United States Patent and Trademark Office

Office of the Chief Financial Officer

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Sale Accounting Date:02/14/2023

Sale Item Reference Number	Effective Date
16762709	02/03/2023

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20232DE16187929	1599	MAINTENANCE/PETITION INTERNAL FEE CODE	$680.00	Credit Card

Finance

167

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: OOSTEHOEK, Jan
Confirmation No.: 5709
Application No.: 16/762,709
Filed: May 8, 2020

Patent No. 11,405,669
Group Art Unit: 2423
Examiner: Ricky Chin
Docket No.: 24010-10166689PF

For: **SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES**

2023 FEB 14 PM 2:01
USPTO
RECEIPTS ACCOUNTING
DIVISION

REQUEST FOR ACCEPTANCE OF PAYMENT OF DEFICIENCY IN US PATENT APPLICATION FEES

Director of the United States
Patent and Trademark Office
Attention: Patent Application Assistance Unit
2051 Jamieson Avenue, Suite 300
Alexandria, Virginia 22314

Via Fax: 571-273-8300

Dear Sir:

On June 24, 2022 Patentee paid the issue fee (fee code 2501) for the above captioned patent at the small entity rate. On May 4, 2021 Patentee paid a late filing fee for oath/declaration (fee code 2617) at the small entity rate. At that time, Patentee verily believed that it was still entitled to small entity status. It has now been determined that, as of March 1, 2021, the Patentee is not entitled to such status and wishes now to pay the deficiency in the fees. Patentee has filed to remove its small entity status in the USPTO.

Patentee reports that the deficiency in payment is $680 as follows:

Fee Period	Fee Paid	Fee Owed	Deficiency
Issue Fee	$600.00	$1200.00	$600.00
Late filing oath	$ 80.00	$ 160.00	$ 80.00
TOTAL			$680.00

Patentee, through a registered patent attorney acting in a representative capacity, encloses herewith a credit card payment form, covering the above noted deficiency fee.

The prior payment of the fees as a small entity was made without deceptive intent. Patentee respectfully requests that the enclosed deficiency payment be accepted.

Respectfully submitted,
DENNEMEYER & ASSOCIATES, LLC.

Daniel M. Gurfinkel
Registration No. 34,177

2 North Riverside Plaza, Suite 1500
Chicago, Illinois 60606
(312) 380-6504 February 3, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	183214

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 02/02/2023 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

X Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/daniel m gurfinkel/
Name:	Daniel M. Gurfinkel
Registration Number:	34177

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/762,709	08/02/2022	11405669	24010-10166689PF	5709

12271 7590 07/13/2022

Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site http://pair.uspto.gov for additional inventors):

Jan OOSTHOEK, Landsmeer, NETHERLANDS;

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

SES-Imagotag GmbH, Fernitz-Mellach, AUSTRIA;

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

PART B - FEE(S) TRANSMITTAL

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

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

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

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

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

12271 7590 04/27/2022
Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

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.
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

TITLE OF INVENTION: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$600	$0.00	$0.00	$600	07/27/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHIN, RICKY	2423	725-115000

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

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

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Dennemeyer & Associates, LLC
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: SES-IMAGOTAG GMBH

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Fernitz-Mellach, Austria

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 /daniel m. gurfinkel/ Date June 24, 2022

Typed or printed name Daniel M. Gurfinkel Registration No. 34177

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

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 5

Electronic Patent Application Fee Transmittal

Application Number:	16762709
Filing Date:	08-May-2020
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan OOSTHOEK
Filer:	Daniel Michael Gurfinkel
Attorney Docket Number:	24010-10166689PF

Filed as Small 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:				
UTILITY APPL ISSUE FEE	2501	1	600	600

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**600**

Electronic Acknowledgement Receipt

EFS ID:	46035485
Application Number:	16762709
International Application Number:	
Confirmation Number:	5709
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan OOSTHOEK
Customer Number:	12271
Filer:	Daniel Michael Gurfinkel
Filer Authorized By:	
Attorney Docket Number:	24010-10166689PF
Receipt Date:	24-JUN-2022
Filing Date:	08-MAY-2020
Time Stamp:	09:10:57
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	E20226N011412018
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	Issue Fee Payment (PTO-85B)	issue_fee_pay.pdf	919760 d6cd4208b42794b1aee445f45919fca752ceec5c	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38071 a44f1733422d8ad77d6a89234abeaa3158c69e4d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	957831		

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

12271 7590 04/27/2022

Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

EXAMINER
CHIN, RICKY

ART UNIT	PAPER NUMBER
2423	

DATE MAILED: 04/27/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

TITLE OF INVENTION: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$600	$0.00	$0.00	$600	07/27/2022

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 10

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)

12271 7590 04/27/2022

Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

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.
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

TITLE OF INVENTION: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$600	$0.00	$0.00	$600	07/27/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHIN, RICKY	2423	725-115000

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

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

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
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. _____

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 11

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

12271 7590 04/27/2022

Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

EXAMINER	
CHIN, RICKY	

ART UNIT	PAPER NUMBER
2423	

DATE MAILED: 04/27/2022

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.

PTOL-85 (Rev. 02/11)
HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 12

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

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

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

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 16/762,709	Applicant(s) OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	AIA (FITF) Status Yes

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 4-11-22.
   ☐ 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 2-13 and 15-17 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

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

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

   * Certified copies not received: _____ .

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

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

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

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

Attachment(s)

1. ☑ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Ricky Chin/
Primary Examiner, AU 2423

REASONS FOR ALLOWANCE

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

Prior art of record fails to teach or reasonably suggest where each playback device transmits the playback progress data to the other device to determine whether the device is synchronous or asynchronous with the other device where the product information is displayed as virtual shelf labels within a section of a screens display area overlapping with video content or substituting a video content of a section of the screen, when taking the claim as a whole.

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

Contact

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ricky Chin whose telephone number is 571-270-3753. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Bruckart can be reached on 571-272-3982. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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).

/Ricky Chin/
Primary Examiner
AU 2423
(571) 270-3753
Ricky.Chin@uspto.gov

Notice of References Cited	Application/Control No. 16/762,709	Applicant(s)/Patent Under Reexamination OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	Page 1 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20150091917-A1	04-2015	Li; Fanzhi	G06F3/1446	345/1.3
*	B	US-20150067521-A1	03-2015	HEO; Jin	G06F3/1446	715/733
*	C	US-20140323036-A1	10-2014	Daley; Michael J.	H04W56/0015	455/3.06
*	D	US-20130038509-A1	02-2013	Jiang; Chun	G09G5/12	345/1.3
*	E	US-20120221628-A1	08-2012	FUJIGAKI; Hayato	H04L67/148	709/203
*	F	US-20120215903-A1	08-2012	Fleischman; Michael Ben	G06Q50/01	709/224
*	G	US-20110242412-A1	10-2011	Lee; Dong Han	G06F3/1446	348/E5.009
*	H	US-20120075334-A1	03-2012	Pourbigharaz; Fariborz	G06F3/1438	345/619
*	I	US-20110157106-A1	06-2011	Kim; Hyo-June	G09G5/12	345/204
*	J	US-20070057865-A1	03-2007	Song; Min-Seok	G06F3/1431	345/1.1
*	K	US-10643609-B1	05-2020	Pogue; Michael Alan	G10L15/18	1/1
*	L	US-10713908-B2	07-2020	Yokoyama; Ryo	G06F3/16	1/1
*	M	US-20020129290-A1	09-2002	Couillard, Bruno	H04L63/12	713/400

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
*	N	EP-2461582-A1	06-2012	EP	ASAMI T	G06F3/147
	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.

Notice of References Cited	Application/Control No. 16/762,709	Applicant(s)/Patent Under Reexamination OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	Page 2 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20140029910-A1	01-2014	Maruyama; Kiyoyasu	H04N21/43074	386/220
*	B	US-20140029701-A1	01-2014	NEWHAM; Adam E.	H04J3/0652	704/E21.001
*	C	US-20130173742-A1	07-2013	Thomas; William L.	H04N21/242	709/217
*	D	US-20160266704-A1	09-2016	PARK; Dong-Won	G06F3/1446	1/1
*	E	US-20160034244-A1	02-2016	Howard; Kevin	G06V10/10	345/156
*	F	US-6046709-A	04-2000	Shelton; Gary	G09G5/12	345/1.1
*	G	US-9086838-B2	07-2015	Panvelwala; Abdeali H.	G06F3/1446	1/1
*	H	US-20210064331-A1	03-2021	Goto; Masataka	H04N21/8113	1/1
*	I	US-20200051527-A1	02-2020	Ngo; Long H.	H04N5/57	1/1
*	J	US-20190043450-A1	02-2019	Kwa; Seh	G06F3/1431	1/1
*	K	US-20170214954-A1	07-2017	Trollope; Ingrid McAulay	H04N21/4788	1/1
*	L	US-20170153864-A1	06-2017	Zhou; Chao	A63F13/358	1/1
*	M	US-20170098431-A1	04-2017	OH; KWAN-YOUNG	G09G5/12	1/1

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Notice of References Cited	Application/Control No. 16/762,709	Applicant(s)/Patent Under Reexamination OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	Page 3 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20210173606-A1	06-2021	OOSTHOEK; Jan	G06F3/1446	1/1
*	B	US-20210176505-A1	06-2021	OOSTHOEK; Jan	H04N21/4402	1/1
*	C	US-20160357493-A1	12-2016	ZERWAS; Udo	G09G5/12	1/1
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

CPC - Searched*		
Symbol	**Date**	**Examiner**
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	06/10/2021	RC
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	11/15/2021	RC
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	03/12/2022	RC
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	04/14/2022	RC

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.

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 20

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

Search Notes		
Search Notes	**Date**	**Examiner**
inventor/double patenting search	06/10/2021	RC
npl search - ip.com	06/10/2021	RC
international search report	06/10/2021	RC
EAST text search - USPAT;USPGPUB;EPO; JPO	06/10/2021	RC
updated previous searches	11/15/2021	RC
updated previous searches	03/12/2022	RC
SEARCH text search - USPAT;USPGPUB;EPO;JPO	03/12/2022	RC
updated previous searches	04/14/2022	RC
interference search - text searched claims in SEARCH- USPAT; USPGPUB	04/14/2022	RC

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
All	All- text searched claims in SEARCH- USPAT; USPGPUB	04/14/2022	RC

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 21

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	**Art Unit**
	RICKY CHIN	2423

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

CLAIMS

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

CLAIM		DATE								
Final	Original	06/09/2021	11/15/2021	03/12/2022	04/14/2022					
	1	✓	✓	✓	-					
	2	✓	✓	✓	=					
	3	✓	✓	✓	=					
	4	✓	✓	✓	=					
	5	✓	✓	✓	=					
	6	✓	✓	✓	=					
	7	✓	✓	✓	=					
	8	✓	✓	✓	=					
	9	✓	✓	✓	=					
	10	✓	✓	✓	=					
	11	✓	✓	✓	=					
	12	✓	✓	✓	=					
	13	✓	✓	✓	=					
	14	✓	✓	O	-					
	15	✓	✓	✓	=					
	16	✓	✓	✓	=					
	17			=	=					

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	**Art Unit**
	RICKY CHIN	2423

CPC							
Symbol						**Type**	**Version**
H04N	/	21	/	2387		F	2013-01-01
G06F	/	3	/	1423		I	2013-01-01
H04N	/	21	/	231		I	2013-01-01
H04N	/	21	/	4302		I	2013-01-01
H04N	/	21	/	4402		I	2013-01-01

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	15	
/Ricky Chin/	14 April 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	17	6

U.S. Patent and Trademark Office — Part of Paper No.: 20220414

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 23

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	**Art Unit**
	RICKY CHIN	2423

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04N21/2387	/	21	/	2387
G06F3/14	/	3	/	14
H04N21/231	/	21	/	231
H04N21/43	/	21	/	43
H04N21/4402	/	21	/	4402

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	15	
/Ricky Chin/	14 April 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	17	6

U.S. Patent and Trademark Office — Part of Paper No.: 20220414

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 24

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	**Art Unit**
	RICKY CHIN	2423

☐ 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	11	10												
2	2	12	11												
3	3	13	12												
4	4	14	13												
5	5	-	14												
6	6	15	15												
7	7	9	16												
8	8	1	17												
10	9														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 15	
/Ricky Chin/ (Primary Examiner)	14 April 2022 (Date)	O.G. Print Claim(s) 17	O.G. Print Figure 6

U.S. Patent and Trademark Office — Part of Paper No.: 20220414

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 25

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	192	(popular$5) near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/06/09 07:27 PM
L2	234	(popular$5 "heat map") near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/06/09 07:27 PM
L3	2	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:04 PM
L4	47570	(h04n21/2387,231,242, 4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:06 PM
L5	686	(h04n21/2387,231,242, 4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:15 PM
L6	147	(h04n21/2387,231,242, 4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:15 PM
L9	9	"2461582"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/06/10 01:21 PM
L10	43	"2461582"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/06/10 01:21 PM
L11	19	"2014029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/06/10 01:22 PM
L12	5	"20140029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/06/10 01:23 PM
L13	8	"20120075334"	(US-PGPUB; USPAT;	OR	OFF	OFF	2021/06/10

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				01:23 PM
L14	77	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 04:58 PM
L15	162	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 05:05 PM
L16	224	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:23 AM
L17	0	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:23 AM
L18	928	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:23 AM

		synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)					
L19	246	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:24 AM
L20	13	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:06 AM
L21	536	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:07 AM
L22	3008847	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) amd (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:07 AM
L23	23	video same (synch$5 synchroniz$7 align$5	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	OFF	OFF	2021/09/16 06:07 AM

		re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	DERWENT)				
L24	10	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:09 AM
L25	109	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:09 AM
L26	109	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:09 AM
L27	7319	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:13 AM
L28	34	(synch$5 synchroniz$7 align$5 re-synch$3	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	OFF	OFF	2021/09/16 06:14 AM

		resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress) same (video content media)	DERWENT)				
L29	141	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:14 AM
L30	220	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:17 AM
L31	138	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:18 AM
L32	636	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:18 AM

		near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4 exchang$4) same (playback progress coordinat$6) same (video content media)					
L33	3160	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3) near20 (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:20 AM
L34	8884	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 09:22 AM
L35	837	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4) same (multiple plural$5 other another second) near5 (display$5 screen$2 device$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 09:43 AM
L36	1	"20130173742"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 09:24 PM

