき込み処理を開始すると、ＣＰＵ２１０はまず、無線デバイス１への無線設定情報の書き込み処理を開始するために、無線デバイス１へ書き込み要求を行う。この要求が無線デバイス１で受信されると、無線デバイス１のＣＰＵ２１０は、書き込み中ランプ１５０を点灯させる（ステップＳ１２０）。その後、ＣＰＵ２１０は、無線設定情

報を２次記憶装置２１１から読み出す。ここで読み出す無線設定情報は、図８に示したように、ネットワークモード、ネットワーク名（有効時間を除く）などがある。その後、ＣＰＵ２１０は、時計回路２０９から現時刻の情報を取得し、さらに接続可能時間を２次記憶装置２１１から読み出す。このとき、ＣＰＵ２１０は、接続可能時間と現時刻とに基づいて、有効時間を算出する。例えば、接続可能時間が２時間であり、現時刻がＰＭ２：３０であるとすると、有効時間をＰＭ４：３０とする。また、年月日も有効時間に含める。次に、ＣＰＵは、２次記憶装置２１１から読み出した無線設定情報と生成した有効時間とを無線設定情報として無線デバイス１へ書き込む処理を開始する（ステップＳ１２１）。

【０１１０】

その後、ＣＰＵ２１０は、書き込みが終了するまで待ち（ステップＳ１２２）、この書き込みが終了すると（ステップＳ１２２：ＹＥＳ）、書き込み中ランプ１５０の消灯を無線デバイス１に要求する。この要求が無線デバイス１で受信されると、無線デバイス１のＣＰＵ１０１は、書き込み中ランプ１５０を消灯させる（ステップＳ１２３）。

【０１１１】

ところで、上述の実施形態においては、暗号キーと有効時間とを別々の情報として無線デバイス１に書き込むこととしたが、暗号キーに有効時間を埋め込むようにしてもよい。この場合、ＣＰＵ２１０は、ランダム変数を生成すると共に、２次記憶装置２１１に記憶している無線設定情報のうち接続可能時間の情報を取得し、このように取得した接続可能時間と時計回路２０９から得られた現時刻の情報と基づいて有効時間を演算する。そして、ＣＰＵ２１０は、このランダム変数と有効時間とに基づいて、暗号キーを生成する。この暗号キーが例えば１２８ｂｉｔの場合、１３文字のうち、前半７文字をランダム変数で構成し、後半６文字を有効時間の日時で構成する。このように、構成することにより、コンピュータ装置４の画像転送アプリケーションは、暗号キーにより有効時間を設定することができる。また、コンピュータ装置４のＣＰＵ４０５は、画像転送アプリケーションの実行により、暗号キーに基づいて、有効時間を検出することができる。

【０１１２】

以上のように、本実施形態における遠隔操作装置２のＣＰＵ２１０は、無線デバイス１がＵＳＢコネクタ２０１に接続されると、画像投影装置３と無線通信を行うための無線設定情報をこの無線デバイス１に書き込むようにしている。また、無線デバイス１に無線設定情報を書き込む毎に暗号キーを更新することによって、無線通信の秘匿性を向上させている。但し、維持ボタンを操作することによって、無線設定情報の更新をさせないようにして、同一の無線設定情報を複数の無線デバイス１に書き込むことができるようにしており、これにより複数のコンピュータ装置４と画像投影装置３との間で無線通信が可能となる。

【０１１３】

なお、同一の無線設定情報を複数の無線デバイス１に書き込む方法としては、同一の無線設定情報を無線デバイス１に書き込むことができる書き込み回数を設定する書き込み回数設定手段としてＣＰＵ２１０を機能させ、無線設定情報がこの書き込み回数を超えて書き込まれるまでは、無線設定情報の更新を行わないようにしてもよい。例えば、左右矢印キー２３４，２３５と決定キー２３６等によってこの書き込み回数を設定するようにしてもよい。また、無線デバイス１を遠隔操作装置２に接続した後、所定時間に更新ボタン２３２を操作した数をこの書き込み回数として設定するようにしてもよい。このように設定された書き込み回数は、２次記憶装置２１１に記憶される。このとき、ＣＰＵ２１０は、表示部２０７に書き込み回数の設定情報と実際に無線設定情報を書き込んだ無線デバイス１の数の情報とを表示するようにしてもよい。

【０１１４】

また、上記本実施形態において遠隔操作装置２は、無線デバイス１が接続されたときに、無線設定情報をこの無線デバイス１に書き込むようにしているが、起動制御ボタン２３１が操作されたときに、無線設定情報の更新を行うようにしてもよい。以下、図１３を参照して、遠隔操作装置２において起動制御ボタン２３１が操作されたときに無線設定情報

の更新を行う動作の一例について説明する。図１３は遠隔操作装置２における無線設定情報の更新処理のフローチャートである。

【０１１５】

図１３に示すように、まず、遠隔操作装置２のＣＰＵ２１０は、起動制御ボタン２３１が操作されたか否かを検出する（ステップＳ１３０）。利用者によって起動制御ボタン２３１が操作されると、ＣＰＵ２１０は、この操作を検出し（ステップＳ１３０：ＹＥＳ）、画像投影装置３に停止指示であるシャットダウンコマンドを送信する（ステップＳ１３１）。画像投影装置３は、遠隔操作装置２からシャットダウンコマンドを受信すると、投影部３０８における後述の光源３２１やＬＣＤ３２３などをＯＦＦすると共に、ＣＰＵ２１０を休止状態とする。

【０１１６】

次に、ＣＰＵ２１０は、２次記憶装置２１１に記憶した無線設定情報の更新処理を行い（ステップＳ１３２）、処理をステップＳ１３３に移行する。なお、このステップＳ１３２の処理は、上述のステップＳ１０４の処理と同様であるため、説明を省略する。

【０１１７】

ステップＳ１３３において、ＣＰＵ２１０は、ステップＳ１００の処理と同様にＵＳＢデバイスが接続されたか否かを検出する。この処理において、ＵＳＢデバイスの接続を検出すると（ステップＳ１３３：ＹＥＳ）、ＣＰＵ２１０は、ステップＳ１３４の処理に移行する。

【０１１８】

ステップＳ１３４において、ＣＰＵ２１０は、ステップＳ１０１の処理と同様にＵＳＢデバイスの識別情報を取得する。その後、ＣＰＵ２１０は、ステップＳ１０２の処理と同様に挿入されているＵＳＢデバイスの識別情報が無線デバイス１が保有する識別情報であるか否かを判定する（ステップＳ１３５）。

【０１１９】

この処理において、挿入されたＵＳＢデバイスが無線デバイス１であると判定すると（ステップＳ１３５：ＹＥＳ）、ＣＰＵ２１０は、無線設定情報を無線デバイス１に書き込む処理を行う（ステップＳ１３６）。この処理は、上述のステップＳ１０５の処理と同様であるため、説明を省略する。

【０１２０】

その後、ＣＰＵ２１０は、起動制御ボタン２３１が操作されたか否かを検出する（ステップＳ１３７）。利用者によって起動制御ボタン２３１が操作されると、ＣＰＵ２１０は、この操作を検出し（ステップＳ１３７：ＹＥＳ）、画像投影装置３へ起動指示である起動コマンドを送信し（ステップＳ１３８）、さらに、赤外線送信部２０３から無線デバイス１へ無線設定情報を赤外線によって送信する（ステップＳ１３９）。

【０１２１】

なお、上述においては、画像投影装置３をシャットダウンしたときに無線設定情報を更新することとしたが、画像投影装置３を起動するときに無線設定情報を更新するようにしてもよい。この場合、例えば、ＣＰＵ２１０は、起動制御ボタン２３１が操作され、画像投影装置３を起動するときに、無線デバイス１が接続されているか否かを判定し、無線デバイス１が接続されている場合には、無線設定情報の更新を行うと共に、画像投影装置３へ起動コマンドを送信し、さらに、無線デバイス１へ無線設定情報を赤外線によって送信する。

【０１２２】

以上のように、遠隔操作装置２は、起動制御ボタンが操作されたとき、無線設定情報を更新するので、画像投影装置３の起動指示毎或いは停止指示毎に無線設定情報を更新することができ、画像投影装置３が使用される毎に無線設定情報の更新が可能となる。また、ステップＳ１３７において、ＣＰＵ２１０は、無線設定情報を書き込んだ無線デバイス１とは別の無線デバイス１が接続されたか否かを検出し、別の無線デバイス１が接続されたと判定したときに、ステップＳ１３６の処理に移行して、この別の無線デバイスに無線設

定情報尾書き込むようにしてもよい。このようにすることにより、同一の無線設定情報を複数の無線デバイス１に書き込むことができる。なお、ここでの同一の無線設定情報とは、図８に示す無線設定情報のうちＩＰアドレスを除いた情報が同一であることを意味する。

【０１２３】

また、上述では、遠隔操作装置２による無線設定情報の更新を、遠隔操作装置２に無線デバイス１が接続されたとき、或いは、起動制御ボタン２３１が操作されたときとしたが、手動操作によって行うようにしてもよい。すなわち、遠隔操作装置２には、無線設定情報のうち少なくとも暗号キーを生成して更新する動作を指示する更新ボタン２３２を備えており、更新ボタン２３２が操作される毎に、無線設定情報のうち少なくとも暗号キーを生成して更新するようにしてもよい。

【０１２４】

（画像投影装置３について）

画像投影装置３は、図１４に示すように、遠隔操作装置２と赤外線通信を行う赤外線受信部３０１（ワイヤレス受信部の一例に相当）と、利用者によって各種操作を行うための制御パネル３０２と、画像投影装置３全体を制御する制御部３０３と、無線設定情報などの情報を保持するための不揮発性メモリ３０４と、計時手段である時計回路３０５と、無線ＬＡＮ規格に準拠した無線通信を行う無線部３０６と、外部から映像信号を入力する映像信号入力回路３０７と、映像信号入力回路３０７を介して入力される映像信号や無線部３０６を介して受信される画像データに基づいた画像を投影する投影部３０８とを備えており、これらはハウジングに内蔵される。

【０１２５】

赤外線受信部３０１は、遠隔操作装置２から送信された赤外線信号を受信する赤外線受光部３１０と、この赤外線受光部３１０によって受信した赤外線信号を制御部３０３に通知する赤外線制御部３１１とを有している。赤外線受光部３１０としては、赤外線ＬＥＤなどが用いられる。

【０１２６】

制御パネル３０２は、投影装置において利用者が操作可能な箇所、すなわちハウジングの外壁面の適所に設けられており、利用者がこの制御パネル３０２を操作することによって、その操作内容に応じた制御を制御部３０３が実行する。

【０１２７】

制御部３０３は、ＣＰＵ，ＲＯＭ，ＲＡＭなどを内蔵しており、ＣＰＵがＲＯＭに予め格納されたプログラムを読み出して実行することによって制御部として機能する。なお、ＲＡＭはワーキングメモリなどとして用いられる。この制御部３０３は、無線部３０６を制御してコンピュータ装置４から無線通信により送信される画像データを受信し、この受信した画像データに応じた画像を投影部３０８により投影する。また、制御部３０３は、遠隔操作装置２から赤外線受信部３０１を介して無線設定情報を受信すると、無線部３０６を動作状態にし、その後無線部３０６を介してコンピュータ装置４と無線通信中か否かを判定し、コンピュータ装置４と無線通信中ではないと判定した状態が一定状態継続したとき、無線部３０６を非動作状態にする。

【０１２８】

不揮発性メモリ３０４は、例えば、フラッシュメモリ（flash memory）などから構成され、無線設定情報などを保持する。

【０１２９】

無線部３０６は、アンテナとアンテナを介して無線信号を送受信するＲＦ（無線）ユニットなどから構成される無線回路３１２と、無線回路３１２により送受信する無線信号を無線ＬＡＮ規格に準じた無線信号とする処理を行う無線制御部３１３とを備えている。なお、ここでの無線制御部３１３は、マイクロコンピュータから構成される。

【０１３０】

映像信号入力回路３０７は、コンポジット映像信号（例えばＮＴＳＣ映像信号）やコン

ポーネント映像信号（例えばＲＧＢ信号）などの映像信号を外部からケーブルを介して入力するときのためのものである。

【０１３１】

投影部３０８は、ランプ駆動回路３２０と、光源３２１と、照明光学系３２２と、透過型液晶パネル３２３（以下、「ＬＣＤ３２３」とする。）と、結像光学系３２４と、画像処理回路３２５と、ＬＣＤ駆動回路３２６と、ピント調整回路３２７とを備えている。

【０１３２】

光源３２１は、ランプなどから構成され、制御部３０３によって制御されたランプ駆動回路３２０から出力される信号に基づいて、点灯駆動されて発光する。光源３２１で発光された光は、照明光学系３２２によって、照明光としてＬＣＤ３２３に照射される。

【０１３３】

画像処理回路３２５は、制御ユニットＵによる制御に基づいて、映像信号入力回路３０７に入力された映像信号或いは無線部３０６により受信した画像データに対し、信号の付加や変更などの加工を行う。このように加工されて生成された画像信号は、ＬＣＤ駆動回路３２６に入力される。

【０１３４】

ＬＣＤ３２３は、ＬＣＤ駆動回路３２６によって駆動され、その表示面に映像を表示する。このように表示された映像は、照明光学系３２２からの照明光によって、光としてＬＣＤ３２３から出射される。続いて、この出射光は、結像光学系３２４及びハウジングの投影用開口部を通って、スクリーン（投射面）に投影される。このように、ＬＣＤ３２３に表示される画像がスクリーンに投影される構成となっている。なお、ピント調整機構によって、スクリーンに投影する画像のピントを調整することができる。

【０１３５】

ここで、画像投影装置３における無線情報の設定について、図面を参照して具体的に説明する。図１５は画像投影装置３における基本的な動作の一例のフローチャートである。

【０１３６】

まず、図１５を参照して、画像投影装置３における基本的な動作の一例について説明する。

【０１３７】

図１５に示すように、画像投影装置３の制御部３０３は、遠隔操作装置２から起動コマンドを受信したか否かを判定する（ステップＳ２００）。この判定は、起動コマンドを受信するまで継続し、起動コマンドを受信したとき（ステップＳ２００：ＹＥＳ）、制御部３０３は、投影部３０８の光源３２１やＬＣＤ３２３などの動作を開始する。このとき、制御部３０３は、無線部３０６を停止した状態を維持する。

【０１３８】

次に、制御部３０３は、内部のＲＡＭに設定されている経過時間記憶領域の経過時間を初期化して０に戻して（ステップＳ２０１）、処理をステップＳ２０２に移行する。

【０１３９】

ステップＳ２０２において、制御部３０３は、遠隔操作装置２から無線設定情報を赤外線受信部３０１を介して受信したか否かを判定する。この処理において、無線設定情報を受信したと判定すると（ステップＳ２０２：ＹＥＳ）、受信した無線設定情報を不揮発性メモリ３０４に記憶すると共に、無線機能をＯＮにする（ステップＳ２０３）。すなわち、制御部３０３は、無線部３０６を動作させて、コンピュータ装置４との無線通信を可能な状態にする。その後、制御部３０３は、無線部３０６の動作が停止されるまでの間、無線部３０６を介してコンピュータ装置４から画像データを受信すると、投影部３０８を制御して受信した画像データに応じた画像をスクリーン（投影面）に投影することになる。

【０１４０】

次に、制御部３０３は、経過時間のカウントアップを開始する（ステップＳ２０４）。すなわち、制御部３０３は、経過時間記憶領域の経過時間を所定時間（例えば、１秒）毎にインクリメントする処理を開始して、ステップＳ２０５の処理に移行する。

【０１４１】
ステップＳ２０５において、制御部３０３は、経過時間記憶領域に記憶している経過時間を取得する。その後、制御部３０３は、無線部３０６とコンピュータ装置４との間で無線接続中であるか否かを判定する（ステップＳ２０６）。この処理において、無線接続中であると判定すると（ステップＳ２０６：ＹＥＳ）、制御部３０３は、経過時間記憶領域に記憶している経過時間をリセットして、０に戻す（ステップＳ２０７）。一方、無線接続中ではないと判定すると（ステップＳ２０７：ＮＯ）、制御部３０３は、経過時間記憶領域に記憶している経過時間が所定時間（例えば、１時間）を越えたか否かを判定する（ステップＳ２０８）。

【０１４２】
ステップＳ２０８において、経過時間が所定時間を超えていないと判定すると（ステップＳ２０８：ＮＯ）、制御部３０３は、処理をステップＳ２０４に戻す。一方、経過時間が所定時間を超えていると判定すると（ステップＳ２０８：ＹＥＳ）、制御部３０３は、無線機能をＯＦＦにする（ステップＳ２０９）。すなわち、制御部３０３は、無線部３０６の動作を停止して、ステップＳ２１０の処理に移行する。

【０１４３】
ステップＳ２１０において、制御部３０３は、不揮発性メモリ３０４に記憶した無線設定情報を破棄（クリア）する。

【０１４４】
ステップＳ２１０の処理が終了すると、制御部３０３は、遠隔操作装置２からシャットダウンコマンドを受信したか否かを判断する（ステップＳ２１１）。制御部３０３は、シャットダウンコマンドを受信したと判定した場合には（ステップＳ２１１：ＹＥＳ）、本処理を終了する一方、シャットダウンコマンドを受信していないと判定した場合には（ステップＳ２１１：ＮＯ）、ステップＳ２００から繰り返し処理を実行することとなる。

【０１４５】
以上のように、本実施形態における画像投影装置３の制御部３０３は、遠隔操作装置２から赤外線受信部３０１を介して無線設定情報を受信すると、無線部３０６を動作状態にし、その後無線部３０６を介してコンピュータ装置４と無線通信中か否かを判定し、コンピュータ装置４と無線通信中ではないと判定した状態が一定状態継続したとき、無線部３０６を非動作状態にする。従って、所定期間以上コンピュータ装置４と画像投影装置３との通信がないときには、一つのプレゼンテーションが終了したと判定することができるので、プレゼンテーション毎に暗号キーを変更することができることになる。

【０１４６】
なお、このように無線接続されていない時間の継続によって無線部３０６を停止させるようにしたが、無線接続されていない状態にかかわらず無線部３０６を動作させるようにしてもよい。例えば、ステップＳ２０１，ステップＳ２０４～ステップＳ２１０の処理をせずに、ステップＳ２１１のシャットダウンコマンドを受信した後に、無線設定情報の破棄を行い（ステップＳ２１０と同様の処理）、さらに無線機能をＯＦＦ（ステップＳ２０９と同様の処理）にする。

【０１４７】
（コンピュータ装置４について）
次に、コンピュータ装置４について、図面を参照して説明する。図１６は本実施形態におけるコンピュータ装置４のブロック図である。

【０１４８】
図１６に示すように、コンピュータ装置４は、ＵＳＢコネクタ４０１と、ＵＳＢバスコントローラ４０２と、表示部であるＬＣＤ４０３と、ＬＤＣ４０３に表示させるための処理を行うグラフィックスコントローラ４０４と、コンピュータ装置４全体の制御を行うＣＰＵ４０５と、プログラムや各種パラメータを格納するメモリ４０６と、これらを接続する第１のバス４０７を備えている。

【０１４９】

さらに、コンピュータ装置４は、１０ＢＡＳＥ-Ｔや１００ＢＡＳＥ-ＴＸに対応したＬＡＮインターフェース４１０と、マウス４１１と、キーボード４１２と、ＣＤ／ＤＶＤドライブ４１３と、フロッピー（登録商標）ディスクドライブ４１４と、ハードディスク４１５と、これらを接続する第２のバス４１６を備えている。さらに、第１のバス４０７と第２のバス４１６とのデータのやり取りを制御するバスコントローラ４０８を備えている。

【０１５０】

ＵＳＢコネクタ４０１とＵＳＢバスコントローラ４０２によって、無線デバイス１や外付けキーボードなどのＵＳＢデバイスとＵＳＢ規格に基づいたデータの送受信を処理を行う。

【０１５１】

また、メモリ４０６には、オペレーティングシステム（ＯＳ）プログラムやプレゼンテーション用アプリケーションプログラムが格納されており、コンピュータ装置４の電源がオンになると、まずＣＰＵ４０５はメモリ４０６からＯＳプログラムを読み出して実行することにより、マウス４１１やキーボード４１２の入出力に関する機能や、メモリ４０６やハードディスク４１５などのメモリ管理など、コンピュータ装置４の基本的な機能を実行可能にするものである。

【０１５２】

そして、このＯＳプログラムがＣＰＵ４０５によって実行された状態で、プレゼンテーション用アプリケーションプログラムなどのコンピュータプログラムがメモリ４０６から読み出されて実行される。なお、後述のように、デバイスドライバや画像転送用アプリケーションプログラムがインストールされた場合には、これらもＣＰＵ４０５によって実行されることにより、各種の制御を行うことになる。

【０１５３】

以上のように構成されたコンピュータ装置４における無線情報設定の基本的な動作の一例について説明する。図１７は、コンピュータ装置４における無線情報設定の動作を示すフローチャートであり、コンピュータ装置４の制御部であるＣＰＵ４０５によって制御されるものである。

【０１５４】

図１７に示すように、コンピュータ装置４のＣＰＵ４０５は、無線デバイス１が接続されたか否かを判定する（ステップＳ３００）。無線デバイス１が接続されたか否かの判定は、ＵＳＢコネクタ４０１にＵＳＢデバイスが接続されたか否かを判定し、さらにＵＳＢデバイスが接続されたときに、このＵＳＢデバイスが特定の識別情報を有しているかによって判定する。

【０１５５】

この処理において、無線デバイス１が挿入されたと判定すると（ステップＳ３００：ＹＥＳ）、ＣＰＵ４０５は、オートラン動作の処理を開始する（ステップＳ３０１）。このオートラン動作処理は、図１８におけるＳ３２０～Ｓ３２７の処理であり、後述する。

【０１５６】

オートラン動作処理が終了すると、ＣＰＵ４０５は、画像転送アプリケーションが正常に起動しているか否かを判定する（ステップＳ３０２）。この処理において、ＣＰＵ４０５は、画像転送アプリケーションが正常に起動していると判定する（ステップＳ３０２：ＹＥＳ）と、処理をステップＳ３０３に移行する。以下、ステップＳ３０３～Ｓ３０９までの動作は、ＣＰＵ４０５が画像転送アプリケーションに従って動作することによって画像送信手段等として機能することによって実行される。

【０１５７】

ステップＳ３０３において、ＣＰＵ４０５は、ＵＳＢコネクタ４０１を介して無線デバイス１の画像転送中ランプ１５１の点灯要求を行う。この点灯要求を受けると無線デバイス１のＣＰＵ１０１は画像転送中ランプ１５１を点灯する。

【０１５８】

次に、ＣＰＵ４０５は、コンピュータ装置４の表示部であるＬＣＤ４０３に表示している画面（以下、「表示画面」とする。）に応じた画像データを画像投影装置３に送信を開始する（ステップＳ３０４）。この処理は、ＣＰＵ４０５が、表示画像のデータをＵＳＢコネクタ４０１を介して無線デバイス１へ送信し、この無線デバイス１から無線通信によって画像投影装置３へ送信されるものであり、このように送信された表示画像データを画像投影装置３が受信すると、この表示画像データに基づいた画像をスクリーンに投影することになる。

【０１５９】

このように表示画像のデータを送信している状態で、ＣＰＵ４０５は、タイムアウト処理を行う（ステップＳ３０５）。このタイムアウト処理は、図１９におけるＳ３３０～Ｓ３３４の処理であり、後述する。

【０１６０】

このタイムアウト処理が終了すると、ＣＰＵ４０５は、有効時間を経過したか否かを判定する（ステップＳ３０６）。この判定は、後述のステップＳ３３１において有効時間を経過したとの判定と有効時間を経過していないとの判定のいずれであったかの判定である。

【０１６１】

この処理において、有効時間を経過していないと判定したとき（ステップＳ３０６：ＮＯ）、ＣＰＵ４０５は、無線デバイス１がコンピュータ装置４から抜かれたか否かを判定する（ステップＳ３０７）。この処理において、無線デバイス１がコンピュータ装置４から抜かれたと判定すると（ステップＳ３０７：ＹＥＳ）、ＣＰＵ４０５は、エラーメッセージをＬＣＤ４０３に表示して（ステップＳ３０８）、画像転送アプリケーションの実行を終了する（ステップＳ２０９）。一方、無線デバイス１がコンピュータ装置４から抜かれていないと判定すると（ステップＳ３０７：ＮＯ）、ＣＰＵ４０５は、処理をステップＳ３０５へ移行する。

【０１６２】

ステップＳ３０２において、画像転送アプリケーションが正常に動作していないとき（ステップＳ３０２：ＮＯ）、ステップＳ３０６において有効時間を経過したと判定したとき（ステップＳ３０６：ＹＥＳ）、ステップＳ３０９の処理の処理が終了したとき、ＣＰＵ４０５は、本処理を終了する。

【０１６３】

次に、ステップＳ３０１におけるオートラン動作処理について、図１８を参照して説明する。図１８はコンピュータ装置４におけるオートラン処理のフローチャートである。このオートラン動作は、無線デバイス１が接続されたときに、この無線デバイス１のＣＤ－ＲＯＭ認識部１２５の機能により、ＣＰＵ４０５が、無線デバイス１をＣＤ－ＲＯＭとして認識し、自動的に無線デバイス１の情報を読み込むことによって動作するものである。

【０１６４】

図１８に示すように、ＣＰＵ４０５は、自コンピュータ装置４にデバイスドライバ１３１がインストールされていないか否かを判定する（ステップＳ３２０）。この処理において、デバイスドライバ１３１がインストールされていないと判定すると（ステップＳ３２０：ＹＥＳ）、ＣＰＵ４０５は、無線デバイス１のフラッシュメモリ１０４に記憶されている無線通信部１０７制御用のデバイスドライバ１３１をＵＳＢコネクタ４０１を介して読み出し、自コンピュータ装置４に対してこのデバイスドライバ１３１のインストール処理を施す（ステップＳ３２１）。

【０１６５】

ステップＳ３２１の処理が終了したとき、或いは、ステップＳ３２０において、デバイスドライバがインストールされていると判定したとき（ステップＳ３２０：ＮＯ）、ＣＰＵ４０５は、無線設定アプリケーションを起動して（ステップＳ３２２）、無線デバイス１に保持されている無線設定情報をＵＳＢコネクタ４０１を介して読み出す（ステップＳ３２３）。

【０１６６】
次に、ＣＰＵ４０５は、無線設定アプリケーションの実行により、ＷＬＡＮ（無線ＬＡＮ）のネットワークの設定を行う（ステップＳ３２４）。このネットワーク設定は、無線デバイス１に対して行うものである。すなわち、ＣＰＵ４０５は、ＵＳＢコネクタ４０１を介して、無線デバイス１に無線設定情報を送信し、無線デバイス１はこの無線設定情報に従ってＷＬＡＮのネットワークの設定を行う。ＷＬＡＮのネットワークの設定には、ＬＡＮ通信を行うためのＩＰアドレス、サブネットマスク、ＤＮＳのＩＰアドレスなどのＩＰネットワークの設定と、ネットワーク名や暗号キーなど無線通信に必要な情報の設定とがある。

【０１６７】
ステップＳ３２４の処理が終了すると、ＣＰＵ４０５は、画像投影装置３との無線通信が無線デバイス１を介して接続されているか否か、言い換えれば画像投影装置３とネットワーク接続がされているか否かを判定する（ステップＳ３２５）。この処理において、画像投影装置３とのネットワーク接続が行われていると判定すると（ステップＳ３２５：ＹＥＳ）、ＣＰＵ４０５は、画像転送アプリケーションを起動する（ステップＳ３２６）。一方、画像投影装置３とのネットワーク接続が行われていないと判定すると（ステップＳ３２５：ＮＯ）、ＣＰＵ４０５は、エラーメッセージ表示処理を行う（ステップＳ３２７）。このエラーメッセージ表示処理は、ＣＰＵ４０５がＬＣＤ４０３にエラーメッセージを表示することによって行われる。

【０１６８】
ステップＳ３２６の処理、又はステップＳ３２７の処理が終了すると、本オートラン動作処理を終了する。

【０１６９】
なお、コンピュータ装置４のＣＰＵ４０５は、無線デバイス１の電源制御を行うようにしている。すなわち、無線デバイス１は、上述のようにメモリコントローラ機能部１２１と無線通信機能部１２３とを有しており、これらの電源をそれぞれ別々にＯＮ，ＯＦＦ制御できるようにしている。このようにメモリコントローラ機能部１２１と無線通信機能部１２３と個別にＯＮ，ＯＦＦすることできるので、ＵＳＢデバイスとしての限られた電力の範囲内で、信頼性の高い無線接続動作を実行することができる。例えば、ステップＳ３２０～Ｓ３２３においては、メモリコントローラ機能部１２１への電源をＯＮにし、無線通信機能部１２３への電源はＯＦＦにする。また、ステップＳ３２４～Ｓ３２７においては、メモリコントローラ機能部１２１への電源をＯＦＦにし、無線通信機能部１２３への電源はＯＮにするのである。また、無線デバイス１の記憶部に格納された画像転送アプリケーションをコンピュータ装置４のハードディスク４１５にコピーする場合には、メモリコントローラ機能部１２１への電源をＯＮにし、無線通信機能部１２３への電源はＯＦＦにする。

【０１７０】
次に、ステップＳ３０５におけるタイムアウト処理について、図１９を参照して説明する。図１９はコンピュータ装置４におけるタイムアウト処理のフローチャートである。

【０１７１】
このタイムアウト処理において、ＣＰＵ４０５は、まず画像投影装置３に対して時刻情報（現時刻の情報）を要求し、この要求に対して画像投影装置３から送信される時刻情報を取得して（ステップＳ３３０）、処理をステップＳ３３１へ移行する。なお、上述のように遠隔操作装置２の現時刻情報と画像投影装置３の現時刻情報とは同期が取れている。

【０１７２】
ステップＳ３３１において、ＣＰＵ４０５は、有効時間が経過したか否かを判定する。有効時間が経過したか否かの判定は、画像投影装置３から取得した時刻情報と無線デバイス１から読み込んだ無線設定情報とに基づいて行う。すなわち、有効時間が経過したか否かの判定を、画像投影装置３から取得した現時刻が無線デバイス１から読み込んだ無線設定情報に含まれる有効時間よりも遅い時間であるか否かにより判定する。

【０１７３】
この処理において、有効時間を経過したと判定すると（ステップＳ３３１：ＹＥＳ）、ＣＰＵ４０５は、タイムアウトメッセージをＬＣＤ４０３に表示して（ステップＳ３３２）、画像投影装置３との無線接続を切断する（ステップＳ３３３）。画像投影装置３との無線接続の切断は、無線デバイス１に対して、ＣＰＵ４０５が、画像投影装置３との無線接続の切断の要求を送信し、無線デバイス１がこの要求に応じることによって行われる。無線接続の切断を終了すると、ＣＰＵ４０５は、画像転送アプリケーションの実行を終了する（ステップＳ３３４）。
【０１７４】
また、有効時間が経過していない場合であっても、ＣＰＵ４０５は、有効時間まで所定時間（例えば、５分）を切ったと判定すると、有効時間を経過する前に有効時間を延長するように、ＬＣＤ４０３に有効時間が迫っている旨の表示を行う。このＬＣＤ４０３への表示に代えて或いは共に、ＣＰＵ４０５は、有効時間が迫っている旨の情報を無線デバイス１を介して画像投影装置３に送信し、画像投影装置３から投影する画像に、有効時間が迫っている旨の情報をスーパーインポーズさせるようにしてもよい。
【０１７５】
ステップＳ３３１において、有効時間を経過していないと判定したとき（ステップＳ３３１：ＮＯ）、或いはステップＳ３３４の処理が終了したとき、ＣＰＵ４０５はタイムアウト処理を終了する。
【０１７６】
以上のように本実施形態の画像投影システムＳでは、無線デバイス１は、無線部３０６を有し、無線部３０６で受信される画像データに応じた画像を投影する画像投影装置３に、画像データを無線通信により送信するコンピュータ装置４の無線部として機能するものである。この無線デバイス１には、画像投影装置３及びコンピュータ装置４のいずれにも接続可能なＵＳＢコネクタ１０５と、画像投影装置３にＵＳＢコネクタ１０５を接続したときに、画像投影装置３から無線設定情報（無線通信の設定情報）を書き込み可能であり、かつコンピュータ装置４にＵＳＢコネクタ１０５を接続したときに、画像投影装置３から書き込まれた無線設定情報をコンピュータ装置４により読み出し可能なフラッシュメモリ１０４と、コンピュータ装置４にＵＳＢコネクタ１０５を接続したときに、画像投影装置３から書き込まれた無線設定情報に基づいた設定により画像投影装置３の無線部３０６と通信を行う無線通信部１０７とを備えたので、画像投影装置３によって設定された無線設定情報に基づいて、画像投影装置３とコンピュータ装置４との間の通信を行うことができ、機密性の高い無線デバイス１或いは画像投影システムＳを提供することが可能となる。
【０１７７】
（画像投影システムＳの他の実施形態）
上記実施形態においては、遠隔操作装置２から無線デバイス１への無線設定情報の書き込みをＵＳＢコネクタ１０５，２０１を介して行う例について説明したが、ここでは、画像投影システムＳの他の実施形態として、遠隔操作装置２'から無線デバイス１'へ無線設定情報の書き込みをワイヤレス信号を送受信するワイヤレス通信により行う実施形態を説明する。ここでは、ワイヤレス通信の一例として、赤外線信号を送受信する赤外線通信について説明する。また、上記実施形態においては、遠隔操作装置２に無線デバイス１が接続されたとき或いは遠隔操作装置２の起動制御ボタン２３１が操作されたときに、遠隔操作装置２において無線設定情報の更新する設定のときの動作について説明したが、ここでは、更新ボタン２３２が操作されたときに無線設定情報を更新するように設定されているときの動作について説明する。
【０１７８】
ここでは、無線デバイス１'は、図２０に示すように、赤外線受信部１１３（ワイヤレス受信部の一例に相当）を設けた無線デバイスとする。赤外線受信部１１３は、遠隔操作装置２から送信された赤外線信号を受信する赤外線受光部１１４と、この赤外線受光部１