L37	2	"20140029701"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 09:30 PM
L38	329	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:20 PM
L39	349	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:20 PM
L40	484	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:20 PM
L41	36	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:23 PM
L42	37	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:23 PM
L43	747	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near20 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near10 (bidirection$4 bi-	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:30 PM

		directional shar$3 exchang$4 determin$6 detect$5)					
L44	406	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:32 PM
L45	42	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:33 PM
L46	71	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near15 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:33 PM
L47	11	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5) and (shelve$1 shelf$1 rack$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:47 PM

L48	80	(multiple pairs plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/17 05:47 PM
L49	80	(multiple plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/17 05:47 PM
L50	0	("2019/0043450").URPN.	(USPAT)	OR	OFF	OFF	2021/09/17 06:07 PM
L51	6	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(USPAT)	OR	OFF	OFF	2021/09/17 06:08 PM
L52	33	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/09/17 06:09 PM
L53	1894	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:03 PM
L54	1986	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:03 PM

		exchang$4)					
L55	36	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:06 PM
L56	36	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:07 PM
L57	38	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:07 PM
L58	38	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:07 PM
L59	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:27 PM

		(video) same (progress time$1 state$1 playback) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)					
L60	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback position$3) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:27 PM
L61	96	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:28 PM
L62	116	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:29 PM
L63	0	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (display$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 10:25 PM
L64	1	(synch$4 synchron$9 align$5) near7 (data	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 10:25 PM

		information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)					
L65	73	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 10:27 PM
L66	2	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/11/15 02:19 AM
L67	152	(h04n21/2387,231,242, 4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/11/15 02:19 AM
L68	116	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/15 02:19 AM
L69	74	(synch$4 synchron$9 align$5 coordinat$7) near15 (data	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/15 02:19 AM

		information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)					
L70	110	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/11/15 02:19 AM
L71	195	(popular$5) near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L72	239	(popular$5 "heat map") near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L73	4	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L74	51815	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L75	693	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L76	143	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

		resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)					
L77	9	"2461582"	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L78	41	"2461582"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/04/14 11:19 AM
L79	19	"2014029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/04/14 11:19 AM
L80	5	"20140029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/04/14 11:19 AM
L81	8	"20120075334"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/04/14 11:19 AM
L82	74	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L83	164	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L84	217	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) and	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

		(shelf$1 rail$1)					
L85	0	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L86	929	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L87	258	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L88	8	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L89	547	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

		asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)					
L90	3500778	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) amd (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L91	17	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L92	10	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L93	112	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L94	112	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

		synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)					
L95	7401	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L96	38	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L97	147	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L98	240	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

L99	150	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L100	638	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4 exchang$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L101	3349	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3) near20 (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L102	9169	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

L103	1405	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4) same (multiple plural$5 other another second) near5 (display$5 screen$2 device$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L104	3	"20130173742"	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L105	2	"20140029701"	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L106	707	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L107	754	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L108	991	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L109	76	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L110	81	(mirror$4) same	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14

		(multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)					11:19 AM
L111	919	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near20 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L112	493	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L113	67	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L114	102	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near15 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near15	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM

		(bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)					
L115	28	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5) and (shelve$1 shelf$1 rack$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L116	129	(multiple pairs plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L117	129	(multiple plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L118	0	("2019/0043450").URPN.	(USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L119	6	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L120	34	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/04/14 11:19 AM

L121	3820	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L122	3985	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L123	60	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L124	62	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L125	71	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM

L126	81	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L127	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L128	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback position$3) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L129	94	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L130	109	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM

		(determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)					
L131	0	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (display$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L132	1	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L133	113	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L134	4	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM
L135	143	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

		align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)					
L136	109	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L137	113	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:19 AM
L138	112	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/04/14 11:19 AM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	18	((synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) SAME (progress time$1 state$1 playback) SAME (determin$7	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:21 AM

		detect$5) near15 (offset$5 unalign$5 asynchron$6)).clm.					
N2	114	((synch$4 synchron$9 align$5) SAME (data information) SAME (bidirection$4 bi-directional shar$3 exchang$4) SAME (progress time$1 state$1 playback) SAME (determin$7 detect$5) SAME (offset$5 unalign$5 asynchron$6)).clm.	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/04/14 11:21 AM

Bibliographic Data

Application No: 16/762,709

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /RICKY CHIN/ (Examiner's Signature) | (Initials)

Title: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
05/08/2020	725	2423	24010-10166689PF
RULE			

APPLICANTS

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INVENTORS

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CONTINUING DATA

This application is a 371 of PCT/EP2017/078844 11/10/2017

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

03/02/2021

** SMALL ENTITY **

STATE OR COUNTRY

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UNITED STATES

FILING FEE RECEIVED

$790

Electronic Acknowledgement Receipt

EFS ID:	45446367
Application Number:	16762709
International Application Number:	
Confirmation Number:	5709
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan OOSTHOEK
Customer Number:	12271
Filer:	Daniel Michael Gurfinkel
Filer Authorized By:	
Attorney Docket Number:	24010-10166689PF
Receipt Date:	11-APR-2022
Filing Date:	08-MAY-2020
Time Stamp:	17:09:42
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	Response After Final Action	resp_AF_.pdf	2059109 62f646af17fb1cd8d3645568de1f9e2d57ac9664	no	5

Warnings:

Information:	
Total Files Size (in bytes):	2059109

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: OOSTEHOEK, Jan

Confirmation No.: 5709 Group Art Unit: 2423

Application No.: 16/762,709 Examiner: Ricky Chin

Filed: May 8,2020 Docket No.: 24010-10166689PF

For: **SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES**

REPLY AND AMENDMENT TO FINAL OFFICE ACTION

Mail Stop: AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Final Office Action dated March 17, 2022, Applicant includes herewith a response. Please amend the above-identified application to accept the allowable claim 17 and amendments to the dependency of other claims. This response is being filed within two months of the mailing date of the office action to allow for the allowance of the application or for an advisory action as needed. Please amend the application as follows:

A Listing of Claims begins on page 2.

Remarks begin on page 5.

LISTING OF CLAIMS

1. (canceled)

2. (currently amended) The system (1) according to claim 17, comprising a video distribution server (7) for distribution of the video data (9) to the devices (6A, 6B), in particular the entire video data (9) of a video upfront to playback start at the devices (6A, 6B).

3. (currently amended) The system (1) according to claim 17, wherein the devices (6A, 6B) are designed to determine independently from a video distribution server (7) which distributed the video data (9) to the devices (6A, 6B) that they are in a synchronous or asynchronous playback progress.

4. (currently amended) The system (1) according to claim 17, wherein the devices (6A, 6B) are designed:
+ to playback compressed video data (9) that are structured in frames labeled by frame numbers, and
+ to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted.

5. (original) The system (1) according to claim 4, wherein each device (6A, 6B) is designed to compare a frame number received with a frame number of the frame currently played back at the device (6A, 6B) and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value.

6. (currently amended) The system (1) according to claim 17, wherein each device (6A, 6B) is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second.

7. (currently amended) The system (1) according to claim 17, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices (6A, 6B) over its communication stage if it detects an asynchronous playback progress.

8. (original) The system (1) according to claim 7, wherein each device (6A, 6B) is designed to embed the adjustment data in a synchronization command.

9. (currently amended) The system (1) according to claim 7, wherein each device (6A, 6B) is designed:

- to receive the adjustment data; and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

10. (currently amended) The system (1) according to claim 17, wherein the communication stage is designed to use UDP multicast data packets for the communication.

11. (currently amended) The system (1) according to claim 17, wherein each display device (6A, 6B):

+ comprises its screen (5) or a number of screens
(5), or
+ is connected to its external screen (5) or a number of screens (5) to be controlled by it.

12. (currently amended) The system (1) according to claim 17, wherein said screen (5) is designed
+ to realize a shelf rail (4) or part of it, or
+ to cover a front of a shelf rail (4) or a part of it to which it is attachable.

13. (currently amended) The system (1) according to claim 17, wherein the system realizes a video playback enabled electronic shelf label system.

14. (cancelled)

15. (currently amended) A use of the system (1) according to claim 17 as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails (4), wherein each of said shelfs rails (4) is realized by a screen (5) or carries a screen (5).

16. (previously presented) The system (1) according to claim 8, wherein each device (6A, 6B) is designed to receive the adjustment data and to adjust its playback progress according to the adjustment

data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

17. (previously presented) A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5), each playback device (6A, 6B) comprises a memory to store video data (9) representing said video, and a communication stage to communicate data with each other, wherein the devices (6A, 6B) are designed:
+ to transmit video playback progress-data via the communication stage to the other device (6B, 6A); and,
+ to determine based on the received progress data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A);
+ wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

REMARKS

Applicant hereby responds to the final Office Action mailed on March 17, 2022.

Review and consideration of the claims are respectfully requested. Upon amendment, Claims 2-13 and 15-17 are pending in the application; Claim 1 and 14 have been cancelled, to advance prosecution. Claim 17 is the sole independent claim, the remaining claims have now been made to depend directly or indirectly from Claim 17. Some small correction to punctuation in the claims has been made. No other amendments have otherwise been made to the claims and no new matter has been added.

ALLOWABLE SUBJECT MATTER

Claim 17 was noted as allowed in the final office action, in light thereof Applicant requests allowance of the application and pending claims.

CONCLUSION

In view of the foregoing, it is believed that all grounds of rejection and/or objection have been overcome and/or successfully traversed and that the application is now in condition for allowance. Continued examination and allowance of the pending claims is respectfully requested.

Should the Examiner have any questions or comments regarding the Applicant's response or believe that a further telephonic interview would expedite prosecution of the pending claims, the Applicant requests that the Examiner telephone the Applicant's undersigned attorney.

Respectfully submitted,

/daniel m. gurfinkel/

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April 11, 2022

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Atty. Docket No. 24010-10166689PF

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/762,709	Filing Date 05/08/2020	☐ 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 $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	04/11/2022	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $240 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/ANTJUAN M RIVERA/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

12271 7590 03/17/2022

Dennemeyer & Associates, LLC
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Chicago, IL 60606

EXAMINER	
CHIN, RICKY	

ART UNIT	PAPER NUMBER
2423	

NOTIFICATION DATE	DELIVERY MODE
03/17/2022	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):

dgurfinkel@dennemeyer-law.com
docket@dennemeyer-law.com

Office Action Summary	Application No. 16/762,709	Applicant(s) OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	AIA (FITF) Status Yes

-- 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 2-16-22.

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

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

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

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

Disposition of Claims*

5) ☑ Claim(s) 1-17 is/are pending in the application.

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

6) ☑ Claim(s) 17 is/are allowed.

7) ☑ Claim(s) 1-13 and 15-16 is/are rejected.

8) ☑ Claim(s) 14 is/are objected to.

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

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Response to Arguments

2. Applicant's arguments filed 2-16-22 have been fully considered.

Newly added claim 17 is allowable.

With regards to claim 10, a reference has been provided to support the official notice taken by the Examiner.

With respect to claims 1-13 and 15-16, the applicant argues that Asami only teaches of unidirectional communication from the management device to the playback devices 10. The Examiner respectfully disagrees. Asami, teaches that in cascade mode, there is bidirectional communication (See [0058] and [0063]-[0064]). Hence, applicant's arguments are moot with regards to Asami not teaching of bi-directional communication and of not being combinable with Oh et al.

Applicant further argues that Oh does not teach of multiple display devices and does not teach of synchronizing multiple playback devices and therefore the combination with Asami is highly questionable. The Examiner respectfully disagrees. As noted above Asami is relied upon for the multiple display devices and synchronizing the playback devices while Oh is merely relied upon for the teachings of determining based on the received progress-data whether it is in a synchronous or asynchronous playback progress with other devices such as the multiple data drivers and multiple timing

controllers connected by the bus. Moreover, applicant states that the combination of a single device with that of Asami that has multiple devices would be highly questionable for synchronization purposes as there are differences in synchronizing regions within a single display versus spatially speared different displays. It should be noted that multiple displays used in a landscape mode wherein a single image being displayed across multiple displays mimicking a single large display is well-known in the art and therefore it would have been obvious to have incorporated separation of images of OH across multiple displays as in Asami for the mere benefit of synchronization of image data to multiple screens/presentation devices.

For the reasons stated above, the rejections are maintained.

Allowable

3. Claim 17 is allowable.

Claim Objections

4. Claim 14 is objected to for being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the

claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-9 and 11-13, and 15-16 are rejected under 35 U.S.C. 103 as being unpatentable over Asima et al., EP 2461582 in view of Oh et al., US 2017/0098431.

Regarding claim 1, Asami teaches of a video playback system, comprising a number of playback devices to playback a video on their screens (See Fig.2, 5, and 6 which discloses of the reproduction devices each having lcd screens), each playback device comprises a memory to store video data representing said video (See [0007] which discloses of each of the reproduction devices having storage for the video), and a communication stage to communicate data with each other (See [0007] and [0058]-0064] which discloses bi-directional communication of data to/from each of the reproduction devices and the management device for communicating standby commands to the reproduction devices and the notification to the management device from the image reproduction device that the device is in standby with the decoder started), wherein the devices are designed to transmit video playback progress-data via the communication stage to the other device (See [0007] and [0058]-0064] which discloses bi-directional communication of data to/from each of the reproduction devices and the management device for communicating standby commands to the reproduction devices and the notification to the management device from the image reproduction device that the device is in standby with the decoder started, whereby the progress data is construed to be that of the management device having the content and able to send

the data and the reproduction device sending the standby state telling the management device that it is ready to receive the data).

Asami is silent with respect to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices.

However, in the same field of endeavor, Oh teaches of to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with other devices (See [0008]-[0014], [0021]-[0022], [0054]-[0058] and [0093] which teaches of sharing the synch signal and fail synch signal to each of the devices which then determines which devices are in synch/synchronous or which devices failed in synch/asynchronous with the fail synch signal).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to have modified the teachings of Asami to have incorporated the teachings of Oh for the mere benefit of knowing which devices are out of synch such that the device may be adjusted.

Regarding claim 2, the combination teaches the system according to claim 1, comprising a video distribution server for distribution of the video data to the devices, in particular the entire video data of a video upfront to playback start at the devices (See Asami, [0007], [0046] and [0050]-[0052] which discloses of the management device/server for distributing/transmitting the content of the entire mpg file for playback at the start to the reproduction devices).

Regarding claim 3, the combination teaches the system according claim 1, wherein the devices are designed to determine independently from a video distribution server which distributed the video data to the device that they are in a synchronous or asynchronous playback progress (See Asami, [0007], [0031], [0033]-[0035], [0070]-[0071] and [0073]-[0078] which discloses of receiving the frame number synch information and count information and determining whether it is within the threshold to determine whether it is already in synch or out of synch/asynchronous when larger than the threshold where the determination is performed at the reproduction devices).

Regarding claim 4, the combination teaches the system according to claim 1 wherein the devices are designed to playback compressed video data that are structured in frames labeled by frame numbers (See Asami, [0050]-[0054] mpg file [0082]-[0085] frames numbers), and to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted (See Asami, [0071]-[0077] and [0082]-[0085] frame numbers in synchronization data in order to adjust the frames to be displayed).

Regarding claim 5, the combination teaches the system according to claim 4, wherein each device is designed to compare a frame number received with a frame number of the frame currently played back at the device and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value (See Asami, [0070]-[0071] and [0073]-[0078] which discloses of receiving the frame number synch information and count information and determining whether it is within the threshold to determine

whether it is already in synch or out of synch/asynchronous when larger than the threshold).

Regarding claim 6, the combination teaches the system according to claim 1, wherein each device is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second (See Asami, [0041], [0070], and [0087] which discloses of continuously transmitting the synch information per second and that each of the reproduction devices may be the one to do the transmission).

Regarding claim 7, the combination teaches the system according to claim 1, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices over its communication stage if it detects an asynchronous playback progress (See Asami, [0041], [0073]-[0078] and [0087] which discloses of each of the devices being able to adjust for the playback progress when detecting asynchronous playback by broadcasting adjustment data of at least the frame information/timestamp to the output device of the decoder/display of the reproduction devices and as well as detecting whether or not there is asynchronous playback from the management device when the synch information has not been broadcast wherein the reproduction devices would then broadcast the adjustment data/synch data for adjustment of playback progress).

Regarding claim 8, the combination teaches the system according to claim 7, wherein each device is designed to embed the adjustment data in a synchronization command (See Asami, [0041] and [0087] which discloses transmitting the synch

information and that each of the reproduction devices may be the one to do the transmission which contains the adjustment data in the command to synchronize).

Regarding claim 9, the combination teaches the system according to claim 7, wherein each device is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data (See Asami, [0050]-[0054]; [0071]-[0077] and [0082]-[0085] which discloses of the reproduction devices receiving the synchronization data in order to synch the playback to the corresponding frame number in the mpg compressed video data).

Regarding claim 11, the combination teaches the system according to claim 1, wherein each display device comprises its screen or a number of screens, or is connected to its external screen or a number of screens to be controlled by it (See Asami, Figs, 2-3, and 5 which discloses the multiple screens).

Regarding claim 12, the combination teaches the system according to claim 1, wherein said screen is designed to realize a shelf rail or a part of it, or to cover a front of a shelf rail or a part of it to which it is attachable (See Asami, Figs.2-3 and [0022]-[0023] which discloses the screen being part of the shelf or being in the front of the rail).

Regarding claim 13, the combination teaches the system according to claim 1, wherein the system realizes a video playback enabled electronic shelf label system

(See Asami, Figs.2-3; [0004]-[0006] and [0022]-[0023] which discloses the point of sales for playback of the video on the shelf for displaying goods/commercials).

Regarding claim 15, the combination teaches of the use of the system according to claim 1 as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails, wherein each of said shelfs rails is realized by a screen or carries a screen (See Asami, [0007] and Fig.3 which discloses of synchronizing the playback of the video and of each shelf rail comprising of screens).

Regarding claim 16, the combination teaches the system according to claim 8, wherein each device is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data (See Asami, [0050]-[0054]; [0071]-[0077] and [0082]-[0085] which discloses of the reproduction devices receiving the synchronization data in order to synch the playback to the corresponding frame number in the mpg compressed video data).

7. Claim 10 is rejected under 35 U.S.C. 103 as being unpatentable over Asima et al., EP 2461582 in view of Oh et al., US 2017/0098431, and in further view of Zerwas, US 2016/0357493.

Regarding claim 10, the combination of Asima and Oh teaches the system according to claim 1, wherein the communication stage is designed to use data packets for the communication (See Asima, [0051]-[0054]).

The combination of Asima and Oh is silent with respect to the packets being that of UDP multicast.

However, in the same field of endeavor, Zerwas teaches of packets being that of UDP multicast for synchronization of multiple displays (See [0009]). It would have been obvious before the effective filing date of the claimed invention to have modified the teachings of Asima and Oh to have incorporated the teachings of packets being that of UDP multicast as taught by Zerwas for the mere benefit of providing different and various types of data of communication formats/protocols for compatibility with different devices/systems.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ricky Chin whose telephone number is 571-270-3753. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Bruckart can be reached on 571-272-3982. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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).

/Ricky Chin/
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Notice of References Cited	Application/Control No. 16/762,709	Applicant(s)/Patent Under Reexamination OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20150091917-A1	04-2015	Li; Fanzhi	G06F3/1446	345/1.3
*	B	US-20150067521-A1	03-2015	HEO; Jin	G06F3/1446	715/733
*	C	US-20140323036-A1	10-2014	Daley; Michael J.	H04W56/0015	455/3.06
*	D	US-20130038509-A1	02-2013	Jiang; Chun	G09G5/12	345/1.3
*	E	US-20120221628-A1	08-2012	FUJIGAKI; Hayato	H04L67/148	709/203
*	F	US-20120215903-A1	08-2012	Fleischman; Michael Ben	G06Q50/01	709/224
*	G	US-20110242412-A1	10-2011	Lee; Dong Han	G06F3/1446	348/E5.009
*	H	US-20120075334-A1	03-2012	Pourbigharaz; Fariborz	G06F3/1438	345/619
*	I	US-20110157106-A1	06-2011	Kim; Hyo-June	G09G5/12	345/204
*	J	US-20070057865-A1	03-2007	Song; Min-Seok	G06F3/1431	345/1.1
*	K	US-10643609-B1	05-2020	Pogue; Michael Alan	G10L15/18	1/1
*	L	US-10713908-B2	07-2020	Yokoyama; Ryo	G06F3/16	1/1
*	M	US-20020129290-A1	09-2002	Couillard, Bruno	H04L63/12	713/400

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Notice of References Cited	Application/Control No. 16/762,709	Applicant(s)/Patent Under Reexamination OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20140029910-A1	01-2014	Maruyama; Kiyoyasu	H04N21/43074	386/220
*	B	US-20140029701-A1	01-2014	NEWHAM; Adam E.	H04J3/0652	704/E21.001
*	C	US-20130173742-A1	07-2013	Thomas; William L.	H04N21/242	709/217
*	D	US-20160266704-A1	09-2016	PARK; Dong-Won	G06F3/1446	1/1
*	E	US-20160034244-A1	02-2016	Howard; Kevin	G06V10/10	345/156
*	F	US-6046709-A	04-2000	Shelton; Gary	G09G5/12	345/1.1
*	G	US-9086838-B2	07-2015	Panvelwala; Abdeali H.	G06F3/1446	1/1
*	H	US-20210064331-A1	03-2021	Goto; Masataka	G06F3/165	1/1
*	I	US-20200051527-A1	02-2020	Ngo; Long H.	G06F3/04842	1/1
*	J	US-20190043450-A1	02-2019	Kwa; Seh	G06F3/1431	1/1
*	K	US-20170214954-A1	07-2017	Trollope; Ingrid McAulay	H04N21/4788	1/1
*	L	US-20170153864-A1	06-2017	Zhou; Chao	A63F13/358	1/1
*	M	US-20160357493-A1	12-2016	ZERWAS; Udo	G09G5/12	1/1

FOREIGN PATENT DOCUMENTS

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	N					
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

CPC - Searched*		
Symbol	**Date**	**Examiner**
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	06/10/2021	RC
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	11/15/2021	RC
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	03/12/2022	RC

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/double patenting search	06/10/2021	RC
npl search - ip.com	06/10/2021	RC
international search report	06/10/2021	RC
EAST text search - USPAT;USPGPUB;EPO; JPO	06/10/2021	RC
updated previous searches	11/15/2021	RC
updated previous searches	03/12/2022	RC
SEARCH text search - USPAT;USPGPUB;EPO;JPO	03/12/2022	RC

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

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

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 76

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	**Art Unit**
	RICKY CHIN	2423

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

CLAIMS

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

CLAIM		DATE								
Final	Original	06/09/2021	11/15/2021	03/12/2022						
	1	✓	✓	✓						
	2	✓	✓	✓						
	3	✓	✓	✓						
	4	✓	✓	✓						
	5	✓	✓	✓						
	6	✓	✓	✓						
	7	✓	✓	✓						
	8	✓	✓	✓						
	9	✓	✓	✓						
	10	✓	✓	✓						
	11	✓	✓	✓						
	12	✓	✓	✓						
	13	✓	✓	✓						
	14	✓	✓	O						
	15	✓	✓	✓						
	16	✓	✓	✓						
	17			=						

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	192	(popular$5) near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/06/09 07:27 PM
L2	234	(popular$5 "heat map") near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/06/09 07:27 PM
L3	2	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:04 PM
L4	47570	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:06 PM
L5	686	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:15 PM
L6	147	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 01:15 PM
L9	9	"2461582"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/06/10 01:21 PM
L10	43	"2461582"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/06/10 01:21 PM
L11	19	"2014029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/06/10 01:22 PM
L12	5	"20140029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/06/10 01:23 PM
L13	8	"20120075334"	(US-PGPUB; USPAT;	OR	OFF	OFF	2021/06/10

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				01:23 PM
L14	77	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 04:58 PM
L15	162	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/06/10 05:05 PM
L16	224	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:23 AM
L17	0	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:23 AM
L18	928	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:23 AM

		synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)					
L19	246	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 05:24 AM
L20	13	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:06 AM
L21	536	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:07 AM
L22	3008847	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) amd (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:07 AM
L23	23	video same (synch$5 synchroniz$7 align$5	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	OFF	OFF	2021/09/16 06:07 AM

		re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	DERWENT)				
L24	10	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:09 AM
L25	109	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:09 AM
L26	109	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:09 AM
L27	7319	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:13 AM
L28	34	(synch$5 synchroniz$7 align$5 re-synch$3	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	OFF	OFF	2021/09/16 06:14 AM

		resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress) same (video content media)	DERWENT)				
L29	141	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:14 AM
L30	220	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:17 AM
L31	138	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:18 AM
L32	636	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:18 AM

		near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4 exchang$4) same (playback progress coordinat$6) same (video content media)					
L33	3160	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3) near20 (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 06:20 AM
L34	8884	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 09:22 AM
L35	837	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4) same (multiple plural$5 other another second) near5 (display$5 screen$2 device$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/09/16 09:43 AM
L36	1	"20130173742"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 09:24 PM

L37	2	"20140029701"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 09:30 PM
L38	329	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:20 PM
L39	349	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:20 PM
L40	484	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:20 PM
L41	36	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:23 PM
L42	37	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:23 PM
L43	747	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near20 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near10 (bidirection$4 bi-	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:30 PM

		directional shar$3 exchang$4 determin$6 detect$5)					
L44	406	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:32 PM
L45	42	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:33 PM
L46	71	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near15 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:33 PM
L47	11	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5) and (shelve$1 shelf$1 rack$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/16 10:47 PM

L48	80	(multiple pairs plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/17 05:47 PM
L49	80	(multiple plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/09/17 05:47 PM
L50	0	("2019/0043450").URPN.	(USPAT)	OR	OFF	OFF	2021/09/17 06:07 PM
L51	6	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(USPAT)	OR	OFF	OFF	2021/09/17 06:08 PM
L52	33	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/09/17 06:09 PM
L53	1894	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:03 PM
L54	1986	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:03 PM

		exchang$4)					
L55	36	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:06 PM
L56	36	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:07 PM
L57	38	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:07 PM
L58	38	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:07 PM
L59	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:27 PM

		(video) same (progress time$1 state$1 playback) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)					
L60	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback position$3) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:27 PM
L61	96	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:28 PM
L62	116	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 06:29 PM
L63	0	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (display$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 10:25 PM
L64	1	(synch$4 synchron$9 align$5) near7 (data	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 10:25 PM

		information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)					
L65	73	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/10/23 10:27 PM
L66	2	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/11/15 02:19 AM
L67	152	(h04n21/2387,231,242, 4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/11/15 02:19 AM
L68	116	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/15 02:19 AM
L69	74	(synch$4 synchron$9 align$5 coordinat$7) near15 (data	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/15 02:19 AM

		information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)					
L70	110	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2021/11/15 02:19 AM
L71	193	(popular$5) near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L72	237	(popular$5 "heat map") near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L73	3	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L74	51212	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L75	687	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L76	142	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

		resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)					
L77	9	"2461582"	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L78	41	"2461582"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/03/12 12:53 AM
L79	19	"2014029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/03/12 12:53 AM
L80	5	"20140029910"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/03/12 12:53 AM
L81	8	"20120075334"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/03/12 12:53 AM
L82	73	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L83	163	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L84	212	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) and	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

		(shelf$1 rail$1)					
L85	0	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L86	925	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L87	256	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L88	8	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same2 (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L89	543	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

		asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)					
L90	3455475	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) amd (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L91	17	video same (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L92	10	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) and (shelf$1 rail$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L93	112	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L94	112	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

		synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)					
L95	7340	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L96	38	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L97	146	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L98	237	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

L99	148	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L100	631	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) same (bidirection$4 bi-direction$4 exchang$4) same (playback progress coordinat$6) same (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L101	3315	(synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3) near20 (video content media)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L102	9123	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

L103	1392	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) near10 (status$3 state$1 progress$3 data) near20 (bidirection$4 bi-direction$4 exchang$4 shar$3 transmit$4 send$4) same (multiple plural$5 other another second) near5 (display$5 screen$2 device$1)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L104	3	"20130173742"	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L105	2	"20140029701"	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L106	701	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L107	748	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L108	984	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near5 (data command determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L109	76	(mirror$4) same (multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L110	81	(mirror$4) same	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12

		(multiple pairs plural$4 other second) near5 (display device) same (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data command$3) near20 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)					12:53 AM
L111	913	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near20 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L112	490	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L113	65	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L114	100	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near15 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near15 (data information) near15	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM

		(bidirection$4 bi-directional shar$3 exchang$4 send$3 transmit$4 transmission) near20 (determin$6 detect$5)					
L115	27	(multiple pairs plural$4 other second another) near5 (display$1 screen$1) near10 (synch$4 synchron$9 asynchron$6 align$4 unalign$4) near7 (data information) near10 (bidirection$4 bi-directional shar$3 exchang$4 determin$6 detect$5) and (shelve$1 shelf$1 rack$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L116	128	(multiple pairs plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L117	128	(multiple plural$4 other second another) near5 (display$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L118	0	("2019/0043450").URPN.	(USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L119	6	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L120	34	("20070146127"|"20150213745"|"20160380830"|"6046709"|"20120086658"|"9947290"|"20050190294"|"6646645"|"9086838"|"20130038509"|"9696958"|"RE40741").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2022/03/12 12:53 AM

L121	3789	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L122	3954	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L123	60	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L124	62	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L125	71	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM

L126	80	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L127	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L128	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback position$3) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L129	94	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L130	107	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM

		(determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)					
L131	0	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (display$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L132	1	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L133	113	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L134	3	((("OOSTHOEK") near3 ("Jan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM
L135	142	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

		align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)					
L136	107	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L137	113	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	(US-PGPUB; USPAT)	OR	OFF	OFF	2022/03/12 12:53 AM
L138	112	h04n21/$.cpc. and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (status$3 state$1 progress$3) same (bidirection$4 bi-direction$4)	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	OFF	OFF	2022/03/12 12:53 AM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Electronic Acknowledgement Receipt

EFS ID:	45010190
Application Number:	16762709
International Application Number:	
Confirmation Number:	5709
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan OOSTHOEK
Customer Number:	12271
Filer:	Daniel Michael Gurfinkel
Filer Authorized By:	
Attorney Docket Number:	24010-10166689PF
Receipt Date:	16-FEB-2022
Filing Date:	08-MAY-2020
Time Stamp:	12:13:50
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	Amendment/Request for Reconsideration-After Non-Final Rejection	response_file.pdf	4111662 4c19197497da79491aeaa24de588e3341202947a	no	8

Warnings:

Information:	
Total Files Size (in bytes):	4111662

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: OOSTEHOEK, Jan

Confirmation No.: 5709 Group Art Unit: 2423

Application No.: 16/762,709 Examiner: Ricky Chin

Filed: May 8,2020 Docket No.: 24010-10166689PF

For: **SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES**

RESPONSE TO OFFICE ACTION UNDER 37 CFR 1.116

Mail Stop: No Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action dated of November 17, 2021, Applicant includes herewith a response. Please amend the above-identified application to add a new claim and review the attendant remarks, traversing the rejections, as follows:

A Listing of Claims begins on page 2.

Remarks begin on page 5.

LISTING OF CLAIMS

1. (original) A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5), each playback device (6A, 6B) comprises a memory to store video data (9) representing said video, and a communication stage to communicate data with each other, wherein the devices (6A, 6B) are designed
+ to transmit video playback progress-data via the communication stage to the other device (6B, 6A) and
+ to determine based on the received progress data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A).

2. (original) The system (1) according to claim 1, comprising a video distribution server (7) for distribution of the video data (9) to the devices (6A, 6B), in particular the entire video data (9) of a video upfront to playback start at the devices (6A, 6B)

3. (previously presented) The system (1) according to claim 1, wherein the devices (6A, 6B) are designed to determine independently from a video distribution server (7) which distributed the video data (9) to the devices (6A, 6B) that they are in a synchronous or asynchronous playback progress.

4. (previously presented) The system (1) according to claim 1, wherein the devices (6A, 6B) are designed
+ to playback compressed video data (9) that are structured in frames labeled by frame numbers, and
+ to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted.

5. (original) The system (1) according to claim 4, wherein each device (6A, 6B) is designed to compare a frame number received with a frame number of the frame currently played back at the device (6A, 6B) and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value.

6. (previously presented) The system (1) according to claim 1, wherein each device (6A, 6B) is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second.

7. (previously presented) The system (1) according to claim 1, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices (6A, 6B) over its communication stage if it detects an asynchronous playback progress.

8. (original) The system (1) according to claim 7, wherein each device (6A, 6B) is designed to embed the adjustment data in a synchronization command.

9. (previously presented) The system (1) according to claim 7, wherein each device (6A, 6B) is designed
- to receive the adjustment data and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

10. (previously presented) The system (1) according to claim 1, wherein the communication stage is designed to use UDP multicast data packets for the communication.

11. (previously presented) The system (1) according to claim 1, wherein each display device (6A, 6B)
+ comprises its screen (5) or a number of screens
(5), or
+ is connected to its external screen (5) or a number of screens (5) to be controlled by it.

12. (previously presented) The system (1) according to claim 1, wherein said screen (5) is designed
+ to realize a shelf rail (4) or part of it, or
+ to cover a front of a shelf rail (4) or a part of it to which it is attachable.

13. (previously presented) The system (1) according to claim 1, wherein the system realizes a video playback enabled electronic shelf label system.

14. (previously presented) The system (1) according to claim 1, wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

15. (previously presented) A use of the system (1) according to claim 1 as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails (4), wherein each of said shelfs rails (4) is realized by a screen (5) or carries a screen (5).

16. (previously presented) The system (1) according to claim 8, wherein each device (6A, 6B) is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

17. (new) A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5), each playback device (6A, 6B) comprises a memory to store video data (9) representing said video, and a communication stage to communicate data with each other, wherein the devices (6A, 6B) are designed:
+ to transmit video playback progress-data via the communication stage to the other device (6B, 6A); and,
+ to determine based on the received progress data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A);
+ wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

REMARKS

Applicant hereby responds to the non-final Office Action mailed on November 17, 2021. Applicant appreciates the time taken by the Examiner in reaching out to Applicant with a suggestion for advancement of the prosecution in the telephonic interview of October 26, 2021.

Claims 1 to 17 are pending in the application. Claims 1 and 17 are independent claims. Claim 17 has been added with this response and in reaction to the matter discussed in the telephonic interview of October 26, 2021. No amendments have been otherwise made to the claims and no new matter has been added. In light of the following remarks and the addition of claim 17, Applicant requests reconsideration and allowance of the application and pending claims.

Claim Rejections under 35 U.S.C. § 103

Claims 1 to 9 and 11 to 16

When referring to claims 1 to 9 and 11 to 16, the Office Action rejects the subject matter under 35 U.S.C. § 103 as allegedly being unpatentable over *Asami* in view of newly cited *Oh* et al. (US 2017/0098431, hereafter *Oh*).

It is however respectfully submitted that the proposed combination of *Asami* and *Oh* does not establish a case of obviousness of the claimed system as set forth in claims 1 to 9 and 11 to 16.

Asami only teaches unidirectional communication from the management device 20 to the playback devices 10. Descriptively speaking, the playback devices of *Asami* work according to the master-and-slave principle, wherein the second playback device 20 would be the master, and all first playback devices 10 would be the slave(s). This becomes even more evident from paragraph [0044] of *Asami* which teaches that "For efficient communication with the image reproduction devices 10, the management device 20 performs either cascade communication or broadcast communication depending on the purpose of communication".

The present Office Action states that *Asami* is "silent with respect to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices". Applicant agrees, in particular because this is also -but not exclusively- a consequence of lack of bidirectional communication between the playback devices in *Asami*.

It is however alleged that it would have been "obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to have modified the teachings of *Asami* to have incorporated the teachings of *Oh* for the mere benefit of knowing which devices are out of synch such that the device may be adjusted". Applicant respectfully disagrees for the following reasons.

First, *Oh* already fails to disclose a video playback system comprising a number of playback devices, which renders a skilled person's motivation to combine *Asami* and *Oh* highly questionable. *Oh* does not teach synchronizing multiple playback devices, either. *Oh* only discloses one display panel 100 which may be divided into multiple regions (*Oh*, [0046]), each of which may be controlled by a respective one of the timing controllers 200, 220 and 240 and a respective one of the data drivers 400, 420 and 440. The display panel 100, if put into the context of *Asami*, would be one of the display parts 110a to 110e and as such a subordinate component of the system. *Oh*, like *Asami*, and unlike the present application, also proposes a master-slave-principle for the communication between the components (*see*, e.g., [0017]).

In other words, when incorporating the teachings of *Oh* into *Asami*, only the display parts of *Asami* would be modified such that different regions of one display part could be synchronized with each other.

However, the inventive concept of the present application aims at providing an electronic shelf label system for the playback of synchronized video content for a number of shelf rails and is achieved by providing that a group of display devices establishes an autonomous, distributed detection system for detecting an asynchronous playback progress within this group. It will be apparent to one of ordinary skill in the art that there is a significant difference between synchronizing the regions within one single display on the one hand and synchronizing spatially separated, different displays as would be the case in an electronic shelf label system.

For those reasons, one of ordinary skill in the art would not get any hints towards providing the system of claim 1 with playback devices comprising a bidirectional communication stage to *determine based on the received progress-data whether [they are] in a synchronous or asynchronous playback progress with the other devices* (*emphasis added*) from *Oh*.

Therefore, the differences between the claimed invention and the prior art are such that the claimed invention as a whole would not have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.

Claims 2 to 9 and 11 to 16 depend directly or indirectly from independent claim 1 and include all the elements and features of claim 1. Thus, *Asami* and *Oh* also fail to render claims 2 to 9 and 11 to 16 unpatentable for at least the same reasons as those presented above regarding independent claim 1.

Thus, the proposed combination fails to render the subject matter of claims 2 to 9 and 11 to 16 unpatentable. Consequently, claims 1 to 9 and 11 to 16 are allowable and Applicant respectfully requests that the rejection of claims 1 to g and 11 under 35 U.S.C. § 103 over *Asami* be withdrawn.

Claim 10

When examining the pending version of dependent claim 10, the Office Action proposes *Asami* in view of *Oh* when rejecting the claim.

The proposed combination of *Asami* and *Oh* does not establish a *prima facie* case of obviousness with respect to the subject matter of claim 10. Dependent claim 10 is directed to designing the communication stage of the claimed video playback system to use UDP multicast data packets for the communication.

As the Office Action correctly states, the combination of *Asami* and *Oh* is "silent with respect to the packets being that of UDP multicast". The Office Action does however reject the claims because allegedly "packets being that of UDP multicast is notoriously well-known in the art and would have been obvious [...]". It is respectfully noted that this obviousness rejection does, however, not provide fully supported reasoning and it is not appropriate to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known [*cf.* MPEP 2144.03.A]. Clearly, this is not the case here, in particular because *Asami* in fact teaches broadcast, which would contradict the use of UDP multicast.

Furthermore, since the subject matter of independent claim 1, from which claim 10 depends, is not obvious from *Asami* in view of Oh as established above, the subject matter of claim 10 is not obvious over the proposed combination of *Asami* and the general knowledge in the art.

Thus, for at least the reasons noted above, the proposed combination of *Asami* and the general knowledge in the art does not establish a *prima facie* case of obviousness of the claimed system as set forth in claim 10.

Hence, the proposed combination of *Asami* and *Oh* as suggested in the Office Action fails to render the subject matter of claim 10 unpatentable.

Consequently, claim 10 is allowable and Applicant respectfully requests that the rejection of claim 10 under 35 U.S.C. § 103 over the proposed combination of *Asami* and the general knowledge in the art be withdrawn.

Claim 17

Applicant avers that upon consideration of the remarks herein, all of the claims, claims 1-16, are patentable over the cited references. Additionally, in the *Examiner-Initiated Interview Summary* dated November 3, 2021, the Examiner notes that the incorporation of the subject matter of claim 14 into the independent claims (claim 1) would advance prosecution and place the application in condition for

allowance. Applicant asserts that claim 17 is comprised of the independent claim and the subject matter of claim 14 and should now also be allowable.

CONCLUSION

In view of the foregoing, it is believed that all grounds of rejection and/or objection have been overcome and/or successfully traversed and that the application is now in condition for allowance. Continued examination and allowance of the pending claims is respectfully requested.

Should the Examiner have any questions or comments regarding the Applicant's response or believe that a further telephonic interview would expedite prosecution of the pending claims, the Applicant requests that the Examiner telephone the Applicant's undersigned attorney.

Respectfully submitted,

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February 16, 2022
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Atty. Docket No. 24010-10166689PF

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16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

12271 7590 11/17/2021

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EXAMINER	
CHIN, RICKY	

ART UNIT	PAPER NUMBER
2423	

NOTIFICATION DATE	DELIVERY MODE
11/17/2021	ELECTRONIC

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

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

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

dgurfinkel@dennemeyer-law.com
docket@dennemeyer-law.com

Office Action Summary	Application No. 16/762,709	Applicant(s) OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	AIA (FITF) Status Yes

-- 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 9-13-21.

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

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

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

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

Disposition of Claims*

5) ☑ Claim(s) 1-16 is/are pending in the application.

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

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-16 is/are rejected.

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

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

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Response to Arguments

2. Applicant's arguments filed 9-13-21 have been fully considered and are persuasive. A new ground(s) of rejection has been provided below.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 and 11-16 are rejected under 35 U.S.C. 103 as being unpatentable over Asima et al., EP 2461582 in view of Oh et al., US 2017/0098431.

Regarding claim 1, Asami teaches of a video playback system, comprising a number of playback devices to playback a video on their screens (See Fig.2, 5, and 6 which discloses of the reproduction devices each having lcd screens), each playback device comprises a memory to store video data representing said video (See [0007] which discloses of each of the reproduction devices having storage for the video), and a

communication stage to communicate data with each other (See [0007] and [0058]-0064] which discloses bi-directional communication of data to/from each of the reproduction devices and the management device for communicating standby commands to the reproduction devices and the notification to the management device from the image reproduction device that the device is in standby with the decoder started), wherein the devices are designed to transmit video playback progress-data via the communication stage to the other device (See [0007] and [0058]-0064] which discloses bi-directional communication of data to/from each of the reproduction devices and the management device for communicating standby commands to the reproduction devices and the notification to the management device from the image reproduction device that the device is in standby with the decoder started, whereby the progress data is construed to be that of the management device having the content and able to send the data and the reproduction device sending the standby state telling the management device that it is ready to receive the data).

Asami is silent with respect to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices

However, in the same field of endeavor, Oh teaches of to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices (See [0008]-[0014], [0021]-[0022], [0054]-[0058] and [0093] which teaches of sharing the synch signal and fail synch signal to each of the

devices which then determines which devices are in synch/synchronous or which devices failed in synch/asynchronous with the fail synch signal).