１４によって受信した赤外線信号をＣＰＵ１０１に通知する赤外線制御部１１５とを有している。無線デバイス１’は、上述のように赤外線受信部１１３を設けており、遠隔操作装置２から送信される赤外線信号の情報を赤外線受信部１１３で受信し、コンピュータ装置４に通知するように動作する。赤外線受光部１１４としては、赤外線ＬＥＤなどが用いられる。なお、ＲＯＭ１０３に格納した制御プログラムが一部異なる以外は、無線デバイス１の構成と異なることがないため、説明を省略する。また、遠隔操作装置２’についても、２次記憶装置２１１に記憶した制御プログラムが一部異なる以外は、遠隔操作装置２の構成と異なることがないため、その構成の説明は省略する。

【０１７９】

まず、遠隔操作装置２’の動作について図面を参照して具体的に説明する。図２１は、遠隔操作装置２’の動作の一例を示すフローチャートである。

【０１８０】

図２１に示すように、まず遠隔操作装置２’のＣＰＵ２１０は、ＩＤ発行コマンドが検出されたか否かを判定する（ステップＳ１４０）。ここで、ＩＤ発行コマンドが検出されたか否かは、ＣＰＵ２１０が更新ボタン２３２（図４参照）を検出したか否かによって判定する。

【０１８１】

ステップＳ１４０において、ＩＤ発行コマンドを検出すると、ＣＰＵ２１０は、無線設定情報の更新を行う（ステップＳ１４１）。この処理は、図１１のフローチャートに示す処理と同様の処理である。

【０１８２】

次に、ＣＰＵ２１０は、表示部２０７を制御してＩＤ発行許可数の設定を促すための表示を行う。利用者は、この表示部２０７の表示に従い、左右矢印キー２３４，２３５や決定キー２３６などを操作して、ＩＤ発行許可数の設定を行う。このＩＤ発行許可数の設定は、ＣＰＵ２１０によって２次記憶装置２１１の所定領域に記憶される（ステップＳ１４２）。このように、ＣＰＵ２１０は、同一の無線設定情報をデバイスに書き込むことができる書き込み回数を設定する書き込み回数設定手段として機能する。

【０１８３】

次に、ＣＰＵ２１０は、操作部１０８に配置された無線情報設定ボタン２３９が検出されたか否かを判定する（ステップＳ１４３）。無線情報設定ボタン２３９の検出は、利用者による無線情報設定ボタン２３９の操作が行われたか否かをＣＰＵ２１０によって判定することによって行う。

【０１８４】

この処理において、無線情報設定ボタン２３９が検出されたと判定すると（ステップＳ１４３：ＹＥＳ）、ＣＰＵ２１０は、同一の無線設定情報の発行済みの数を更新する（ステップＳ１４４）。すなわち、ＣＰＵ２１０は、同一の無線設定情報発行済みの数を１つインクリメントする。この発行済みの数は、ステップＳ１４２の処理時に初期化されて“０”に設定される。

【０１８５】

次に、ＣＰＵ２１０は、無線設定情報の発行済みの数がステップＳ１４２で設定された発行許可数を超えているか否かを判定する（ステップＳ１４５）。この処理において、無線設定情報の発行済みの数が発行許可数を超えていないと判定すると（ステップＳ１４５：ＮＯ）、ＣＰＵ２１０は、２次記憶装置２１１に記憶されている無線設定情報を取り出し、この無線設定情報を無線デバイス１’に対して赤外線送信部２０３から赤外線信号として送信する（ステップＳ１４６）。このようにＣＰＵ２１０は、２次記憶装置２１１に設定された発行許可数（書き込み回数）を超えて書き込まれるまでは、無線設定情報の更新を行わずない。一方、発行済みのＩＤ数がＩＤ発行許可数を超えていると判定すると（ステップＳ１４５：ＹＥＳ）、ＣＰＵ２１０は、ＣＰＵ２１０は、２次記憶装置２１１に記憶されている無線設定情報を破棄（クリア）して（ステップＳ１４７）、無線デバイス１’に対して、無線設定情報の送信が発行許可数になった旨の情報である設定許可数超え

の通知を送信する（ステップＳ１４８）。なお、ステップＳ１４６～Ｓ１４８の送信は、ＣＰＵ２１０がこれらの情報を赤外線送信部２０３から赤外線信号として送信することによって行う。

【０１８６】

このように、遠隔操作装置２’は、設定された発行許可数を超えるまでは、無線情報設定ボタン２３９を操作する毎に無線設定情報の送信を行うようにしているため、無線デバイス１’を接続した複数のコンピュータ装置４に対して、それぞれ無線設定情報を書き込むことができる。

【０１８７】

次に、無線デバイス１’を接続したコンピュータ装置４’の動作について図面を参照して具体的に説明する。図２２は、コンピュータ装置４’の動作の一例を示すフローチャートである。なお、図２２におけるステップＳ３４０～Ｓ３４９の処理は、図１７におけるステップＳ３００～Ｓ３０９の処理と同等であるため、Ｓ３５０～Ｓ３５４についてのみ説明する。なお、ステップＳ３４２において、画像転送アプリケーションが正常に起動しているか否かは、無線設定情報が設定されて、画像転送アプリケーションによって画像投影装置３に対して画像データが転送することができる状態になっているか否かで判断する。

【０１８８】

ステップＳ３４２において、ＣＰＵ４０５は、画像転送アプリケーションが正常に起動していないと判定する（ステップＳ３４２：ＮＯ）と、遠隔操作装置２からの赤外線信号が無線デバイス１の赤外線受信部１１３により受信されたか否かを判定する（ステップＳ３５０）。

【０１８９】

この処理において、赤外線信号を受信したと判定すると（ステップＳ３５０：ＹＥＳ）、ＣＰＵ４０５は、その赤外線信号が無線設定情報であるか否かを判定する（ステップＳ３５１）。このとき、赤外線信号が無線設定情報であると判定されると（ステップＳ３５１：ＹＥＳ）、ＣＰＵ４０５は、無線デバイス１の無線設定情報を更新する（ステップＳ３５４）。すなわち、ステップＳ３５１で受信した無線設定情報に基づいて無線デバイス１を動作させるのである。一方、赤外線信号が無線設定情報ではないと判定されると（ステップＳ３５１：ＮＯ）、ＣＰＵ４０５は、ステップＳ３５０で受信した赤外線信号が設定許可数超えの通知であるか否かを判定する（ステップＳ３５２）。

【０１９０】

ステップＳ３５２において、設定許可数超えの通知であると判定すると（ステップＳ３５２：ＹＥＳ）、ＣＰＵ４０５は、無線通信設定ができない旨のエラーメッセージを表示する（ステップＳ３５３）。

【０１９１】

ステップＳ３５３，Ｓ３５４の処理が終了したとき、ステップＳ３５０において赤外線信号を受信していないと判定したとき（ステップＳ３５０：ＮＯ）、ステップＳ３５１において赤外線信号が無線設定情報であると判定したとき（ステップＳ３５１：ＹＥＳ）、ステップＳ３５２において設定許可数超えの通知ではないと判定したとき（ステップＳ３５２：ＮＯ）、ＣＰＵ４０５は、処理をステップＳ３４２に移行する。

【０１９２】

以上、本発明の実施の形態のうちのいくつかを図面に基づいて詳細に説明したが、これらは例示であり、当業者の知識に基づいて種々の変形、改良を施した他の形態で本発明を実施することが可能である。

【０１９３】

例えば、無線デバイス１と画像投影装置３及びコンピュータ装置４との間をＵＳＢ規格に基づく通信で説明したが、これに限られず、他の通信規格により通信を行うようにしてもよい。

【０１９４】

また、無線デバイス１は、無線通信部１０７を設けることとしているが、コンピュータ装置４の無線部を用いるようにすることもでき、このようにする場合には、無線デバイス１から無線通信部１０７の機能を削除したデバイスを用いることができる。

【図面の簡単な説明】

【０１９５】

【図１】本実施形態における画像投影システムの全体構成図である。

【図２】本実施形態における画像投影システムにおける概略動作を説明するための図である。

【図３】本実施形態における無線デバイスの外観図である。

【図４】本実施形態における遠隔操作装置の外観図である。

【図５】本実施形態における無線デバイスのブロック図である。

【図６】本実施形態における無線デバイスの機能ブロック図である。

【図７】図６のメモリコントローラ機能部のブロック図である。

【図８】本実施形態における無線設定情報の例を示す図である。

【図９】本実施形態における遠隔操作装置のブロック図である。

【図１０】本実施形態における遠隔操作装置の無線設定情報の処理のフローチャートである。

【図１１】本実施形態における遠隔操作装置の無線設定情報の更新処理のフローチャートである。

【図１２】本実施形態における遠隔操作装置の無線設定情報の書き込み処理のフローチャートである。

【図１３】本実施形態における遠隔操作装置の他の無線設定情報の処理のフローチャートである。

【図１４】本実施形態における画像投影装置のブロック図である。

【図１５】本実施形態における画像投影装置の動作説明のためのフローチャートである。

【図１６】本実施形態におけるコンピュータ装置のブロック図である。

【図１７】本実施形態におけるコンピュータ装置の動作説明のためのフローチャートである。

【図１８】本実施形態におけるコンピュータ装置の動作説明のためのフローチャートである。

【図１９】本実施形態におけるコンピュータ装置の動作説明のためのフローチャートである。

【図２０】他の実施形態における遠隔操作装置のブロック図である。

【図２１】他の実施形態における遠隔操作装置の無線設定情報の処理のフローチャートである。

【図２２】他の実施形態におけるコンピュータ装置の動作説明のためのフローチャートである。

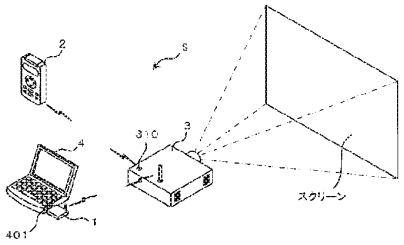
【符号の説明】

【０１９６】

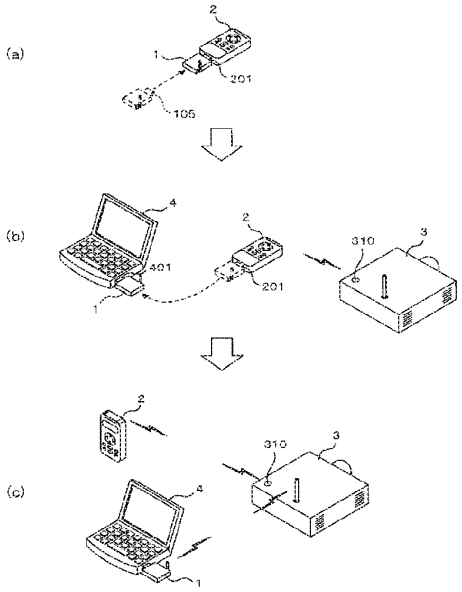
１　無線デバイス
２　遠隔操作装置
３　画像投影装置
４　コンピュータ装置
１０１　無線デバイスのＣＰＵ（制御部）
１０４　無線デバイスのフラッシュメモリ（記憶部）
１０５　無線デバイスのＵＳＢコネクタ
２０１　遠隔操作装置のＵＳＢコネクタ
２０３　遠隔操作装置の赤外線送信部
２１０　遠隔操作装置のＣＰＵ（制御部）
２３１　遠隔操作装置の起動制御ボタン

３０１　画像投影装置の赤外線受信部
３０３　画像投影装置の制御部
３０６　画像投影装置の無線部
４０１　コンピュータ装置のＵＳＢコネクタ
４０５　コンピュータ装置のＣＰＵ（制御部）

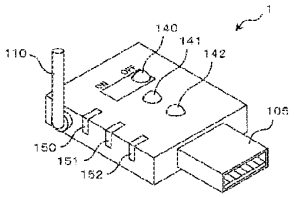
【図１】



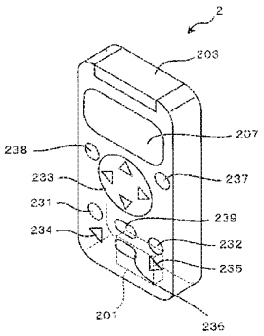
【図２】



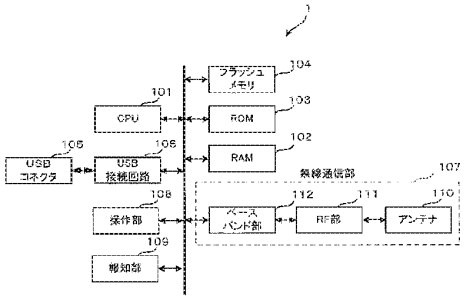
【図３】



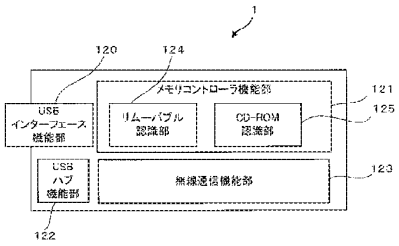
【図４】



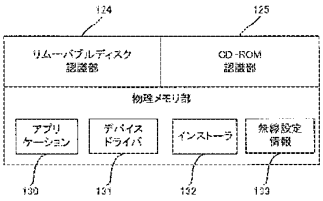
【図５】



【図６】



【図７】

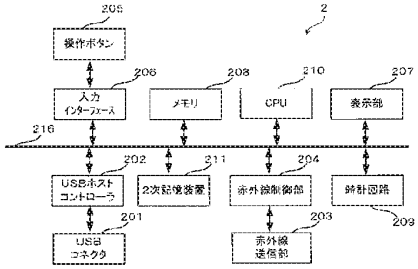


【図８】

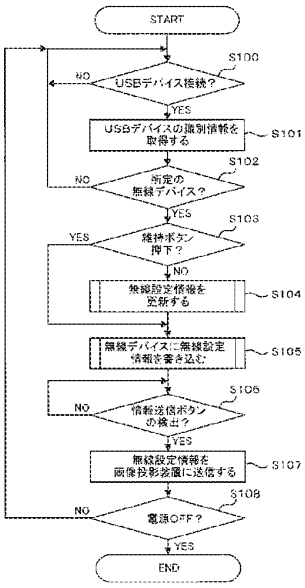
無線設定情報

バンド	IEEE802.11g
ネットワークモード	アドホックモード
ネットワーク名	Projector-net
無線チャンネル	11
認証レベル	オープンシステム
暗号化レベル	128ビット
データ暗号化	WEP
暗号キー	ga54121・・・
IPアドレス	192.168.0.1
サブネットマスク	255.255.255.0
DNS	192.168.0.1
有効時間	2060.01.01 18:20
(接続可能時間	120min)

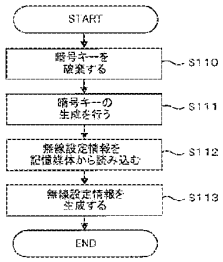
【図９】



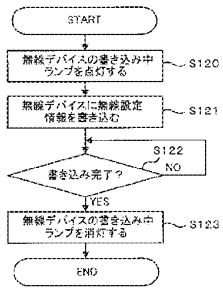
【図１０】



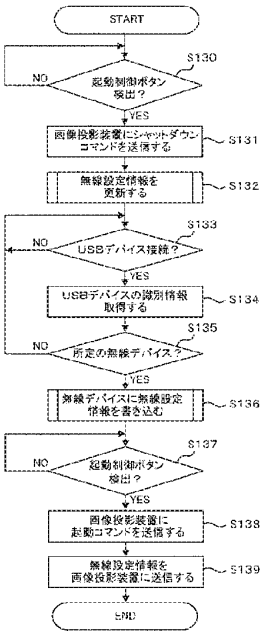
【図１１】



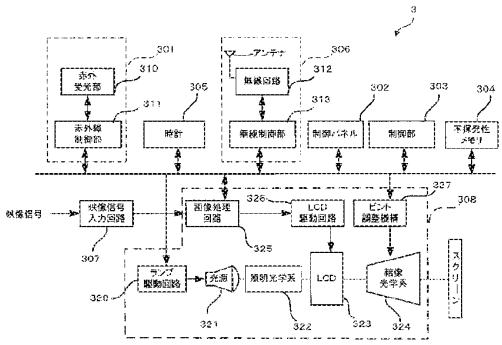
【図１２】



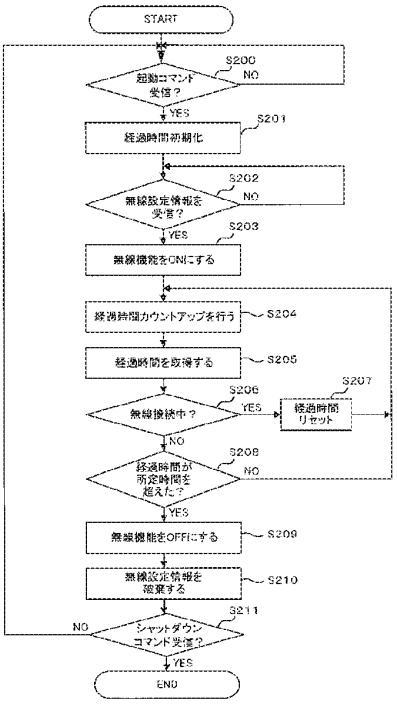
【図１３】



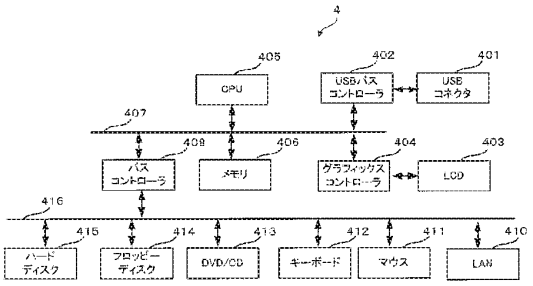
【図１４】



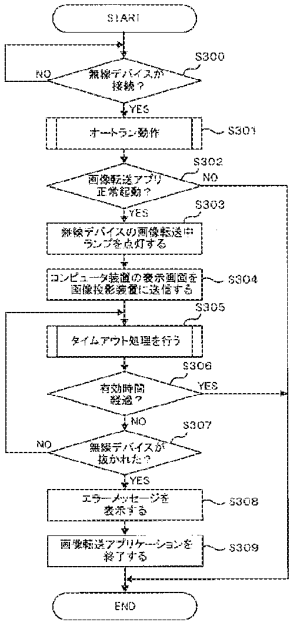
【図１５】



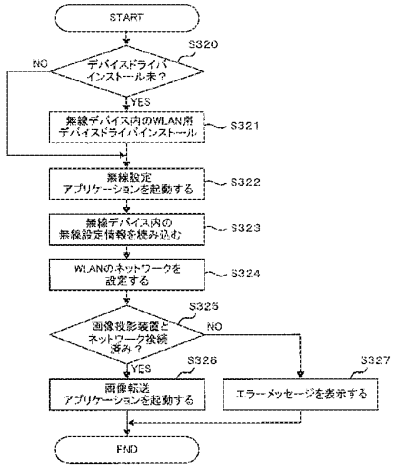
【図１６】



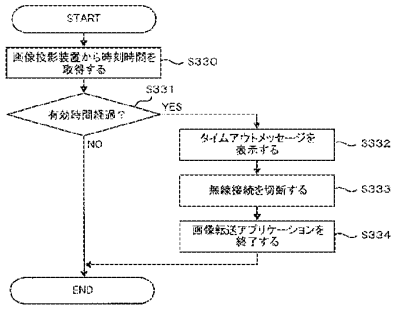
【図１７】



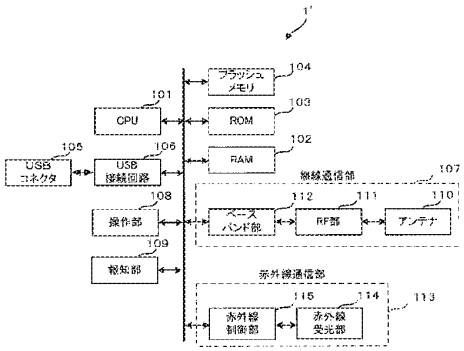
【図１８】



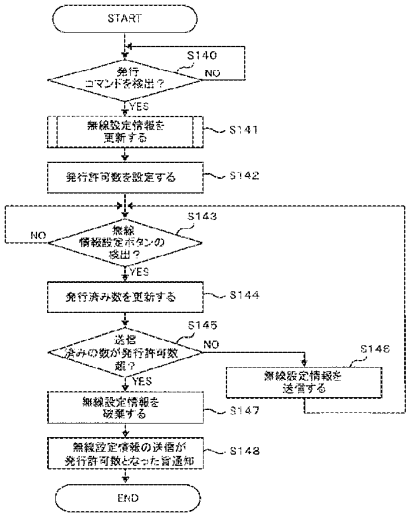
【図１９】



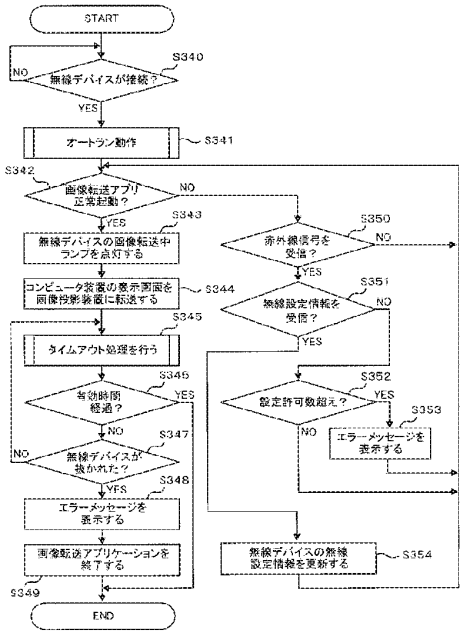
【図２０】



【図２１】



【図２２】



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DESCRIPTION JP2000242257

[0001]

BACKGROUND OF THE INVENTION 1. Field of the Invention The present invention relates to a display device, an image display method, and a storage medium, and more particularly to a case where a smooth and comfortable operation environment is provided in a conference or presentation using a plurality of image sources An image display method, and a storage medium.

[0002]

2. Description of the Related Art In recent years, image data created by a notebook personal computer (notebook PC) or the like is displayed on a large-sized display device, for example, a liquid crystal projector or a plasma display to present a presentation (a convincing explanatory technique in a meeting or the like) It is increasing to do. Meanwhile, attendees at each conference saved their data on a computer, browsed it, and exchanged files on the spot. Against such a background, in the image display system, it is necessary to display a plurality of image sources at the same time and have a function capable of collectively controlling these pieces of information and the displayed image information in a centralized manner.

[0003]

However, in the conventional large-sized display device for presentation, when simultaneously displaying a plurality of image sources, in order to decide at which position on the screen of the large-sized display device the display layout is to be performed, the display position is determined in advance Or, when the presenter listens to the display format (the number of

display lines, the number of dots, the number of colors) of the image source of the conference participant and decides the display layout one by one through complicated manual setting of the display driver software before the meeting I had to do.

[0004]

In addition, for conference participants watching the large screen display device, there are many cases where a character or image is not visible in the display layout predetermined by the presenter depending on the seated position, and at that time, the seating position is moved one by one Or you have to interrupt the meeting and ask the presenter to see what is being displayed or, in the worst case, the presenter had to redo the redisplay layout using the above-mentioned display driver software.

[0005]

However, unlike the above-described prior art, it is difficult to perform layout determination and redoing through a plurality of image sources via display driver software before or during a meeting, In addition to not only impeding the smooth progress of the multi-display conference system, which is the primary purpose of providing the efficiency improvement of the entire meeting, it is necessary to provide an inconvenient user interface that is just setting time There are many problems such as becoming it.

[0006]

SUMMARY OF THE INVENTION The present invention has been made in view of the above-described problems, and it is an object of the present invention to provide a display device, an image display method, and a storage medium capable of providing a user with a smooth and comfortable operation environment in a conference or presentation using a plurality of image sources And to provide a method for manufacturing the same.

[0007]

In order to achieve the above object, according to a first aspect of the present invention, there is provided a display device capable of simultaneously displaying images inputted from a plurality of image sources or independently, A selection unit configured to select an area on the screen of the display unit to display the image, a detection unit configured to detect a position of the selected area on the screen, and a display unit configured to display, on the basis of the input image data and the detected display position information And display control means for scaling the input image to a predetermined size for display.

[0008]
In order to achieve the above object, according to a second aspect of the present invention, there is provided a communication device for transmitting selection information by the selection device to a display device body, wherein the display control device controls the horizontal resolution / Calculates a scaling magnification ratio to display data of the input image data based on the number of lines and the detected display position information, and scales and displays the input image to a size corresponding to the scaling magnification ratio .

[0009]
In order to achieve the above object, according to a third aspect of the present invention, the selecting means comprises a selection side transmitting and receiving unit for transmitting and receiving infrared rays, an infrared ray propagation time between the selecting means and the target detecting means A counting unit for counting the number of times of transmission of the infrared rays, a counting unit for issuing information to which the identification code is added and for detecting the position of the detecting unit and the target selecting unit and the detection unit, And a comparing section which repeats the received information to the selecting section when the identification code transmitted from the selecting section matches, and wherein the transmitting section and the receiving section are arranged on a horizontal axis and a vertical axis of a screen of the display section Which is characterized in that

[0010]
In order to achieve the above object, according to a fourth aspect of the present invention, the selecting means can designate one of the diagonal lines of the rectangular frame as the starting point and the other as the ending point as the display selection range on the screen It is characterized by being there.

[0011]
In order to achieve the above object, the present invention according to Claim 5 has a storage means for storing a layout frame indicating a display selection range, wherein said display control means displays display screen data and And overlaying and displaying the layout frame data.

[0012]
In order to achieve the above object, according to a sixth aspect of the present invention, there is provided a confirmation selecting means for allowing an operator to confirm and select whether or not to display in the display selection range when a display selection range is decided Features

[0013]
In order to achieve the above object, according to a seventh aspect of the present invention, the confirmation selecting means is an On Screen Display.

[0014]
In order to achieve the above object, the present invention according to claim 8 is characterized in that the confirmation selecting means is input / output means for voice information.

[0015]
In order to achieve the above object, according to a ninth aspect of the present invention, in the case where the display selection range overlaps with the display area of another input image already displayed, the display control means displays the size of the display selection range The display position is shifted without changing the display position.

[0016]
In order to achieve the above object, according to a tenth aspect of the present invention, in the case where the boundary of the frame memory corresponding to the display screen is exceeded when the display position is shifted and displayed, a virtual space display As shown in FIG.

[0017]
In order to attain the above object, the present invention according to claim 11 is a display device capable of simultaneously displaying images input from a plurality of image sources, or a single display, wherein a plurality of images A selection means for selecting desired image data from the data, distance measuring means for measuring the distance between the selection means and the selected image, display control means for scaling the selected image to a predetermined size based on the measurement and displaying the selected image, .

[0018]
In order to achieve the above object, a twelfth aspect of the present invention is characterized in that it further comprises communication means for transmitting the distance measurement information by the distance measuring means to the main body of the display device, wherein the display control means controls the moving distance Of the selected image data and the scaling magnification ratio to the display data of the selected image data on the basis of the horizontal resolution and the number of vertical lines of the selected image data, and scales and displays the

selected image to the size corresponding to the scaling magnification ratio Features

[0019]
In order to achieve the above object, the present invention according to claim 13 is characterized in that the display control means calculates the scaling magnification ratio on the basis of a reference table showing the relationship between the movement distance and the scaling magnification ratio .

[0020]
In order to achieve the above object, according to a fourteenth aspect of the present invention, in the case where the identification code transmitted from the selection means is identical with the detection side transmission / reception section for transmitting and receiving infrared rays, the reception information is repeated to the selection means The distance measuring means has a comparing section and has detection means arranged at at least three different points on the display means, and the distance measuring means calculates each distance to each of the detecting means, calculates the distance between the selecting means and the selected image And the distance is measured.

[0021]
In order to achieve the above object, according to a fifteenth aspect of the present invention, the image source is a device such as a computer, a workstation, a digital television, a video, or the like.

[0022]
According to a sixteenth aspect of the present invention, there is provided an image display method applied to a display device capable of simultaneously displaying images input from a plurality of image sources or independently, comprising: A selection step of selecting which region on the screen of the display means to display by using the selection means; a detection step of detecting the position of the selected region on the screen using the detection means; And a display control step of scaling and displaying the input image in a predetermined size based on the detected display position information.

[0023]
In order to achieve the above object, the present invention according to claim 17 has a communication step of transmitting selection information in the selection step to the display device main body, wherein in the display control step, the horizontal resolution / vertical

Calculates a scaling magnification ratio to display data of the input image data based on the number of lines and the detected display position information, and scales and displays the input image to a size corresponding to the scaling magnification ratio .

[0024]

In order to attain the above object, the present invention according to claim 18 is characterized in that the selecting step comprises a selection side transmitting and receiving step of transmitting and receiving infrared rays, an infrared transmission time between the selecting means and the target detecting means And a control step of issuing information to which the identification code is added and detecting the position of the selection means and the target detection means, wherein the detection step includes a detection step of detecting transmission / reception of infrared rays And a comparing step of repeating the received information to the selecting step when the identification code transmitted from the selecting step matches, wherein the detecting means used in the detecting step is a step of detecting And are arranged on a horizontal axis and a vertical axis, respectively.

[0025]

In order to achieve the above object, the present invention according to claim 19 is characterized in that, in the selection step, one of the diagonal lines of the rectangular frame is set as a start point and the other point can be designated as an end point as the display selection range on the screen It is characterized by being there.

[0026]

In order to achieve the above object, according to a twentieth aspect of the present invention, there is provided a storage step of storing a layout frame indicating a display selection range, wherein in the display control step, display screen data And overlaying and displaying the layout frame data.

[0027]

In order to achieve the above object, the present invention according to Claim 21 is characterized in that it has a confirmation selecting step of allowing the operator to confirm and select whether or not to display in the display selection range when the display selection range is decided Features

[0028]

In order to achieve the above object, the present invention according to claim 22 is characterized

in that in the confirmation selecting step, the confirmation and selection are performed using On Screen Display.

[0029]
In order to attain the above object, the present invention according to claim 23 is characterized in that in the confirmation selecting step, the confirmation and selection are performed using input and output means of sound information.

[0030]
In order to attain the above object, the present invention according to Claim 24 is characterized in that, in the display control step, when the display selection range overlaps the display area of another input image already displayed, the size of the display selection range The display position is shifted without changing the display position.

[0031]
In order to achieve the above object, according to a twenty-fifth aspect of the present invention, in the display control step, when the boundary of the frame memory corresponding to the display screen is exceeded when the display position is shifted and displayed, a virtual space display As shown in FIG.

[0032]
According to a twenty-sixth aspect of the present invention, there is provided an image display method applied to a display device capable of displaying images input from a plurality of image sources simultaneously or separately, comprising: A selection step of selecting desired image data from a plurality of displayed image data by using a selection means; a distance measuring step of measuring a distance between the selection means and the selected image; And a display control step of scaling and displaying the scaled image.

[0033]
In order to achieve the above object, the present invention according to a twenty-seventh aspect of the present invention is characterized in that it further comprises a communication step of transmitting the distance measurement information by the distance measuring step to the display device body, wherein in the display control step, Of the selected image data and the scaling magnification ratio to the display data of the selected image data on the basis of the horizontal resolution and the number of vertical lines of the selected image data, and scales and displays the selected image to the size corresponding to the scaling magnification ratio Features

[0034]
In order to achieve the above object, the present invention according to Claim 28 is characterized in that in the display control step, the scaling magnification ratio is calculated based on a look-up table showing the relationship between the moving distance and the scaling magnification ratio .

[0035]
In order to achieve the above object, the present invention according to a twenty-ninth aspect of the present invention provides a method for transmitting and receiving infrared rays, comprising the steps of: a detecting-side transmitting and receiving step of transmitting and receiving infrared rays; repeating reception information to the selecting step when the identification codes transmitted from the selecting step match Wherein the detection step used in the detection step is arranged at at least three different points on the display means, and in the distance measurement step, each distance to the respective detection means is calculated And measures the distance between the selection means and the selected image.

[0036]
In order to achieve the above object, the present invention according to claim 30 is characterized in that the image source is a device such as a computer, a workstation, a digital television, a video, or the like.

[0037]
In order to achieve the above object, the present invention according to claim 31 is a program for executing an image display method applied to a display device capable of displaying images input from a plurality of image sources simultaneously or independently A storage medium readable by a computer, the image display method comprising: a selection step of selecting an area on the screen of the display unit to display an input image by using a selection unit; a selection step of selecting, A detection step of detecting an absolute position on the input image using the detection means; and a display control step of scaling the input image to a predetermined size and displaying it based on the input image data and the detected display position information .

[0038]
According to a thirty-second aspect of the present invention, in the above-described aspect of the invention, the selecting step includes a selecting-side transmitting and receiving step of transmitting and receiving infrared rays, an infrared ray propagation time between the selecting

means and the target detecting means And a control step of issuing information to which the identification code is added and detecting the position of the selection means and the target detection means, wherein the detection step includes a detection step of detecting transmission / reception of infrared rays And a comparing step of repeating the received information to the selecting step when the identification code transmitted from the selecting step matches, wherein the detecting means used in the detecting step is a step of detecting And are arranged on a horizontal axis and a vertical axis, respectively.

[0039]

In order to achieve the above object, the present invention according to claim 33 is a program for executing an image display method applied to a display device capable of displaying images input from a plurality of image sources simultaneously or independently A storage medium readable by a computer, the image display method comprising: a selection step of selecting desired image data from a plurality of image data displayed on a display means using selection means; a selection step of selecting A distance measuring step of measuring a distance to the image, and a display control step of displaying the selected image by scaling the selected image to a predetermined size based on the measurement.

[0040]

In order to achieve the above object, the present invention according to a thirty-fourth aspect of the present invention repeats the reception information to the selection step when the identification code transmitted from the selection step matches the detection-side transmission / reception step of transmitting and receiving infrared rays Wherein the detection step used in the detection step is arranged at at least three different points on the display means, and in the distance measurement step, each distance to the respective detection means is calculated And measures the distance between the selection means and the selected image.

[0041]

DESCRIPTION OF THE PREFERRED EMBODIMENTS Hereinafter, embodiments of the present invention will be described with reference to the drawings.

[0042]

First Embodiment FIG. 1 shows a configuration of a main part of a multi display system according to a first embodiment of the present invention and a second embodiment to be described later, and corresponds to the scope of claims FIG.

The multi display system according to the first embodiment of the present invention is configured to include a display means 101, a selection means 102, a distance measuring means 103, a communication means 104, a detection means 105, a display control means 106, and a storage means 107 ing.

111 - 1, 111 - 2,... 111 - n in the drawing indicate image sources.

[0043]

Explaining the functions of the above parts, the display means 101 displays an image under the control of the display control means 106.

The selection means 102 selects in which area on the screen of the display means 101 the image inputted from the image sources 111 - 1, 111 - 2,... 111 - n is to be displayed.

The distance measuring means 103 measures the absolute distance between the selecting means 102 and the selected display image and is mounted on the multi display system according to the second embodiment to be described later.

The communication unit 104 transmits selection information by the selection unit 102 to the display apparatus main body.

The detection means 105 detects the absolute position on the screen of the display means 101 of the selected area.

[0044]

The display control means 106 calculates the scaling magnification ratio to the display data of the input image data on the basis of the horizontal resolution and the number of vertical lines of the input image data and the detected display position information and stores the input image in

a size corresponding to the scaling magnification Then, the scaled display is made (first embodiment).

Further, the display control means 106 controls the scaling magnification ratio to the display data of the selected image data on the basis of the difference of the moving distance of the selection means 102 measured by the distance measuring means 103 and the horizontal resolution / number of vertical lines of the selected image data, (Second embodiment) by using a reference table showing the relationship between the distance and the scaling magnification factor and scaled the selected image to a size corresponding to the scaling magnification ratio.

The storage unit 107 stores a layout frame indicating a display selection range, and is provided separately from a storage unit that stores display data.

[0045]

Incidentally, the correspondence relationship between each constituent element in the claims of the present invention and each part in the multi display system according to the first and second embodiments of the present invention is as follows.

[0046]

The display means (101) corresponds to the display device 313 of FIG. 2, the selection means (102) corresponds to the display pointer controller 321 of FIG. 2, the distance measuring means (103) corresponds to the distance measuring sensor 539 of FIG. 5 , The communication means (104) corresponds to the infrared light emitting section 330, the infrared data light receiving section 320 and the infrared ray data control section 319 in FIG. 2, the detection means (105) corresponds to the X axis (horizontal axis) infrared repeater 322, Y Corresponds to the axis (vertical axis) infrared repeater 323, the display control means (106) corresponds to the control section 260, the superposition data controller 280, the output display format conversion section 311, the display drive controller 312, the storage means (107) This corresponds to the superposition data store memory 310 in FIG. 2.

[0047]

8, the light emitting unit 854, the receiving circuit 853, and the light receiving unit 855. The counting unit of the selecting unit (102) corresponds to the counting unit of FIG. 8 Unit 845, and the control unit included in the selection unit (102) corresponds to the control unit 844 in FIG. 8.

The detection-side transceiver included in the detection unit (105) corresponds to the transmission circuit 861, the light-emitting unit 863, the reception circuit 862, and the light-receiving unit 864 in FIG. 8, the comparison unit of the detection unit (105) This corresponds to the comparison unit 846.

It should be noted that illustration of the confirmation selecting means in the claims is omitted.

[0048]

FIG. 2 is a block diagram showing the basic configuration of the multi display system according to the first embodiment of the present invention.

In the multi display system according to the first embodiment of the present invention, for example, four independent image sources are displayed on one monitor, input / output devices of each image source, for example, a mouse, a keyboard, a remote controller, a speaker, etc. are monitored So that it is possible to control in conjunction with the image data displayed on the monitor, and to realize the mapping display optimum for the desired area of each monitor from each of the four image sources.

These image sources may be more or less than four.

[0049]

The multi display system 331 according to the first embodiment of the present invention includes input units 221, 222, 223, 224, display format conversion units 231, 232, 233, 234, bus interfaces 241, 242, 243, Controller 250, control unit 260, frame memory controller 270, superposition data controller 280, frame memory 290, superposition data store memory 310, output display format conversion unit 311, display drive controller 312, display device 313, selection unit 314, packet Distribution control unit 315, packet control unit 316 with FIFO memory, FIFO memory 317, infrared data conversion unit 318, infrared data control unit 319, infrared data light receiving unit 320, display pointer controller 321, FIF Per packet control unit

326, D / A converter 327, an amplifier 328 has a configuration in which a speaker 329.

Reference numerals 211, 212, 213, and 214 in the drawing denote the source of the image signal (hereinafter referred to as an image source group).

[0050]

To describe the configuration of each of the above parts, the image source groups 211, 212, 213, and 214 are configured as, for example, a personal computer, a workstation, a digital television, a video, and the like.

There are four in the present embodiment.

The input units 221, 222, 223, and 224 receive image data output from the image source groups 211, 212, 213, and 214, respectively.

The A / D converter and the PLL (Phase Locked Loop) for sampling the image data are equipped in each of the input units 221, 222, 223, and 224 if the image data to be received is an analog signal of a computer , And if it is a digital signal such as LVDS (Low Voltage Differential Signaling), it is equipped with its decoder and a differential buffer, and if it is a composite signal of television or video, it is R, G, An encoder that encodes to B signal is equipped.

[0051]

Each of the input units 221, 222, 223, and 224 receives a control signal for receiving image data and image data from each image source group 211, 212, 213, 214, for example, a horizontal synchronization signal for synchronizing one line, A vertical synchronization signal for synchronizing one field, a clock signal for sampling one pixel, a display enable signal for indicating a transfer period of effective image data, and the like.

Each of the input units 221, 222, 223, and 224 receives image data from the image source groups 211, 212, 213, and 214 at independent timings.

Further, each of the input units 221, 222, 223, and 224 has a serial communication unit with image source groups 211, 212, 213, and 214 to be described later.

[0052]

The display format conversion units 231, 232, 234, and 235 convert the display format (the number of display lines, the number of dots, the number of colors) of the image data received by the input units 221, 222, 223, and 224 according to the control of the control unit 260 .

The bus interfaces 241, 242, 243, 245 are for inputting four independent image data to one common bus.

The bus controller 250 receives the image data output from the bus interfaces 241, 242, 243, 245, the frame memory controller 270, the image data output from the superposition controller 280, and transfer requests from them, And arbitrates image data transfer.

[0053]

The control unit 260 controls the entire multi display system 331, and includes a RAM for temporarily storing CPU data having computing power, a ROM for storing a control program, a counter for measuring time, a peripheral input / output interface, etc. doing.

Further, the control unit 260 may include only logic logic.

The program that performs control may be built in the ROM or may be transferred from the outside via the peripheral input / output interface.

The frame memory controller 270 processes and controls the image data input by arbitration of the bus controller 250 into data suitable for the frame memory 290 by computation.

This may be a CPU or a media processor capable of parallel computation.

[0054]

The superimposing data controller 280 is for displaying image data different from the input units 221 to 224 so as to be superimposed on the display device 313.

The frame memory 290 is a memory that stores image data to be drawn on the display device 313 for at least one frame.

The superposition data store memory 310 is a memory for storing data to be superimposed.

The output display format conversion unit 311 inputs the image data on the bus under the control of the bus controller 250 and converts it into a display format suitable for the display drive controller 312.

The display drive controller 312 drives the display device 313.

[0055]

The display device 313 displays images.

The display device 313 may be a flat panel (liquid crystal, plasma, etc.) having a matrix electrode structure or a CRT as long as it can display an image.

Further, on the display device 313, an X axis (horizontal axis) infrared repeater 322 and a Y axis (vertical axis) infrared repeater 323 are provided.

The selection unit 314 switches high-speed serial data lines capable of transmitting and receiving

packets by multiplexing data such as a mouse (infrared), a keyboard, a speaker, etc., which are input / output devices of the image source groups 211 to 214.

IEEE 1394 (Institute of Electrical and Electronics Engineers: serial interface standards by the American Electrical and Electronic Engineers Association) and USB (Universal Serial Bus: relatively slow peripheral devices and computers Interfaces between) and the like.

[0056]

The packet distribution control unit 315 distributes the serial data selected by the selection unit 314 for each packet.

The FIFO memory-equipped packet control unit 316 incorporates a FIFO (First In First Out) memory for adjusting the timing at which packet data sent to the multi display system 331 is received.

The display pointer controller (pointing device) 321 is mainly provided with a display position layout function, and is equipped with an infrared light emitting unit 330, a confirmation control button 324 for a display pointer, and a cancel pointer control button 325 for a display pointer.

The infrared data receiving unit 320 receives the infrared data transmitted from the display pointer controller 321.

The infrared data control unit 319 outputs the data format received by the infrared data receiving unit 320 to the control unit 260 and the infrared data conversion unit 318.

[0057]

The infrared data conversion unit 318 converts the data sent from the infrared data control unit 319 into packets of serial data.

The FIFO memory 317 is a memory for adjusting the timing of transferring the packet data created by the infrared data conversion unit 318 to the packet distribution control unit 315.

The packet control unit with FIFO 326 incorporates a timing adjustment FIFO memory for receiving the sound packet sent from each of the image source groups 211 to 214.

The D / A converter 327 converts the inputted digital sound data into analog sound data.

The amplifier 328 amplifies the sound data.

The speaker 329 is equipped in the present multi display system 331 and outputs sound.

[0058]

FIG. 8 is a diagram showing a distance measurement system (display pointer controller 321, X axis (horizontal axis) infrared repeater 322, Y axis (vertical axis) infrared repeater 323 using the infrared ray in the multi display system according to the first embodiment of the present invention FIG. 2 is a block diagram showing the electrical configuration of FIG. The display pointer controller side includes a request detection unit 843, a control unit 844, a counting unit 845, a buffer 851, a transmission circuit 852, a reception circuit 853, a light emitting unit 854, and a light receiving unit 855. Further, the infrared repeater side includes an Id comparing section 846, a transmitting circuit 861, a receiving circuit 862, a light emitting section 863, and a light receiving section 864.

[0059]

Describing in detail the functions of the above parts, on the display pointer controller side, the request detection part 843 detects a request from the confirmation control button 324. The control unit 844 issues a count start pulse, transmits a command, and the like. The counting unit 845 counts the count start pulse. The buffer 851 accumulates transmission / reception data. The transmission circuit 852 performs transmission control via the light emitting unit 854. The receiving circuit 853 performs reception control via the light receiving unit 855. Further, on the infrared repeater side, the Id comparison unit 846 compares Id (identification code). The

transmission circuit 861 performs transmission control via the light emitting unit 863. The receiving circuit 862 performs reception control via the light receiving unit 864.

[0060]

FIG. 11 is an explanatory diagram showing a concept example in which the program and the related data of the present invention are supplied from the storage medium to the apparatus. The program and the related data of the present invention are supplied by inserting a storage medium 1101 such as a floppy disk or a CD-ROM into the insertion opening 1103 of the storage medium drive equipped in the device 1102. After that, the program of the present invention and related data are once installed on the hard disk from the storage medium 1101 and loaded from the hard disk into the RAM, or loaded into the RAM directly without installing it on the hard disk, so that the program can be executed Become.

[0061]

FIG. 10 is an explanatory diagram showing a configuration example of storage contents of a storage medium storing the program and related data of the present invention. The storage medium is composed of storage contents such as volume information 1001, directory information 1002, program execution file 1003, program related data file 1004, and the like. The program of the present invention is program codeized based on each of the following processes executed in the multi display system.

[0062]

Next, the operation of the multi display system according to the first embodiment of the present invention configured as described above will be described.

[0063]

<Display Position Layout Initialization> After powering on the image source groups 211 to 214 and the multi display system 331, the bidirectional serial communication lines provided in the input units 221, 222, 223 and 224 of the multi display system 331 .

Data such as the number of display dots, the number of display lines, the number of display colors, the video output timing, and the like are sent from the input units 221 to 224 to the image source groups 211 to 214, respectively. This format is carried out by both communication protocols predetermined.

[0064]

For example, DDC (Display Data Channel) determined by VESA (Video Electronics Standards Association) of the US standardization organization may be used, and the data format is also EDID (Extended Display Identification Data) also established by VESA Good. At this time, the number of display dots, the number of display lines, and the number of display colors to be transferred transfer the display dots, lines, and the number of colors of the display device 313. Alternatively, the control unit 260 may have a predetermined display format. Based on the received information, the image source groups 211, 212, 213, 214 output image data and control signals thereof to the respective input units 221, 222, 223, 224 of the multi display system 331.

[0065]

However, when the image source groups 211 to 214 and the multi display system 331 can not communicate via the bidirectional serial communication line as described above (analog video output or the like), information on the number of display dots and the number of display lines , Each input unit 221, 222, 223, and 224 uses a horizontal synchronization signal for synchronizing one line, a vertical synchronization signal for synchronizing one frame or one field, a clock signal for sampling one pixel, It is also possible to know by counting the number of horizontal synchronizing signals directly. In any case, at the time of initialization, the multi display system 331 recognizes the display format (the number of display lines, the number of dots, the number of colors) of the image data output from the image source groups 211, 212, 213, 214 (Or it is possible to know).

[0066]

At this time, in order to identify how many image sources are connected to the multi display system 331, the input units 221 to 224 constantly monitor the connection identification signal from the image source. This connection identification signal is logically received as a binary

signal of "1" or "0" from the image source groups 211 to 214. If the connection cable is disconnected or the power source of the image source is turned off, since the resistors are terminated at the input units 211 to 214, this logic becomes "0", and the multi display system 331 recognizes that no image data is input it can. This monitoring information is sent to the control unit 260 every certain period.

[0067]

First, the control unit 260 detects the connection recognition signal of the input unit 221, and when the connection recognition signal is "1", the input unit 221 outputs the received image data to the display format conversion unit 231, At 231, display format conversion is performed. On the other hand, when the connection recognition signal is "0", the connection recognition signal of the input unit 222 is detected and the input units 221 to 224 are scanned until it is detected. When all the connection recognition signals are "0", the multi display system 331 enters the power save mode, and the control unit 260 and the selection unit 314, the packet distribution control unit 315, the packet control unit 316 with the FIFO memory, the FIFO memory 317, the infrared data conversion unit 318, the infrared data control unit 319, and the infrared data light receiving unit 320 are dropped.

[0068]

<Case Where One Image Source Is Connected> An example in the case where only the connection recognition signal of the input unit 221 is "1" will now be described. A user using the multi display system 331 starts by deciding at what position and to what size the image data of the image source 211 is to be displayed on the display device 313. This will be described with reference to FIG. 3. The display state of the display device 313 when nothing is connected to the multi display system 331 or when the display position is not determined although it is connected to the multi display system 331 is arbitrarily set on the system side like the initial display state in FIG. The determined image pattern is displayed. This can be easily realized by the frame memory controller 270 writing an arbitrary image pattern in the image display area of the frame memory 290 after turning on the power supply under the direction of the control unit 260.

[0069]

Next, a display position layout method by the X axis (horizontal axis) infrared repeater 322 and

the Y axis (vertical axis) infrared repeater 323 mounted on the display device 313 will be described. This explanation is the basic point of the present invention. The user touches the start point (X 0, Y 0) of the display device 313 using the display pointer controller 321, and determines the start point with the confirmation control button 324. At this time, the display pointer controller 321 detects a request from the confirmation control button 324 by the request detection unit 843 shown in FIG. 8, and notifies the control unit 844 of the request.

[0070]

The control unit 844 issues a count start pulse to the counting unit 845 to start counting and also outputs Id dedicated to the X axis (horizontal axis) infrared repeater 322 so that only the X axis (horizontal axis) infrared repeater 322 will react Send the attached command. This command reaches the X axis (horizontal axis) infrared repeater 322 and the Y axis (vertical axis) infrared repeater 323, but only the X axis (horizontal axis) infrared repeater 322 where the Id comparison is seen in the Id comparison section 846 react. At this time, the X axis (horizontal axis) infrared repeater 322 repeatedly transmits the same command to the display pointer controller 321.

[0071]

Upon detecting the reception of this command by the control section 844, the display pointer controller 321 issues a count start pulse to the counting section 845 to end the counting and transmits the count value to the infrared data light emission section 320. As a result, the control unit 260 can obtain the count value. The control unit 260 performs the following calculation based on this.

[0072]

Counting time = count value × (1 / count clock frequency) (1) If the propagation time other than the infrared ray propagation time known in advance is taken as the in-circuit propagation time, from (1)

[0073]

Distance between the display pointer controller 321 and the target infrared repeater is calculated as shown by the measurement distance = infrared propagation speed × (counting time - propagation time in circuit) / 2 (2).

[0074]

Hereinafter, a specific calculation method of the start point (X 0, Y 0) will be described with reference to FIG. 7.

7, the upper left corner of the display is expressed by the origin (0, 0), the upper right of the display is A (X, 0), the lower left of the display is B (0, Y), the direct designated position on the display of the display pointer controller 321 is set as S (X 0, Y 0) (point indicated by 740 in the drawing).

In this state, if the distance from S to A is denoted by 741 in the figure and the distance from S to B is denoted by d 1 denoted by 742 in the figure, d 0 and d 1 can be measured with the above method. Here, the control unit 260 performs the following calculation.

[0075]

D 0 2 = (X - X 0) 2 + Y 0 2 (3)

[0076]

(4) d12 = X02 + (Y0 - Y) 2 (4) From (3) - (4)

[0077]

Substituting (5) into (3) and solving the quadratic equation of X 0 under the condition of X 0> 0 is obtained by substituting (5) into (3) and Y 0 = (d 0 2 - d 12 + Y 2 - X 2) / 2 Y + (X / Y) × X 0 , (X 0, Y 0) is determined in a chain manner.

[0078]

Next, the user likewise uses the display pointer controller 321 to touch the end point (X 1, Y 1) of the display device 313, and determines the end point with the confirmation control button 324.

[0079]

The above series of operations can be performed directly by the absolute position on the screen of the display device 313 as shown in the layout frame display preparation state of FIG. 3 (b).

Furthermore, in order to make this work more user-friendly user interface, the display pointer movement position from the start point to the end point is constantly monitored, and its trajectory is displayed as a layout frame indicated by reference numeral 332 in FIG. 3 .

In this realization method, the movement locus information of the display pointer is set as X and Y information, and packets are converted into infrared light at certain constant time intervals to emit light.

The infrared ray is received by the infrared data receiving section 320 and converted into an electric signal.

The infrared data control unit 319 sends the packetized electrical signal from the infrared data receiving unit 320 to the control unit 260. The control unit 260 extracts necessary X and Y information from the packet data and sends the information to the superposition data controller 280.

[0080]

The superposition data controller 280 creates data in which the X and Y positions of the movement track information of the display pointer are plotted according to an instruction from the control unit 260 and writes the data in the superposition data store memory 310. Apart from input image data (image pattern arbitrarily determined on the system side in this example), read data from the superposition data store memory 310 that stores data to be displayed on the display device 313 is controlled by the control unit 260 And is output on the bus via the superposing data controller 280 which operates. The superposition data and the input image data output to the bus via the frame memory controller 270 (the image pattern arbitrarily determined on the system side in the present example) are selected and input by the output display format conversion unit 311 . The selection timing is set from the control unit 260.

[0081]

The output display format conversion unit 311 converts the output display format conversion unit 311 into data (data bus width or the like) suitable for the input of the display drive controller 312. The image data output by the output display format conversion unit 311 is output to the display drive controller 312. In the display drive controller 312, a drive signal for driving the display device 313 is created. For example, when the display device 313 is TFT (Thin Film Transistor) liquid crystal, it is a line-based synchronization signal for driving the driver IC in the display device, a frame synchronization signal, an image data shift clock, image data, and an AC conversion signal. If the display device 313 is a CRT, the image data is divided into R, G, and B, respectively, and D / A conversion is performed for each color to generate analog R, G, and B signals, and together with horizontal and vertical synchronization signals And outputs it to the display device 313. The display drive controller 312 transfers the desired image data to the display device 313 and draws it on the display device 313.

[0082]

Incidentally, when canceling the work of inputting the start point position and inputting the end point position, pressing the cancel control button 325 of the display pointer controller 321 resets the work.

[0083]

The display state when the above work is finished is like the layout frame display state in FIG. 3 (c).

The user checks the position and size of the layout frame, and if he / she wishes to fit the input image, it uses the determination control button 324 of the display pointer controller 321 to determine it.

[0084]

Next, how to fit the input image into the layout frame will be described. Based on the start point (X 0, Y 0) and the end point (X 1, Y 1) determined in the above-described layout frame creation work, the control section 260 sets the display dot number Hdot (L) of the layout frame and the

display line number Vline (L) As shown in FIG.

[0085]
Since the control unit 260 knows the number of display dots Hdot (I) and the number of display lines Vline (I) of the input image from the image source 211, Hdot (L) = X 1 - X 0 Vline (L) = Y 1 - The scaling factor of the input image to the layout frame can be calculated as follows.

[0086]
Horizontal magnification ratio = H dot (L) / H dot (I) (6)

[0087]

Vertical magnification ratio = Vline (L) / Vline (I) (7) When the magnification is larger than 1, the magnification is variable magnification, when the magnification is smaller than 1, the reduction magnification is changed, and when it is equal to 1, it is equal magnification.

The scaling magnifications (6) and (7) are passed from the control unit 260 to the display format conversion unit 231.

The input unit 221 outputs the image signal to the display format conversion unit 231 in a desired format. When the scaling magnification is (6) = 1 and (7) = 1, the display format conversion unit 231 passes the image data. (6) = 1 and (7) = 1, the image data is arbitrarily converted according to the calculated scaling magnification, and the number of dots and lines of the input image is set to the number of lines and the number of lines of the layout frame Together. Further, when the number of display colors input from the number of possible display colors of the display device 313 is large, the number of colors is determined by using intermediate processing such as dithering (a method of expressing an intermediate gradation by combining white and black) Reduce the number of bits of image data.

[0088]

The image data output from the display format conversion unit 231 is stored in the frame memory 290 via the bus interface 241, the bus controller 251, and the frame memory controller

270. Further, the storage location of the data scaled when stored in the frame memory 290 is such that the controller 260 hands the start point information (X 0, Y 0) to the frame memory controller 270 and the physical address to the frame memory in the frame memory controller 270 It is specified by adding an offset corresponding to an appropriate starting point (X 0, Y 0) at the time of generation. The frame memory 290 has a plurality of layers, and under the control of the control unit 260, the hierarchy for storing the image data input via the bus controller 250 is controlled.

[0089]

The image data stored in the frame memory 290 is output on the bus at a certain timing controlled by the control unit 260 and output to the output display format conversion unit 311. At this time, according to the control of the control unit 260, the bus controller 250 controls which hierarchy data to output. Through such internal processing, the display state of the display device 313 becomes like the input display state of FIG. 3 (d), and input display in the target frame is realized.

[0090]

<Case Where Two or More Image Sources Are Connected> Next, an example in the case where two or more image sources are connected to the present multi display system 331 will be described. In this example, a case where the image source 212 is connected when the image data of the image source 211 of FIG. 2 is being drawn will be described as an example. When the image data of the image source 211 is input, the input recognizing signal is detected by the input unit 221, and the information is transmitted to the control unit 260. When the control unit 260 recognizes the presence of a new second image source, the user can use the display pointer controller 321 to determine the layout display frame of the next input. This will be described below with reference to FIG. 4.

[0091]

As shown in FIG. 4 (e), the layout frame display state does not overlap with the input 1 - 1, and the user sets the start point (X 2, Y 2) and the end point (X 3, Y 3) When determining the layout frame display, as shown in the input display state of FIG. 4 (g), the image source 1-2 is displayed on the screen of the display device 313 with JUSTFIT by optimal scaling with respect to the input

. However, as in the layout frame display state of FIG. 4 (f), in order for the user to overlap the input 1 - 1, the start point (X 4, Y 4) and the end point (X 5, Y 5) , A point indicated by 435) are decided, and when the layout frame display is decided, display states such as the input display state of FIG. 4 (h) and the input display state of FIG. 4 (i) are conceivable. The input display state shown in FIG. 4 (h) is an example of a display state when the user desires to superimpose and display the layout frame of the input 2 - 1 as determined above. In this case, the scaling method is equivalent to the above-described method, but in this case, the priority of overlay display must be added. In this realization method, storage hierarchies of two image data items 1-1 and 1-2 stored in the frame memory 290 are set. The layers of these frame memories 290 have a priority order. When data of a plurality of layers are output to the same position on the display device 313, the image data of the higher priority hierarchy is assigned to another lower priority hierarchy To the output display format converting unit 311 in preference to the data of the output display format converting unit 311. The way of deciding this priority can be arbitrarily decided by the user at the instruction by the display pointer controller 321 at the time of determining the layout frame.

[0092]

FIG. 4 (i) The input display state is an example of a display state in a case where the user does not want to superimpose and display the layout frame of the input 2 - 1 only by designating the size of the frame. In this case, the scaling method is equivalent to the above-described method, but in this case, the virtual space indication must be added. This realization method receives the information on the capacity of the mounted memory detected by the frame memory controller 270 by the control unit 260 and calculates a virtual display that can be corresponded from the used memory space of the input 1-1 and the used memory space of the input 1-2 By deciding on the space and where in the space the used memory space of 1-1 and 1-2 is to be mapped by arithmetic processing which judges by software or hardware, the control section 260 writes to the frame memory controller 270 to the frame memory controller 270 By correcting the offset of the proper starting point movement at the time of generating the physical address of

[0093]

In the first embodiment of the present invention, in the case where layouting as in the layout frame display state of FIG. 4 (f) is performed, that is, when the control unit 260 sets the start point (X 0, Y 0) and the end point (X 1 , Y 1) and the overlap of the start point (X 4, Y 4) and the end point (X 5, Y 5) of the input 1 - 2 are detected as X 0 <X 4 <X 1 <X 5, Y 4 <Y 0 <Y 1 <Y 5 (I) input display state shown in FIG. 4 (h) input display state as shown in FIG. 4 (j), as shown in FIG. 4 (j) And causes the display device 313 to display a message indicated by 436.

[0094]

In order to realize this, the control unit 260 issues an instruction to the superposition data controller 280, writes the output character in the superposition data store memory 310, and makes it possible to realize it by functioning as OSD (OnScreen Display).

The user can arbitrarily select either one by an instruction from the display pointer controller 321 by looking at this notification. In the above description, the means for indicating the character output by the superimposing data store memory 310 is used as the notifying means, but a means for causing the control unit 260 to generate sound data and notifying the sound from the speaker 290 may be used.

[0095]

As described above, according to the multi display system of the first embodiment of the present invention, the selection means 102 for selecting which area on the screen of the display means 101 the image inputted from the image source is to be displayed A communication means 104 for transmitting the selection information selected by the selection means 102 to the main body of the display, a detection means 105 for detecting the absolute position on the screen of the display means 101 of the selection region, And a display control means (106) for calculating a scaling magnification ratio to the display data of the input image data based on the number of vertical lines and display position information and scaling the input image to a magnitude corresponding to the scaling magnification ratio for display, Furthermore, the selecting means 102 includes a transmitting circuit 852 for transmitting and receiving infrared rays, a light emitting portion 854, a receiving circuit 853, a light receiving portion 855, a selecting means and a purpose A counting section 845 for counting the infrared ray propagation time between the detection section and the detection section, a control section for issuing information added with Id (identification code) and detecting the absolute position between the selection section and the target detection section 844. The detecting means 105 includes a transmitting circuit 861 for transmitting and receiving infrared rays, a light emitting portion 863, a receiving circuit 862, a light receiving portion 864, and a selection means And an Id comparing section 846 for repeating the same, and since they are respectively arranged on the horizontal axis and the vertical axis of the screen of the display means, the following actions and effects are exhibited.

[0096]

A display layout of a plurality of image sources is determined by a pointing device (selection means 102) capable of specifying a start point and an end point on the large screen display device.

More specifically, the infrared repeater 322 on the X axis and the infrared repeater 323 (detecting means 105) on the Y axis, on which the two-dimensional coordinate position of the pointing device is mounted on the large screen display device, and the infrared port of the pointer , And by informing the multi display system of the information, the internal control circuit (the display control means 106) automatically displays the mapping in the layout area automatically determined above Is possible.

[0097]

Therefore, in the multi-display system according to the first embodiment of the present invention, the layout work confirming the absolute position on the display of the multi-input screen at the time of initial use of the system, which was conventionally impossible, It can be realized without complicated setting of the driver. Thereby, it is possible to provide a user with a smooth and comfortable operation environment in a conference or presentation using a plurality of image sources.

[0098]

Second Embodiment Next, as a second embodiment of the present invention, a case where the layout frame of the input image source displayed as a layout in the first embodiment is varied after it is determined will be described below . Variably, there are two types of expansion variable and reduction variable.

[0099]

The multi display system according to the second embodiment of the present invention includes display means 101, selection means 102, distance measuring means 103, communication means 104, detection means 105, display control means 106, And a storage means 107 (see FIG. 1). 111 - 1, 111 - 2,... 111 - n in the drawing indicate image sources.

[0100]

The multi display system 331 according to the second embodiment of the present invention includes input units 221, 222, 223, and 224, display format conversion units 231, 232, 233, and 234, bus interfaces 241, 242, 243, and 244 , A bus controller 250, a control unit 260, a frame memory controller 270, a superposition data controller 280, a frame memory 290, a superposition data store memory 310, an output display format conversion unit 311, a display drive controller 312, a display device 313, a selection unit 314 , A packet distribution control unit 315, a packet control unit 316 with a FIFO memory, a FIFO memory 317, an infrared data conversion unit 318, an infrared data control unit 319, an infrared data receiving unit 320, a display pointer controller 321, IFO with packet control unit 326, D / A converter 327, an amplifier 328 has a configuration in which a speaker 329 (see FIG. 2). Reference numerals 211, 212, 213, and 214 in the drawing indicate sources of image signals.

[0101]

The point that the multi display system according to the second embodiment of the present invention is different from the multi display system according to the first embodiment is that an X axis (horizontal axis) infrared repeater 322, (See FIG. 5) in addition to the Y-axis (vertical axis) infrared repeater 323 as well as the origin infrared repeater 539, and the control unit 260 has a moving distance / magnification ratio reference table (see FIG. 6) Since other configurations are the same as those of the first embodiment, the details of the details of FIG. 1 and FIG. 2 will be omitted.

[0102]

<Case of Selecting and Enlarging One of Image Sources> An example of enlarging the input image display after layout display will be described with reference to FIG. 5.

In enlarging the display image 1 - 2 in the layout state displayed as in the initial display state of FIG. 5 (k), the user must first select the display image 1 - 2 (active state). This selection method can be realized by displaying a display control cursor or the like on a multiwindow and making the active selection when the cursor enters the designated window.

[0103]

When enlarging the selected display image 1 - 2, the user measures the distance d 0 between the display pointer controller 321 and the display device 313 by pressing the confirm control button 324. A specific range finding method will be described below with reference to FIG. 9. 9 is represented in a form in which the display window region is replaced with a three-dimensional XYZ coordinate system, the upper left corner of the display is the origin (0, 0, 0), the upper right of the display is A (X, 0, 0), the lower left S (x, y, z) denoted by reference numeral 943 in the command issuing position of the display pointer controller 321, G (XG, YG, 0) indicating the center of gravity position of the active selected window, far.

[0104]

In this state, the distance from S to A is denoted by 944 in the figure, the distance from S to B is dy shown in the figure 945, and the distance from S to O is denoted by 946 in the figure, dx, dy , Do can measure distance by the above-mentioned method. Here, the control unit 260 performs the following calculation.

[0105]
Dx 2 = (X - x) 2 + y 2 + z 2 (8)

[0106]
Dy 2 = x 2 + (Y - y) 2 + z 2 (9)

[0107]
(10) do 2 = x 2 + y 2 + z 2 (10) From (8) - (10)

[0108]
ｘ＝（ｄ０2－ｄｘ2＋Ｘ2）／２Ｘ……（１１）（９）－（１０）より、

[0109]
y = (d 02 - d y 2 + Y 2) / 2 Y (12) When substituting (11) and (12) into (10)

[0110]

S (x, y, z) denoted by reference numeral 943 in the figure is given by the following equation: z = [d 0 2 - {do 2 - dy 2 + Y 2} / 2 Y] 2 - {(do 2 - dx 2 + X 2) / 2 X} 2] 1/2 It is determined.

また、

[0111]
XG = (X 0 + X 1) / 2 (14)

[0112]
It can be determined that YG = (Y 0 + Y 1) / 2 (15).

[0113]

By substituting the constant values of (11) - (15), the distance between the display pointer controller 321 and the target window can be obtained by substituting the constant values of (11) - (15) Do can be obtained accurately and easily.

This is also characterized in that troubles such as the user specifying the focus like camera distance measurement do not occur.

[0114]

Next, the enlarging method will be described.

In order to realize the enlargement of the selected image 1 - 2, the user needs to hold down the confirmation control button 324 of the display pointer controller 321 in the above-described initial distance measuring step, as shown by the enlarged stroke denoted by reference numeral 537 in FIG. 5, the display pointer Pull the controller 321 toward you.

Measurement of the distance d 1 between the display pointer controller 321 and the display device 313 during this movement is performed in the above-described method, and the final distance d 1 is determined by opening the confirmation control button 324 by the user.

During this enlargement stroke, in order to make this work more user-friendly user interface, the display pointer movement position from the start point to the end point is constantly monitored, and its trajectory is displayed as a layout frame indicated by reference numeral 332 in FIG. 5 As shown in the layout frame display state of FIG. 5 (l).

[0115]

How to make the size of the final enlarged layout frame from the measurement distance d 1 from the layout frame will be described below with reference to FIG. 6.

The measurement distances d 0 and d 1 are delivered to the control unit 260 by the infrared transmission unit (infrared light emission unit 330) from the display pointer controller 321 in FIG. 2.

The control unit 260 calculates the movement distance d 1 - d 0 based on this information. In this enlarged example, a positive change of d 1 - d 0> 0 is obtained. In order to realize this, a reference table as shown in FIG. 6 is provided in the control unit 260 in advance. The horizontal axis indicates the movement distance D, and the vertical axis indicates the magnification ratio M. When the movement distance is 0, the magnification ratio is 1 × equal, if the movement distance is positive, the magnification ratio is 1 It changes more than twice.