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to have modified the teachings of Asami to have incorporated the teachings of Oh for the mere benefit of knowing which devices are out of synch such that the device may be adjusted.

Regarding claim 2, the combination teaches the system according to claim 1, comprising a video distribution server for distribution of the video data to the devices, in particular the entire video data of a video upfront to playback start at the devices (See Asami, [0007], [0046] and [0050]-[0052] which discloses of the management device/server for distributing/transmitting the content of the entire mpg file for playback at the start to the reproduction devices).

Regarding claim 3, the combination teaches the system according claim 1, wherein the devices are designed to determine independently from a video distribution server which distributed the video data to the device that they are in a synchronous or asynchronous playback progress (See Asami, [0007], [0031], [0033]-[0035], [0070]-[0071] and [0073]-[0078] which discloses of receiving the frame number synch information and count information and determining whether it is within the threshold to determine whether it is already in synch or out of synch/asynchronous when larger than the threshold where the determination is performed at the reproduction devices).

Regarding claim 4, the combination teaches the system according to claim 1 wherein the devices are designed to playback compressed video data that are structured in frames labeled by frame numbers (See Asami, [0050]-[0054] mpg file [0082]-[0085] frames numbers), and to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted (See Asami, [0071]-[0077] and [0082]-[0085] frame numbers in synchronization data in order to adjust the frames to be displayed).

Regarding claim 5, the combination teaches the system according to claim 4, wherein each device is designed to compare a frame number received with a frame number of the frame currently played back at the device and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value (See Asami, [0070]-[0071] and [0073]-[0078] which discloses of receiving the frame number synch information and count information and determining whether it is within the threshold to determine whether it is already in synch or out of synch/asynchronous when larger than the threshold).

Regarding claim 6, the combination teaches the system according to claim 1, wherein each device is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second (See Asami, [0041], [0070], and [0087] which discloses of continuously transmitting the synch information per second and that each of the reproduction devices may be the one to do the transmission).

Regarding claim 7, the combination teaches the system according to claim 1, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices over its communication stage if it detects an asynchronous playback progress (See Asami, [0041], [0073]-[0078] and [0087] which discloses of each of the devices being able to adjust for the playback progress when detecting asynchronous playback by broadcasting adjustment data of at least the frame information/timestamp to the output device of the decoder/display of the reproduction devices and as well as detecting whether or not there is asynchronous playback from the management device when the synch information has not been broadcast wherein the reproduction devices would then broadcast the adjustment data/synch data for adjustment of playback progress).

Regarding claim 8, the combination teaches the system according to claim 7, wherein each device is designed to embed the adjustment data in a synchronization command (See Asami, [0041] and [0087] which discloses transmitting the synch information and that each of the reproduction devices may be the one to do the transmission which contains the adjustment data in the command to synchronize).

Regarding claim 9, the combination teaches the system according to claim 7, wherein each device is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data (See Asami, [0050]-[0054]; [0071]-[0077] and [0082]-[0085] which discloses of the

reproduction devices receiving the synchronization data in order to synch the playback to the corresponding frame number in the mpg compressed video data).

Regarding claim 11, the combination teaches the system according to claim 1, wherein each display device comprises its screen or a number of screens, or is connected to its external screen or a number of screens to be controlled by it (See Asami, Figs, 2-3, and 5 which discloses the multiple screens).

Regarding claim 12, the combination teaches the system according to claim 1, wherein said screen is designed to realize a shelf rail or a part of it, or to cover a front of a shelf rail or a part of it to which it is attachable (See Asami, Figs.2-3 and [0022]-[0023] which discloses the screen being part of the shelf or being in the front of the rail).

Regarding claim 13, the combination teaches the system according to claim 1, wherein the system realizes a video playback enabled electronic shelf label system (See Asami, Figs.2-3; [0004]-[0006] and [0022]-[0023] which discloses the point of sales for playback of the video on the shelf for displaying goods/commercials).

Regarding claim 14, the combniation teaches the system according to claim 1, wherein the display devices are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's display area overlapping with a video content or substituting a video content of said section (See Asami, Fig.3; [0004]-[0006] and [0023] which discloses of displaying the advertising video images of the commercial goods being displayed on the whole of the display rack/shelf and on the display screens thereby consisting of at least

product information and of at least substituting a video content within a section of the screens display area in order to display the relevant commercial/advertising).

Regarding claim 15, the combination teaches of the use of the system according to claim 1 as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails, wherein each of said shelfs rails is realized by a screen or carries a screen (See Asami, [0007] and Fig.3 which discloses of synchronizing the playback of the video and of each shelf rail comprising of screens).

Regarding claim 16, the combination teaches the system according to claim 8, wherein each device is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data (See Asami, [0050]-[0054]; [0071]-[0077] and [0082]-[0085] which discloses of the reproduction devices receiving the synchronization data in order to synch the playback to the corresponding frame number in the mpg compressed video data).

5. Claim 10 is rejected under 35 U.S.C. 103 as being unpatentable over Asima et al., EP 2461582 in view of Oh et al., US 2017/0098431.

Regarding claim 10, the combination of Asima and Oh teaches the system according to claim 1, wherein the communication stage is designed to use data packets for the communication (See Asima, [0051]-[0054]).

The combination of Asima and Oh is silent with respect to the packets being that of UDP multicast.

OFFICIAL NOTICE is taken to note that packets being that of UDP multicast is notoriously well-known in the art and would have been obvious before the effective filing date of the claimed invention to have modified the teachings of Asima and Oh to have incorporated the well-known teachings of packets being that of UDP multicast for the mere benefit of providing different and various types of data of communication formats/protocols for compatibility with different devices/systems.

The Applicant is entitled to traverse any/all official notice taken in this action according to MPEP § 2144.03, namely, "if applicant traverses such an assertion, the examiner should cite a reference in support of his or her position". However, MPEP § 2144.03 further states "See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice)." Specifically, In re Boon, 169 USPQ 231, 234 states "as we held in Ahlert, an applicant must be given the opportunity to challenge either the correctness of the fact asserted or the notoriety or repute of the reference cited in support of the assertion. We did not mean to imply by this statement that a bald challenge, with nothing more, would be all that was needed". Further note that 37 CFR § 1.671(c)(3) states "Judicial notice means official notice". Thus, a traversal by the Applicant that is merely "a bald challenge, with nothing more" will be given very little weight.

Conclusion

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

- US 2015/0091917 – [0083]-[0084] teaches of determining synchronous or asynchronous of the devices based on the shared timeline data transmitted and received between all of the devices.

Contact

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ricky Chin whose telephone number is 571-270-3753. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Bruckart can be reached on 571-272-3982. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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).

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Notice of References Cited	Application/Control No. 16/762,709	Applicant(s)/Patent Under Reexamination OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	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-20170098431-A1	04-2017	OH; KWAN-YOUNG	G09G3/2096	1/1
*	B	US-20150091917-A1	04-2015	Li; Fanzhi	G09G5/12	345/520
*	C	US-20110242412-A1	10-2011	Lee; Dong Han	G06F3/1446	348/500
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FOREIGN PATENT DOCUMENTS

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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*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
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

CPC - Searched*		
Symbol	Date	Examiner
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	06/10/2021	RC
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	11/15/2021	RC

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/double patenting search	06/10/2021	RC
npl search - ip.com	06/10/2021	RC
international search report	06/10/2021	RC
EAST text search - USPAT;USPGPUB;EPO; JPO	06/10/2021	RC
updated previous searches	11/15/2021	RC

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

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 126

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

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

CLAIMS

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

CLAIM		DATE								
Final	Original	06/09/2021	11/15/2021							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 127

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	((("OOSTHOEK") near3 ("Jan"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2021/11/15 02:19
L2	152	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2021/11/15 02:19
L3	116	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	US-PGPUB; USPAT	OR	OFF	2021/11/15 02:19
L4	74	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	US-PGPUB; USPAT	OR	OFF	2021/11/15 02:19
S53	1,894	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:03
S54	1,986	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:03
S55	36	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:06

		shar$3 exchang$4) same (video) same (progress time)				
S56	36	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:07
S57	38	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:07
S58	38	(multiple pairs plural$4 other second another) near18 (display$1 device$1) near10 (synch$4 synchron$9 asynchron$6 align$5) near7 (data information) near15 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:07
S59	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:27
S60	0	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (video) same (progress time$1 state$1 playback position$3) same (determin$7 detect$5) near7 (offset$5 unalign$5 asynchron$6)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:27
S61	96	(synch$4 synchron$9 align$5) near7 (data information) near6 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:28
S62	116	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (progress time$1 state$1 playback) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6)	US-PGPUB; USPAT	OR	OFF	2021/10/23 18:29
S63	0	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (display$6)	US-PGPUB; USPAT	OR	OFF	2021/10/23 22:25

S64	1	(synch$4 synchron$9 align$5) near7 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (coordinat$7) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	US-PGPUB; USPAT	OR	OFF	2021/10/23 22:25
S65	73	(synch$4 synchron$9 align$5 coordinat$7) near15 (data information) near20 (bidirection$4 bi-directional shar$3 exchang$4) same (determin$7 detect$5) near15 (offset$5 unalign$5 asynchron$6 lag$4 delay$3 sequence alternat$4) same (multiple pairs plural$4 other second another) near10 (display$1 device$1)	US-PGPUB; USPAT	OR	OFF	2021/10/23 22:27

EAST Search History (Interference)

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11/15/2021 3:03:28 AM
C:\Users\rchin2\Documents\EAST\Workspaces\16762709.wsp

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

12271 7590 11/03/2021

Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

EXAMINER	
CHIN, RICKY	

ART UNIT	PAPER NUMBER
2423	

NOTIFICATION DATE	DELIVERY MODE
11/03/2021	ELECTRONIC

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

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

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

dgurfinkel@dennemeyer-law.com
docket@dennemeyer-law.com

Examiner-Initiated Interview Summary	**Application No.** 16/762,709	**Applicant(s)** OOSTHOEK, Jan		
	Examiner RICKY CHIN	**Art Unit** 2423	**AIA (First Inventor to File) Status** Yes	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
RICKY CHIN	Primary Examiner	Telephonic
Daniel Gurfinkel	Attorney of Record	

Date of Interview: 26 October 2021

Issues Discussed:

Proposed Amendment(s)

The Examiner discussed the invention with respect to incorporating the subject matter of claim 14 into the independent claims to advance prosecution and place the application into condition for allowance. No agreement was reached and an Office Action will be mailed.

/Ricky Chin/ Primary Examiner, AU 2423	

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

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

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/762,709	Filing Date 05/08/2020	☐ 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 $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	09/13/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $240 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/JACQUELYN L WILLIAMS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Electronic Acknowledgement Receipt

EFS ID:	43743369
Application Number:	16762709
International Application Number:	
Confirmation Number:	5709
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan OOSTHOEK
Customer Number:	12271
Filer:	Daniel Michael Gurfinkel
Filer Authorized By:	
Attorney Docket Number:	24010-10166689PF
Receipt Date:	13-SEP-2021
Filing Date:	08-MAY-2020
Time Stamp:	10:16:12
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	Amendment/Req. Reconsideration-After Non-Final Reject	resp_oa_file.pdf	4477939 7f65424b400100fa7391f834fec4e740fb03a29a	no	9

Warnings:

Information:	
Total Files Size (in bytes):	4477939

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.

24010-10166689PF PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Jan Oosthoek	)	Examiner: Ricky Chin
	)	
	)	Art Unit: 2423
Serial No.: 16/762,709	)	
	)	
Conf. No. 5709	)	
	)	
Filed: May 8, 2020	)	
	)	
For: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	)	

RESPONSE TO OFFICE ACTION UNDER 37 CFR 1.116

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-0001

Dear Sir:

Applicant hereby responds to the non-final Office Action issued on 06/16/2021, Applicant requests reconsideration in light of the following remarks.

A Listing of Claims begins on page 2.

Remarks begin on page 5.

LISTING OF CLAIMS

Claims 1 to 16 are pending in the application. Claim 1 is independent. No amendments are made in the claims. Thus, no new matter is added to the claims.

1. (original) A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5), each playback device (6A, 6B) comprises a memory to store video data (9) representing said video, and a communication stage to communicate data with each other, wherein the devices (6A, 6B) are designed
+ to transmit video playback progress-data via the communication stage to the other device (6B, 6A) and
+ to determine based on the received progress data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A).

2. (original) The system (1) according to claim 1, comprising a video distribution server (7) for distribution of the video data (9) to the devices (6A, 6B), in particular the entire video data (9) of a video upfront to playback start at the devices (6A, 6B)

3. (previously presented) The system (1) according to claim 1, wherein the devices (6A, 6B) are designed to determine independently from a video distribution server (7) which distributed the video data (9) to the devices (6A, 6B) that they are in a synchronous or asynchronous playback progress.

4. (previously presented) The system (1) according to claim 1, wherein the devices (6A, 6B) are designed
+ to playback compressed video data (9) that are structured in frames labeled by frame numbers, and
+ to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted.

5. (original) The system (1) according to claim 4, wherein each device (6A, 6B) is designed to compare a frame number received with a frame number of the frame currently played back at the device (6A, 6B) and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value.

6. (previously presented) The system (1) according to claim 1, wherein each device (6A, 6B) is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second.

7. (previously presented) The system (1) according to claim 1, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices (6A, 6B) over its communication stage if it detects an asynchronous playback progress.

8. (original) The system (1) according to claim 7, wherein each device (6A, 6B) is designed to embed the adjustment data in a synchronization command.

9. (previously presented) The system (1) according to claim 7, wherein each device (6A, 6B) is designed
- to receive the adjustment data and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

10. (previously presented) The system (1) according to claim 1, wherein the communication stage is designed to use UDP multicast data packets for the communication.

11. (previously presented) The system (1) according to claim 1, wherein each display device (6A, 6B)
+ comprises its screen (5) or a number of screens
(5), or
+ is connected to its external screen (5) or a number of screens (5) to be controlled by it.

12. (previously presented) The system (1) according to claim 1, wherein said screen (5) is designed
+ to realize a shelf rail (4) or part of it, or
+ to cover a front of a shelf rail (4) or a part of it to which it is attachable.

13. (previously presented) The system (1) according to claim 1, wherein the system realizes a video playback enabled electronic shelf label system.

14. (previously presented) The system (1) according to claim 1, wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

15. (previously presented) A use of the system (1) according to claim 1 as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails (4), wherein each of said shelfs rails (4) is realized by a screen (5) or carries a screen (5).