[0116]

The moving distance converges to the maximum scaling factor M (max) at a certain limit value D (max), and it can not be expanded any further. The way of determining the maximum scaling factor M (max) is as follows. When JUSTFIT is performed as shown in FIG. 4G, the relationship with the layout position of the peripheral input image 1 - 2 (1-1 in this example) As shown in FIG. 4 (h), it can be appropriately set according to the relationship with the display area, the relationship with the address map of the frame memory 290 when virtual space is displayed as

shown in FIG. 4 (i) . If the movement distance is negative, the magnification change region also changes to 1 time or less correspondingly. The moving distance converges to the minimum magnification ratio M (min) at a certain limit value D (min), and it can not be reduced any further. The method of determining the minimum scaling factor M (min) is determined by the minimum scaling factor of the display format converters 231 to 234 in FIG. 2.

[0117]
According to the reference table described above, the layout frame of 1-2 at the movement distance d1-d0 is enlarged by m times, and in the example where the enlargement center is (X1, Y0) as shown in FIG. 5, the start point is (1 - m) X 1 + m X 0, m Y 1 + (1 - m) Y 0) without being changed from the layout frame (X 1, Y 0) shown in FIG. 5 (l) It is displayed as an enlarged display state of 5 (m).

[0118]

<Case of Selection and Reduction of One of Image Sources> An example of reducing the input image display after layout display will be described with reference to FIG. 5.

The reducing means is the same as the enlarging means. In the layout state displayed as in the initial display state (enlarged display state) of FIG. 5 (m), when reducing the display image 1 - 2, the user first selects (activates) the display image 1 - 2 There must be. Several means are conceivable for this selection method, but since it is out of the point of the present invention, it is not limited here. In the case of reducing the selected display image 1 - 2, the user measures the distance d 1 between the display pointer controller 321 and the display device 313 by pressing the confirm control button 324.

[0119]

Next, the reduction method will be described. In order to realize the reduction of the selected image 1 - 2, the user needs to hold down the confirmation control button 324 of the display pointer controller 321 in the above-described initial distance measuring step, while holding down the confirmation control button 324 of the display pointer controller 321, as shown in the reduced stroke indicated by reference numeral 538 in FIG. 5, Pushes the controller 321 toward the display device 313. During this movement, the distance d 0 between the display pointer controller 321 and the display device 313 is measured, and the final distance d 0 is determined

by opening the confirmation control button 324 by the user. Even during this reduction stroke, in order to make this work more user-friendly user interface, the display pointer movement position from the start point to the end point is constantly monitored, and its trajectory is displayed as a layout frame indicated by reference numeral 332 in FIG. 5 As shown in the layout frame display state of FIG. 5 (l).

[0120]

How to make the size of the final reduced layout frame from the measurement distance d 0 from the layout frame will be described below with reference to FIG. 6. The measurement distances d 0 and d 1 are delivered to the control unit 260 by the infrared transmission unit (infrared light emission unit 330) from the display pointer controller 321 in FIG. 2. The control unit 260 calculates the moving distance d 0 - d 1 based on this information. In this enlarged example, it is a negative change s of d 0 - d 1 <0. Based on this result, the reduction ratio is determined. To realize this, a reference table as shown in FIG. 6 is used in the same manner as in the above expansion.

[0121]

According to the reference table described above, the layout frame of the display image 1 - 2 at the movement distance d 0 - d 1 is reduced by 1 / m times, and in the example where the reduction center is (X 1 ', Y 0') as shown in FIG. 5 (1 - 1 / m) X 1 '+ 1 / m X 0', 1 / m Y 1 '+ (1 1 / m) Y 0') and the starting point is not changed from (X 1 ', Y 0' Is finally calculated and displayed as the reduced display state of FIG. 5 (k) while drawing the layout frame locus of FIG. 5 (l).

[0122]

As described above, according to the multi display system of the second embodiment of the present invention, the selection means 102 for selecting one of the image data displayed on the display means 101, the selection means 102 and Distance measuring means 103 for measuring the absolute distance from the selected image, communication means 104 for transmitting the distance measurement information measured by the distance measuring means 103 to the display device main body, moving distance of the selection means 102 measured by the distance measuring means 103 And the scaling magnification ratio to the display data of the selected image data on the basis of the horizontal resolution and the number of vertical lines of the selected image data by using the reference table showing the relationship between the moving distance and the scaling magnification ratio, And a display control means 106 for scaling and displaying the scaled image in accordance with the scaling magnification ratio, and further includes a detection means 1 5 (the X axis (horizontal axis) infrared repeater 322, the Y axis

(vertical axis) infrared repeater 323, the origin infrared ray repeater 539), and the distance measuring means 103 calculates three distances to each detection means , The absolute distance between the selection means and the selected display image is measured, so that the following actions and effects are obtained.

[0123]

An origin infrared repeater 539 (detection means 105) is further arranged on the display means 101, and in conjunction with the infrared port of the pointing device possessed by the presenter, in response to the scaling request of the image source at the time of use of the system, the target image source And the pointing device of the presenter is generated by the stroke action by the presenter, the internal control circuit (the display control means 106) refers to this distance change information and enlarges the image source to the appropriate size Or display it in reduced form.

[0124]

Therefore, in the multi-display system according to the second embodiment of the present invention, even when there is an unexpected enlargement / reduction at the time of using the presentation, which was impossible in the past, the presenter can display the presentation display pointer It is possible to respond to this request only with the stroke action of.

Thereby, it is possible to provide a user with a smooth and comfortable operation environment in a conference or presentation using a plurality of image sources.

[0125]

It should be noted that the present invention may be applied to a system constituted by a plurality of devices or an apparatus composed of a single device.

A storage medium storing program codes of software for realizing the functions of the embodiments described above is supplied to a system or an apparatus and the computer (or CPU or MPU) of the system or apparatus stores the program codes stored in the storage medium It is needless to say that it can also be achieved by reading out.

[0126]
In this case, the program code itself read from the storage medium realizes the functions of the above-described embodiments, and the storage medium storing the program code constitutes the present invention.

[0127]
As a storage medium for supplying the program code, for example, a floppy disk, a hard disk, an optical disk, a magneto-optical disk, a CD-ROM, a CD-R, a magnetic tape, a nonvolatile memory card, a ROM or the like can be used.

[0128]
Further, by executing the program code read out by the computer, not only the functions of the above-described embodiments are realized, but also the OS or the like operating on the computer executes the actual processing based on the instruction of the program code But also the case where the functions of the above-described embodiments are realized by the processing, as a matter of course.

[0129]
Furthermore, after the program code read out from the storage medium is written in a memory provided in a function expansion board inserted in the computer or a function expansion unit connected to the computer, based on the instruction of the program code, the function expansion It goes without saying that a CPU or the like included in the board or the function expansion unit performs part or all of the actual processing, and the functions of the above-described embodiments are realized by the processing.

[0130]
As described above, according to the display devices of the first to tenth and fifteenth aspects, it is selected which area on the screen of the display means the input image is to be displayed, and the selection area On the screen, detects the position on the screen, scales and displays the input image in a predetermined size based on the input image data and the detected display position information, and further controls the selection means and the target detection means , So that it is impossible in the past to control the position of the multi input screen on the display means at the time of initial use of the system, since the control for detecting the position of both of them is performed by counting the infrared ray propagation time between The work can be realized without complicated setting of the display driver, so that it is possible for the user to have a smooth and comfortable operation environment for conferences and presentations using a

plurality of image sources There is an effect that it is Succoth.

[0131]
According to the display device of the present invention, it is possible to select desired image data from a plurality of image data displayed on the display means, measure the distance between the selection means and the selected image, The distance between the selection means and the selected image is controlled by performing control of scaled and displaying the selected image in a predetermined size and further calculating each distance to each detecting means arranged at three different points on the display means , So that even when there is an unexpected enlargement or reduction at the time of using the presentation which was impossible conventionally, the presenter can make this request with only the stroke action of the presentation selection means (display pointer) This makes it possible for the user to smoothly and comfortably operate the conference or presentation using a plurality of image sources There is an effect that it is possible class.

[0132]
According to the image display method of claims 16 to 25 and 30, in the display apparatus to which the image display method is applied, at the initial use of the system, which was conventionally impossible, the display of the multi-input screen It is possible to realize the layout work confirming the position on the means without complicated setting of the display driver so that a smooth and comfortable operation environment can be provided to the user in a conference or presentation using a plurality of image sources There is.

[0133]
According to the image display method of the twenty-sixth to thirtieth aspects, even when there is an unexpected enlargement or reduction at the time of using the presentation, which was conventionally impossible in the display device to which the image display method is applied, the presenter Can respond to this request only by the stroke action of the selection means (display pointer) for presentation so that it is possible to provide the user with a smooth and comfortable operating environment in meetings and presentations using a plurality of image sources There is an effect.

[0134]
Further, according to the storage medium of the present invention, by reading the image display method from the storage medium and executing it on the display device, at the time of initial use of the system, which was conventionally impossible, the multi input screen It is possible to realize the layout work confirming the position on the display means without complicated setting of the

display driver and thereby it is possible to provide the user with a smooth and comfortable operation environment in conferences and presentations using a plurality of image sources effective.

[0135]

Further, according to the storage medium of the thirty-third and thirty-fourth aspects, by reading the image display method from the storage medium and executing it on the display device, it is impossible in the past, when unexpected enlargement / reduction is performed at the time of using the presentation When present, the presenter can respond to this request only by the stroke action of the selection means (display pointer) for presentation so that it is possible to smoothly and comfortably operate the conference or presentation using a plurality of image sources Can be provided to the user.

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CLAIMS JP2000242257

1.

What is claimed is: 1. A display device capable of simultaneously or separately displaying images input from a plurality of image sources, comprising: selection means for selecting which area on the screen of the display means the input image is to be displayed; And display control means for scaling and displaying the input image in a predetermined size on the basis of the input image data and the detected display position information. .

2.

Wherein the display control means includes communication means for transmitting the selection information by the selection means to the display device main body, wherein the display control means displays the input image data on the basis of the horizontal resolution / vertical line number of the input image data and the detected display position information The display device according to claim 1, wherein the scaling magnification ratio to the data is calculated, and the input image is scaled and displayed to a size corresponding to the scaling magnification ratio.

3.

Wherein said selecting means comprises a selection side transmitting and receiving unit for transmitting and receiving infrared rays, a counting unit for counting infrared ray propagation time between said selecting means and said target detecting means, information issuing means for issuing information added with an identification code And a control unit which detects the position of the target detection unit and the selection unit, wherein the detection unit includes: a detection-side transmission-reception unit that performs transmission and reception of infrared rays; and a detection- And a comparing section for repeating the received information to the

selecting section in the case where it is determined that the display information is displayed on the display section, and the display section is arranged on the horizontal axis and the vertical axis of the screen of the display section .

4.

4. The display device according to any one of claims 1 to 3, wherein the selection means can designate one of the diagonal lines of the rectangular frame as a starting point and the other point as an end point as the display selection range on the screen Display device.

5.

The information processing apparatus according to claim 1, further comprising a storage unit that stores a layout frame indicating a display selection range, wherein the display control unit superimposes the display screen data and the layout frame data when displaying on the screen To (4) above.

6.

6. The display device according to claim 1, further comprising confirmation selecting means for allowing the operator to confirm and select whether or not to display in the display selection range when the display selection range is decided.

7.

7. The display device according to claim 6, wherein said confirmation selecting means is OnScreen Display.

8.

7. The display device according to claim 6, wherein said confirmation selection means is input and output means for voice information.

9.

Wherein the display control means causes the display position to be shifted and displayed without changing the size of the display selection range when the display selection range overlaps the display area of another input image already displayed The display device according to any one of claims 1 to 8.

10.

10. The display device according to claim 9, wherein said display control means causes the virtual space display to be displayed when the boundary of the frame memory corresponding to the display screen is exceeded when the display position is shifted and displayed.

11.

A display device capable of displaying images input from a plurality of image sources simultaneously or independently, comprising: selection means for selecting desired image data from a plurality of image data displayed on a display means; Distance measuring means for measuring the distance between the selected image and the selected image; and display control means for displaying the selected image by scaling the selected image to a predetermined size based on the measurement.

12.

16. A distance measuring apparatus according to claim 1, further comprising a communication means for transmitting distance measurement information by said distance measuring means to a display device main body, wherein said display control means selects based on a difference in movement distance of said selection means and a horizontal resolution / 12. The display device according to claim 11, wherein the scaling magnification ratio to the display data of the image data is calculated, and the selected image is scaled and displayed according to the scaling magnification factor.

13.

15. A display device according to claim 12, wherein said display control means calculates said scaling magnification ratio on the basis of a look-up table showing a relationship between a moving distance and a scaling magnification ratio.

14.

A detection side transmitting and receiving unit for transmitting and receiving infrared rays and a comparing unit for repeating the received information to the selecting means when the identification codes transmitted from the selecting means match, Wherein the distance measuring means calculates each distance to each of the detecting means and measures the distance between the selecting means and the selected image according to any one of claims 11 to 13 A display device according to claim 3.

15.

15. The display device according to claim 1, wherein the image source is a computer, a workstation, a digital television, a video, or the like.

16.

An image display method applied to a display device capable of simultaneously displaying images input from a plurality of image sources simultaneously or separately, the image display method comprising the steps of: selecting which area on the screen of the display means the input image is to be displayed A detecting step of detecting a position of the selected region on the screen by using a detecting means; a detecting step of detecting the position of the selected region on the screen by using the detecting means; And displaying the scaled image on the display screen.

17.

16. The method according to claim 14, further comprising a communication step of transmitting the selection information in said selection step to the display device body, wherein in said display control step, based on the horizontal resolution / vertical line number of the input image data and the detected display position information, 17. The image display method according to claim 16, wherein a scaling magnification ratio to the display data is calculated, and the input image is scaled and displayed to a size corresponding to the scaling magnification ratio and displayed.

18.

Wherein said selecting step comprises a selection-side transmitting and receiving step of transmitting and receiving infrared rays, a counting step of counting the infrared ray propagation time between said selecting means and said target detecting means, and issuing information to which an identification code is added And a control step of detecting the position of the selection means and the objective detection means, wherein the detection step includes a detection-side transmission / reception step of transmitting and receiving infrared rays and a detection step of comparing the identification code transmitted from the selection step And a comparing step of repeating the received information to the selecting step when it is detected that the detecting means used in the detecting step is located on the horizontal axis and the vertical axis of the screen of the display means And the image display method according to claim 16 or 17.

19.

18. The method according to claim 16, wherein in said selecting step, one of the diagonal lines of the rectangular frame can be specified as the starting point and the other point can be designated as the end point as the display selection range on the screen .

20.

15. The display control method according to claim 1, further comprising a storing step of storing a layout frame indicating a display selection range, wherein in said display control step, display screen data and layout frame data are superimposed and displayed at the time of display on said screen The image display method according to any one of 16 to 19.

21.

An image display according to any one of claims 16 to 20, further comprising a confirmation selecting step of confirming and selecting whether or not to display in the display selection range when a display selection range is decided Method.

22.

22. The image display method according to claim 21, wherein in said confirmation selecting step, said confirmation and selection are performed using OnScreenDisplay.

23.

22. The image display method according to claim 21, wherein in said confirmation selecting step, said confirmation and selection are performed using input and output means of audio information.

24.

16. The display control method according to claim 14, wherein in the display control step, when the display selection range overlaps the display area of another input image already displayed, the display position is shifted without changing the size of the display selection range Wherein the image display method according to any one of claims 16 to 23 is performed.

25.

25. The image display method according to claim 24, wherein, in said display control step, when said display position is shifted and displayed, when a boundary of a frame memory for a display screen is exceeded, said virtual space is displayed.

26.

An image display method applied to a display device capable of simultaneously displaying images input from a plurality of image sources simultaneously or separately, comprising the steps of: selecting desired image data from a plurality of image data displayed on a display means , A

distance measuring step of measuring a distance between the selection means and the selected image and a display control step of scaling the selected image to a predetermined size based on the measurement and displaying the selected image A characteristic image display method.

27.

16. A method according to claim 14, further comprising a communication step of transmitting the distance measurement information by said distance measuring step to a display device main body, wherein in said display control step, based on a difference in movement distance of said selection means and a number of horizontal resolution / 27. The image display method according to claim 26, wherein the scaling magnification ratio to the display data of the image data is calculated, and the selected image is scaled to a size corresponding to the scaling magnification ratio and displayed.

28.

28. The image display method according to claim 27, wherein in said display control step, said scaling magnification ratio is calculated on the basis of a reference table showing a relationship between a movement distance and a scaling magnification ratio.

29.

A detecting step having a detecting step of transmitting and receiving infrared rays and a comparing step of repeating the received information to said selecting step when the identification codes transmitted from said selecting step match, Characterized in that the detecting means is arranged at at least three different points on the display means and in the distance measuring step each distance to the respective detecting means is calculated and the distance between the selecting means and the selected image is measured And the image display method according to any one of claims 26 to 28.

30.

The image display method according to any one of claims 16 to 29, wherein the image source is a computer, a workstation, a digital television, a video, or the like.

31.

16. A storage medium readable by a computer which stores a program for executing an image display method applied to a display device capable of simultaneously displaying images inputted from a plurality of image sources or independently, , A selection step of selecting which region on the screen of the display means the input image is to be displayed by using a selection means,

a detection step of detecting the absolute position on the screen of the selected region by using the detection means And a display control step of scaling and displaying the input image in a predetermined size based on the input image data and the detected display position information.

32.

Wherein said selecting step comprises a selection-side transmitting and receiving step of transmitting and receiving infrared rays, a counting step of counting the infrared ray propagation time between said selecting means and said target detecting means, and issuing information to which an identification code is added And a control step of detecting the position of the selection means and the objective detection means, wherein the detection step includes a detection-side transmission / reception step of transmitting and receiving infrared rays and a detection step of comparing the identification code transmitted from the selection step And a comparing step of repeating the received information to the selecting step when it is detected that the detecting means used in the detecting step is located on the horizontal axis and the vertical axis of the screen of the display means And the storage medium according to claim 31.

33.

16. A storage medium readable by a computer which stores a program for executing an image display method applied to a display device capable of simultaneously displaying images inputted from a plurality of image sources or independently, , A selection step of selecting desired image data from the plurality of image data displayed on the display means by using a selection means, a distance measuring step of measuring a distance between the selection means and the selected image, a selection And a display control step of scaling the image to a predetermined size and displaying the scaled image.

34.

A detecting step having a detecting step of transmitting and receiving infrared rays and a comparing step of repeating the received information to said selecting step when the identification codes transmitted from said selecting step match, Characterized in that the detecting means is arranged at at least three different points on the display means and in the distance measuring step each distance to the respective detecting means is calculated and the distance between the selecting means and the selected image is measured And the storage medium according to claim 33.

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CLAIMS JP2000242257

1.

What is claimed is: 1. A display device capable of simultaneously or separately displaying images input from a plurality of image sources, comprising: selection means for selecting which area on the screen of the display means the input image is to be displayed; And display control means for scaling and displaying the input image in a predetermined size on the basis of the input image data and the detected display position information. .

2.

Wherein the display control means includes communication means for transmitting the selection information by the selection means to the display device main body, wherein the display control means displays the input image data on the basis of the horizontal resolution / vertical line number of the input image data and the detected display position information The display device according to claim 1, wherein the scaling magnification ratio to the data is calculated, and the input image is scaled and displayed to a size corresponding to the scaling magnification ratio.

3.

Wherein said selecting means comprises a selection side transmitting and receiving unit for transmitting and receiving infrared rays, a counting unit for counting infrared ray propagation time between said selecting means and said target detecting means, information issuing means for issuing information added with an identification code And a control unit which detects the position of the target detection unit and the selection unit, wherein the detection unit includes: a detection-side transmission-reception unit that performs transmission and reception of infrared rays; and a detection- And a comparing section for repeating the received information to the

selecting section in the case where it is determined that the display information is displayed on the display section, and the display section is arranged on the horizontal axis and the vertical axis of the screen of the display section .

4.

4. The display device according to any one of claims 1 to 3, wherein the selection means can designate one of the diagonal lines of the rectangular frame as a starting point and the other point as an end point as the display selection range on the screen Display device.

5.

The information processing apparatus according to claim 1, further comprising a storage unit that stores a layout frame indicating a display selection range, wherein the display control unit superimposes the display screen data and the layout frame data when displaying on the screen To (4) above.

6.

6. The display device according to claim 1, further comprising confirmation selecting means for allowing the operator to confirm and select whether or not to display in the display selection range when the display selection range is decided.

7.

7. The display device according to claim 6, wherein said confirmation selecting means is OnScreen Display.

8.

7. The display device according to claim 6, wherein said confirmation selection means is input and output means for voice information.

9.

Wherein the display control means causes the display position to be shifted and displayed without changing the size of the display selection range when the display selection range overlaps the display area of another input image already displayed The display device according to any one of claims 1 to 8.

10.

10. The display device according to claim 9, wherein said display control means causes the virtual space display to be displayed when the boundary of the frame memory corresponding to the display screen is exceeded when the display position is shifted and displayed.

11.

A display device capable of displaying images input from a plurality of image sources simultaneously or independently, comprising: selection means for selecting desired image data from a plurality of image data displayed on a display means; Distance measuring means for measuring the distance between the selected image and the selected image; and display control means for displaying the selected image by scaling the selected image to a predetermined size based on the measurement.

12.

16. A distance measuring apparatus according to claim 1, further comprising a communication means for transmitting distance measurement information by said distance measuring means to a display device main body, wherein said display control means selects based on a difference in movement distance of said selection means and a horizontal resolution / 12. The display device according to claim 11, wherein the scaling magnification ratio to the display data of the image data is calculated, and the selected image is scaled and displayed according to the scaling magnification factor.

13.

15. A display device according to claim 12, wherein said display control means calculates said scaling magnification ratio on the basis of a look-up table showing a relationship between a moving distance and a scaling magnification ratio.

14.

A detection side transmitting and receiving unit for transmitting and receiving infrared rays and a comparing unit for repeating the received information to the selecting means when the identification codes transmitted from the selecting means match, Wherein the distance measuring means calculates each distance to each of the detecting means and measures the distance between the selecting means and the selected image according to any one of claims 11 to 13 A display device according to claim 3.

15.

15. The display device according to claim 1, wherein the image source is a computer, a workstation, a digital television, a video, or the like.

16.

An image display method applied to a display device capable of simultaneously displaying images input from a plurality of image sources simultaneously or separately, the image display method comprising the steps of: selecting which area on the screen of the display means the input image is to be displayed A detecting step of detecting a position of the selected region on the screen by using a detecting means; a detecting step of detecting the position of the selected region on the screen by using the detecting means; And displaying the scaled image on the display screen.

17.

16. The method according to claim 14, further comprising a communication step of transmitting the selection information in said selection step to the display device body, wherein in said display control step, based on the horizontal resolution / vertical line number of the input image data and the detected display position information, 17. The image display method according to claim 16, wherein a scaling magnification ratio to the display data is calculated, and the input image is scaled and displayed to a size corresponding to the scaling magnification ratio and displayed.

18.

Wherein said selecting step comprises a selection-side transmitting and receiving step of transmitting and receiving infrared rays, a counting step of counting the infrared ray propagation time between said selecting means and said target detecting means, and issuing information to which an identification code is added And a control step of detecting the position of the selection means and the objective detection means, wherein the detection step includes a detection-side transmission / reception step of transmitting and receiving infrared rays and a detection step of comparing the identification code transmitted from the selection step And a comparing step of repeating the received information to the selecting step when it is detected that the detecting means used in the detecting step is located on the horizontal axis and the vertical axis of the screen of the display means And the image display method according to claim 16 or 17.

19.

18. The method according to claim 16, wherein in said selecting step, one of the diagonal lines of the rectangular frame can be specified as the starting point and the other point can be designated as the end point as the display selection range on the screen .

20.

15. The display control method according to claim 1, further comprising a storing step of storing a layout frame indicating a display selection range, wherein in said display control step, display screen data and layout frame data are superimposed and displayed at the time of display on said screen The image display method according to any one of 16 to 19.

21.

An image display according to any one of claims 16 to 20, further comprising a confirmation selecting step of confirming and selecting whether or not to display in the display selection range when a display selection range is decided Method.

22.

22. The image display method according to claim 21, wherein in said confirmation selecting step, said confirmation and selection are performed using OnScreenDisplay.

23.

22. The image display method according to claim 21, wherein in said confirmation selecting step, said confirmation and selection are performed using input and output means of audio information.

24.

16. The display control method according to claim 14, wherein in the display control step, when the display selection range overlaps the display area of another input image already displayed, the display position is shifted without changing the size of the display selection range Wherein the image display method according to any one of claims 16 to 23 is performed.

25.

25. The image display method according to claim 24, wherein, in said display control step, when said display position is shifted and displayed, when a boundary of a frame memory for a display screen is exceeded, said virtual space is displayed.

26.

An image display method applied to a display device capable of simultaneously displaying images input from a plurality of image sources simultaneously or separately, comprising the steps of: selecting desired image data from a plurality of image data displayed on a display means , A

distance measuring step of measuring a distance between the selection means and the selected image and a display control step of scaling the selected image to a predetermined size based on the measurement and displaying the selected image A characteristic image display method.

27.

16. A method according to claim 14, further comprising a communication step of transmitting the distance measurement information by said distance measuring step to a display device main body, wherein in said display control step, based on a difference in movement distance of said selection means and a number of horizontal resolution / 27. The image display method according to claim 26, wherein the scaling magnification ratio to the display data of the image data is calculated, and the selected image is scaled to a size corresponding to the scaling magnification ratio and displayed.

28.

28. The image display method according to claim 27, wherein in said display control step, said scaling magnification ratio is calculated on the basis of a reference table showing a relationship between a movement distance and a scaling magnification ratio.

29.

A detecting step having a detecting step of transmitting and receiving infrared rays and a comparing step of repeating the received information to said selecting step when the identification codes transmitted from said selecting step match, Characterized in that the detecting means is arranged at at least three different points on the display means and in the distance measuring step each distance to the respective detecting means is calculated and the distance between the selecting means and the selected image is measured And the image display method according to any one of claims 26 to 28.

30.

The image display method according to any one of claims 16 to 29, wherein the image source is a computer, a workstation, a digital television, a video, or the like.

31.

16. A storage medium readable by a computer which stores a program for executing an image display method applied to a display device capable of simultaneously displaying images inputted from a plurality of image sources or independently, , A selection step of selecting which region on the screen of the display means the input image is to be displayed by using a selection means,

a detection step of detecting the absolute position on the screen of the selected region by using the detection means And a display control step of scaling and displaying the input image in a predetermined size based on the input image data and the detected display position information.

32.

Wherein said selecting step comprises a selection-side transmitting and receiving step of transmitting and receiving infrared rays, a counting step of counting the infrared ray propagation time between said selecting means and said target detecting means, and issuing information to which an identification code is added And a control step of detecting the position of the selection means and the objective detection means, wherein the detection step includes a detection-side transmission / reception step of transmitting and receiving infrared rays and a detection step of comparing the identification code transmitted from the selection step And a comparing step of repeating the received information to the selecting step when it is detected that the detecting means used in the detecting step is located on the horizontal axis and the vertical axis of the screen of the display means And the storage medium according to claim 31.

33.

16. A storage medium readable by a computer which stores a program for executing an image display method applied to a display device capable of simultaneously displaying images inputted from a plurality of image sources or independently, , A selection step of selecting desired image data from the plurality of image data displayed on the display means by using a selection means, a distance measuring step of measuring a distance between the selection means and the selected image, a selection And a display control step of scaling the image to a predetermined size and displaying the scaled image.

34.

A detecting step having a detecting step of transmitting and receiving infrared rays and a comparing step of repeating the received information to said selecting step when the identification codes transmitted from said selecting step match, Characterized in that the detecting means is arranged at at least three different points on the display means and in the distance measuring step each distance to the respective detecting means is calculated and the distance between the selecting means and the selected image is measured And the storage medium according to claim 33.

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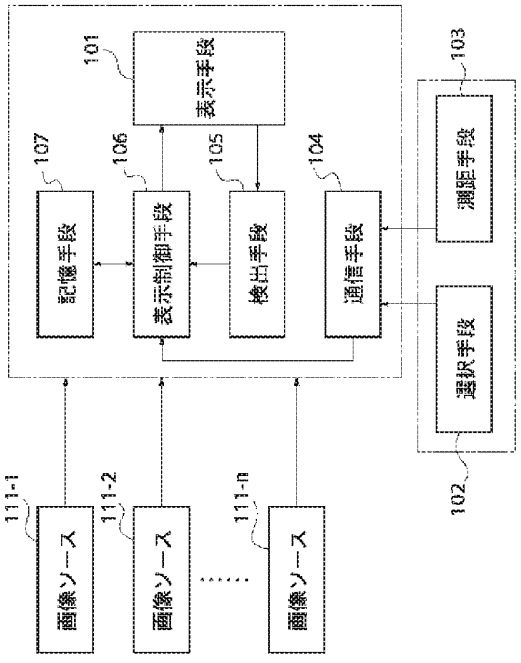
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最終頁に続く

【発明の名称】表示装置、画像表示方法及び記憶媒体

【要約】
【課題】　複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことを可能とした表示装置、画像表示方法及び記憶媒体を提供する。
【解決手段】　入力画像を表示手段１０１上のどの領域に表示させるか選択する選択手段１０２、選択情報を表示装置本体に送信する通信手段１０４、選択領域の表示手段１０１上での絶対位置を検出する検出手段１０５、入力画像をスケーリング変倍率に応じた大きさにスケーリングし表示させる表示制御手段１０６を有し、選択手段１０２は、赤外線を送受信する機能、赤外線伝播時間を計数する機能、Ｉｄを発行すると共に選択手段１０２と検出手段１０５の絶対位置を検出する機能を有し、検出手段１０５は、赤外線を送受信する機能、Ｉｄ一致時に受信情報を選択手段１０２へリピートする機能を有する。



【特許請求の範囲】

【請求項１】　複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置であって、
入力画像を表示手段の画面上のどの領域に表示させるか選択する選択手段と、選択した領域の前記画面上での位置を検出する検出手段と、入力画像データ及び前記検出された表示位置情報に基づき入力画像を所定の大きさにスケーリングして表示させる表示制御手段とを有することを特徴とする表示装置。

【請求項２】　前記選択手段による選択情報を表示装置本体に送信する通信手段を有し、前記表示制御手段は、入力画像データの水平解像度・垂直ライン数及び前記検出された表示位置情報に基づき入力画像データの表示データへのスケーリング変倍率を算出し、入力画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする請求項１記載の表示装置。

【請求項３】　前記選択手段は、赤外線の送受信を行う選択側送受信部と、該選択手段と目的とする前記検出手段との間の赤外線伝播時間を計数する計数部と、識別符号を付加した情報を発行すると共に該選択手段と目的とする前記検出手段の位置を検出する制御部とを有し、前記検出手段は、赤外線の送受信を行う検出側送受信部と、前記選択手段から送信された識別符号が一致した場合に受信情報を前記選択手段へリピートする比較部とを有すると共に、前記表示手段の画面の水平軸及び垂直軸上に各々配置されていることを特徴とする請求項１又は２記載の表示装置。

【請求項４】　前記選択手段は、前記画面上における表示選択範囲として矩形枠の対角線の一方の点を始点とし他方の点を終点として指定可能であることを特徴とする請求項１乃至３の何れかに記載の表示装置。

【請求項５】　表示選択範囲を示すレイアウト枠を記憶する記憶手段を有し、前記表示制御手段は、前記画面上への表示時に表示画面データとレイアウト枠データを重ね合わせて表示させることを特徴とする請求項１乃至４の何れかに記載の表示装置。

【請求項６】　表示選択範囲が決定した場合に該表示選択範囲に表示させるか否かを操作者に確認及び選択させる確認選択手段を有することを特徴とする請求項１乃至５の何れかに記載の表示装置。

【請求項７】　前記確認選択手段は、ＯｎＳｃｒｅｅｎ Ｄｉｓｐｌａｙであることを特徴とする請求項６記載の表示装置。

【請求項８】　前記確認選択手段は、音声情報の入出力手段であることを特徴とする請求項６記載の表示装置。

【請求項９】　前記表示制御手段は、表示選択範囲が既に表示されている別の入力画像の表示領域と重なった場合は表示選択範囲の大きさを変化させずに表示位置をずらして表示させることを特徴とする請求項１乃至８の何れかに記載の表示装置。

【請求項１０】　前記表示制御手段は、前記表示位置をずらして表示させる際に表示画面分のフレームメモリのバウンダリを超えている場合は仮想空間表示させることを特徴とする請求項９記載の表示装置。

【請求項１１】　複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置であって、
表示手段に表示されている複数の画像データから所望の画像データを選択する選択手段と、該選択手段と選択画像との距離を測定する測距手段と、測定に基づき選択画像を所定の大きさにスケーリングして表示させる表示制御手段とを有することを特徴とする表示装置。

【請求項１２】　前記測距手段による測距情報を表示装置本体に送信する通信手段を有し、前記表示制御手段は、前記選択手段の移動距離の差分及び選択画像データの水平解像度・垂直ライン数に基づき選択画像データの表示データへのスケーリング変倍率を算出し、選択画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする請求項１１記載の表示装置。

【請求項１３】　前記表示制御手段は、移動距離とスケーリング変倍率との関係を示す参照テーブルに基づき前記スケーリング変倍率を算出することを特徴とする請求項１２記載の表示装置。

【請求項１４】　赤外線の送受信を行う検出側送受信部、前記選択手段から送信された識別符号が一致した場合に受信情報を前記選択手段へリピートする比較部を有すると共に前記表示手段上の異なる少なくとも３点に配置された検出手段を有し、前記測距手段は、前記各検出手段までの各距離を算出して前記選択手段と選択画像との距離を測定することを特徴とする請求項１１乃至１３の何れかに記載の表示装置。

【請求項１５】　前記画像ソースは、コンピュータ、ワークステーション、ディジタルテレビ、ビデオ等の機器であることを特徴とする請求項１乃至１４の何れかに記載の表示装置。

【請求項１６】　複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法であって、
入力画像を表示手段の画面上のどの領域に表示させるかを選択手段を用いて選択する選択ステップと、選択した領域の前記画面上での位置を検出手段を用いて検出する検出ステップと、入力画像データ及び前記検出された表示位置情報に基づき入力画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする画像表示方法。

【請求項１７】　前記選択ステップによる選択情報を表示装置本体に送信する通信ステップを有し、前記表示制御ステップでは、入力画像データの水平解像度・垂直ライン数及び前記検出された表示位置情報に基づき入力画像データの表示データへのスケーリング変倍率を算出

し、入力画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする請求項１６記載の画像表示方法。

【請求項１８】　前記選択ステップは、赤外線の送受信を行う選択側送受信ステップと、前記選択手段と目的とする前記検出手段との間の赤外線伝播時間を計数する計数ステップと、識別符号を付加した情報を発行すると共に前記選択手段と目的とする前記検出手段の位置を検出する制御ステップとを有し、前記検出ステップは、赤外線の送受信を行う検出側送受信ステップと、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする比較ステップとを有し、前記検出ステップで用いる前記検出手段は前記表示手段の画面の水平軸及び垂直軸上に各々配置されていることを特徴とする請求項１６又は１７記載の画像表示方法。

【請求項１９】　前記選択ステップでは、前記画面上における表示選択範囲として矩形枠の対角線の一方の点を始点とし他方の点を終点として指定可能であることを特徴とする請求項１６乃至１８の何れかに記載の画像表示方法。

【請求項２０】　表示選択範囲を示すレイアウト枠を記憶する記憶ステップを有し、前記表示制御ステップでは、前記画面上への表示時に表示画面データとレイアウト枠データを重ね合わせて表示させることを特徴とする請求項１６乃至１９の何れかに記載の画像表示方法。

【請求項２１】　表示選択範囲が決定した場合に該表示選択範囲に表示させるか否かを操作者に確認及び選択させる確認選択ステップを有することを特徴とする請求項１６乃至２０の何れかに記載の画像表示方法。

【請求項２２】　前記確認選択ステップでは、ＯｎＳｃｒｅｅｎＤｉｓｐｌａｙを用いて前記確認及び選択を行うことを特徴とする請求項２１記載の画像表示方法。

【請求項２３】　前記確認選択ステップでは、音声情報の入出力手段を用いて前記確認及び選択を行うことを特徴とする請求項２１記載の画像表示方法。

【請求項２４】　前記表示制御ステップでは、表示選択範囲が既に表示されている別の入力画像の表示領域と重なった場合は表示選択範囲の大きさを変化させずに表示位置をずらして表示させることを特徴とする請求項１６乃至２３の何れかに記載の画像表示方法。

【請求項２５】　前記表示制御ステップでは、前記表示位置をずらして表示させる際に表示画面分のフレームメモリのバウンダリを超えている場合は仮想空間表示させることを特徴とする請求項２４記載の画像表示方法。

【請求項２６】　複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法であって、
表示手段に表示されている複数の画像データから所望の画像データを選択手段を用いて選択する選択ステップと、前記選択手段と選択画像との距離を測定する測距ステップと、測定に基づき選択画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする画像表示方法。

【請求項２７】　前記測距ステップによる測距情報を表示装置本体に送信する通信ステップを有し、前記表示制御ステップでは、前記選択手段の移動距離の差分及び選択画像データの水平解像度・垂直ライン数に基づき選択画像データの表示データへのスケーリング変倍率を算出し、選択画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする請求項２６記載の画像表示方法。

【請求項２８】　前記表示制御ステップでは、移動距離とスケーリング変倍率との関係を示す参照テーブルに基づき前記スケーリング変倍率を算出することを特徴とする請求項２７記載の画像表示方法。

【請求項２９】　赤外線の送受信を行う検出側送受信ステップ、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする比較ステップを有する検出ステップを有し、前記検出ステップで用いる前記検出手段は前記表示手段上の異なる少なくとも３点に配置され、前記測距ステップでは、前記各検出手段までの各距離を算出して前記選択手段と選択画像との距離を測定することを特徴とする請求項２６乃至２８の何れかに記載の画像表示方法。

【請求項３０】　前記画像ソースは、コンピュータ、ワークステーション、ディジタルテレビ、ビデオ等の機器であることを特徴とする請求項１６乃至２９の何れかに記載の画像表示方法。

【請求項３１】　複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法を実行するプログラムを記憶したコンピュータにより読み出し可能な記憶媒体であって、
前記画像表示方法は、入力画像を表示手段の画面上のどの領域に表示させるかを選択手段を用いて選択する選択ステップと、選択した領域の前記画面上での絶対位置を検出手段を用いて検出する検出ステップと、入力画像データ及び前記検出された表示位置情報に基づき入力画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする記憶媒体。

【請求項３２】　前記選択ステップは、赤外線の送受信を行う選択側送受信ステップと、前記選択手段と目的とする前記検出手段との間の赤外線伝播時間を計数する計数ステップと、識別符号を付加した情報を発行すると共に前記選択手段と目的とする前記検出手段の位置を検出する制御ステップとを有し、前記検出ステップは、赤外線の送受信を行う検出側送受信ステップと、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする比較ステップとを有し、前記検出ステップで用いる前記検出手段は前記表

示手段の画面の水平軸及び垂直軸上に各々配置されていることを特徴とする請求項３１記載の記憶媒体。

【請求項３３】　複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法を実行するプログラムを記憶したコンピュータにより読み出し可能な記憶媒体であって、

前記画像表示方法は、表示手段に表示されている複数の画像データから所望の画像データを選択手段を用いて選択する選択ステップと、前記選択手段と選択画像との距離を測定する測距ステップと、測定に基づき選択画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする記憶媒体。

【請求項３４】　赤外線の送受信を行う検出側送受信ステップ、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする比較ステップを有する検出ステップを有し、前記検出ステップで用いる前記検出手段は前記表示手段上の異なる少なくとも３点に配置され、前記測距ステップでは、前記各検出手段までの各距離を算出して前記選択手段と選択画像との距離を測定することを特徴とする請求項３３記載の記憶媒体。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、表示装置、画像表示方法及び記憶媒体に係り、更に詳しくは、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境を提供する場合に好適な表示装置、画像表示方法及び記憶媒体に関する。

【０００２】

【従来の技術】近年、ノート型パーソナルコンピュータ（ノートＰＣ）等で作成した画像データを大型の表示装置、例えば液晶プロジェクタやプラズマディスプレイに表示させてプレゼンテーション（会議等における説得力のある説明の技法）を行うことが増えてきている。一方、会議では出席者がそれぞれデータをコンピュータにセーブしてきてそれを閲覧したり、ファイルの交換をその場で行うようになってきている。このような背景から、画像表示システムでは、一度に複数の画像ソースを同時に表示させ且つそれらの情報や表示された各画像情報を一元的にコントロールできる機能が必要とされる。

【０００３】しかしながら、従来のプレゼンテーション用の大型表示装置は、複数の画像ソースを同時に表示させるときに、大型表示装置の画面のどの位置に表示レイアウトするかを決定するためには、前もって表示位置を決めておくか、プレゼンテータが会議参加者の画像ソースの表示フォーマット（表示ライン数やドット数、色数）を聞いて、会議前に表示用ドライバソフトの煩雑なマニュアル設定を介し、表示レイアウトをいちいち決めていかなければならなかった。

【０００４】また、大画面表示装置を見る会議参加者にとっては、着席する位置によりプレゼンテータが予め決めた表示レイアウトでは文字や画像が見えない状態が発生することが多々あり、そのときは、着席位置をいちいち移動するか、会議を中断させ何が表示されているかをプレゼンテータに確認するか、最悪の場合は、プレゼンテータが再表示レイアウトを上述した表示用ドライバソフトを用いてやり直したりしなければならなかった。

【０００５】

【発明が解決しようとする課題】しかしながら、上述した従来技術のように、複数の画像ソースを会議前・会議中に表示用ドライバソフトを介してレイアウト決めを行ったり、やり直したりすることは、会議のスムーズな進行を妨げる要因になってしまうばかりか、会議全体の効率化を提供することが本来の目的であるマルチ表示会議システムにあって、設定時間をとられるばかりの不快適なユーザインタフェースになってしまうなどの多くの問題が生じている。

【０００６】本発明は、上述した点に鑑みなされたものであり、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことを可能とした表示装置、画像表示方法及び記憶媒体を提供することを目的とする。

【０００７】

【課題を解決するための手段】上記目的を達成するために、請求項１記載の本発明は、複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置であって、入力画像を表示手段の画面上のどの領域に表示させるか選択する選択手段と、選択した領域の前記画面上での位置を検出する検出手段と、入力画像データ及び前記検出された表示位置情報に基づき入力画像を所定の大きさにスケーリングして表示させる表示制御手段とを有することを特徴とする。

【０００８】上記目的を達成するために、請求項２記載の本発明は、前記選択手段による選択情報を表示装置本体に送信する通信手段を有し、前記表示制御手段は、入力画像データの水平解像度・垂直ライン数及び前記検出された表示位置情報に基づき入力画像データの表示データへのスケーリング変倍率を算出し、入力画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする。

【０００９】上記目的を達成するために、請求項３記載の本発明は、前記選択手段は、赤外線の送受信を行う選択側送受信部と、該選択手段と目的とする前記検出手段との間の赤外線伝播時間を計数する計数部と、識別符号を付加した情報を発行すると共に該選択手段と目的とする前記検出手段の位置を検出する制御部とを有し、前記検出手段は、赤外線の送受信を行う検出側送受信部と、前記選択手段から送信された識別符号が一致した場合に受信情報を前記選択手段へリピートする比較部とを有すると共に、前記表示手段の画面の水平軸及び垂直軸上に

各々配置されていることを特徴とする。

【００１０】上記目的を達成するために、請求項４記載の本発明は、前記選択手段は、前記画面上における表示選択範囲として矩形枠の対角線の一方の点を始点とし他方の点を終点として指定可能であることを特徴とする。

【００１１】上記目的を達成するために、請求項５記載の本発明は、表示選択範囲を示すレイアウト枠を記憶する記憶手段を有し、前記表示制御手段は、前記画面上への表示時に表示画面データとレイアウト枠データを重ね合わせて表示させることを特徴とする。

【００１２】上記目的を達成するために、請求項６記載の本発明は、表示選択範囲が決定した場合に該表示選択範囲に表示させるか否かを操作者に確認及び選択させる確認選択手段を有することを特徴とする。

【００１３】上記目的を達成するために、請求項７記載の本発明は、前記確認選択手段は、Ｏｎ Ｓｃｒｅｅｎ Ｄｉｓｐｌａｙであることを特徴とする。

【００１４】上記目的を達成するために、請求項８記載の本発明は、前記確認選択手段は、音声情報の入出力手段であることを特徴とする。

【００１５】上記目的を達成するために、請求項９記載の本発明は、前記表示制御手段は、表示選択範囲が既に表示されている別の入力画像の表示領域と重なった場合は表示選択範囲の大きさを変化させずに表示位置をずらして表示させることを特徴とする。

【００１６】上記目的を達成するために、請求項１０記載の本発明は、前記表示制御手段は、前記表示位置をずらして表示させる際に表示画面分のフレームメモリのバウンダリを超えている場合は仮想空間表示させることを特徴とする。

【００１７】上記目的を達成するために、請求項１１記載の本発明は、複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置であって、表示手段に表示されている複数の画像データから所望の画像データを選択する選択手段と、該選択手段と選択画像との距離を測定する測距手段と、測定に基づき選択画像を所定の大きさにスケーリングして表示させる表示制御手段とを有することを特徴とする。

【００１８】上記目的を達成するために、請求項１２記載の本発明は、前記測距手段による測距情報を表示装置本体に送信する通信手段を有し、前記表示制御手段は、前記選択手段の移動距離の差分及び選択画像データの水平解像度・垂直ライン数に基づき選択画像データの表示データへのスケーリング変倍率を算出し、選択画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする。

【００１９】上記目的を達成するために、請求項１３記載の本発明は、前記表示制御手段は、移動距離とスケーリング変倍率との関係を示す参照テーブルに基づき前記スケーリング変倍率を算出することを特徴とする。

【００２０】上記目的を達成するために、請求項１４記載の本発明は、赤外線の送受信を行う検出側送受信部、前記選択手段から送信された識別符号が一致した場合に受信情報を前記選択手段へリピートする比較部を有すると共に前記表示手段上の異なる少なくとも３点に配置された検出手段を有し、前記測距手段は、前記各検出手段までの各距離を算出して前記選択手段と選択画像との距離を測定することを特徴とする。

【００２１】上記目的を達成するために、請求項１５記載の本発明は、前記画像ソースは、コンピュータ、ワークステーション、ディジタルテレビ、ビデオ等の機器であることを特徴とする。

【００２２】上記目的を達成するために、請求項１６記載の本発明は、複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法であって、入力画像を表示手段の画面上のどの領域に表示させるかを選択手段を用いて選択する選択ステップと、選択した領域の前記画面上での位置を検出手段を用いて検出する検出ステップと、入力画像データ及び前記検出された表示位置情報に基づき入力画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする。

【００２３】上記目的を達成するために、請求項１７記載の本発明は、前記選択ステップによる選択情報を表示装置本体に送信する通信ステップを有し、前記表示制御ステップでは、入力画像データの水平解像度・垂直ライン数及び前記検出された表示位置情報に基づき入力画像データの表示データへのスケーリング変倍率を算出し、入力画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする。

【００２４】上記目的を達成するために、請求項１８記載の本発明は、前記選択ステップは、赤外線の送受信を行う選択側送受信ステップと、前記選択手段と目的とする前記検出手段との間の赤外線伝播時間を計数する計数ステップと、識別符号を付加した情報を発行すると共に前記選択手段と目的とする前記検出手段の位置を検出する制御ステップとを有し、前記検出ステップは、赤外線の送受信を行う検出側送受信ステップと、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする比較ステップとを有し、前記検出ステップで用いる前記検出手段は前記表示手段の画面の水平軸及び垂直軸上に各々配置されていることを特徴とする。

【００２５】上記目的を達成するために、請求項１９記載の本発明は、前記選択ステップでは、前記画面上における表示選択範囲として矩形枠の対角線の一方の点を始点とし他方の点を終点として指定可能であることを特徴とする。

【００２６】上記目的を達成するために、請求項２０記載の本発明は、表示選択範囲を示すレイアウト枠を記憶

する記憶ステップを有し、前記表示制御ステップでは、前記画面上への表示時に表示画面データとレイアウト枠データを重ね合わせて表示させることを特徴とする。

【００２７】上記目的を達成するために、請求項２１記載の本発明は、表示選択範囲が決定した場合に該表示選択範囲に表示させるか否かを操作者に確認及び選択させる確認選択ステップを有することを特徴とする。

【００２８】上記目的を達成するために、請求項２２記載の本発明は、前記確認選択ステップでは、Ｏｎ Ｓｃｒｅｅｎ Ｄｉｓｐｌａｙを用いて前記確認及び選択を行うことを特徴とする。

【００２９】上記目的を達成するために、請求項２３記載の本発明は、前記確認選択ステップでは、音声情報の入出力手段を用いて前記確認及び選択を行うことを特徴とする。

【００３０】上記目的を達成するために、請求項２４記載の本発明は、前記表示制御ステップでは、表示選択範囲が既に表示されている別の入力画像の表示領域と重なった場合は表示選択範囲の大きさを変化させずに表示位置をずらして表示させることを特徴とする。

【００３１】上記目的を達成するために、請求項２５記載の本発明は、前記表示制御ステップでは、前記表示位置をずらして表示させる際に表示画面分のフレームメモリのバウンダリを超えている場合は仮想空間表示させることを特徴とする。

【００３２】上記目的を達成するために、請求項２６記載の本発明は、複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法であって、表示手段に表示されている複数の画像データから所望の画像データを選択手段を用いて選択する選択ステップと、前記選択手段と選択画像との距離を測定する測距ステップと、測定に基づき選択画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする。

【００３３】上記目的を達成するために、請求項２７記載の本発明は、前記測距ステップによる測距情報を表示装置本体に送信する通信ステップを有し、前記表示制御ステップでは、前記選択手段の移動距離の差分及び選択画像データの水平解像度・垂直ライン数に基づき選択画像データの表示データへのスケーリング変倍率を算出し、選択画像を前記スケーリング変倍率に応じた大きさにスケーリングして表示させることを特徴とする。

【００３４】上記目的を達成するために、請求項２８記載の本発明は、前記表示制御ステップでは、移動距離とスケーリング変倍率との関係を示す参照テーブルに基づき前記スケーリング変倍率を算出することを特徴とする。

【００３５】上記目的を達成するために、請求項２９記載の本発明は、赤外線の送受信を行う検出側送受信ステップ、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする比較ステップを有する検出ステップを有し、前記検出ステップで用いる前記検出手段は前記表示手段上の異なる少なくとも３点に配置され、前記測距ステップでは、前記各検出手段までの各距離を算出して前記選択手段と選択画像との距離を測定することを特徴とする。

【００３６】上記目的を達成するために、請求項３０記載の本発明は、前記画像ソースは、コンピュータ、ワークステーション、ディジタルテレビ、ビデオ等の機器であることを特徴とする。

【００３７】上記目的を達成するために、請求項３１記載の本発明は、複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法を実行するプログラムを記憶したコンピュータにより読み出し可能な記憶媒体であって、前記画像表示方法は、入力画像を表示手段の画面上のどの領域に表示させるかを選択手段を用いて選択する選択ステップと、選択した領域の前記画面上での絶対位置を検出手段を用いて検出する検出ステップと、入力画像データ及び前記検出された表示位置情報に基づき入力画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする。

【００３８】上記目的を達成するために、請求項３２記載の本発明は、前記選択ステップは、赤外線の送受信を行う選択側送受信ステップと、前記選択手段と目的とする前記検出手段との間の赤外線伝播時間を計数する計数ステップと、識別符号を付加した情報を発行すると共に前記選択手段と目的とする前記検出手段の位置を検出する制御ステップとを有し、前記検出ステップは、赤外線の送受信を行う検出側送受信ステップと、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする比較ステップとを有し、前記検出ステップで用いる前記検出手段は前記表示手段の画面の水平軸及び垂直軸上に各々配置されていることを特徴とする。

【００３９】上記目的を達成するために、請求項３３記載の本発明は、複数の画像ソースから入力された画像を同時或いは単独に表示可能な表示装置に適用される画像表示方法を実行するプログラムを記憶したコンピュータにより読み出し可能な記憶媒体であって、前記画像表示方法は、表示手段に表示されている複数の画像データから所望の画像データを選択手段を用いて選択する選択ステップと、前記選択手段と選択画像との距離を測定する測距ステップと、測定に基づき選択画像を所定の大きさにスケーリングして表示させる表示制御ステップとを有することを特徴とする。

【００４０】上記目的を達成するために、請求項３４記載の本発明は、赤外線の送受信を行う検出側送受信ステップ、前記選択ステップから送信された識別符号が一致した場合に受信情報を前記選択ステップへリピートする

比較ステップを有する検出ステップを有し、前記検出ステップで用いる前記検出手段は前記表示手段上の異なる少なくとも３点に配置され、前記測距ステップでは、前記各検出手段までの各距離を算出して前記選択手段と選択画像との距離を測定することを特徴とする。

【００４１】

【発明の実施の形態】以下、本発明の実施の形態を図面に基づいて説明する。

【００４２】［第１の実施の形態］図１は本発明の第１の実施の形態、及び後述する第２の実施の形態に係るマルチ表示システムの要部の構成を示すと共に特許請求の範囲に対応させた機能ブロック図である。本発明の第１の実施の形態に係るマルチ表示システムは、表示手段１０１、選択手段１０２、測距手段１０３、通信手段１０４、検出手段１０５、表示制御手段１０６、記憶手段１０７を備える構成となっている。図中１１１－１、１１１－２、・・・１１１－ｎは画像ソースを示す。

【００４３】上記各部の機能を説明すると、表示手段１０１は、表示制御手段１０６の制御に基づき画像を表示する。選択手段１０２は、画像ソース１１１－１、１１１－２、・・・１１１－ｎから入力された画像を表示手段１０１の画面上の何れの領域に表示させるか選択する。測距手段１０３は、選択手段１０２と選択された表示画像との絶対距離を測定するものであり、後述する第２の実施の形態に係るマルチ表示システムに装備されている。通信手段１０４は、選択手段１０２による選択情報を表示装置本体に送信する。検出手段１０５は、選択された領域の表示手段１０１の画面上での絶対位置を検出する。

【００４４】表示制御手段１０６は、入力画像データの水平解像度・垂直ライン数及び検出された表示位置情報に基づき入力画像データの表示データへのスケーリング変倍率を算出し、入力画像をスケーリング変倍率に応じた大きさにスケーリングして表示させる（第１の実施の形態）。また、表示制御手段１０６は、測距手段１０３で測定した選択手段１０２の移動距離の差分及び選択画像データの水平解像度・垂直ライン数に基づき選択画像データの表示データへのスケーリング変倍率を、移動距離とスケーリング変倍率との関係を示す参照テーブルを利用して算出し、選択画像をスケーリング変倍率に応じた大きさにスケーリングして表示させる（第２の実施の形態）。記憶手段１０７は、表示選択範囲を示すレイアウト枠を記憶するものであり、表示データを記憶する記憶手段とは別個に設けられている。

【００４５】尚、本発明の特許請求の範囲における各構成要件と、本発明の第１及び第２の実施の形態に係るマルチ表示システムにおける各部との対応関係は下記の通りである。

【００４６】表示手段（１０１）は図２の表示デバイス３１３に対応し、選択手段（１０２）は図２の表示ポインタコントローラ３２１に対応し、測距手段（１０３）は図５の測距センサ５３０に対応し、通信手段（１０４）は図２の赤外線発光部３３０、赤外線データ受光部３２０、赤外線データ制御部３１９に対応し、検出手段（１０５）は図２のＸ軸（水平軸）赤外線リピータ３２２、Ｙ軸（垂直軸）赤外線リピータ３２３に対応し、表示制御手段（１０６）は制御部２６０、重ねあわせデータコントローラ２８０、出力表示フォーマット変換部３１１、表示駆動コントローラ３１２に対応し、記憶手段（１０７）は図２の重ねあわせデータストアメモリ３１０に対応する。

【００４７】また、選択手段（１０２）が有する選択側送受信部は図８の送信回路８５２、発光部８５４、受信回路８５３、受光部８５５に対応し、選択手段（１０２）が有する計数部は図８の計数部８４５に対応し、選択手段（１０２）が有する制御部は図８の制御部８４４に対応する。また、検出手段（１０５）が有する検出側送受信部は図８の送信回路８６１、発光部８６３、受信回路８６２、受光部８６４に対応し、検出手段（１０５）が有する比較部は図８のｉｄ比較部８４６に対応する。尚、特許請求の範囲における確認選択手段の図示は省略する。

【００４８】図２は本発明の第１の実施の形態に係るマルチ表示システムの基本構成を示すブロック図である。本発明の第１の実施の形態に係るマルチ表示システムは、例えば４つの独立した画像ソースを１つのモニタに表示し、各画像ソースの入出力機器、例えばマウスやキーボード、リモコン、スピーカ等をモニタに表示された画像データと連動して制御できるようにし、更に、各４つの画像ソースをモニタの所望の領域に最適なマッピング表示が実現できるようにしている。これら画像ソースは、４つより更に多い数でも、また少ない少ないでもよい。

【００４９】本発明の第１の実施の形態に係るマルチ表示システム３３１は、入力部２２１、２２２、２２３、２２４、表示フォーマット変換部２３１、２３２、２３３、２３４、バスインタフェース２４１、２４２、２４３、２４４、バスコントローラ２５０、制御部２６０、フレームメモリコントローラ２７０、重ねあわせデータコントローラ２８０、フレームメモリ２９０、重ねあわせデータストアメモリ３１０、出力表示フォーマット変換部３１１、表示駆動コントローラ３１２、表示デバイス３１３、選択部３１４、パケット分配制御部３１５、ＦＩＦＯメモリ付きパケット制御部３１６、ＦＩＦＯメモリ３１７、赤外線データ変換部３１８、赤外線データ制御部３１９、赤外線データ受光部３２０、表示ポインタコントローラ３２１、ＦＩＦＯ付きパケット制御部３２６、Ｄ／Ａ変換器３２７、アンプ３２８、スピーカ３２９を備える構成となっている。図中２１１、２１２、２１３、２１４は画像信号のソース（以下、画像ソース

群）を示す。

【００５０】上記各部の構成を説明すると、画像ソース群２１１、２１２、２１３、２１４は、例えばパーソナルコンピュータ、ワークステーション、ディジタルテレビ、ビデオ等として構成されている。本実施形態では４つ存在する。各入力部２２１、２２２、２２３、２２４は、それぞれ画像ソース群２１１、２１２、２１３、２１４から出力された画像データを受け取るものである。各入力部２２１、２２２、２２３、２２４には、もし受け取る画像データがコンピュータのアナログ信号であれば、Ａ／Ｄコンバータや、画像データをサンプリングするためのＰＬＬ（Ｐｈａｓｅ Ｌｏｃｋｅｄ Ｌｏｏｐ）が装備されており、また、ＬＶＤＳ（Ｌｏｗ Ｖｏｌｔａｇｅ Ｄｉｆｆｅｒｅｎｔｉａｌ Ｓｉｇｎａｌｉｎｇ）等のディジタル信号であれば、その復号器や差動のバッファが装備されており、また、テレビやビデオのコンポジット信号であれば、それをＲ、Ｇ、Ｂ信号にエンコードするエンコーダが装備されている。

【００５１】各入力部２２１、２２２、２２３、２２４は、各画像ソース群２１１、２１２、２１３、２１４から画像データと画像データを受け取るための制御信号、例えば１ラインの同期を取る水平同期信号、１フレームもしくは１フィールドの同期を取る垂直同期信号、１画素をサンプルするクロック信号、有効画像データの転送期間を示すディスプレイイネーブル信号等も同時に受け取る。各入力部２２１、２２２、２２３、２２４は、各々独立したタイミングで画像ソース群２１１、２１２、２１３、２１４から画像データを受け取る。また、各入力部２２１、２２２、２２３、２２４は、後述する画像ソース群２１１、２１２、２１３、２１４とのシリアル通信手段を有している。

【００５２】表示フォーマット変換部２３１、２３２、２３４、２３５は、各入力部２２１、２２２、２２３、２２４で受け取った画像データの表示フォーマット（表示ライン数やドット数、色数）を制御部２６０の制御に従って変換する。バスインタフェース２４１、２４２、２４３、２４５は、独立した４つの画像データを１つの共通したバスに入力するためのものである。バスコントローラ２５０は、バスインタフェース２４１、２４２、２４３、２４５から出力される画像データ、及びフレームメモリコントローラ２７０、重ねあわせコントローラ２８０から出力される画像データと、それらからの転送要求を受け、優先順位に基づき画像データ転送を調停する。

【００５３】制御部２６０は、本マルチ表示システム３３１全体を制御するものであり、演算能力を持つＣＰＵ、データを一時格納するＲＡＭ、制御プログラムを格納するＲＯＭ、時間を計測するカウンタ、周辺入出力インタフェース等を有している。また、制御部２６０は、論理ロジックのみで構成されていてもよい。制御を行うプログラムはＲＯＭに内蔵されていてもよいし、周辺入出力インタフェースを介して外部から転送されてもよい。フレームメモリコントローラ２７０は、バスコントローラ２５０の調停によって入力する画像データをフレームメモリ２９０に適したデータに演算により加工、制御する。これはＣＰＵや並列演算が可能なメディアプロセッサであってもよい。

【００５４】重ねあわせデータコントローラ２８０は、入力部２２１～２２４とは別の画像データを表示デバイス３１３に重ねて表示するためのものである。フレームメモリ２９０は、表示デバイス３１３に描画する画像データを少なくとも１フレーム分蓄えるメモリである。重ねあわせデータストアメモリ３１０は、重ねあわせをするデータを格納しておくメモリである。出力表示フォーマット変換部３１１は、バス上の画像データをバスコントローラ２５０の制御に従って入力し、表示駆動コントローラ３１２に適した表示フォーマットに変換する。表示駆動コントローラ３１２は、表示デバイス３１３を駆動する。

【００５５】表示デバイス３１３は、画像を表示するものである。表示デバイス３１３は、例えばマトリクス電極構造を持つフラットパネル（液晶、プラズマ等）でもＣＲＴでも、画像を表示可能なものであればよい。また、この表示デバイス３１３上には、Ｘ軸（水平軸）赤外線リピータ３２２とＹ軸（垂直軸）赤外線リピータ３２３が装備されている。選択部３１４は、各画像ソース群２１１～２１４の入出力デバイスであるマウス（赤外線）、キーボード、スピーカ等のデータをパケット多重して送受できる高速シリアルデータラインを切り替える。このようなデータをパケット多重して転送できる例として、ＩＥＥＥ１３９４（Ｉｎｓｔｉｔｕｔｅ ｏｆ Ｅｌｅｃｔｒｉｃａｌ ａｎｄ Ｅｌｅｃｔｒｏｎｉｃｓ Ｅｎｇｉｎｅｅｒｓ：米国電気電子技術者協会によるシリアルインタフェースの規格）やＵＳＢ（Ｕｎｉｖｅｒｓａｌ Ｓｅｒｉａｌ Ｂｕｓ：比較的低速な周辺機器とコンピュータ間のインタフェース）等がある。

【００５６】パケット分配制御部３１５は、選択部３１４で選択されたシリアルデータを各パケット毎に分配する。ＦＩＦＯメモリ付きパケット制御部３１６は、本マルチ表示システム３３１に送られてきたパケットデータを受け取る時のタイミングを調整するためのＦＩＦＯ（Ｆｉｒｓｔ Ｉｎ Ｆｉｒｓｔ Ｏｕｔ）メモリを内蔵している。表示ポインタコントローラ（ポインティングデバイス）３２１は、表示位置レイアウト機能を主とするものであり、赤外線発光部３３０、表示ポインタの確定制御ボタン３２４、表示ポインタの取り消し制御ボタン３２５を装備している。赤外線データ受光部３２０は、表示ポインタコントローラ３２１から発信された赤外線データを受け取る。赤外線データ制御部３１９は、赤外線データ受光部３２０で受け取ったデータフォーマ

ットを制御部２６０や赤外線データ変換部３１８に出力する。

【００５７】赤外線データ変換部３１８は、赤外線データ制御部３１９から送られたデータをシリアルデータのパケットに変換する。ＦＩＦＯメモリ３１７は、赤外線データ変換部３１８で作られたパケットデータをパケット分配制御部３１５に転送するタイミングを調整するためのメモリである。ＦＩＦＯ付きパケット制御部３２６は、各画像ソース群２１１～２１４から送られてきたサウンドパケットを受け取るためのタイミング調整用ＦＩＦＯメモリを内蔵している。Ｄ／Ａ変換器３２７は、入力されたディジタルサウンドデータをアナログサウンドデータに変換する。アンプ３２８は、サウンドデータの増幅を行う。スピーカ３２９は、本マルチ表示システム３３１に装備され、音声出力を行う。

【００５８】図８は本発明の第１の実施の形態に係るマルチ表示システムにおける赤外線を用いた距離測定系（表示ポインタコントローラ３２１、Ｘ軸（水平軸）赤外線リピータ３２２、Ｙ軸（垂直軸）赤外線リピータ３２３）の電気的構成を示すブロック図である。表示ポインタコントローラ側は、リクエスト検知部８４３、制御部８４４、計数部８４５、バッファ８５１、送信回路８５２、受信回路８５３、発光部８５４、受光部８５５を備えている。また、赤外線リピータ側は、Ｉｄ比較部８４６、送信回路８６１、受信回路８６２、発光部８６３、受光部８６４を備えている。

【００５９】上記各部の機能を詳述すると、表示ポインタコントローラ側において、リクエスト検知部８４３は、確定制御ボタン３２４からのリクエストを検知する。制御部８４４は、カウントスタートパルスの発行やコマンドの送信等を行う。計数部８４５は、カウントスタートパルスを計数する。バッファ８５１は、送信／受信データを蓄積する。送信回路８５２は、発光部８５４を介して送信制御を行う。受信回路８５３は、受光部８５５を介して受信制御を行う。また、赤外線リピータ側において、Ｉｄ比較部８４６は、Ｉｄ（識別符号）の比較を行う。送信回路８６１は、発光部８６３を介して送信制御を行う。受信回路８６２は、受光部８６４を介して受信制御を行う。

【００６０】図１１は本発明のプログラム及び関連データが記憶媒体から装置に供給される概念例を示す説明図である。本発明のプログラム及び関連データは、フロッピディスク或いはＣＤ－ＲＯＭ等の記憶媒体１１０１を装置１１０２に装備された記憶媒体ドライブの挿入口１１０３に挿入することで供給される。その後、本発明のプログラム及び関連データを記憶媒体１１０１から一旦ハードディスクへインストールしハードディスクからＲＡＭにロードするか、或いはハードディスクへインストールせずに直接ＲＡＭにロードすることで、プログラムを実行することが可能となる。

【００６１】図１０は本発明のプログラム及び関連データを記憶した記憶媒体の記憶内容の構成例を示す説明図である。記憶媒体は、例えばボリューム情報１００１、ディレクトリ情報１００２、プログラム実行ファイル１００３、プログラム関連データファイル１００４等の記憶内容で構成される。本発明のプログラムは、本マルチ表示システムで実行する下記の各処理に基づきプログラムコード化されたものである。

【００６２】次に、上記の如く構成された本発明の第１の実施の形態に係るマルチ表示システムの動作を説明する。

【００６３】＜表示位置レイアウト初期化＞画像ソース群２１１～２１４とマルチ表示システム３３１は、それぞれ電源投入後、マルチ表示システム３３１の入力部２２１、２２２、２２３、２２４に装備されている双方向シリアル通信線を介して通信を行う。入力部２２１～２２４からは、表示ドット数、表示ライン数、表示色数、ビデオ出力タイミング等のデータをそれぞれ画像ソース群２１１～２１４に送る。このフォーマットは双方で予め決められた通信プロトコルで行われる。