16. (previously presented) The system (1) according to claim 8, wherein each device (6A, 6B) is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

REMARKS

Claims 1 to 16 are pending in the application. Claim 1 is independent. In light of the following remarks, Applicant requests reconsideration and allowance of the application and pending claims.

Claim Rejections under 3S U.S.C. § 102

When referring to claims 1 to 9 and 11 to 16, the Office Action rejects the subject matter under 35 U.S.C. § 102 as allegedly being anticipated by Asami *et al.* (EP 2461582 A1, hereafter *Asami).*

A claimed invention may be rejected under 35 U.S.C. § 102 when the invention is anticipated (or is "not novel") over a disclosure that is available as prior art. To reject a claim as anticipated by a reference, the disclosure must teach every element required by the claim under its broadest reasonable interpretation. See, e.g., MPEP § 2114, subsections II and IV.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir, 1987). "When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art." Brown v. 3M, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) (claim to a system for setting a computer clock to an offset time to address the Year 2000 (Y2K) problem, applicable to records with year date data in "at least one of two-digit, three-digit, or four-digit" representations, was held anticipated by a system that offsets year dates in only two-digit formats). See also MPEP § 2131.02. "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In* re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Claims 1-9 and 11 to 16

The proposed document by *Asami* does not anticipate the subject matter of claim 1, as originally presented.

Claim 1 is directed to a video playback system, comprising a number of playback devices to playback a video on their screens, each playback device comprising a memory to store video data representing said video. Each playback device further comprises a communication stage *to communicate data with each other,* wherein the devices are designed to transmit video playback progress data *via the*

communication stage to the other device and to determine, based on the received progress data, whether it is in a synchronous or asynchronous playback progress with the other devices *(emphasis added).*

The emphasized language in claim 1 has the technical effect that that each individual playback device can independently detect an asynchronous playback progress within the group of playback devices. This is achieved by a simple and fast comparison of the playback progress of another device or of other devices with its own playback progress. (See, e.g., specification of present application, US 2021/0176505 A1, paragraph [0007). In the words of claim 1, a simple and fast comparison of the playback progress of the devices can be achieved by communicating "*with each other*". "With each other" particularly describes a bidirectional relationship (*cf.* Merriam-Webster dictionary, definition for "*Each other*": *"each of two or more in reciprocal action or relation"*).

In contrast, *Asami* discloses a display system, which, in the language of present independent claim 1, comprises a number of playback devices to playback a video on their screens, each playback device comprising a memory to store video data representing said video. Each playback device further comprises a communication stage. However, *Asami* does not disclose that the communication stage is used *to communicate data with each other,* wherein the devices are designed to transmit video playback progress-data *via the communication stage to the other device* and to determine based on the received progress data whether it is in a synchronous or asynchronous playback progress *with* the other *devices (cf.* claim 1 of *Asami; emphasis added).*

In this regard, it has to be noted that *Asami* discloses a [plurality of] first playback device(s) (the "first image reproduction devices 10(a...e)") and one second playback device (the "second image reproduction device 20"). The first playback device and the second playback device are, however, not the same. This becomes more obvious in the fifth paragraph of claim 1 of *Asami (cf.* column 17, lines 10 ff), wherein [only] the second playback device 20 further comprises: a synchronization information transmitting part 251 for transmitting synchronization information including information [...] of said second playback device 20 to said first image reproduction device by *unidirectional* communication *(emphasis added).* In other words, in contrast to the present independent claim 1, wherein different ones of the of playback devices communicate *with each other bidirectionally,* thereby enabling *independent* detection of an asynchronous playback progress within the group of playback devices, in *Asami,* different ones of the first playback devices 10 can only detect an asynchronous playback progress *dependent* from the second playback device 20 *(emphasis added).* Descriptively speaking, the playback devices of *Asami* work according to the master-and-slave principle, wherein the second playback device 20 would be the master, and all first playback devices 10 would be the slave(s). Therefore, in Asami, a simple and fast comparison of the playback progress of another first playback device or of other first playback devices

with its own playback progress cannot be achieved for individual ones of the number of first playback devices.

Thus, for at least the reasons noted above, the proposed document *Asami* does not anticipate the claimed video playback system of claim 1.

Hence, *Asami* does not render the subject matter of claim 1 unpatentable, as suggested In the Office Action. Claims 2 to 9 and 11 to 16 depend directly or indirectly from independent claim 1 and include all the elements and features of claim 1. Thus, *Asami* also fails to render claims 2 to 9 and 11 to 16 unpatentable for at least the same reasons as those presented above regarding independent claim 1.

Consequently, claims 1 to 9 and 11 to 16 are allowable and Applicant respectfully requests that the rejection of claims 1 to g and 11 under 35 U.S.C. § 103 over *Asami* be withdrawn.

Claim Rejections under 35 U.S.C. § 103

When referring to claims 1 to 9 and 11 to 16, the Office Action does not reject the subject matter under 35 U.S.C. § 103.

When referring to claim 10, the Office Action rejects the subject matter under 35 U.S.C. § 103 as allegedly being unpatentable over *Asami* in view of the general knowledge in the art.

To establish a *prima facie* showing of obviousness, the Examiner bears the burden of showing that the prior art references in combination teach or suggest all the claim limitations (MPEP 2143.03; *In re* Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974» as well as the burden of clearly articulating a reason why the claimed invention would have been obvious, such as a motivation for combining the references in the manner claimed. See MPEP § 2143.03 (citing KSR International Co. v. Teleflex Inc., 550 U.S. 398, 82 USPQ2d 1385,1395-97 (2007))

Claims 1 to 9 and 11 to 16

When examining the pending version of claims 1 to 9 and 11 to 16, the Office Action rejects the subject matter under 35 U.S.C. § 102 as allegedly being anticipated by Asami (see arguments established above). Therefore, the Office Action does not address non-obviousness of the subject matter of claims 1 to 9 and 11 to 16 according to the provisions of 35 U.S.C. § 102.

It is however respectfully submitted, for the sake of completeness only, that neither *Asami* alone nor the proposed combination of *Asami* and the general knowledge in the art establish a *prima facie* case of obviousness of the claimed system as set forth in claims 1 to 9 and 11 to 16.

In particular, since *Asami* teaches that different ones of the first playback devices 10 can only detect an asynchronous playback progress *dependent* from the second playback device 20 by

unidirectional communication, the skilled person would not get any hints towards providing the system of claim 1 with playback devices comprising a bidirectional communication stage *to communicate data with each other* (*emphasis added*).

Claims 2 to 9 and 11 to 16 depend directly or indirectly from independent claim 1 and include all the elements and features of claim 1. Thus, *Asami* also fails to render claims 2 to 9 and 11 to 16 unpatentable for at least the same reasons as those presented above regarding independent claim 1.

Thus, *Asami and* the proposed combination of *Asami* and the general knowledge in the art fail to render the subject matter of claims 2 to 9 and 11 to 16 unpatentable. Consequently, claims 1 to 9 and 11 to 16 are allowable.

Claim 10

When examining the pending version of dependent claim 10, the Office Action proposes *Asami* in view of the general knowledge in the art when rejecting the claim.

The proposed combination of *Asami* and the general knowledge in the art does not establish a *prima facie* case of obviousness with respect to the subject
matter of claim 10.

Dependent claim 10 is directed to designing the communication stage of the claimed video playback system to use UDP multicast data packets for the communication. Since the subject matter of independent claim 1, from which claim 10 depends, is novel and not obvious over *Asami* as established above, the subject matter of claim 10 is not obvious over the proposed combination of *Asami* and the general knowledge in the art.

Thus, for at least the reasons noted above, the proposed combination of *Asami* and the general knowledge in the art does not establish a *prima facie* case of obviousness of the claimed system as set forth in claim 10.

Thus, the proposed combination of *Asami* and the general knowledge in the art as suggested in the Office Action, fails to render the subject matter of claim 10 unpatentable.

Consequently, claim 10 is allowable and Applicant respectfully requests that the rejection of claim 10 under 35 U.S.C. § 103 over the proposed combination of *Asami* and the general knowledge in the art be withdrawn.

CONCLUSION

In view of the foregoing, it is believed that all grounds of rejection and/or objection have been overcome and/or successfully traversed and that the application is now in condition for allowance. Should the Examiner have any questions or comments regarding the Applicant's response or believe that a telephonic interview would expedite prosecution of the pending claims, the Applicant requests that the Examiner telephone the Applicant's undersigned attorney.

Respectfully submitted,

/Daniel M. Gurfinkel/

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September 13, 2021
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UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF	5709

12271 7590 06/16/2021

Dennemeyer & Associates, LLC
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EXAMINER	
CHIN, RICKY	

ART UNIT	PAPER NUMBER
2423	

NOTIFICATION DATE	DELIVERY MODE
06/16/2021	ELECTRONIC

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

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

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

dgurfinkel@dennemeyer-law.com
docket@dennemeyer-law.com

Office Action Summary	Application No. 16/762,709	Applicant(s) OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	AIA (FITF) Status Yes

-- 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 5-8-2020.

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

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

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

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

Disposition of Claims*

5) ☑ Claim(s) 1-16 is/are pending in the application.

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

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-16 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 5-8-2020 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Claim Rejections - 35 USC § 102

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

A person shall be entitled to a patent unless –

> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

3. Claims 1-9 and 11-16 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Asima et al., EP 2461582.

Regarding claim 1, Asami teaches of a video playback system, comprising a number of playback devices to playback a video on their screens (See Fig.2, 5, and 6 which discloses of the reproduction devices each having lcd screens), each playback device comprises a memory to store video data representing said video (See [0007] which discloses of each of the reproduction devices having storage for the video), and a communication stage to communicate data with each other (See [0007] which discloses communication of data to/from each of the reproduction devices), wherein the devices are designed to transmit video playback progress-data via the communication stage to

the other device (See [0007] transmitting frame number and synch data to the other reproduction device) and to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices (See [0007], [0031], [0033]-[0035], [0070]-[0071] and [0073]-[0078] which discloses of receiving the frame number synch information and count information and determining whether it is within the threshold to determine whether it is already in synch or out of synch/asynchronous when larger than the threshold).

Regarding claim 2, Asami, teaches the system according to claim 1, comprising a video distribution server for distribution of the video data to the devices, in particular the entire video data of a video upfront to playback start at the devices (See Asami, [0007], [0046] and [0050]-[0052] which discloses of the management device/server for distributing/transmitting the content of the entire mpg file for playback at the start to the reproduction devices).

Regarding claim 3, Asami teaches the system according claim 1, wherein the devices are designed to determine independently from a video distribution server which distributed the video data to the device that they are in a synchronous or asynchronous playback progress (See Asami, [0007], [0031], [0033]-[0035], [0070]-[0071] and [0073]-[0078] which discloses of receiving the frame number synch information and count information and determining whether it is within the threshold to determine whether it is already in synch or out of synch/asynchronous when larger than the threshold where the determination is performed at the reproduction devices).

Regarding claim 4, Asami teaches the system according to claim 1 wherein the devices are designed to playback compressed video data that are structured in frames labeled by frame numbers (See [0050]-[0054] mpg file [0082]-[0085] frames numbers), and to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted (See Asami, [0071]-[0077] and [0082]-[0085] frame numbers in synchronization data in order to adjust the frames to be displayed).

Regarding claim 5, Asami teaches the system according to claim 4, wherein each device is designed to compare a frame number received with a frame number of the frame currently played back at the device and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value (See Asami, [0070]-[0071] and [0073]-[0078] which discloses of receiving the frame number synch information and count information and determining whether it is within the threshold to determine whether it is already in synch or out of synch/asynchronous when larger than the threshold).

Regarding claim 6, Asami teaches the system according to claim 1, wherein each device is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second (See Asami, [0041], [0070], and [0087] which discloses of continuously transmitting the synch information per second and that each of the reproduction devices may be the one to do the transmission).

Regarding claim 7, Asami teaches the system according to claim 1, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices over its communication stage if it detects an asynchronous playback

progress (See Asami, [0041], [0073]-[0078] and [0087] which discloses of each of the devices being able to adjust for the playback progress when detecting asynchronous playback by broadcasting adjustment data of at least the frame information/timestamp to the output device of the decoder/display of the reproduction devices and as well as detecting whether or not there is asynchronous playback from the management device when the synch information has not been broadcast wherein the reproduction devices would then broadcast the adjustment data/synch data for adjustment of playback progress).

Regarding claim 8, Asaimi teaches the system according to claim 7, wherein each device is designed to embed the adjustment data in a synchronization command (See Asami, [0041] and [0087] which discloses transmitting the synch information and that each of the reproduction devices may be the one to do the transmission which contains the adjustment data in the command to synchronize).

Regarding claim 9, Asaimi teaches the system according to claim 7, wherein each device is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data (See Asami, [0050]-[0054]; [0071]-[0077] and [0082]-[0085] which discloses of the reproduction devices receiving the synchronization data in order to synch the playback to the corresponding frame number in the mpg compressed video data).

Regarding claim 11, Asami teaches the system according to claim 1, wherein each display device comprises its screen or a number of screens, or is connected to its external screen or a number of screens to be controlled by it (See Asami, Figs, 2-3, and 5 which discloses the multiple screens).

Regarding claim 12, Asami teaches the system according to claim 1, wherein said screen is designed to realize a shelf rail or a part of it, or to cover a front of a shelf rail or a part of it to which it is attachable (See Asami, Figs.2-3 and [0022]-[0023] which discloses the screen being part of the shelf or being in the front of the rail).

Regarding claim 13, Asami teaches the system according to claim 1, wherein the system realizes a video playback enabled electronic shelf label system (See Asami, Figs.2-3; [0004]-[0006] and [0022]-[0023] which discloses the point of sales for playback of the video on the shelf for displaying goods/commercials).

Regarding claim 14, Asami teaches the system according to claim 1, wherein the display devices are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's display area overlapping with a video content or substituting a video content of said section (See Asami, Fig.3; [0004]-[0006] and [0023] which discloses of displaying the advertising video images of the commercial goods being displayed on the whole of the display rack/shelf and on the display screens thereby consisting of at least product information and of at least substituting a video content within a section of the screens display area in order to display the relevant commercial/advertising).

Regarding claim 15, Asami teaches of the use of the system according to claim 1 as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails, wherein each of said shelfs rails is realized by a screen or carries a screen (See Asami, [0007] and Fig.3 which discloses of synchronizing the playback of the video and of each shelf rail comprising of screens).