【００６４】一例を示せば、米国の標準化団体のＶＥＳＡ（Ｖｉｄｅｏ Ｅｌｅｃｔｒｏｎｉｃｓ Ｓｔａｎｄａｒｄｓ Ａｓｓｏｃｉａｔｉｏｎ）で決められたＤＤＣ（Ｄｉｓｐｌａｙ Ｄａｔａ Ｃｈａｎｎｅｌ）を用いてもよく、データフォーマットは、同じくＶＥＳＡで制定されたＥＤＩＤ（Ｅｘｔｅｎｄｅｄ Ｄｉｓｐｌａｙ Ｉｄｅｎｔｉｆｉｃａｔｉｏｎ Ｄａｔａ）でもよい。この時、転送される表示ドット数、表示ライン数、表示色数は表示デバイス３１３の表示ドット、ライン、色数を転送する。もしくは、制御部２６０で予め決められた表示フォーマットでもよい。画像ソース群２１１、２１２、２１３、２１４は、受け取った情報に基づき画像データ及びその制御信号をマルチ表示システム３３１の各入力部２２１、２２２、２２３、２２４に出力する。

【００６５】しかし、画像ソース群２１１～２１４とマルチ表示システム３３１が上記のように双方向シリアル通信線を介して通信を行うことができない（アナログビデオ出力など）場合、表示ドット数、表示ライン数の情報は、各入力部２２１、２２２、２２３、２２４が１ラインの同期を取る水平同期信号、１フレームもしくは１フィールドの同期を取る垂直同期信号、１画素をサンプルするクロック信号などを用いて、クロック数、水平同期信号数を直接カウントすることによって知ることも可能となる。何れのケースにおいても、初期化時にマルチ表示システム３３１は、画像ソース群２１１、２１２、２１３、２１４から出力された画像データの表示フォーマット（表示ライン数やドット数、色数）は認識している（または知ることが可能である）。

【００６６】また、この時、マルチ表示システム３３１にいくつの画像ソースが接続されているかを識別するた

め、入力部２２１～２２４は画像ソースから接続識別信号を常時監視している。この接続識別信号は、画像ソース群２１１～２１４から論理的に“１”もしくは“０”の２値信号として受け取る。もし、接続ケーブルが抜かれたり画像ソースの電源が切れた場合は、入力部２１１～２１４で抵抗終端しているためこの論理は“０”となり、マルチ表示システム３３１は画像データが入力されないことを認識できる。この監視情報は制御部２６０にある期間毎に送られる。

【００６７】制御部２６０は先ず入力部２２１の接続認識信号を検知し、接続認識信号が“１”であった場合は、入力部２２１は受け取った画像データを表示フォーマット変換部２３１に出力し、同変換部２３１で表示フォーマット変換を行う。他方、接続認識信号が“０”であった場合は、入力部２２２の接続認識信号を検知し、検知されるまで入力部２２１～２２４をスキャンする。全ての接続認識信号が“０”であった場合は、マルチ表示システム３３１はパワーセーブモードに入り、制御部２６０と選択部３１４、パケット分配制御部３１５、ＦＩＦＯメモリ付きパケット制御部３１６、ＦＩＦＯメモリ３１７、赤外線データ変換部３１８、赤外線データ制御部３１９、赤外線データ受光部３２０以外の電力は落とされる。

【００６８】＜１つの画像ソースが接続された場合＞入力部２２１の接続認識信号のみが“１”であった場合の例についてこれから記述する。マルチ表示システム３３１を利用するユーザは、先ず画像ソース２１１の画像データを表示デバイス３１３のどの位置にどの大きさで表示するかを決めることからスタートする。これについて図３を用いて説明する。マルチ表示システム３３１に何もつながっていない、或いは、つながっているが表示位置が決定していないときの表示デバイス３１３の表示状態は、図３（ａ）初期表示状態のようにシステム側で任意に決めた画像パターンが表示されている。これは、制御部２６０の指示のもとに、フレームメモリコントローラ２７０がフレームメモリ２９０の画像表示領域に任意の画像パターンを電源投入後に書き込んでおくことにより簡単に実現できる。

【００６９】次に、この表示デバイス３１３上に装備されているＸ軸（水平軸）赤外線リピータ３２２とＹ軸（垂直軸）赤外線リピータ３２３による表示位置レイアウト方法について説明する。この説明が本発明の基本ポイントとなるところである。ユーザは表示ポインタコントローラ３２１を用い表示デバイス３１３の始点（Ｘ０、Ｙ０）にタッチし、確定制御ボタン３２４で始点を決定する。このとき、表示ポインタコントローラ３２１は、上記図８に示したリクエスト検知部８４３で確定制御ボタン３２４からのリクエストを検知し、制御部８４４に伝える。

【００７０】制御部８４４は、計数部８４５へカウントスタートパルスを発行し計数を開始させると共に、Ｘ軸（水平軸）赤外線リピータ３２２だけが反応するように、Ｘ軸（水平軸）赤外線リピータ３２２専用のＩｄをつけたコマンドを送信する。このコマンドは、Ｘ軸（水平軸）赤外線リピータ３２２、Ｙ軸（垂直軸）赤外線リピータ３２３へ到達するが、Ｉｄ比較部８４６でＩｄの一致が見られるＸ軸（水平軸）赤外線リピータ３２２だけが反応する。このとき、Ｘ軸（水平軸）赤外線リピータ３２２は、同コマンドを表示ポインタコントローラ３２１へリピート送信する。

【００７１】表示ポインタコントローラ３２１は、このコマンドを受信したことを制御部８４４で検知すると、計数部８４５へカウントスタートパルスを発行し計数を終了させると共に、計数値を赤外線データ発光部３２０に向けて送信する。これにより、制御部２６０は、計数値を得ることができる。制御部２６０では、これを元に以下の演算を行う。

【００７２】

【数１】

$$\text{計数時間} = \text{計数値} \times (1 / \text{計数クロック周波数}) \quad \cdots (1)$$

【００７３】

【数２】

$$\text{測定距離} = \text{赤外線伝播速度} \times (\text{計数時間} - \text{回路内伝播時間}) / 2 \quad \cdots (2)$$

【００７４】以下に、始点（Ｘ０、Ｙ０）の具体的な算出方法を図７を用いて説明する。図７は表示ウィンドウ領域を２次元のＸＹ座標に置き換えた形で表現され、ディスプレイの左上を原点（０、０）、ディスプレイの右上をＡ（Ｘ、０）、ディスプレイの左下をＢ（０、Ｙ）、表示ポインタコントローラ３２１のディスプレイ上での直接指定位置をＳ（Ｘ０、Ｙ０）（図中７４０で示す点）とおく。この状態でＳからＡまでの距離を図中７４１で示すｄ０、ＳからＢまでの距離を図中７４２で示すｄ１とすると、ｄ０、ｄ１は上述した方法で測距可能である。ここで、制御部２６０は次の演算を行う。

【００７５】

【数３】 $d0 = (X - X0) + Y0 \quad \cdots (3)$

【００７６】

【数４】 $d1 = X0 + (Y0 - Y) \quad \cdots (4)$

（３）－（４）より、

【００７７】

【数５】

$$Y0 = (d0 - d1 + Y - X) / 2Y + (X / Y) \times X0 \quad \cdots (5)$$

となり、（５）を（３）に代入して、Ｘ０＞０の条件でＸ０の２次方程式を解けば、連鎖的に（Ｘ０、Ｙ０）が確定する。

【００７８】次に、ユーザは同様に表示ポインタコントローラ３２１を用い表示デバイス３１３の終点（Ｘ１、Ｙ１）にタッチし、確定制御ボタン３２４で終点を決定する。

【００７９】上記一連の作業は、図３（ｂ）レイアウト枠表示準備状態に示す如く、直接、表示デバイス３１３の画面上での絶対位置により行うことができる。更に、この作業をよりユーザが使いやすいユーザインタフェースとするために、始点から終点までの表示ポインタ移動位置を常にモニタし、その軌跡を図３に符号３３２で示すようなレイアウト枠として表示させている。この実現方法は、表示ポインタの移動軌跡情報をＸ、Ｙ情報として、ある一定した時間毎にパケットにして赤外線に変換し発光させる。赤外線は赤外線データ受光部３２０で受光し、電気信号に変換される。赤外線データ制御部３１９は、赤外線データ受光部３２０からのパケット化された電気信号を制御部２６０に送る。制御部２６０はパケットデータから必要なＸ、Ｙ情報を抜き取り、その情報を重ねあわせデータコントローラ２８０に送る。

【００８０】重ねあわせデータコントローラ２８０は、制御部２６０の指示により表示ポインタの移動軌跡情報のＸ、Ｙ位置をプロットしたデータを作成し、重ねあわせデータストアメモリ３１０に書き込んでいく。入力された画像データ（本例ではシステム側で任意に決めた画像パターン）とは別に、表示デバイス３１３に表示させるデータを蓄える重ねあわせデータストアメモリ３１０からの読み出しデータは、制御部２６０の制御によって動作する重ねあわせデータコントローラ２８０を介してバス上に出力される。この重ねあわせデータと、フレームメモリコントローラ２７０を介してバス上に出力される入力画像データ（本例ではシステム側で任意に決めた画像パターン）は、出力表示フォーマット変換部３１１で選択されて入力される。この選択タイミングは制御部２６０から設定される。

【００８１】出力表示フォーマット変換部３１１は、表示駆動コントローラ３１２の入力に適したデータ（データバス幅等）に変換する。出力表示フォーマット変換部３１１で出力された画像データは、表示駆動コントローラ３１２に出力される。表示駆動コントローラ３１２では、表示デバイス３１３を駆動するための駆動信号が作られる。例えば、表示デバイス３１３がＴＦＴ（ＴｈｉｎＦｉｌｍＴｒａｎｓｉｓｔｏｒ）液晶の場合は、表示デバイス内のドライバＩＣを駆動するライン単位の同期信号、フレーム単位の同期信号、画像データシフトクロック、画像データ、交流化信号である。もし、表示デバイス３１３がＣＲＴの場合は、画像データをそれぞれＲ、Ｇ、Ｂに分割し各色毎にＤ／Ａ変換を行い、アナログＲ、Ｇ、Ｂ信号を生成し、水平、垂直同期信号と共に表示デバイス３１３に出力する。表示駆動コントローラ３１２は、所望の画像データを表示デバイス３１３に転送し、表示デバイス３１３上に描画する。

【００８２】尚、始点位置入力、終点位置入力の各作業を取り消す場合は、表示ポインタコントローラ３２１の取り消し制御ボタン３２５を押すことにより、作業のリセットがなされる。

【００８３】上記作業が終わったときの表示状態は、図３（ｃ）レイアウト枠表示状態のようになっている。ユーザはこのレイアウト枠の位置・大きさを確認し、入力画像をはめ込みたい場合は、表示ポインタコントローラ３２１の確定制御ボタン３２４で決定する。

【００８４】次に、上記レイアウト枠内にいかにして入力画像をはめ込むかを説明する。上記レイアウト枠作成作業で決まった始点（Ｘ０、Ｙ０）、終点（Ｘ１、Ｙ１）を基に、制御部２６０はレイアウト枠の表示ドット数Ｈｄｏｔ（Ｌ）、表示ライン数Ｖｌｉｎｅ（Ｌ）を下記のような差分演算する。

【００８５】Ｈｄｏｔ（Ｌ）＝Ｘ１－Ｘ０

Ｖｌｉｎｅ（Ｌ）＝Ｙ１－Ｙ０

また、制御部２６０は画像ソース２１１からの入力画像の表示ドット数Ｈｄｏｔ（Ｉ）、表示ライン数Ｖｌｉｎｅ（Ｉ）を知っているので、入力画像のレイアウト枠へのスケーリング倍率は下記のように計算できる。

【００８６】

【数６】

横変倍率＝Ｈｄｏｔ（Ｌ）／Ｈｄｏｔ（Ｉ）……（６）

【００８７】

【数７】

縦変倍率＝Ｖｌｉｎｅ（Ｌ）／Ｖｌｉｎｅ（Ｉ）……（７）

上記倍率が１より大きいときは拡大変倍、１より小さいときは縮小変倍、１と等しいときは等倍となる。このスケーリング倍率（６）、（７）は制御部２６０から表示フォーマット変換部２３１に渡される。入力部２２１は表示フォーマット変換部２３１に画像信号を所望のフォーマットで出力する。表示フォーマット変換部２３１は、スケーリング倍率が（６）＝１且つ（７）＝１の場合は、画像データを通過させる。（６）＝１且つ（７）＝１でない場合には、画像データを上記の計算されたスケーリング倍率に応じて任意に変換し、入力画像のドット、ライン数をレイアウト枠のドット、ライン数に合わせる。また、色数は、表示デバイス３１３の可能表示色数より入力された表示色数が多い場合は、ディザ（白と黒を組み合わせて中間階調を表現する手法）等の中間処理等を用いて画像データのビット数を落とす。

【００８８】表示フォーマット変換部２３１から出力された画像データは、バスインタフエース２４１、バスコントローラ２５１、フレームメモリコントローラ２７０

を介してフレームメモリ２９０にストアされる。また、フレームメモリ２９０にストアするときにスケーリングされたデータの格納場所は、制御部２６０がフレームメモリコントローラ２７０に始点情報（Ｘ０、Ｙ０）を渡し、フレームメモリコントローラ２７０内のフレームメモリへの物理アドレス生成時に適正な始点（Ｘ０、Ｙ０）分のオフセットをつけることにより指定される。このフレームメモリ２９０は複数の階層をもち、制御部２６０の制御により、バスコントローラ２５０を介して入力される画像データを格納する階層を制御される。

【００８９】フレームメモリ２９０に蓄えられた画像データは、制御部２６０が制御する或るタイミングでバス上に出力され、出力表示フォーマット変換部３１１に出力される。この時、どの階層のデータを出力するかは、制御部２６０の制御に従いバスコントローラ２５０が制御する。このような内部処理により、表示デバイス３１３の表示状態は図３（ｄ）入力表示状態のようになり、目的とする枠内への入力表示が実現される。

【００９０】＜２つ以上の画像ソースが接続された場合＞次に、本マルチ表示システム３３１に対し２つ以上の画像ソースが接続された場合の例について説明する。本例では、上記図２の画像ソース２１１の画像データが描画されている時に画像ソース２１２が接続された場合を例に上げて説明する。画像ソース２１１の画像データが入力されると接続認識信号を入力部２２１が検知し、その情報を制御部２６０に伝える。制御部２６０は、新たな２番目の画像ソースの存在を認識すると、ユーザは表示ポインタコントローラ３２１を用い次の入力のレイアウト表示枠を決める作業ができるようになる。図４を用いて以下に説明する。

【００９１】図４（ｅ）レイアウト枠表示状態の如く、入力１－１とは重ならないように上述した方法でユーザが始点（Ｘ２、Ｙ２）と終点（Ｘ３、Ｙ３）（図中符号４３２、４３３で示す点）を決め、レイアウト枠表示を決定したときには、図４（ｇ）入力表示状態の如く、１－２の画像ソースは表示デバイス３１３の画面上に入力に対しての最適なスケーリングによりＪＵＳＴＦＩＴで表示される。しかし、図４（ｆ）レイアウト枠表示状態の如く、入力１－１とは重なってしまうように、上述した方法でユーザが始点（Ｘ４、Ｙ４）と終点（Ｘ５、Ｙ５）（図中符号４３４、４３５で示す点）を決め、レイアウト枠表示を決定したときには、図４（ｈ）入力表示状態と図４（ｉ）入力表示状態などの表示状態が考えられる。図４（ｈ）入力表示状態は、ユーザが入力２－１のレイアウト枠を上記の決定通り重ねて表示したい場合の表示状態例である。この場合、スケーリング方法は上述した方法と同等であるが、この場合は重ね合わせ表示の優先度を加味しなければならない。この実現方法は、フレームメモリ２９０に格納する１－１、１－２の二つの画像データの格納階層を設定する。これらフレームメモリ２９０が持つ階層は優先順位を持っており、表示デバイス３１３上で同じ位置に複数の階層のデータを出力する場合は、優先順位の高い階層の画像データを他の低い優先順位の階層のデータより優先して出力表示フォーマット変換部３１１に出力する。この優先度の決め方は、レイアウト枠決定時にユーザが表示ポインタコントローラ３２１による指示で任意に決めることができる。

【００９２】図４（ｉ）入力表示状態は、ユーザが入力２－１のレイアウト枠を枠のサイズだけ指定したいだけで重ねて表示したくない場合の表示状態例である。この場合、スケーリング方法は上述した方法と同等であるが、この場合は仮想空間表示を加味しなければならない。この実現方法は、制御部２６０がフレームメモリコントローラ２７０により検知した実装されているメモリの容量の情報を受け取り、入力１－１の使用メモリ空間と入力１－２の使用メモリ空間から対応できる仮想表示空間とその空間のどこに１－１、１－２の使用メモリ空間をマッピングするかを、ソフト的或いはハード的に判断する演算処理で決めることにより、制御部２６０がフレームメモリコントローラ２７０にフレームメモリへの物理アドレス生成時に適正な始点移動分のオフセットを直すことにより実現することができる。

【００９３】本発明の第１の実施の形態では、図４（ｆ）レイアウト枠表示状態のようなレイアウティングをした場合、つまり、制御部２６０が入力１－１の始点（Ｘ０、Ｙ０）と終点（Ｘ１、Ｙ１）と、入力１－２の始点（Ｘ４、Ｙ４）と終点（Ｘ５、Ｙ５）の重なりが、

Ｘ０＜Ｘ４＜Ｘ１＜Ｘ５、Ｙ４＜Ｙ０＜Ｙ１＜Ｙ５

のように検知された場合に、ユーザが上述した図４（ｈ）入力表示状態、図４（ｉ）入力表示状態のどの入力表示状態にするかを、図４（ｊ）メッセージ出力状態の如く、本マルチ表示システム３３１が符号４３６で示すメッセージを表示デバイス３１３上に表示通知させる。

【００９４】これを実現するためには、制御部２６０が重ねあわせデータコントローラ２８０に指示を出し、重ねあわせデータストアメモリ３１０に出力文字を書き込み、ＯＳＤ（ＯｎＳｃｒｅｅｎＤｉｓｐｌａｙ）として機能させることにより実現できる。ユーザはこの通知を見て、表示ポインタコントローラ３２１による指示で任意にどちらかを選択することができる。この通知手段は上述した説明では、重ねあわせデータストアメモリ３１０による文字出力表示という手段を用いたが、制御部２６０が音声データを生成し、スピーカ２９０から音声通知させる手段を用いてもよい。

【００９５】以上説明したように、本発明の第１の実施の形態に係るマルチ表示システムによれば、画像ソースから入力された画像を表示手段１０１の画面上のどの領域に表示させるか選択する選択手段１０２と、選択手段１０２で選択した選択情報を表示装置本体に送信する通

信手段１０４と、選択領域の表示手段１０１の画面上での絶対位置を検出する検出手段１０５と、入力画像データの水平解像度・垂直ライン数及び表示位置情報に基づき入力画像データの表示データへのスケーリング変倍率を算出し、入力画像をスケーリング変倍率に応じた大きさにスケーリングして表示させる表示制御手段１０６とを有し、更に、選択手段１０２は、赤外線の送受信を行う送信回路８５２、発光部８５４、受信回路８５３、受光部８５５と、選択手段と目的とする検出手段との間の赤外線伝播時間を計数する計数部８４５と、Ｉｄ（識別符号）を付加した情報を発行すると共に選択手段と目的とする検出手段との間の絶対位置を検出する制御部８４４とを有し、検出手段１０５は、赤外線の送受信を行う送信回路８６１、発光部８６３、受信回路８６２、受光部８６４と、選択手段から送信されたＩｄが一致した場合に受信情報を選択手段へリピートするＩｄ比較部８４６とを有すると共に、表示手段の画面の水平軸及び垂直軸上に各々配置されているため、下記のような作用及び効果を奏する。

【００９６】複数の画像ソースの表示レイアウトを、大画面表示装置上で始点と終点を指定できるポインティングデバイス（選択手段１０２）により決定する。具体的には、そのポインティングデバイスの２次元の座標位置を大画面表示装置上に搭載したＸ軸上の赤外線リピータ３２２とＹ軸上の赤外線リピータ３２３（検出手段１０５）、及びポインタの赤外線ポートとの連動によって認知することで決定し、その情報を本マルチ表示システムへ知らせることにより、内部の制御回路（表示制御手段１０６）が自動的に上記で決められたレイアウト領域に最適にマッピング表示させることが可能となる。

【００９７】従って、本発明の第１の実施の形態に係るマルチ表示システムにおいては、従来は不可能であった、システムの初期使用時に、マルチ入力画面の表示器上の絶対位置を確認したレイアウト作業がディスプレイドライバの煩雑な設定無しに実現することができる。これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【００９８】［第２の実施の形態］次に、本発明の第２の実施の形態として、上記第１の実施の形態においてレイアウト表示された入力画像ソースのレイアウト枠を確定後に可変する場合の説明を以下に行う。可変には、拡大可変と縮小可変の２種類がある。

【００９９】本発明の第２の実施の形態に係る特許請求の範囲に対応させたマルチ表示システムは、表示手段１０１、選択手段１０２、測距手段１０３、通信手段１０４、検出手段１０５、表示制御手段１０６、記憶手段１０７を備える構成となっている（上記図１参照）。図中１１１－１、１１１－２、…１１１－ｎは画像ソースを示す。

【０１００】また、本発明の第２の実施の形態に係るマルチ表示システム３３１は、入力部２２１、２２２、２２３、２２４、表示フォーマット変換部２３１、２３２、２３３、２３４、バスインタフェース２４１、２４２、２４３、２４４、バスコントローラ２５０、制御部２６０、フレームメモリコントローラ２７０、重ねあわせデータコントローラ２８０、フレームメモリ２９０、重ねあわせデータストアメモリ３１０、出力表示フォーマット変換部３１１、表示駆動コントローラ３１２、表示デバイス３１３、選択部３１４、パケット分配制御部３１５、ＦＩＦＯメモリ付きパケット制御部３１６、ＦＩＦＯメモリ３１７、赤外線データ変換部３１８、赤外線データ制御部３１９、赤外線データ受光部３２０、表示ポインタコントローラ３２１、ＦＩＦＯ付きパケット制御部３２６、Ｄ／Ａ変換器３２７、アンプ３２８、スピーカ３２９を備える構成となっている（上記図２参照）。図中２１１、２１２、２１３、２１４は画像信号のソースを示す。

【０１０１】本発明の第２の実施の形態に係るマルチ表示システムが、上記第１の実施の形態に係るマルチ表示システムと相違する点は、表示デバイス３１３上に、Ｘ軸（水平軸）赤外線リピータ３２２、Ｙ軸（垂直軸）赤外線リピータ３２３の他に、原点赤外線リピータ５３９を装備している点（図５参照）、及び制御部２６０が移動距離・変倍率参照テーブル（図６参照）を有している点であり、これ以外の構成は上記第１の実施の形態と同様であるため、上記図１及び図２の詳細については説明を省略する。

【０１０２】＜画像ソースの一つを選択拡大する場合＞図５を用いてレイアウト表示後の入力画像表示を拡大する例を説明する。図５（ｋ）初期表示状態のように表示されているレイアウト状態において、表示画像１－２を拡大する場合、ユーザは表示画像１－２を先ず選択（アクティブ状態）しなければならない。この選択方法については、マルチウインドウ上に表示制御カーソルなどを表示し、そのカーソルが指定ウインドウ内に入った場合にアクティブ選択とすることにより実現できる。

【０１０３】選択された表示画像１－２を拡大する場合、ユーザは表示ポインタコントローラ３２１と表示デバイス３１３との距離ｄ０を確定制御ボタン３２４を押すことにより測定する。以下に具体的な測距方法について図９を用いて説明する。図９は表示ウインドウ領域を３次元のＸＹＺ座標系に置き換えた形で表現され、ディスプレイの左上を原点（０、０、０）、ディスプレイの右上をＡ（Ｘ、０、０）、ディスプレイの左下をＢ（０、Ｙ、０）、表示ポインタコントローラ３２１のコマンド発行位置を図中９４３で示すＳ（ｘ、ｙ、ｚ）、アクティブ選択されたウインドウの重心位置をＧ（Ｘ、Ｙ、０）とおく。

【０１０４】この状態でＳからＡまでの距離を図中９４

４で示すｄｘ、ＳからＢまでの距離を図中９４５で示すｄｙ、Ｓから０までの距離を図中９４６で示すｄｏとすると、ｄｘ、ｄｙ、ｄｏは上述した方法で測距可能である。ここで、制御部２６０は次の演算を行う。

【０１０５】

【数８】ｄｘ ＝（Ｘ－ｘ）＋ｙ ＋ｚ ……（８）

【０１０６】

【数９】ｄｙ ＝ｘ ＋（Ｙ－ｙ）＋ｚ ……（９）

【０１０７】

【数１０】ｄｏ ＝ｘ ＋ｙ ＋ｚ ……（１０）

（８）－（１０）より、

$$z = [d0 - \{do - dy + Y\} / 2Y] - \{(do - dx + X) / 2X\} \quad \cdots\cdots (13)$$

となり、図中９４３で示すＳ（ｘ、ｙ、ｚ）が求まる。また、

【０１１１】

【数１４】ＸＧ＝（Ｘ０＋Ｘ１）／２……（１４）

【０１１２】

$$d0 = \{(x - XG) + (y - YG) + z\} \quad \cdots\cdots (16)$$

となり、（１１）～（１５）の定数値を代入すれば、表示ポインタコントローラ３２１とターゲットウインドウの距離ｄｏを正確且つ容易に求めることができる。これは、カメラの測距のようなユーザがピントを指定するような煩わしさは発生しないことが特徴でもある。

【０１１４】次に、拡大方法について述べる。ユーザは選択画像１－２の拡大を実現するには、上述した初期測距ステップにおける表示ポインタコントローラ３２１の確定制御ボタン３２４を押したまま図５の符号５３７で示す拡大ストロークのように、表示ポインタコントローラ３２１を手前に引く。この移動間に表示ポインタコントローラ３２１と表示デバイス３１３との距離ｄ１の測定は上述した方法で行われ、ユーザによる確定制御ボタン３２４の開放で最終的な距離ｄ１が確定される。この拡大ストローク中にも、この作業をよりユーザが使いやすいユーザインタフエースとするために、始点から終点までの表示ポインタ移動位置を常にモニタし、その軌跡を図５の符号３３２で示すようなレイアウト枠として、上記図５（ｌ）のレイアウト枠表示状態のように表示させている。

【０１１５】以下に、上記レイアウト枠から最終的な拡大レイアウト枠の大きさを測定距離ｄ１からどのように作成するかについて図６を用いて説明する。測定距離ｄ０、ｄ１は、上記図２の表示ポインタコントローラ３２１からの赤外線送信手段（赤外線発光部３３０）により制御部２６０に受け渡す。制御部２６０では、この情報を基に移動距離ｄ１－ｄ０を計算する。本拡大例では、ｄ１－ｄ０＞０の正の変化となる。この結果を基に拡大倍率を決定することになるが、これを実現するために図６のような参照テーブルを制御部２６０に予め持たせる。これは、横軸に移動距離Ｄ、縦軸に変倍率Ｍを対応づけており、移動距離が０のときは変倍率は１の等倍、移動距離が正ならそれに対応して変倍率も１倍以上に変化していく。

【０１１６】移動距離はある限界値Ｄ（ｍａｘ）で最大変倍率Ｍ（ｍａｘ）に収束しており、これ以上は拡大することができない。この最大変倍率Ｍ（ｍａｘ）の決め方は、上記図４（ｇ）のように｜ＵＳＴＦＩＴさせる場合は１－２の周辺入力画像（この例では１－１）のレイアウト位置との関係、上記図４（ｈ）のように重ね合わせ表示する場合は表示領域との関係、上記図４（ｉ）のように仮想空間表示する場合はフレームメモリ２９０のアドレスマップとの関係などにより適宜に設定可能である。移動距離が負ならそれに対応して変倍領域も１倍以下に変化していく。移動距離はある限界値Ｄ（ｍｉｎ）で最小変倍率Ｍ（ｍｉｎ）に収束しており、これ以上は縮小することができない。この最小変倍率Ｍ（ｍｉｎ）の決め方は、上記図２の表示フォーマット変換部２３１～２３４の最小スケーリング倍率によって決められる。

【０１１７】上述した参照テーブルにより、移動距離ｄ１－ｄ０のときの１－２のレイアウト枠はｍ倍に拡大され、上記図５のように拡大中心が（Ｘ１、Ｙ０）の例では、始点は拡大前の（Ｘ１、Ｙ０）と変わらず、終点が（（１－ｍ）Ｘ１＋ｍＸ０、ｍＹ１＋（１－ｍ）Ｙ０）と計算され、上記図５（ｌ）のレイアウト枠軌跡を描きながら、最終的に上記図５（ｍ）の拡大表示状態として表示される。

【０１１８】＜画像ソースの一つを選択縮小する場合＞上記図５を用いてレイアウト表示後の入力画像表示を縮小する例を説明する。縮小手段は上記拡大手段と同様である。上記図５（ｍ）初期表示状態（拡大表示状態）のように表示されているレイアウト状態において、表示画

像１－２を縮小する場合、ユーザは表示画像１－２を先ず選択（アクティブ状態）しなければならない。この選択方法については幾つかの手段が考えられるが、本発明のポイントから外れるのでここでは限定しない。選択された表示画像１－２を縮小する場合、ユーザは表示ポインタコントローラ３２１と表示デバイス３１３との距離ｄ１を確定制御ボタン３２４を押すことにより測定する。

【０１１９】次に、縮小方法について述べる。ユーザは選択画像１－２の縮小を実現するには、上述した初期測距ステップにおける表示ポインタコントローラ３２１の確定制御ボタン３２４を押したまま図５の符号５３８で示す縮小ストロークのように、表示ポインタコントローラ３２１を表示デバイス３１３方向へ押し出す。この移動間に表示ポインタコントローラ３２１と表示デバイス３１３との距離ｄ０の測定が行われ、ユーザによる確定制御ボタン３２４の開放で最終的な距離ｄ０が確定される。この縮小ストローク中にも、この作業をよりユーザが使いやすいユーザインタフェースとするために、始点から終点までの表示ポインタ移動位置を常にモニタし、その軌跡を図５の符号３３２で示すようなレイアウト枠として、図５（ｌ）のレイアウト枠表示状態のように表示させている。

【０１２０】以下に、上記レイアウト枠から最終的な縮小レイアウト枠の大きさを測定距離ｄ０からどのように作成するかについて図６を用いて説明する。測定距離ｄ０、ｄ１は、上記図２の表示ポインタコントローラ３２１からの赤外線送信手段（赤外線発光部３３０）により制御部２６０に受け渡す。制御部２６０では、この情報を基に移動距離ｄ０－ｄ１を計算する。本拡大例では、ｄ０－ｄ１＜０の負の変化ｓとなる。この結果を基に縮小倍率を決定することになるが、これを実現するために図６のような参照テーブルを、上記拡大時と同様に用いる。

【０１２１】上述した参照テーブルにより、移動距離ｄ０－ｄ１のときの表示画像１－２のレイアウト枠は１／ｍ倍に縮小され、上記図５のように縮小中心が（Ｘ１’、Ｙ０’）の例では、始点は拡大前の（Ｘ１’、Ｙ０’）と変わらず、終点が（（１－１／ｍ）Ｘ１’＋１／ｍＸ０’、１／ｍＹ１’＋（１－１／ｍ）Ｙ０’）と計算され、上記図５（ｌ）のレイアウト枠軌跡を描きながら、最終的に上記図５（ｋ）の縮小表示状態として表示される。

【０１２２】以上説明したように、本発明の第２の実施の形態に係るマルチ表示システムによれば、表示手段１０１に表示されている各画像データの一つを選択する選択手段１０２と、選択手段１０２と選択画像との絶対距離を測定する測距手段１０３と、測距手段１０３で測定した測距情報を表示装置本体に送信する通信手段１０４と、測距手段１０３で測定した選択手段１０２の移動距離の差分及び選択画像データの水平解像度・垂直ライン数に基づき選択画像データの表示データへのスケーリング変倍率を、移動距離とスケーリング変倍率との関係を示す参照テーブルを利用して算出し、選択画像をスケーリング変倍率に応じた大きさにスケーリングして表示させる表示制御手段１０６とを有し、更に、表示手段１０１上の異なる３点に検出手段１０５（Ｘ軸（水平軸）赤外線リピータ３２２、Ｙ軸（垂直軸）赤外線リピータ３２３、原点赤外線リピータ５３９）を配置し、測距手段１０３は、各検出手段までの３種類の距離を算出することで選択手段と選択表示画像との絶対距離を測定するため、下記のような作用及び効果を奏する。

【０１２３】表示手段１０１上に更に原点赤外線リピータ５３９（検出手段１０５）を配置し、プレゼンテータの持つポインティングデバイスの赤外線ポートとの連動によって、システム使用時の画像ソースのスケーリング要求に対して、目的とする画像ソースとプレゼンテータの持つポインティングデバイスとの距離の変化をプレゼンテータがストロークアクションによって生み出すことで、内部の制御回路（表示制御手段１０６）がこの距離の変化情報を参照して、適正な大きさまで画像ソースを拡大或いは縮小表示させることが可能となる。

【０１２４】従って、本発明の第２の実施の形態に係るマルチ表示システムにおいては、従来は不可能であった、プレゼンテーション使用時に、不意の拡大・縮小があったときにも、プレゼンテータはプレゼンテーション用の表示ポインタのストロークアクションのみでこの要求に応じることができる。これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【０１２５】尚、本発明は、複数の機器から構成されるシステムに適用しても、１つの機器からなる装置に適用してもよい。前述した実施形態の機能を実現するソフトウエアのプログラムコードを記憶した記憶媒体を、システム或いは装置に供給し、そのシステム或いは装置のコンピュータ（またはＣＰＵやＭＰＵ）が記憶媒体に格納されたプログラムコードを読み出し実行することによっても、達成されることは言うまでもない。

【０１２６】この場合、記憶媒体から読み出されたプログラムコード自体が前述した実施形態の機能を実現することになり、そのプログラムコードを記憶した記憶媒体は本発明を構成することになる。