Regarding claim 16, Asaimi teaches the system according to claim 8, wherein each device is designed to receive the adjustment data and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data (See Asami, [0050]-[0054]; [0071]-[0077] and [0082]-[0085] which discloses of the reproduction devices receiving the synchronization data in order to synch the playback to the corresponding frame number in the mpg compressed video data).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 10 is rejected under 35 U.S.C. 103 as being unpatentable over Asima et al., EP 2461582.

Regarding claim 10, Asima teaches the system according to claim 1, wherein the communication stage is designed to use data packets for the communication (See Asima, [0051]-[0054]).

Asima is silent with respect to the packets being that of UDP multicast.

OFFICIAL NOTICE is taken to note that packets being that of UDP multicast is notoriously well-known in the art and would have been obvious before the effective filing date of the claimed invention to have modified the teachings of Asima to have incorporated the well-known teachings of packets being that of UDP multicast for the mere benefit of providing different and various types of data of communication formats/protocols for compatibility with different devices/systems.

The Applicant is entitled to traverse any/all official notice taken in this action according to MPEP § 2144.03, namely, "if applicant traverses such an assertion, the examiner should cite a reference in support of his or her position". However, MPEP § 2144.03 further states "See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice)." Specifically, In re Boon, 169 USPQ 231, 234 states "as we held in Ahlert, an applicant must be given the opportunity to challenge either the correctness of the fact asserted or the notoriety or repute of the reference cited in support of the assertion. We did not mean to imply by this statement that a bald challenge, with nothing more, would be all that was needed". Further note that 37 CFR

§ 1.671(c)(3) states "Judicial notice means official notice". Thus, a traversal by the Applicant that is merely "a bald challenge, with nothing more" will be given very little weight.

Contact

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ricky Chin whose telephone number is 571-270-3753. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Bruckart can be reached on 571-272-3982. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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).

/Ricky Chin/
Primary Examiner
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Ricky.Chin@uspto.gov

Notice of References Cited	Application/Control No. 16/762,709	Applicant(s)/Patent Under Reexamination OOSTHOEK, Jan	
	Examiner RICKY CHIN	Art Unit 2423	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-10713908-B2	07-2020	Yokoyama; Ryo	H04W4/06	1/1
*	B	US-20140029910-A1	01-2014	Maruyama; Kiyoyasu	H04N21/4122	386/220
*	C	US-20120075334-A1	03-2012	Pourbigharaz; Fariborz	G06F3/1438	345/619
*	D	US-20210064331-A1	03-2021	Goto; Masataka	H04N21/4307	1/1
*	E	US-20160034244-A1	02-2016	Howard; Kevin	G06Q30/0601	345/156
	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	EP-2461582-A1	06-2012	EP	ASAMI TOMONOBU	H04N21/6405
	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
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

CPC - Searched*		
Symbol	Date	Examiner
h04n21/2387,231, 242, 4302,4305, 4307, 4788, 8547; g06f3/1423	06/10/2021	RC

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/double patenting search	06/10/2021	RC
npl search - ip.com	06/10/2021	RC
international search report	06/10/2021	RC
EAST text search - USPAT;USPGPUB;EPO; JPO	06/10/2021	RC

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

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 156

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/762,709	OOSTHOEK, Jan
	Examiner	Art Unit
	RICKY CHIN	2423

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

CLAIMS

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

CLAIM		DATE								
Final	Original	06/09/2021								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 157

Bibliographic Data

Application No: 16/762,709

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /RICKY CHIN/ (Examiner's Signature) | (Initials)

Title: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
05/08/2020	725	2423	24010-10166689PF
RULE			

APPLICANTS

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INVENTORS

Jan OOSTHOEK, Landsmeer, NETHERLANDS

CONTINUING DATA

This application is a 371 of PCT/EP2017/078844 11/10/2017

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

03/02/2021

** SMALL ENTITY **

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FILING FEE RECEIVED

$790

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	192	(popular$5) near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	US-PGPUB; USPAT	OR	OFF	2021/06/09 19:27
S2	234	(popular$5 "heat map") near15 (segment$1 chunk$1 portion$1 fragment$1 clip$1) near10 (event$1)	US-PGPUB; USPAT	OR	OFF	2021/06/09 19:27
S3	2	((("OOSTHOEK") near3 ("Jan"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2021/06/10 13:04
S4	47,570	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2021/06/10 13:06
S5	686	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) and (shelf$1 rail$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2021/06/10 13:15
S6	147	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7) same2 (shelf$1 rail$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2021/06/10 13:15
S9	9	"2461582"	US-PGPUB; USPAT	OR	OFF	2021/06/10 13:21

S10	43	"2461582"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2021/06/10 13:21
S11	19	"2014029910"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2021/06/10 13:22
S12	5	"20140029910"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2021/06/10 13:23
S13	8	"20120075334"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2021/06/10 13:23
S14	77	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8 re-synchroniz$7 synchronous$3 asynchronous$5) same (shelf$1 rail$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2021/06/10 16:58
S15	162	(h04n21/2387,231,242,4302,4305,4307,4788,8547.cpc. or g06f3/1423.cpc.) and (synch$5 synchroniz$7 align$5 re-synch$3 resynchroniz$8	US-PGPUB; USPAT;	OR	OFF	2021/06/10 17:05

		re-synchroniz$7 synchronous$3 asynchronous$5) same2 (shelf$1 rail$1)	USOCR; EPO; JPO; DERWENT			

EAST Search History (Interference)

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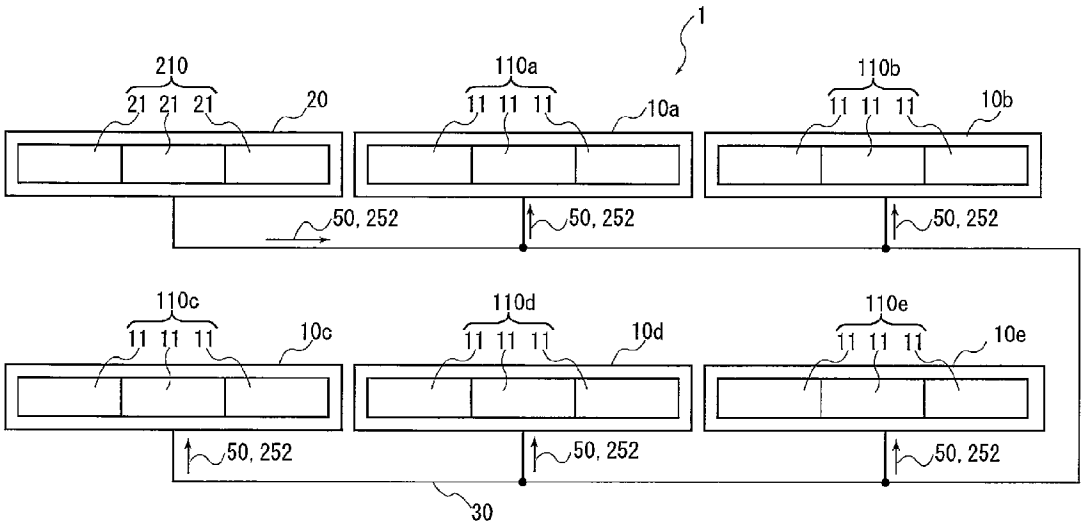
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(54) DISPLAY SYSTEM AND IMAGE REPRODUCTION DEVICE

(57) Image reproduction devices (10a to 10e) and a management device (20) each hold moving image data. The management device (20) goes into a reproduction standby state in which the moving image data (50) can be reproduced and instructs the image reproduction devices (10a to 10e) to go into the reproduction standby state, by cascade communication. The management device (20) starts reproduction of the moving image data (50) and instructs the image reproduction devices (10a to 10e) to start reproduction of the moving image data (50), by broadcast communication. The management device (20) periodically broadcasts synchronization information (252). The image reproduction devices (10a to 10e) use the synchronization information (252) to specify a frame number of a frame displayed on the management device (20). Frames corresponding to the specified frame number are displayed on the display parts (110a to 110e).

FIG. 1



EP 2 461 582 A1

Description

Technical Field

[0001] The present invention relates to a display system constituted of thin display devices each using liquid crystal display panels or the like.

Background Art

[0002] In retail stores such as supermarkets, convenience stores, and the like, generally, display racks are placed in the stores and commercial goods are displayed on the display racks. Further, for the purpose of sales promotion of the goods displayed on the display racks, a technique called "electronic POP (Point Of Purchase)" has been conventionally used.

[0003]

[Patent Document 1] Japanese Patent Application Laid Open Gazette No. 2001-100683
[Patent Document 2] Japanese Patent Application Laid Open Gazette No. 2007-289636

[0004] Patent Document 1 discloses an electronic POP apparatus using a thin display panel such as a liquid crystal display panel or the like. In the electronic POP apparatus disclosed in Patent Document 1, an advertising video image is displayed on the liquid crystal display panel or the like by reproducing moving image data or the like stored in a storage medium. For using the electronic POP apparatus of Patent Document 1, however, another space for setting the electronic POP apparatus is needed separately from the space for displaying the commercial goods.

[0005] Patent Document 2 discloses a display rack on which a video image for electronic POP can be displayed. A projector is set inside the display rack and a transmission screen is attached to a front surface of a shelf board on which the commercial goods are placed. An advertising video image is displayed entirely on the display rack by displaying the advertising video image projected from the projector on the screen. The display rack of Patent Document 2 allows display of the advertising video image thereon, not requiring any space for setting an electronic POP apparatus, and it is thereby possible to efficiently use the salesrooms in the retail stores.

[0006] Electronic POP systems in each of which one video image is displayed on a plurality of display devices have been also used. In order to synchronize video images displayed on the display devices, such an electronic POP system needs a content reproduction device for generating frames to be displayed on the display devices, respectively, from moving image data and distributing the frames to the display devices. Therefore, the electronic POP system using a plurality of display devices disadvantageously has a complicated configuration, and this arises a problem that it is difficult to lower the price thereof.

Disclosure of Invention

[0007] The present invention is intended for a display system. According to the present invention, the display system includes a first image reproduction device for reproducing first moving image data and a second image reproduction device for reproducing second moving image data, which can be communicated with the first image reproduction device, and in the display system of the present invention, the first image reproduction device and the second image reproduction device each comprise a storage part for storing therein moving image data to be reproduced by the device itself, a decoder for decoding the moving image data stored in the storage part, to thereby generate a frame, and a display part for displaying the frame thereon in the order of frame number, the second image reproduction device further comprises a synchronization information transmitting part for transmitting synchronization information including information specifying a frame number of a reference frame displayed on the display part of the second image reproduction device to the first image reproduction device by unidirectional communication, and the first image reproduction device further comprises a frame adjustment part for specifying the frame number of the reference frame on the basis of the synchronization information and displaying a frame corresponding to the frame number specified thus on the display part.

[0008] The display system needs no device other than the first image reproduction device and the second image reproduction device and can synchronize the frame numbers of the pieces of moving image data reproduced by these devices, respectively. Therefore, it is possible to simplify the configuration of the display system.

[0009] According to another preferred embodiment, the display system further includes a third image reproduction device for reproducing third moving image data, and in the display system of another preferred embodiment, the synchronization information transmitting part (251) includes a broadcast communication part for broadcasting the synchronization information to the first image reproduction device and the third image reproduction device by unidirectional communication.

[0010] It is thereby possible to easily synchronize the pieces of moving image data reproduced by three or more image reproduction devices.

[0011] Therefore, it is an object of the present invention to provide a technique for facilitating reduction in the cost of a display system which displays one video image by using a plurality of display devices.

[0012] These and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

Brief Description of Drawings

[0013]

[Fig. 1] is a schematic diagram showing a configuration of a display system in accordance with a preferred embodiment of the present invention;
[Fig. 2] is a perspective view of an image reproduction device;
[Fig. 3] is a view showing an exemplary state where the image reproduction devices and a management device are attached;
[Fig. 4A] is a view showing moving image data used for displaying a video image on the whole of the display system;
[Fig. 4B] is a view showing a state where the pieces of moving image data are reproduced out of synchronization;
[Fig. 4C] is a view showing a state where the pieces of moving image data are reproduced in synchronization;
[Fig. 5] is a block diagram showing a functional constitution of the image reproduction device;
[Fig. 6] is a block diagram showing a functional constitution of the management device;
[Fig. 7] is a flowchart showing an operation flow for distributing moving image data;
[Fig. 8] is a view showing distribution destination information;
[Fig. 9] is a view showing a cascade communication packet;
[Fig. 10] is a view showing a broadcast communication packet;
[Fig. 11] is a flowchart showing an operation flow for adjusting a frame to be displayed on a display part by using synchronization information; and
[Fig. 12] is a schematic diagram showing another exemplary configuration of the display system.

Best Mode for Carrying Out the Invention

{Configuration and Use of Display System}

[0014] Hereinafter, with reference to figures, the preferred embodiment of the present invention will be discussed. Fig. 1 is a schematic diagram showing a display system 1 in accordance with the preferred embodiment. The display system 1 comprises image reproduction devices 10a, 10b, 10c, 10d, and 10e, a management device 20, and a communication cable 30. The image reproduction devices 10a to 10e and the management device 20 each have a function for reproducing moving image data 50.

[0015] The display system 1 can be used as an electronic POP system and can display one video image by using the image reproduction devices 10a to 10e and the management device 20. In this case, The pieces of moving image data 50 held by the image reproduction devices 10a to 10e and the management device 20 are obtained by dividing one piece of moving image data 500 (see Fig. 4A) by six. In order for these devices to reproduce the pieces of moving image data 50 in synchronization, the management device 20 periodically sends synchronization information 252 to the image reproduction devices 10a to 10e.

[0016] The image reproduction devices 10a to 10e have display parts 110a to 110e, respectively, and the display parts 110a to 110e are each constituted of liquid crystal display panels 11, 11, and 11. In each of the display parts 110a to 110e, the three liquid crystal display panels 11 are aligned in a horizontal scan direction and constitute one virtual display panel. In other words, the three liquid crystal display panels 11 displays thereon a reproduced video image of the moving image data 50 on the whole.

[0017] The image reproduction devices 10a to 10e have the same configuration. For this reason, when common discussion on the image reproduction devices 10a to 10e will be made, the image reproduction devices are generally referred to as the image reproduction device (s) 10, not individually referred to as the image reproduction devices 10a, 10b, ..., and 10e.