【０１２７】プログラムコードを供給するための記憶媒体としては、例えば、フロッピディスク、ハードディスク、光ディスク、光磁気ディスク、ＣＤ－ＲＯＭ、ＣＤ－Ｒ、磁気テープ、不揮発性のメモリカード、ＲＯＭなどを用いることができる。

【０１２８】また、コンピュータが読出したプログラムコードを実行することにより、前述した実施形態の機能

が実現されるだけでなく、そのプログラムコードの指示に基づき、コンピュータ上で稼働しているＯＳなどが実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【０１２９】更に、記憶媒体から読出されたプログラムコードが、コンピュータに挿入された機能拡張ボードやコンピュータに接続された機能拡張ユニットに備わるメモリに書込まれた後、そのプログラムコードの指示に基づき、その機能拡張ボードや機能拡張ユニットに備わるＣＰＵなどが実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【０１３０】

【発明の効果】以上説明したように、請求項１乃至１０、請求項１５記載の表示装置によれば、入力画像を表示手段の画面上のどの領域に表示させるかを選択し、選択領域の前記画面上での位置を検出し、入力画像データ及び前記検出された表示位置情報に基づき入力画像を所定の大きさにスケーリングして表示させる制御を行い、更に、選択手段と目的とする検出手段との間の赤外線伝播時間を計数することで両者の位置を検出する制御を行うため、従来は不可能であった、システムの初期使用時に、マルチ入力画面の表示手段上の位置を確認したレイアウト作業がディスプレイドライバの煩雑な設定無しに実現でき、これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【０１３１】また、請求項１１乃至１５記載の表示装置によれば、表示手段に表示されている複数の画像データから所望の画像データを選択し、選択手段と選択画像との距離を測定し、測定に基づき選択画像を所定の大きさにスケーリングして表示させる制御を行い、更に、表示手段上の異なる３点に配置された各検出手段までの各距離を算出することで選択手段と選択画像との距離を測定する制御を行うため、従来は不可能であった、プレゼンテーション使用時に、不意の拡大・縮小があったときにも、プレゼンテータはプレゼンテーション用の選択手段（表示ポインタ）のストロークアクションのみでこの要求に応じることができ、これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【０１３２】また、請求項１６乃至２５、請求項３０記載の画像表示方法によれば、画像表示方法が適用される表示装置において、従来は不可能であった、システムの初期使用時に、マルチ入力画面の表示手段上の位置を確認したレイアウト作業がディスプレイドライバの煩雑な設定無しに実現でき、これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【０１３３】請求項２６乃至３０記載の画像表示方法によれば、画像表示方法が適用される表示装置において、従来は不可能であった、プレゼンテーション使用時に、不意の拡大・縮小があったときにも、プレゼンテータはプレゼンテーション用の選択手段（表示ポインタ）のストロークアクションのみでこの要求に応じることができ、これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【０１３４】また、請求項３１及び３２記載の記憶媒体によれば、記憶媒体から画像表示方法を読み出して表示装置で実行することで、従来は不可能であった、システムの初期使用時に、マルチ入力画面の表示手段上の位置を確認したレイアウト作業がディスプレイドライバの煩雑な設定無しに実現でき、これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【０１３５】また、請求項３３及び３４記載の記憶媒体によれば、記憶媒体から画像表示方法を読み出して表示装置で実行することで、従来は不可能であった、プレゼンテーション使用時に、不意の拡大・縮小があったときにも、プレゼンテータはプレゼンテーション用の選択手段（表示ポインタ）のストロークアクションのみでこの要求に応じることができ、これにより、複数の画像ソースを用いた会議やプレゼンテーションにおいてスムーズ且つ快適な操作環境をユーザにもたらすことができるという効果がある。

【図面の簡単な説明】

【図１】本発明の第１及び第２の実施の形態に係るマルチ表示システムの要部の構成を示すと共に特許請求の範囲に対応させた機能ブロック図である。

【図２】本発明の第１及び第２の実施の形態に係るマルチ表示システムの基本構成を示すブロック図である。

【図３】本発明の第１の実施の形態に係るＸ軸赤外線リピータ及びＹ軸赤外線リピータを用いたレイアウト表示枠作成のイメージを示す説明図である。

【図４】本発明の第１の実施の形態に係る複数画像ソース入力時の表示レイアウトの例を示す説明図である。

【図５】本発明の第２の実施の形態に係る原点赤外線リピータを用いたレイアウト表示枠変更のイメージを示す説明図である。

【図６】本発明の第２の実施の形態に係る移動距離・変倍率参照テーブルのグラフを示す説明図である。

【図７】本発明の第１の実施の形態に係る２次元測距方法を示す説明図である。

【図８】本発明の第１の実施の形態に係る赤外線を用い

た距離測定系の構成を示すブロック図である。

【図９】本発明の第２の実施の形態に係る３次元測距方法を示す説明図である。

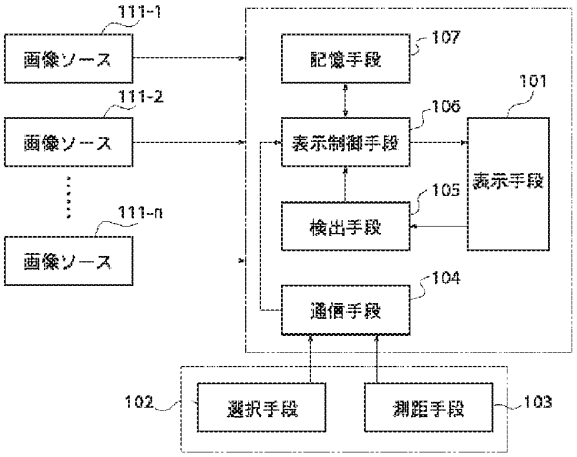
【図１０】本発明のプログラム及び関連データを記憶した記憶媒体の記憶内容の構成例を示す説明図である。

【図１１】本発明のプログラム及び関連データが記憶媒体から装置に供給される概念例を示す説明図である。

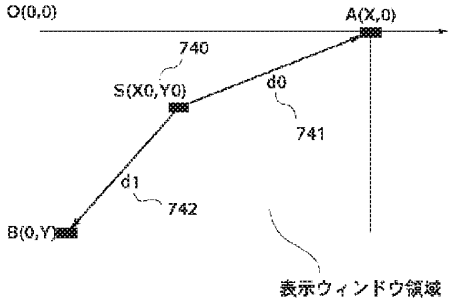
【符号の説明】

１０１　表示手段
１０２　選択手段
１０３　測距手段
１０４　通信手段
１０５　検出手段
１０６　表示制御手段
１０７　記憶手段
１１１－１～１１１－ｎ、２１１～２１４　画像ソース
２６０　制御部
２８０　重ねあわせデータコントローラ
３１０　重ねあわせデータストアメモリ
３１１　出力表示フォーマット変換部
３１２　表示駆動コントローラ
３１３　表示デバイス
３１９　赤外線データ制御部
３２０　赤外線データ受光部
３２１　表示ポインタコントローラ
３２２　Ｘ軸（水平軸）赤外線リピータ
３２３　Ｙ軸（垂直軸）赤外線リピータ
３３０　赤外線発光部
５３９　原点赤外線リピータ
８４４　制御部
８４５　計数部
８４６　Ｉｄ比較部
８５２、８６１　送信回路
８５３、８６２　受信回路
８５４、８６３　発光部
８５５、８６４　受光部

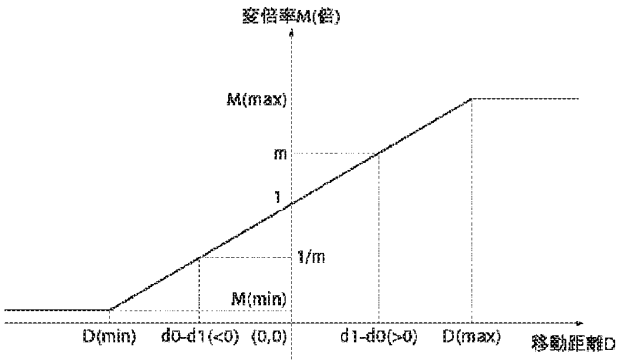
【図１】



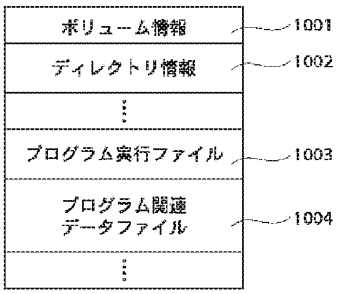
【図７】



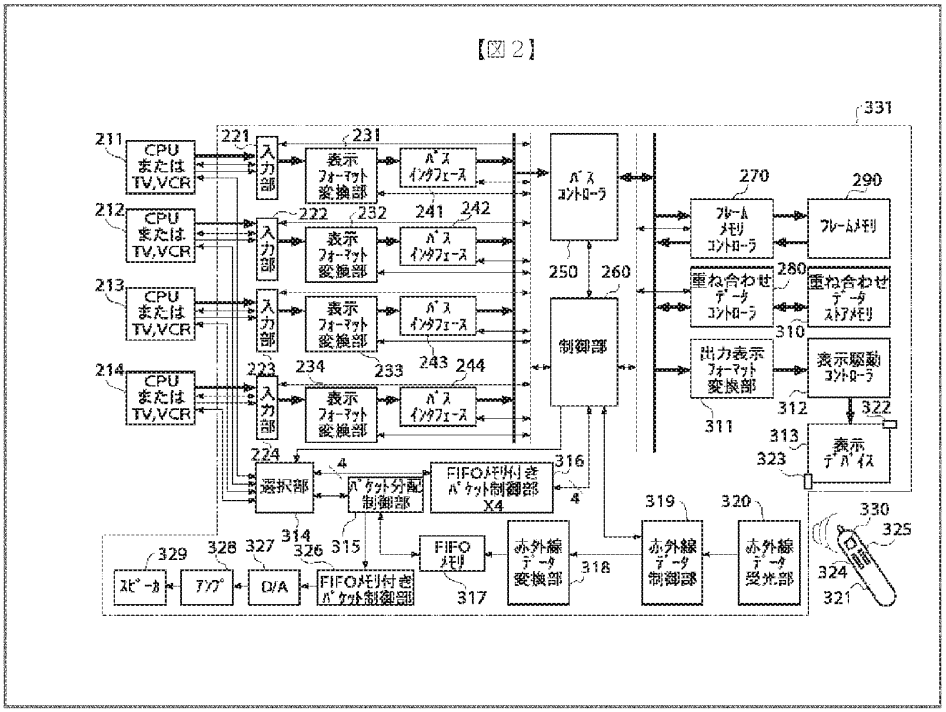
【図６】



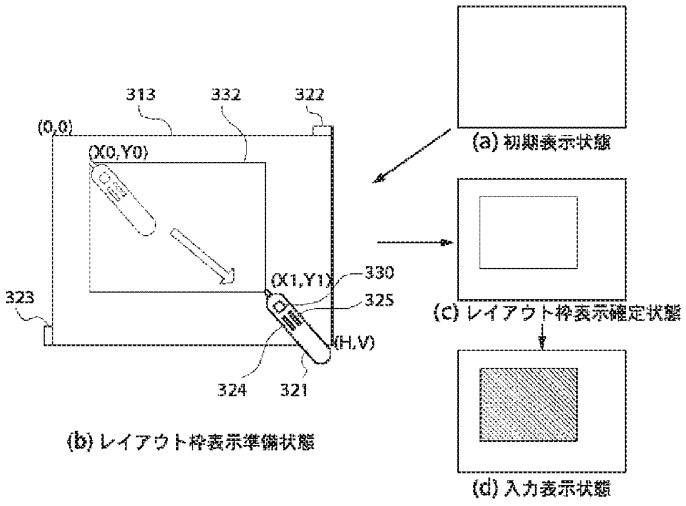
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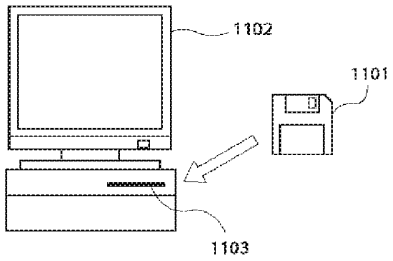
【図２】


CPU または TV,VCR
入力部
表示フォーマット変換部
バスインタフェース
バスコントローラ
制御部
フレームメモリコントローラ
フレームメモリ
重ね合わせデータコントローラ
重ね合わせデータストアメモリ
出力表示フォーマット変換部
表示駆動コントローラ
表示デバイス
選択部
パケット分配制御部
FIFOメモリ付きパケット制御部 X4
FIFOメモリ
赤外線データ変換部
赤外線データ制御部
赤外線データ受光部
スピーカ
アンプ
D/A
FIFOメモリ付きパケット制御部

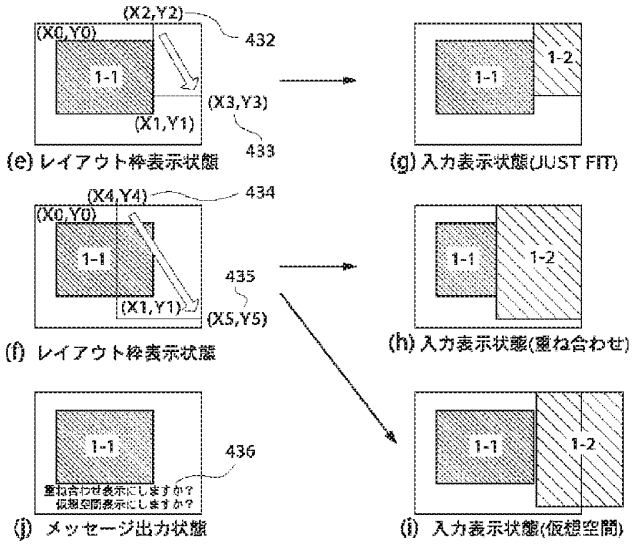
【図３】


(0,0)
(X0,Y0)
(X1,Y1)
(H,V)
(a) 初期表示状態
(b) レイアウト枠表示準備状態
(c) レイアウト枠表示確定状態
(d) 入力表示状態

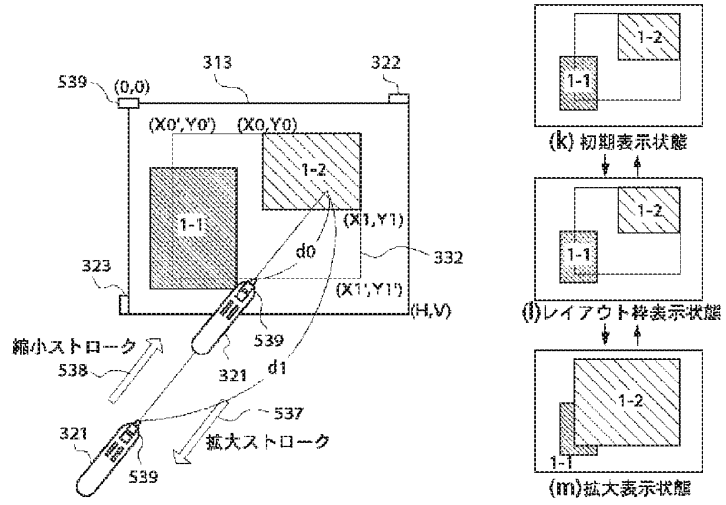
【図１１】


1101
1102
1103

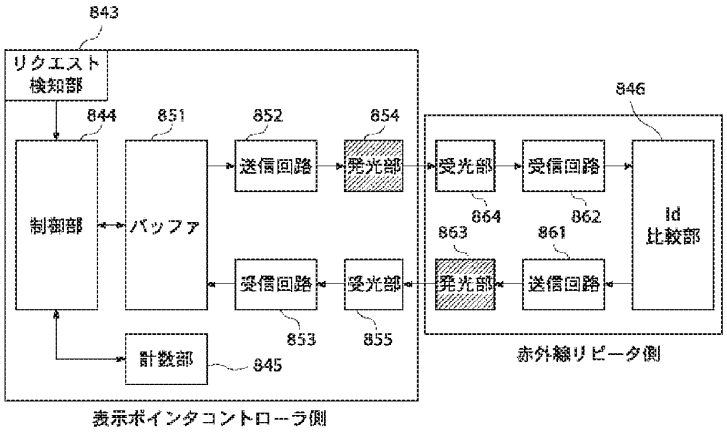
【図４】


(X2,Y2)
(X0,Y0)
1-1
432
(X3,Y3)
(X1,Y1)
433
(e) レイアウト枠表示状態
(g) 入力表示状態(JUST FIT)
1-2
(X4,Y4)
434
(X0,Y0)
1-1
435
(X1,Y1)
(X5,Y5)
(f) レイアウト枠表示状態
(h) 入力表示状態(重ね合わせ)
436
重ね合わせ表示にしますか?
仮想空間表示にしますか?
(j) メッセージ出力状態
(i) 入力表示状態(仮想空間)

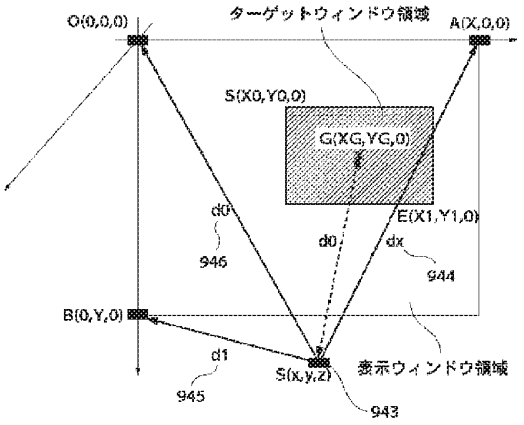
【図５】


313
322
539
(0,0)
(X0',Y0')
(X0,Y0)
1-2
1-1
(X1,Y1)
d0
332
323
(X1',Y1')
(H,V)
縮小ストローク
539
538
321
d1
537
321
拡大ストローク
539
(k) 初期表示状態
(l)レイアウト枠表示状態
(m)拡大表示状態

【図８】



【図９】



フロントページの続き

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東京都大田区下丸子３丁目　番２号　キヤノン株式会社内
発明者　荒谷　俊太郎
東京都大田区下丸子３丁目　番２号　キヤノン株式会社内

Electronic Patent Application Fee Transmittal

Application Number:	14344836
Filing Date:	03-Mar-2015
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Filer:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

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:	34331350
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	16-NOV-2018
Filing Date:	03-MAR-2015
Time Stamp:	12:41:06
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$240
RAM confirmation Number	111618INTEFSW12423200
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Information:					

7	Fee Worksheet (SB06)	fee-info.pdf	30283 3a3753c88a159440b0d1f4ed9ff9a8f1f56d65cc	no	2
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New International Application Filed with the USPTO as a Receiving Office

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

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Scott C. Sun
	Attorney Docket Number	BEEL3004/BEU/TL

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Scott C. Sun
	Attorney Docket Number	BEEL3004/BEU/TL

	1	SIPO Office Action in corresponding app. CN 201280074077.2 dated August 23, 2018.	X
	2	Office Action in corresponding app. 15/449,048 dated October 12, 2018.	☐

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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.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Scott C. Sun
	Attorney Docket Number	BEEL3004/BEU/TL

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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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-10-30
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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EFS ID:	34164370
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	30-OCT-2018
Filing Date:	03-MAR-2015
Time Stamp:	17:31:54
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	BEEL3001C2_OA_12OCT18.pdf	1531140 40b3ecbd10fbaf8504ce619a256d18ab0a1dde42	no	36

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2	Non Patent Literature	CNOA4_23AUG18.pdf	12460767 b972d4d7756fac95beab0344f13b67a6696abed7	no	14
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3	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS_30OCT18.pdf	1035013 ea46c4b95be0501307b3f525bbf5903e353e9fec	no	4
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Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	Scott C. Sunn
Attorney Docket Number	BEEL3004/BEU/TL

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Scott C. Sunn
	Attorney Docket Number	BEEL3004/BEU/TL

	1	SIPO Office Action in corresponding app. CN 201280001542.X dated July 30, 2018.	X
	2	EPO Office Action in corresponding app. EP 12759440.6-1204 dated August 9, 2018.	☐
	3	EPO Office Action in corresponding app. EP 12775162.6-1204 dated August 9, 2018.	☐
	4	Office Action in corresponding app. 14/725,401 dated September 10, 2018.	☐
	5	Office Action in corresponding app. 90/014,087 dated September 4, 2018.	☐

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Examiner Signature		Date Considered	

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Scott C. Sunn
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-09-18
Name/Print	THOMAS LEE	Registration Number	66396

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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Electronic Acknowledgement Receipt

EFS ID:	33738718
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	18-SEP-2018
Filing Date:	03-MAR-2015
Time Stamp:	09:41:44
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_IDS_13SEP18.pdf	1035142 b73575309baf20a2ac9e5eb6b36ac7b3d4686eeb	no	4

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2	Non Patent Literature	CN_OA_with_English_translation.pdf	2523823 d6934a3535359b417924504dda87c774382a8b62	no	20
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3	Non Patent Literature	EP_OA1.pdf	673802 87b96e7bab626e6da41964154705d62a1c4bae4d	no	6
Warnings:					
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4	Non Patent Literature	EP_OA2.pdf	673692 a25a26dd0611bc56160cac9d0df2e77e4bb165d2	no	6
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5	Non Patent Literature	BEEL3002CIPC_OA_10SEPT18.pdf	2284511 cfc8b684a23fefee1a00ab3f7c58070b34cdcec5	no	48
Warnings:					
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6	Non Patent Literature	BEEL3001REX_OA_04SEPT18.pdf	1581900 4bd0181bb0404ddb890d7ae55fd6691e3c650ed3	no	32
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Application No.:	14/344,836	**Confirm. No.:**	1046
Filing Date:	March 3, 2015	**Art Unit:**	2184
First Inventor:	Koen Simon Herman BEEL	**Customer No.:**	23364
Attorney No.:	BEEL3004/BEU/TL	**Examiner:**	Christopher A. Bartels
For:	**ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS**		

REPLY UNDER 37 C.F.R. § 1.111 TO OFFICE ACTION OF FEBRUARY 28, 2018

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

Sir:

INTRODUCTORY COMMENTS

This is responsive to the Office Action dated February 28, 2018 in the above application.

In view of the following amendments and remarks, reconsideration of the application is respectfully requested.

A petition and appropriate fee to extend the period of reply by two month are concurrently filed herewith.

AMENDMENT

Please amend the pending application in accordance with the following particulars.

In the Claims

The claims are amended as shown on the following pages under the heading LIST OF CURRENT CLAIMS. The list shows the status of all claims presently in the application and is intended to supersede all prior versions of the claims in the application. Any cancellation of claims is made without prejudice or disclaimer.

LIST OF CURRENT CLAIMS

1-81. (Cancelled)

82. (Currently Amended) A method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a class of peripheral devices, the method comprising:

a) coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver and a connector configured to couple to the port of the processing device;

b) setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device;

c) using the peripheral device to connect the processing device to a communications network via the transceiver;

d) routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device,

wherein the peripheral device comprises an audio output adapter.

83. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

84. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

85. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

86. (Previously Presented) The method of claim 82, wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

87. (Previously Presented) The method of claim 86 wherein the client application is a portable application.

88. (Previously Presented) The method of claim 82 wherein the peripheral device is adapted to analyze an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

89. (Previously Presented) The method of claim 88 wherein if audio is received, the peripheral device will initiate an additional TCP/IP socket connection to the base unit through the communications network.

90. (Previously Presented) The method of claim 82 further comprising time-stamping synchronously the audio with the data stream.

91. (Previously Presented) The method of claim 90 further comprising encoding, optionally encrypting the audio data.

92. (Currently Amended) A system for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a class of peripheral devices, the system comprising:

a) means for coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver and a connector configured to couple to the port of the processing device;

b) means for setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device;

c) wherein the peripheral device is configured in a way to connect the processing device to a communications network via the transceiver;

d) means for routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device,

wherein the peripheral device comprises an audio output adapter.

93. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

94. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

95. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

96. (Previously Presented) The system of claim 92 wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

97. (Previously Presented) The system of claim 96 wherein the client application is a portable application.

98. (Previously Presented) The system of claim 92 wherein the peripheral device is adapted to analyse an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

99. (Previously Presented) The system of claim 98 wherein if audio is received, the peripheral device will initiate an additional connection to the base unit through the communications network.

100. (Previously Presented) The system of claim 92 further comprising time-stamping synchronously the audio stream with the data stream.

101. (Previously Presented) The system of claim 100 further comprising means for encoding, optionally encrypting the audio data.

102. (Currently Amended) A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a class of peripheral devices, the

peripheral device comprising a connection configured to be physically coupled to a port of the processing device and a memory in which executable software code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for audio communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via a transceiver of the peripheral device;

a third software code portion for routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device,

wherein the peripheral device comprises an audio output adapter.

REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. Applicant's Summary of Interview with Examiner

Applicant is gratefully appreciative of the opportunity for Applicant's counsel, Mr. Thomas Lee, to discuss the pending application with Examiner Bartels on July 18, 2018.

During the interview, Applicant through counsel presented proposed claim amendments and arguments against the Examiner's prior art rejections. While the Examiner agreed that the proposed amendments would likely overcome the prior art rejections, the Examiner suggested that the claims be further amended to further clarify the claimed features.

In view of the Examiner's suggestion, Applicant submits herewith amendments to the claims and arguments for formal consideration.

2. Claim Amendments

Claim 82 is amended to recite "coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver and a connector configured to couple to the port of the processing device." Claim 82 is also amended to recite "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device, wherein the peripheral device comprises an audio output adapter."

It is respectfully submitted that no new matter is added, since support for the amendments may be found, for example, at least on page 37, lines 16-20 and page 49, line 11 to page 53, line 7 of the accompanying description in the specification as originally filed.

Claims 92 and 102 are amended to recite similar features as recited in amended claim 82.

Claims 83-91 and 93-101 are left unchanged.

3. Rejection of claims 82-85, 87-95, and 97-102 under 35 U.S.C. § 103 as being unpatentable over U.S. publication 2007/0033289 (*Nuyttens*) in view of U.S. publication 2009/0247006 (*Thompson*)

Reconsideration of this rejection is respectfully requested on the basis that the cited prior art fails to establish obviousness with respect to amended claims 82, 92, and 102, from which the remaining claims depend.

Specifically, the Examiner's proposed modification of the method for displaying images on a display system of *Nuyttens* in accordance with the teachings of *Thompson* fails to at least result in "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device, wherein the peripheral device comprises an audio output adapter," as recited in amended claim 82.

As discussed during the interview, Applicant submits that *Nuyttens* fails to disclose "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device, wherein the peripheral device comprises an audio output adapter." At most, *Nuyttens* discloses the DGU unit receives a number of encoded signals – unicasted or multicasted on the network 13 - through the redundant 1 Gb/s network interface in a number of input buffers 30 (para. [0112]). This baseboard takes care of inserting the decoded image on the internal bus to the multi-viewer driver 2 (para. [0112]). Because of the fact that the DGU 14 has to take over the rendering capability of the multi-viewer driver 2, e.g. Hydra single board computer, the DGU 14 can be equipped with a

drawing unit 40 existing of a GPU – graphical processor unit/graphical accelerator+ DDR SRAM+panellink transmitter (para. [0114]). The CPU unit 47 is in control of the setup and operation of the DGU unit and can receive commands across a separated control network (out-of-band control) or across the video network (in-band control) (para. [0116]). In other words, *Nuyttens* discloses a display generator unit equipped with a drawing unit, but fails to disclose "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device, wherein the peripheral device comprises an audio output adapter."

The Examiner attempts to resolve the missing element in *Nuyttens* by modifying the method for displaying images on a display system of *Nuyttens* in accordance with certain teachings of *Thompson* to establish that such modification would have been obvious to result in the claimed invention. *Thompson*, however, fails to cure the deficiencies of *Nuyttens* with respect to amended claim 82. Rather, *Thompson* discloses an access point (AP) 102 that provides an adaptable access port for a variety of network configurations (e.g. wired and/or wireless; computer, telephone, television, audio, etc) (para. [0049]). Access point 102 enables the use of a single cable or multiple cables to distribute a plurality of exclusive protocols using various transmission media types (para. [0049]). Conveniently, now with the module 104, the network medium can comprise most any type of conductor and connector, where this is a noteworthy feature of the disclosed embodiments because module 104 is intended to be standardized through the network, while cartridge 106 is specific to an application, therefor one generic module 104 will appropriately connect a plurality of function specific application interface cartridges 106 (para. [0062]). In other words, *Thompson* only discloses an access point, but fails to disclose "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between

the processing device and the peripheral device, wherein the peripheral device comprises an audio output adapter."

Therefore, since neither *Nuyttens* nor *Thompson* discloses or suggests "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver to a base node, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device, wherein the peripheral device comprises an audio output adapter," the proposed modification of the method for displaying images on a display system of *Nuyttens* in accordance with the teachings of *Thompson* fails to result in the features now recited in amended claim 82, as discussed during the interview. Rather, even assuming, but not admitting that the prior art teach certain features recited in the claims, "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 127 S. Ct. 1727, 1741 (2007).

In this case, Applicant submits that the skilled person would not have observed the necessary evidence that would have prompted the skilled person to have combined the teachings of *Nuyttens* and *Thompson* in the same way to result in the same combination of features as recited in the new invention of amended claim 82. Instead, the skilled person would have appreciated that the teachings of *Nuyttens* and *Thompson* are directed to different methods and structures for overcoming their respective prior art deficiencies. For example, *Nuyttens* is at least directed to improvements in multi-head display controllers and multi-head displays, whereas *Thompson* is directed to providing a simple and flexible means for tapping various types of multimedia analog or digital transmission carried on any installed cable without requiring a change in the cable type, connector or enclosure. In

so doing, Applicant submits that the skilled person would not have observed any evidence in the prior art references that would have prompted the skilled person to have combined the teachings of *Nuyttens* and *Thompson* in the same way to result in the same combination of features as recited in amended claim 82, at least because of the different structures and methods taught in the prior art references.

Since the proposed modification of the invention of *Nuyttens* in accordance with the teachings of *Thompson* fails to result in each and every feature recited in amended claim 82, obviousness cannot be established.

Claims 92 and 102 are allowable over the cited prior art at least for reciting similar features as recited in amended claim 82, as well as their individually recited features.

The remaining claims are allowable over the cited prior art at least based on their dependency on claims 82, 92, and 102, as well as their individually recited features.

Accordingly, withdrawal of this rejection is respectfully requested.

4. Rejection of claims 86 and 96 under 35 U.S.C. § 103(a) as being unpatentable over U.S. publication 2007/0033289 (*Nuyttens*) in view of U.S. publication 2009/0247006 (*Thompson*) and further in view of U.S. publication 2013/0060662 (*Carlson*)

Reconsideration of this rejection is requested on the basis that the rejection fails to establish obviousness with respect to amended claims 82 and 92, from which claims 86 and 96 depend.

Specifically, the teachings of *Carlson* fail to cure the deficiencies of the modified method for displaying images on a display system of *Nuyttens* in accordance with the teachings of *Thompson* with respect to amended claims 82 and 92. Therefore, the proposed modification of the invention of *Nuyttens* in accordance with the teachings of *Thompson* and *Carlson* fails to result in each and every feature recited in amended claims 82 and 92, from which claims 86 and 96 depend, and obviousness cannot be established.

Accordingly, withdrawal of this rejection is requested.

5. Conclusion

As a result of the amendments to the claims and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that the currently presented claims be approved and the application passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500
Facsimile: (703) 683-1080

Date: July 24, 2018

Respectfully submitted,

/Thomas Lee/

THOMAS LEE
Attorney for Applicant
Registration No. 66,396

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20110180380	A1	2011-07-28	Lee	

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

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Intervention according to Art. 105 EPS in corresponding European patent 2756668, dated May 3, 2018.	

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-07-24
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14344836
Filing Date:	03-Mar-2015
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Filer:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

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 $0 paid	1252	1	600	600
Miscellaneous:				
			Total in USD ($)	**600**

Electronic Acknowledgement Receipt	
EFS ID:	33261588
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	24-JUL-2018
Filing Date:	03-MAR-2015
Time Stamp:	11:30:03
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$600
RAM confirmation Number	072418INTEFSW11311900
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	BEEL3004_EOT_24JULY18.pdf	148386 f6601fad6e62263d7768738f1b6c74ad576d362e	no	2
Warnings:					
Information:					
2		BEEL3004_nfoa_amnd_24JUL18.pdf	66125 d959e0e4145b05f0970fbbab38bbc5fc58af5f57	yes	13

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	2
Claims	3	7
Applicant Arguments/Remarks Made in an Amendment	8	13

Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_SB08_24JULY18.pdf	1034350 d6f0e8cb630278acb29433da3c05c9abdab1e881	no	4
Warnings:					
Information:					
4	Non Patent Literature	BAR1427EPIntervention3May2018.pdf	2528942 2487677bf436196f5cea57a5dc20f4c6e8f7737e	no	20
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30736 eb212ff33adfdfc603397792c066d44f1201bc76	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	3808539

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/AIA/22 (03-13)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) BEEL3004/BEU/TL
Application Number 14/344,836	Filed March 3, 2015
For ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS	
Art Unit 2184	Examiner Christopher A. Bartels

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☑	Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$ 600.00
☐	Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$
☐	Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐	Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

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

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 020200.

☑ Payment made via EFS-Web.

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.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 66396.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Thomas Lee/ — Signature

July 24, 2018 — Date

THOMAS LEE — Typed or printed name

7036830500 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). 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 6 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: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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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.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/344,836	Filing Date 03/03/2015	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	07/24/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 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

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE
ERIC DANTZLER

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.

Doc Code: ECOMM.AUTH/ECOMM.WTDW
Doc Description: Internet Communications Authorized/Internet Communications Authorization Withdrawn

PTO/SB/439 (11-15)

AUTHORIZATION FOR INTERNET COMMUNICATIONS IN A PATENT APPLICATION OR REQUEST TO WITHDRAW AUTHORIZATION FOR INTERNET COMMUNICATIONS		
	Application No.	14/344,836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Practitioner Docket No.	BEEL3004/BEU/TL

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

I. To authorize permission for Internet Communications.

☑ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 66396.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Thomas Lee/ — Signature

July 16, 2018 — Date

THOMAS LEE — Typed or printed name

571-317-7026 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

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)).
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Electronic Acknowledgement Receipt

EFS ID:	33184246
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	16-JUL-2018
Filing Date:	03-MAR-2015
Time Stamp:	12:33:15
Application Type:	U.S. National Stage under 35 USC 371

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	Internet Communications Authorized	BEEL3004_intrnt_authrztn_16JUL18.pdf	99216 f8aa79c11bf13a175a33ed8edc3b33276d87df94	no	2

Warnings:

Information:	
Total Files Size (in bytes):	99216

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
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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/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS Remove

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

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Final Office Action in related U.S. Application No. 14/278,442, dated June 8, 2018.	

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-06-26
Name/Print	THOMAS LEE	Registration Number	66396

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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Electronic Acknowledgement Receipt

EFS ID:	33001158
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	26-JUN-2018
Filing Date:	03-MAR-2015
Time Stamp:	11:45:35
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_SB08_26JUNE18.pdf	1034280 615b3c9fb2f606101930ddbdacd94358ca697eb3	no	4

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2	Non Patent Literature	14278442_Final_OA_08JUNE18.pdf	493316 7f855b88b8d5a36c850183e5a137bcef0e6b301c	no	15
Warnings:					
Information:					
			Total Files Size (in bytes):	1527596	

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

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

New International Application Filed with the USPTO as a Receiving Office

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PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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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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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Chinese Office Action in related Chinese Application Number 201280055744.2, dated March 30, 2018.	X

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-04-24
Name/Print	THOMAS LEE	Registration Number	66396

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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Electronic Acknowledgement Receipt

EFS ID:	32412200
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee/shelly darrenkamp
Filer Authorized By:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	24-APR-2018
Filing Date:	03-MAR-2015
Time Stamp:	09:49:09
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_SB08_24APR18.pdf	1034323 99e39fb8e8a7b638aa9d12b2fd435a2c943ac851	no	4

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2	Non Patent Literature	CN_OA_Transl_30MAR18.pdf	476601 21b93d6afa39db5f135500bb0d7e4d9ccbefcb84	no	7
Warnings:					
Information:					
			Total Files Size (in bytes):	1510924	

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New International Application Filed with the USPTO as a Receiving Office

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PTO/SB/08a (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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS Remove

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

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

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Office Action in related U.S. Application Number 15/449,048, dated February 16, 2018.	

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

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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	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-03-29
Name/Print	THOMAS LEE	Registration Number	66396

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	32182211
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	29-MAR-2018
Filing Date:	03-MAR-2015
Time Stamp:	13:05:00
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_SB08_29MAR18.pdf	1034285 55539d9d5d2a5903fb92659bbc7278d3980e5ad4	no	4

Warnings:

Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	BEEL3001C2_nfoa_mailed_16FEB18.pdf	2052561 f49d42568b1716e442c62cf208c4d14f7dc64d6b	no	40
Warnings:					
Information:					
			Total Files Size (in bytes):	3086846	

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New Applications Under 35 U.S.C. 111

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

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

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

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Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2184
Examiner Name	Christopher A. Bartels
Attorney Docket Number	BEEL3004/BEU/TL

U.S.PATENTS Remove

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

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	Application Number	14344836
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	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2184
	Examiner Name	Christopher A. Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Request for Reexamination of Patent No. 8,756,348, dated February 9, 2018.	
	2	Request for Reexamination of Patent No. 9,083,769, dated February 9, 2018.	

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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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See attached certification statement.

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A certification statement is not submitted herewith.

SIGNATURE

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Signature	/Thomas Lee/	Date (YYYY-MM-DD)	2018-03-14
Name/Print	THOMAS LEE	Registration Number	66396

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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.

Electronic Acknowledgement Receipt

EFS ID:	32032203
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	14-MAR-2018
Filing Date:	03-MAR-2015
Time Stamp:	09:40:53
Application Type:	U.S. National Stage under 35 USC 371

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	BEEL3001REX_reexam_rqst_09 FEB18.pdf	9789284 c8faf568f1b0f418c7875befe94983854a9d93a9	no	148

Warnings:

Information:					
2	Non Patent Literature	BEEL3002CIPREX_Reexam_Rqst_09FEB18.pdf	2009301 7eb7b015305357635e2d885601286db20f1aa0d1	no	121
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	BEEL3004_SB08_13MAR18.pdf	1034354 72dd10c4193e2587096435e4b048e281e1908005	no	4
Warnings:					
Information:					

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

Total Files Size (in bytes):	12832939

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

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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.
14/344,836	03/03/2015	Koen Simon Herman Beel	BEEL3004/BEU/TL	1046

23364 7590 02/28/2018

BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314-1176

EXAMINER	
BARTELS, CHRISTOPHER A.	

ART UNIT	PAPER NUMBER
2184	

NOTIFICATION DATE	DELIVERY MODE
02/28/2018	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):

MAIL@BACONTHOMAS.COM

Office Action Summary	Application No. 14/344,836	Applicant(s) BEEL ET AL.	
	Examiner CHRISTOPHER BARTELS	Art Unit 2184	AIA (First Inventor to File) Status No

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *01/22/2018*.

☐ 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) *82-102* 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) *82-102* 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 *02/14/2018*.

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

4) ☐ Other: _____.

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

DETAILED ACTION

2. Claims 1-20 and 23-28 are pending.

Continued Examination Under 37 CFR 1.114

3. 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 mailed on 10/20/2017. 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 9/22/2017 has been entered.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 02/14/2018. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

5. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

6. 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 through 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.

7. Claim 82-85, 87-95, and 97-102 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable Nuyttens et al. (USPGPUB No. ***2007/0033289 A1***, *hereinafter referred to as Nuyttens*) in view of Thompson (USPGPUB No. ***2009/0247006 A1***).

Referring to claim 82, Nuyttens discloses a method for connecting a processing device {CPU mezzanine board 47, see Fig. 8, [0116], lines 1-3} ***to a communications network*** {"eth 1000", see Fig. 7, [0112].}, ***the processing device having a memory***

{"flash 33", see Fig. 7.}, ***a display*** {Monitor coupled to graphic accelerator 44, see Fig. 8, [0117].} ***and an operating system*** {Windows or Linux, see Fig. 8, [0117].} ***with pre-installed generic drivers providing a generic communications protocol*** {PCI express to couple peripheral devices, [0116], first 4 lines, see Fig. 8.} ***for communication between processing device and a standard class of peripheral devices, the method comprising:***

b) setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication {"proprietary busses used for transporting video, audio…", [0088].} ***between the peripheral device and the processing device and by means of a second pre-installed generic driver*** {multi-viewer driver 2, see Fig. 7, [0112].} ***of the operating system, a means for data communication*** {"metadata with building blocks based on standard IP and compression technologies", [0088].} ***between the peripheral device and the processing device;***

d) routing audio data between the processing device and the communication network {"a characteristic of such a [communication] network is to… route data from one address to

another", [0088].} ***via the means for audio communication and the transceiver, wherein the first pre-installed generic audio driver is used for transferring the audio data*** {"inserting the decoded image [and corresponding audio] on the internal bus of the [pre-installed generic audio driver] the multi-viewer driver 2", [0112].} ***between the processing device and the peripheral device.***

Furthermore, Thompson discloses a) coupling an external peripheral device {external peripheral devices "NCM 104 and 106" (see Fig. 11, [0049].} ***physically to a port*** {"access port of a variety of network configurations", [0049].} ***of the processing device, the peripheral device having a transceiver*** {said nodes "104 and 106" transceiving via COAX, HDMI and ETHERNET (see Fig. 11).};

c) using the peripheral device to connect the processing device to a communications network {processing device "Gateway 200" (see Fig. 11) to a communication network "cable 113", [0062].} ***via the transceiver;***

Nuyttens and Thompson are analogous art because they are from the same field of endeavor, methods and systems communicating with networked peripherals.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of

Nuyttens and Thompson before him or her, to modify Nuyttens' "graphics accelerator 44" incorporating Thompson's "gateway 200".

The suggestion/motivation for doing so would have been to provide a simple and flexible means for tapping various types of multimedia analog or digital transmissions carried on any installed cable without requiring a change in the cable type, connector or enclosure).

Therefore, it would have been obvious to combine Thompson with Nuyttens to obtain the invention as specified in the instant claim(s).

As per claim 83, the rejection of claim 82 is incorporated and Nuyttens discloses wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device {"proper mouse and keyboard", [0006].} ***and wherein the pre-installed generic driver is a human interface device driver*** {"human machine interface is composed of several displays", [0006].}.

As per claim 84, the rejection of claim 82 is incorporated and Nuyttens discloses wherein Step b) comprises presenting the peripheral device to the processing device as a mass storage

device {"such as a storage device which is part of mass storage", [0252].} ***and wherein the pre-installed generic driver is a mass storage device driver.***

As per claim 85, the rejection of claim 82 is incorporated and Nuyttens discloses wherein Step b) comprises presenting the peripheral device to the processing device as a composite device {"human machine interface is [a composite] of several displays", [0006].} ***and wherein pre-installed generic drivers drive different device interfaces independently*** {"each compression decoding device 45 may work independently of the other compression decoding devices 45", [0138].}.

As per claim 87, the rejection of claim 86 is incorporated and Nuyttens discloses wherein the client application is a portable application {"standard [portable] X.11 methods can be used to feed this information to the DGU 14", [0172], [0171].}.

As per claim 88, the rejection of claim 82 is incorporated and Nuyttens discloses wherein the peripheral device is adapted to anal se an incoming signal {the Examiner is presuming the claim language meant to say "analyse an incoming signal".} ***from the processing device and if no audio is received, the incoming***

signal is discarded {"monitoring elements within a [incoming signal] source (audio metering) in an effective way", [0175].}.

As per claim 89, the rejection of claim 88 is incorporated and Nuyttens discloses wherein if audio is received, the peripheral device will initiate an additional connection TCP/IP socket {as a "network switch… a GbE switch", GbE refers to Gigabit Ethernet protocol includes support for both TCP and UDP streams/sockets, [0102].} ***to the base unit*** {base unit "baseboard of the multi-viewer driver 2", [0112].} ***through the communications network.***

As per claim 90, the rejection of claim 82 is incorporated and Nuyttens discloses wherein further comprising time-stamping synchronously the audio with the data stream {time-stamping "Real time encoding at full frame rate… [for the data stream] in-sports events phases", [0109].}.

As per claim 91, the rejection of claim 90 is incorporated and Nuyttens discloses wherein further comprising encoding, optionally encrypting {encoding "the document [into] SGML, XML, SVG" and so on ([0044]), where the XML format is well-known for encrypting functionalities.} ***the audio data.***

Referring to claims 92-95, and 98-101 are system claims reciting claim language corresponding to the method claim of claims 81-85, 87-91, respectively, thereby rejected under the same rationale as claims 81-85, 87-91.

As per claim 97, the rejection of claim 96 is incorporated and Nuyttens wherein the client application is a portable application {"X.11 windows" known for its' portability and versatility in different platforms, [0171].}.

Referring to claims 102 is an apparatus claim reciting claim language corresponding to the method claim of claims 81-91, respectively, thereby rejected under the same rationale as claims 81-91.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 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.

2. Claims 86 and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nuyttens in view of Thompson and further in view of Carlson et al. (USPGPUB No. ***2013/0060662 A1,*** *hereinafter referred to as Carlson*).

As per claim 86, the rejection of claim 82 is incorporated however neither Nuyttens nor Thompson appears to explicitly disclose any limitation in this dependent claim.

Furthermore, Carlson discloses ***wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data*** {client application "Product catalog system 130" (see Fig. 1) obtaining screen scraped data "screen scraping mechanism", [0023].}.

Nuyttens/Thompson and Carlson are analogous art because they are from the same field of endeavor, methods and systems communicating with networked peripherals.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Nuyttens/Thompson and Carlson before him or her, to modify Nuyttens/Thompson's device incorporating Carlson's "screen scraping mechanism".

The suggestion/motivation for doing so would have been to provide and facilitate the creation of user interfaces that

organize results to reduce cognitive load on the user (Carlson [0003], lines 4-6).

Therefore, it would have been obvious to combine Carlson with Nuyttens/Thompson to obtain the invention as specified in the instant claim(s).

As per claim 96, the rejection of claim 92 is incorporated however neither Nuyttens nor Thompson appears to explicitly disclose any limitation in this dependent claim.

Furthermore, Carlson discloses ***wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data*** {client application "Product catalog system 130" (see Fig. 1) obtaining screen scraped data "screen scraping mechanism", [0023].}.

The 103 motivation for this dependent claim relied upon as recited in claim 86 above.

Response to Arguments

Applicant's arguments, filed on 01/22/2018, have been considered however rendered moot in view of the new ground of rejection(s).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are 103 art for teaching at least one limitation recited in claim 1 above: US 20040125777, US 20070065078, and US 20130054348.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER A. BARTELS whose telephone number is (571)270-3182. The examiner can normally be reached on Monday To Thursday; 7:30am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Dr. Henry Tsai can be reached on (571) 272-4176. 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.

/C. A. B./

/HENRY TSAI/
Supervisory Patent Examiner, Art Unit 2184

Notice of References Cited	Application/Control No. 14/344,836	Applicant(s)/Patent Under Reexamination BEEL ET AL.	
	Examiner CHRISTOPHER BARTELS	Art Unit 2184	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-2004/0125777 A1	07-2004	Doyle, James	H04W48/18	370/338
*	B	US-2007/0065078 A1	03-2007	Jiang; Shumiao	H04L12/2861	385/76
*	C	US-2009/0247006 A1	10-2009	Thompson; William H.	H02G3/121	439/527
*	D	US-2013/0054348 A1	02-2013	Holsman; Ian	G06Q30/00	705/14.43
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
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	S					
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NON-PATENT DOCUMENTS

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

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2181
Examiner Name	Christopher Bartels
Attorney Docket Number	BEEL3004/BEU/TL

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.A.B/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
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	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

/C.A.B/	1	Chinese Office Action in Chinese Application Number 201280074077.2, dated January 4, 2018.	X

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EXAMINER SIGNATURE

Examiner Signature	/CHRISTOPHER A BARTELS/	Date Considered	02/20/2018

*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.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-02-14
Name/Print	THOMAS LEE	Registration Number	66396

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.

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	2	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/03/10 20:50
S2	204	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:30
S3	1	S2 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:30
S4	12070	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:33
S5	95	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/04/03 08:34
S7	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:43
S8	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:43
S9	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:47
S10	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 08:57
S11	1	(S7 S8 S9 S10) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 09:05

S12	95	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/04/03 10:57
S13	77	S12 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 10:57
S14	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 10:59
S15	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/04/03 10:59
S16	8	S12 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/04/03 11:03
S17	10	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S18	11	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S19	10	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S20	15	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/04/03 13:24
S21	3	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S22	224	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S23	1	S22 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S24	12761	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S25	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/13 22:55

S26	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S27	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S28	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S29	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S30	1	(S26 S27 S28 S29) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S31	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/13 22:55
S32	79	S31 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S33	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S34	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/13 22:55
S35	8	S31 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/13 22:55
S36	11	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S37	12	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S38	11	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S39	16	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/13 22:55
S40	3	"20150169477"	US-PGPUB; USPAT;	OR	ON	2017/10/16

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			14:06
S41	224	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S42	1	S41 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S43	12797	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S44	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S45	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S46	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S47	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S48	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S49	1	(S45 S46 S47 S48) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S50	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S51	79	S50 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S52	2	"20020174254"	US-PGPUB; USPAT;	OR	ON	2017/10/16

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			14:06
S53	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S54	8	S50 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S55	11	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S56	12	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S57	11	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S58	16	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S59	3	"20150169477"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S60	224	(audio near2 driver audio adj driver) and (hmi human near2 (machine interface)) and (usb with (mass storage class))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S61	1	S60 and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S62	12797	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S63	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S64	13	"2007137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S65	3	"20070137415"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S66	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2017/10/16 14:06

			EPO; JPO; DERWENT; IBM_TDB			
S67	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S68	1	(S64 S65 S66 S67) and screen near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S69	98	(web data screen) near2 scrap$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S70	79	S69 and (portable cellular pda smartphone smart adj phone mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S71	2	"20020174254"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S72	9	("20110023096" "20070033289" "20140082227").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/10/16 14:06
S73	8	S69 and usb	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/10/16 14:06
S74	11	(("BEEL") near3 ("Koen")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S75	12	(("NIR") near3 ("Yoav")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S76	11	(("LOUWET") near3 ("Filip")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S77	16	(("COEN") near3 ("Guy")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/10/16 14:06
S78	3	"14344836"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/01/16 08:58
S79	3	(US-20070033289-$ or US-20130060662-$).did. or (US-8346753-$).did.	US-PGPUB; USPAT	OR	OFF	2018/02/16 19:47
S80	1	S79 and (driver)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:47

S81	1096	(audio speaker) with (driver module) and (driver module) with (generic and specific)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:49
S82	636	S81 and (adhoc ad adj hoc network$3 lan vpn wan) and (port peripheral)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:50
S83	522	S82 and (window microsoft operat$3 near2 system)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:50
S84	544	S82 and (window microsoft operat$3 near2 system kernel linux unix mac os adj x)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:51
S85	22	S84 not S83	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/16 19:51

2/20/2018 11:24:52 AM
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14344836	BEEL ET AL.
	Examiner	Art Unit
	CHRISTOPHER BARTELS	2184

CPC- SEARCHED		
Symbol	Date	Examiner

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
inventor search performed in East (USPAT USOCR USPGPUB)	04/03/2017, 10/16/2017	C.A.B.
Text search performed in East (ALL DATABASES)	04/03/2017, 10/16/2017, 02/2018	C.A.B.

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/C.B./ Examiner.Art Unit 2184	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14344836	BEEL ET AL.
	Examiner	**Art Unit**
	CHRISTOPHER BARTELS	2184

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

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

CLAIM		DATE								
Final	Original	04/27/2017	10/16/2017	02/20/2018						
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	CHRISTOPHER BARTELS	2184

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CLAIM		DATE								
Final	Original	04/27/2017	10/16/2017	02/20/2018						
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
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✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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CLAIM		DATE								
Final	Original	04/27/2017	10/16/2017	02/20/2018						
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	101	✓	✓	✓						
	102	✓	✓	✓						

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14344836
Filing Date	2015-03-03
First Named Inventor	Koen Simon Herman BEEL
Art Unit	2181
Examiner Name	Christopher Bartels
Attorney Docket Number	BEEL3004/BEU/TL

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

	1	Chinese Office Action in Chinese Application Number 201280074077.2, dated January 4, 2018.	X

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14344836
	Filing Date	2015-03-03
	First Named Inventor	Koen Simon Herman BEEL
	Art Unit	2181
	Examiner Name	Christopher Bartels
	Attorney Docket Number	BEEL3004/BEU/TL

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	/Thomas Lee/	Date (YYYY-MM-DD)	2018-02-14
Name/Print	THOMAS LEE	Registration Number	66396

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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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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EFS ID:	31778823
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	14-FEB-2018
Filing Date:	03-MAR-2015
Time Stamp:	14:42:41
Application Type:	U.S. National Stage under 35 USC 371

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	BEEL3004_CN_3rd_OA_with_Translation.pdf	2040555 ffad22b1b6aa141baef4508cf1e7fb50aefe3a1e	no	15

Warnings:

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	IDS_Filed_SB08_14FEB18.pdf	1034948 72bcb43b5adbe259afb2d3a5163fe8c99269653a	no	4

Warnings:

Information:

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Total Files Size (in bytes):	3075503

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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.

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PTO/SB/30EFS (07-14)
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	14/344,836	Filing Date	2015-03-03	Docket Number (if applicable)	BEEL3004/BEU/TL	Art Unit	2184
First Named Inventor	Koen Simon Herman BEEL			Examiner Name	Christopher A. Bartels		

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, to any international application that does not comply with the requirements of 35 U.S.C. 371, 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 020200

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Signature of Registered U.S. Patent Practitioner			
Signature	/Thomas Lee/	Date (YYYY-MM-DD)	2018-01-22
Name	THOMAS LEE	Registration Number	66396

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.

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

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

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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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.

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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.

Electronic Patent Application Fee Transmittal

Application Number:	14344836
Filing Date:	03-Mar-2015
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Filer:	Thomas Lee
Attorney Docket Number:	BEEL3004/BEU/TL

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

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($)
Miscellaneous:				
RCE- 1st Request	1801	1	1300	1300
		Total in USD ($)		**1300**

Electronic Acknowledgement Receipt	
EFS ID:	31560282
Application Number:	14344836
International Application Number:	
Confirmation Number:	1046
Title of Invention:	ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS
First Named Inventor/Applicant Name:	Koen Simon Herman Beel
Customer Number:	23364
Filer:	Thomas Lee
Filer Authorized By:	
Attorney Docket Number:	BEEL3004/BEU/TL
Receipt Date:	22-JAN-2018
Filing Date:	03-MAR-2015
Time Stamp:	08:12:00
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

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Payment Type	DA
Payment was successfully received in RAM	$1300
RAM confirmation Number	012218INTEFSW00009546020200
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		BEEL3004_foa_114_amnd_22JAN18.pdf	173635 c2380504f0fa4d1aed760dca979acecadecae67a	yes	13
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	2	
	Claims		3	7	
	Applicant Arguments/Remarks Made in an Amendment		8	13	
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	BEEL3004_RCE_19JAN18.pdf	1349883 7b9a6dae9aed508547da1bd80d663c875eed18b9	no	3
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30309 7db3c443b1b9fc5ba762fffb9c00b533c31f9e85	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1553827		

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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:

Application No.:	14/344,836	**Confirm. No.:**	1046
Filing Date:	March 3, 2015	**Art Unit:**	2184
First Inventor:	Koen Simon Herman BEEL	**Customer No.:**	23364
Attorney No.:	BEEL3004/BEU/TL	**Examiner:**	Christopher A. Bartels
For:	**ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS**		

SUBMISSION UNDER 37 C.F.R. § 1.114 TO ACCOMPANY REQUEST FOR CONTINUED EXAMINATION

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

Sir:

INTRODUCTORY COMMENTS

This is a submission to accompany the Request for Continued Examination to re-open prosecution of this application. This submission seeks reconsideration of the Final Office Action dated October 20, 2017 in the above application finally rejecting claims 82-102. The fee set forth in 37 C.F.R. § 1.17 is submitted herewith.

In view of the following amendments and remarks, reconsideration of the application is respectfully requested.

AMENDMENT

Please amend the pending application in accordance with the following particulars.

In the Claims

The claims are amended as shown on the following pages under the heading LIST OF CURRENT CLAIMS. The list shows the status of all claims presently in the application and is intended to supersede all prior versions of the claims in the application. Any cancellation of claims is made without prejudice or disclaimer.

LIST OF CURRENT CLAIMS

1-81. (Cancelled)

82. (Currently Amended) A method for connecting a processing device to a communications network, the processing device having a memory, a display and an operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a ~~standard~~ class of peripheral devices, the method comprising:
a) coupling [[a]] an external peripheral device physically to a port of [[to]] the processing device, the peripheral device having a transceiver;
b) setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device;
c) ~~coupling~~ using the peripheral device to connect the processing device to a communications network via the ~~peripheral device~~ transceiver;
d) routing audio data between the processing device and the communication network via the means for audio communication and the transceiver, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device.

83. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

84. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a mass storage device and wherein the

pre-installed generic driver is a mass storage device driver.

85. (Previously Presented) The method of claim 82 wherein Step b) comprises presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

86. (Previously Presented) The method of claim 82, wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

87. (Previously Presented) The method of claim 86 wherein the client application is a portable application.

88. (Currently Amended) The method of claim 82 wherein the peripheral device is adapted to ~~anal se~~ analyze an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

89. (Currently Amended) The method of claim 88 wherein if audio is received, the peripheral device will initiate an additional TCP/IP socket connection to the base unit through the communications network.

90. (Previously Presented) The method of claim 82 further comprising time-stamping synchronously the audio with the data stream.

91. (Previously Presented) The method of claim 90 further comprising encoding, optionally encrypting the audio data.

92. (Currently Amended) A system for connecting a processing device to a communications network, the processing device having a memory, a display and an

operating system with pre-installed generic drivers providing a generic communications protocol for communication between processing device and a ~~standard~~ class of peripheral devices, the system comprising:

a) means for coupling [[a]] an external peripheral device physically to a port of [[to]] the processing device, the peripheral device having a transceiver;

b) means for setting up, by means of a first pre-installed generic audio driver of the operating system, a means for audio communication between the peripheral device and the processing device and by means of a second pre-installed generic driver of the operating system, a means for data communication between the peripheral device and the processing device;

c) ~~means for coupling~~ wherein the peripheral device is configured in a way to connect the processing device to a communications network via the ~~peripheral device~~ transceiver;

d) means for routing audio data between the processing device and the communication network via the means for audio communication and the transceiver, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device.

93. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a human interface device and wherein the pre-installed generic driver is a human interface device driver.

94. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a mass storage device and wherein the pre-installed generic driver is a mass storage device driver.

95. (Previously Presented) The system of claim 92 further comprising means for presenting the peripheral device to the processing device as a composite device and wherein pre-installed generic drivers drive different device interfaces independently.

96. (Previously Presented) The system of claim 92 wherein a client application is stored on the peripheral device which when run on the processing device obtains screen scraped data.

97. (Previously Presented) The system of claim 96 wherein the client application is a portable application.

98. (Previously Presented) The system of claim 92 wherein the peripheral device is adapted to analyse an incoming signal from the processing device and if no audio is received, the incoming signal is discarded.

99. (Previously Presented) The system of claim 98 wherein if audio is received, the peripheral device will initiate an additional connection to the base unit through the communications network.

100. (Previously Presented) The system of claim 92 further comprising time-stamping synchronously the audio stream with the data stream.

101. (Previously Presented) The system of claim 100 further comprising means for encoding, optionally encrypting the audio data.

102. (Currently Amended) A peripheral device for providing communication connectivity to a processing device which is provided with memory, a display and an operating system with at least one pre-installed generic driver providing a generic communication protocol for communication between the processing device and a ~~standard~~ class of peripheral devices, the peripheral device comprising a connection configured to be physically coupled to a port of the processing device and a memory in which executable software

code is stored for execution on the processing device, said executable software code comprising:

a first software code portion for setting up, by means of the pre-installed generic driver of the operating system, a means for audio communication between the peripheral device and the processing device;

a second software code portion for connecting the processing device to a communications network via ~~the peripheral device, the peripheral device having~~ a transceiver of the peripheral device;

a third software code portion for routing audio data between the processing device and the communication network via the means for audio communication and the transceiver, wherein the first pre-installed generic audio driver is used for transferring the audio data between the processing device and the peripheral device.

REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. Applicant's Summary of Interview with Examiner

Applicant is gratefully appreciative of the opportunity for Applicant's counsel, Mr. Thomas Lee, to discuss the pending application with Examiner Bartels on January 16, 2018.

During the interview, Applicant through counsel presented proposed amendments and arguments to overcome the Examiner's prior art rejection. The Examiner indicated that although the proposed amendments may overcome *Nuyttens*, the Examiner suggested that the claims be further amended to further differentiate the invention over the prior art. No agreement was reached as to the patentability of the claims.

In view of the interview, Applicant submits amendments to the claims and arguments for formal consideration.

2. Claim Amendments

Claim 82 is amended to recite "coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver." Claim 82 is also amended to recite "using the peripheral device to connect the processing device to a communications network via the transceiver." Additionally, claim 82 is amended to recite "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver."

It is respectfully submitted that no new matter is added, since support for the amendments may be found, for example, at least in Figs. 4, 7, 10, and 11 of the pending application and, for example, at least on page 28, line 18 to page 30, line 12 and page 37, line 23 to page 40, line 17 of the accompanying description in the specification as originally filed.

Claim 88 is amended to correct a minor grammatical informality.

Claim 89 is amended to recite features discussed during the interview. It is respectfully submitted that no new matter is added, since support for the amendments may be found, for example, at least on page 49, line 24 to page 50, line 1 of the accompanying description in the specification as originally filed.

Claims 92 and 102 are amended to recite similar features as recited in amended claim 82.

Claims 83-87, 90-91, and 93-101 are left unchanged.

3. Rejection of claims 82-85, 87-95, and 97-102 under 35 U.S.C. § 102(b) as being anticipated by U.S. publication 2007/0033289 (*Nuyttens*)

Reconsideration of this rejection is respectfully requested, in view of the amendments to claims 82, 92, and 102, on the basis that *Nuyttens* fails to disclose each and every recited element of amended claims 82, 92, and 102, from which the remaining claims depend.

Specifically, as discussed during the interview, Applicant submits that *Nuyttens* fails to at least disclose or suggest "coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver," "using the peripheral device to connect the processing device to a communications network via the transceiver," and "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver," as now recited in amended claim 82.

Rather, *Nuyttens* discloses solving the distribution problems by using an off-the-shelf network, e.g., using an IP based or similar data protocol, such as an IP network based distributed system architecture to bring the display controller functionality closer to the source and to replace proprietary busses used for transporting video, audio, RGB, graphic information and/or metadata with building blocks based on standard IP and compression technologies (para. [0088]). The DGU card and the single board computer are replaced in

the Hydra based solution by a completely new DGU unit 14, where use can be made of a dedicated GPU – graphics processor unit sometimes called a gaming video processor – for example, (inside the DGU 14) to render the images (para. [0103]). Fig. 7 illustrates the block schematic of the different functional parts provided in the DGU mezzanine (para. [0111]). The DGU unit receives a number of encoded signals – unicasted or multicasted on the network 13 - through the redundant 1 Gb/s network interface in a number of input buffers 30 (para. [0112]). Because of the fact that the DGU 14 has to take over the rendering capability of the multi-viewer driver 2, e.g. Hydra single board computer, the DGU 14 can be equipped with a drawing unit 40 existing of a GPU – graphical processor unit/graphical accelerator+ DDR SRAM+panellink transmitter (para. [0114]). The CPU unit 47 is in control of the setup and operation of the DGU unit and can receive commands across a separated control network (out-of-band control) or across the video network (in-band control) (para. [0116]). The drawing unit 40 renders the information requested in the graphics configuration file, e.g. tagged mark-up language configuration document 61 (para. [0116]). In other words, *Nuyttens* discloses a display generator unit equipped with a drawing unit, but fails to disclose "coupling an external peripheral device physically to a port of the processing device, the peripheral device having a transceiver," "using the peripheral device to connect the processing device to a communications network via the transceiver," and "routing audio data between the processing device and the communication network via the means for audio communication and the transceiver."

Although the Examiner suggests on pages 3 and 10 of the Final Office Action that *Nuyttens* discloses the previously recited features, as discussed during the interview, Applicant submits that the skilled person would have appreciated that *Nuyttens* fails to disclose or suggest the features clarified in amended claim 82. Rather, the skilled person would have appreciated, for example, as seen in Figs. 4, 7, and 10 of the present application, the features recited in the claims are at least directed to coupling an external peripheral device physically to a port of the processing device, using the peripheral device to connect the processing device to a communications network via the transceiver, and routing audio data between the processing device and the communication network via the means for

audio communication and the transceiver. That is, the skilled person would have appreciated that the peripheral device connected to a port of the processing device, e.g., a laptop, smartphone, PDS computer, table, and such, is used to connect the processing device to the communication network. In so doing, the audio data from the processing device is routed between the processing device and the communications network via the means for audio communication and transceiver to, for example, a base node.

On the other hand, even assuming, but not admitting that the drawing unit of *Nuyttens* can be considered a peripheral device, the drawing unit is not physically coupled to a port of the CPU, where the drawing unit is used to connect the CPU to a communications network via the transceiver. Rather, the skilled person would have understood that *Nuyttens* discloses that the DGU receives encoded signals through the redundant 1 Gb/s network interface. In so doing, the skilled person would have appreciated that the drawing unit does not route audio data between the processing device and the communications network via the means for audio communication and the transceiver. In fact, Applicant submits that the skilled person would not have observed any evidence in *Nuyttens* that would have taught or suggested the recited features, at least because *Nuyttens* is directed to a different structural architecture than recited in the claims.

Since *Nuyttens* fails to disclose or suggest each and every feature recited in amended claim 82, *Nuyttens* cannot anticipate the claims.

Claims 92 and 102 are allowable over the cited prior art at least for reciting similar features as recited in amended claim 82, as well as their individually recited features.

The remaining claims are allowable over the cited prior art at least based on their dependency on claims 82, 92, and 102, as well as their individually recited features.

Accordingly, withdrawal of this rejection is respectfully requested.

4. Rejection of claims 86 and 96 under 35 U.S.C. § 103(a) as being unpatentable over U.S. publication 2007/0033289 (*Nuyttens*) in view of U.S. publication 2013/0060662 (*Carlson*)

Reconsideration of this rejection is requested on the basis that the rejection fails to establish obviousness with respect to amended claims 82 and 92, from which claims 86 and 96 depend.

Specifically, the teachings of *Carlson* fail to cure the deficiencies of the invention of *Nuyttens* with respect to amended claims 82 and 92. Therefore, the proposed modification of the invention of *Nuyttens* in accordance with the teachings of *Carlson* fails to result in each and every feature recited in amended claims 82 and 92, from which claims 86 and 96 depend, and obviousness cannot be established.

Accordingly, withdrawal of this rejection is requested.

5. Conclusion

As a result of the amendments to the claims and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that the currently presented claims be approved and the application passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500
Facsimile: (703) 683-1080

Date: January 22, 2018

Respectfully submitted,

/ Thomas Lee /

THOMAS LEE
Attorney for Applicant
Registration No. 66,396

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 14/344,836	Filing Date 03/03/2015	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	01/22/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 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

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
SHEILA D. CHAPMAN

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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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/344,836	03/03/2015	Koen Simon Herman Beel	BEEL3004/BEU/TL

CONFIRMATION NO. 1046

23364
BACON & THOMAS, PLLC
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ALEXANDRIA, VA 22314-1176

PUBLICATION NOTICE

OC0000000095941161

Title:ELECTRONIC TOOL AND METHODS WITH AUDIO FOR MEETINGS

Publication No.US-2017-0351621-A9
Publication Date:12/07/2017

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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.

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