[0018] The management device 20 also has a function for managing the image reproduction devices 10 as well as the function for reproducing the moving image data 50. Specifically, the management device 20 performs distribution of the moving image data 50 to the image reproduction devices 10, gives an instruction for reproduction of the moving image data 50 to the image reproduction devices 10, and so on. The management device 20 has a display part 210 constituted of three liquid crystal display panels 21, like the image reproduction devices 10.

[0019] The communication cable 30 is a cable which accommodates a standard such as RS-485 or the like and connects the image reproduction devices 10 and the management device 20 to each other.

{Appearance of Image Reproduction Device 10}

[0020] Fig. 2 is a perspective view of the image reproduction device 10. The image reproduction device 10 further comprises a housing 12, an attachment part 13, and a tilt control part 14 as well as the three liquid crystal display panels 11. The appearance of the management device 20 is the same as that of the image reproduction device 10, except that the management device 20 further comprises a memory card slot 26 (see Fig. 6).

[0021] The housing 12 accommodates a control part 15 (see Fig. 5) of the image reproduction device 10 and fixes the three liquid crystal display panels 11 on the same plane. The attachment part 13 fixes the image reproduction device 10. The tilt control part 14 controls the orientation of a display surface of the liquid crystal display panel 11.

{Attachment of Image Reproduction Devices 10 and Management Device 20}

[0022] Fig. 3 is a view showing an exemplary use of the display system 1. The image reproduction devices 10 and the management device 20 are attached to front surfaces of shelf boards 41 of a display rack 4 which is used for display of commercial goods. On the upper shelf board 41, the management device 20, the image reproduction device 10a, and the image reproduction device 10b are attached in this order from the back thereof. On the lower shelf board 41, the image reproduction devices 10c, 10d, and 10e are attached in this order from the back thereof. Inside a wiring cover 42 which is attached to a lower surface of each shelf board 41, accommodated are the communication cable 30 and a power line for supplying power to the image reproduction devices 10 and the management device 20.

[0023] By attaching the image reproduction devices 10 and the management device 20 to the display rack 4, an advertising video image of commercial goods is displayed on the whole of the display rack 4. As shown in Fig. 3, by using the tilt control part 14, the orientations of the display parts of the image reproduction devices 10 and the management device 20 can be controlled to be so angled as to be easily viewed by customers. The display system 1 attached to the display rack 4 can thereby display a clear video image and this increases the effect of sales promotion.

[0024] In order to suit to a limited space such as the front surface of the shelf board 41 or the like, the image reproduction devices 10 and the management device 20 have elongated display parts 110 and 210 each constituted of a plurality of liquid crystal display panels 11. Therefore, since the display system 1 does not need to use any liquid crystal display panel suited to the size of the front surface of the shelf board 41, it is thereby possible to achieve substantial reduction in the cost.

{Overview of Reproduction of Moving Image Data 50}

[0025] Next, an overview of reproduction of the moving image data 50 will be discussed. As content data to be used for display of one video image on the whole of the display system 1, moving image data 500 is generated. The moving image data 500 is divided into six pieces of moving image data 50 in accordance with display areas of the image reproduction devices 10 and the management device 20.

[0026] Fig. 4A is a view showing a frame 500a of the moving image data 500. The frame 500a shown in Fig. 4A corresponds to a frame number 128, in which circles 501 and 501 are drawn. The circles 501 and 501 are moved from the left side to the right side of the paper as the reproduction proceeds.

[0027] By dividing the frame 500a into the six areas, six pieces of moving image data 50 are generated. The management device 20, the image reproduction device 10a, and the image reproduction device 10b correspond to the left side area, the center area, and the right side area on the upper row of the frame 500a, respectively. The image reproduction device 10c, the image reproduction device 10d and the image reproduction device 10e correspond to the left side area, the center area, and the right side area on the lower row of the frame 500a, respectively. The image reproduction devices 10 and the management device 20 hold the pieces of moving image data 50 corresponding to the respective areas.

[0028] The image reproduction devices 10 and the management device 20 decode the respective pieces of moving image data 50, to thereby generate the frames, and display the frames in the order of the frame number. Each frame is updated at a frequency of 30 frames or the like per second on the basis of a clock signal generated by a crystal oscillator included in each of the devices. Since the characteristics of the crystal oscillators included in the devices vary, however, the timings for updating the frame in the devices are not completely coincident.

[0029] Immediately after the reproductions of the moving image data 50 in the image reproduction devices 10 and the management device 20 are started at the same time, the difference in the timing for updating the frame among the devices is very small, e.g., about a few milliseconds. As the reproductions of the moving image data 50 proceed, the difference in the update timing becomes larger. As a result, there occurs a difference among the frame numbers of the frames displayed on these devices.

[0030] Fig. 4B is a view showing the moving image data 500 displayed on the whole of the display rack 4 with the difference in the frame number. When there occurs a difference among the frame numbers of the frames displayed on the devices, the frames in which the respective positions of the circles 501 are different are displayed on the display parts 110a to 110e and 210. As a result, the video image displayed on the whole of the display rack 4 lacks a sense of unity.

[0031] Then, the management device 20 periodically sends the synchronization information 252 to the image reproduction devices 10a to 10e. The synchronization information 252 includes information specifying a frame number of a frame displayed on the management device 20 and a time stamp indicating the display time of the frame. On the basis of the synchronization information 252, each of the image reproduction devices 10 synchronizes a frame number of a frame displayed on the display part 110 thereof with the frame number specified by using the synchronization information 252. The image reproduction devices 10 and the management device 20 can thereby display the frames of the same frame number, as shown in Fig. 4C. Therefore, the display system 1 can display a unified video image on the whole of the display rack 4.

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 165
6/10/2021, EAST Version: 4.1.7.1

{Functional Constitution of Image Reproduction Device 10}

[0032] Fig. 5 is a block diagram showing a functional constitution of the image reproduction device 10. The image reproduction device 10 comprises a control part 15, a panel control part 16, a storage part 17, and a communication control part 18 as well as the display part 110.

[0033] The control part 15 performs a general control of the image reproduction device 10. The control part 15 comprises a decoder 151, a clock generation circuit 152, a cumulative counter part 153, and a frame adjustment part 154.

[0034] The decoder 151 decodes the moving image data 50 stored in the storage part 17, to thereby generate a frame. The clock generation circuit 152 incorporates a crystal oscillator (not shown) to generate a clock signal. The cumulative counter part 153 cumulatively counts the clock signal from the time when the image reproduction device 10 starts reproduction of the moving image data 50.

[0035] The frame adjustment part 154 uses cumulative count information 155 and the synchronization information 252 received from the management device 20 to specify a frame number of a frame displayed on the management device 20. The cumulative count information 155 is information in which a cumulative count value obtained by the cumulative counter part 153 is recorded. The panel control part 16 is notified of the frame number which is specified by the frame adjustment part 154.

[0036] The panel control part 16 counts the clock signal and updates the frame to be displayed on the display part 110 every time when the count value of the clock signal reaches an update count value. In a normal state, the frame is displayed on the display part 110 in the order of the frame number. When the frame adjustment part 154 notifies the panel control part 16 of the frame number, the panel control part 16 displays a frame corresponding to the notified frame number on the display part 110.

[0037] The storage part 17 is a flash memory or the like and stores the moving image data 50 therein. The communication control part 18 performs serial communication on the basis of the standard of RS-485.

{Functional Constitution of Management Device 20}

[0038] Fig. 6 is a block diagram showing a functional constitution of the management device 20. Constituent elements identical to those of the image reproduction device 10 are represented by the same reference signs and discussion thereof will be omitted.

[0039] The management device 20 further comprises the panel control part 16, the storage part 17, the communication control part 18, a control part 25, and a memory card slot 26 as well as the display part 210.

[0040] The control part 25 performs a general control of the management device 20. The control part 25 comprises the decoder 151, the clock generation circuit 152, the cumulative counter part 153, and a synchronization information transmitting part 251.

[0041] The synchronization information transmitting part 251 periodically generates the synchronization information 252 and broadcasts the synchronization information 252 to the image reproduction devices 10. The synchronization information transmitting part 251 holds the cumulative count value at the last frame update as reference count information 253. The synchronization information 252 includes the reference count information 253 and a time stamp indicating the last frame update time.

[0042] Into the memory card slot 26, a memory card 45 is inserted. In the memory card 45, the pieces of moving image data 50, 50, ... and distribution destination information 46 are stored. The number of moving image data 50 to be stored in the memory card 45 corresponds to the number of the image reproduction devices 10 and the management device 20 (i.e., six). The distribution destination information 46 is information associating each moving image data 50 with the (destination) device to which the moving image data 50 is distributed.

{Operation of Display System 1}

[0043] Hereinafter, as to operations of the display system 1, (1) communication modes used in the display system 1, (2) distribution of the moving image data 50, (3) start of reproduction of the moving image data 50, and (4) display of the moving image data 50 in synchronization will be discussed in this order.

(1) Communication Modes used in Display System

[0044] The management device 20 performs distribution of the moving image data 50, gives an instruction for starting reproduction of the moving image data 50, and sends the synchronization information 252 to the image reproduction devices 10. For efficient communication with the image reproduction devices 10, the management device 20 performs either cascade communication or broadcast communication depending on the purpose of communication.

[0045] The cascade communication is bidirectional communication between the management device 20 and each of the image reproduction devices 10. The cascade communication is used when the management device 20 distributes the moving image data 50 having a large data size. The cascade communication is used also when the management device 20 requires the image reproduction device 10 to transmit status information thereto. In other words, the cascade communication is one-to-one communication, and therefore, the management device 20 cannot simultaneously transmit data to a plurality of image reproduction devices 10.

[0046] The broadcast communication is unidirectional communication from the management device 20 to the image reproduction devices 10 and used when the man-

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 166
6/10/2021, EAST Version: 4.1.7.1

agement device 20 transmits data to all the image reproduction devices 10 at the same time. In other words, the broadcast communication is used when the management device 20 controls the operation timing of all the image reproduction devices 10. As exemplary cases for controlling the operation timing, there are cases where the management device 20 gives an instruction for starting reproduction to all the image reproduction devices 10 and where the management device 20 sends the synchronization information 252 to all the image reproduction devices 10.

[0047] The cascade communication and the broadcast communication are performed via the communication cable 30. For this reason, the management device 20 performs time sharing control of the cascade communication and the broadcast communication in order to prevent communications from being performed by the two communication modes at the same time.

(2) Distribution of Moving Image Data 50

[0048] The management device 20 distributes the moving image data 50 stored in the memory card 45 to one of the image reproduction devices 10 on the basis of the distribution destination information 46. It is thereby possible to simplify the operation of storing the moving image data 50 in each of these devices.

[0049] Fig. 7 is a flowchart showing an operation flow of the management device 20 for distributing the moving image data 50. As an initial state, no moving image data 50 is stored in the storage part 17 of each of the image reproduction devices 10 and the management device 20.

[0050] The management device 20 starts the operation shown in the flowchart of Fig. 7 when the memory card 45 is inserted into the memory card slot 26. The management device 20 specifies a distribution destination of the moving image data 50 stored in the memory card 45 on the basis of the distribution destination information 46 (Step S11). Fig. 8 is a view showing an example of distribution destination information 46. For example, a file name "fileA.mpg" is associated with identifying information "10a" of the image reproduction device 10a. The respective identifying information of the image reproduction devices 10b to 10e are "10b" to "10e" and the identifying information of the management device 20 is "20". The management device 20 specifies the image reproduction device 10a as the distribution destination of the moving image data 50 having a file name "fileA.mpg".

[0051] In order to transmit the moving image data 50 with the file name "fileA.mpg" to the image reproduction device 10a, the management device 20 generates a cascade communication packet 55 (Step S12).

[0052] Fig. 9 is a view showing an exemplary communication packet 55. The communication packet 55 shown in Fig. 9 is a communication packet which is generated for distribution of the moving image data 50 with the file name "fileA.mpg". The communication packet 55 is constituted of a detection/synchronization code part 51, a destination address part 52, a payload part 53, and an error code part 54.

[0053] In the detection/synchronization code part 51, stored is code information used when the receiving-side image reproduction device 10a detects the communication packet 55. In the destination address part 52, set is the identifying information "10a" of the destination of the communication packet 55, i.e., the image reproduction device 10a. In the payload part 53, stored is the moving image data 50 to be distributed. Further, in the payload part 53, a control command for the image reproduction device 10, status information of the device, and the like can be stored, as well as the moving image data 50. In the error code part 54, stored is an error detection code used for detecting an error of the communication packet 55.

[0054] The management device 20 confirms that the communication packet 55 can be sent out ("Yes" in Step S13) and transmits the communication packet 55 to the image reproduction device 10a (Step S14). As a case where the communication packet 55 cannot be sent out, there is a case where the time slot is assigned to the broadcast communication, or the like. In this case, the management device 20 waits until the cascade communication can be performed and thereafter performs an operation of Step S14.

[0055] When the image reproduction device 10a receives the communication packet 55 shown in Fig. 9, the image reproduction device 10a stores the moving image data 50 stored in the communication packet 55 into the storage part 17. The image reproduction device 10a transmits a response to the communication packet 55 to the management device 20 by cascade communication.

[0056] When the management device 20 receives the response to the communication packet 55 from the image reproduction device 10a ("Yes" in Step S15), the management device 20 checks if the distribution of all the moving image data 50 is finished (Step S16). When the distribution of all the moving image data 50 is not finished ("No" in Step S16), the management device 20 returns the process to Step S11. On the other hand, when the distribution of all the moving image data 50 is finished ("Yes" in Step S16), the management device 20 ends the process shown in the flowchart of Fig. 7.

[0057] When the management device 20 finds that the distribution destination of the moving image data 50 with the file name "fileF.mpg" is the device itself in Step S11, the management device 20 does not perform the process steps S12 to S15. The management device 20 stores the moving image data 50 with the file name "fileF.mpg" into the storage part 17 thereof.

[0058] Thus, the management device 20 distributes the moving image data 50 stored in the memory card 45 by using the cascade communication which is one-to-one bidirectional communication. The management device 20 can reliably transmit the moving image data 50 to the distribution destination and can also confirm that

the distribution destination has acquired the moving image data 50. Further, since it is not necessary to provide the image reproduction device 10 with any interface used for updating the moving image data 50 stored in the storage part 17, such as the memory card slot 26, it is possible to cut the cost for the image reproduction device 10.

[0059] The management device 20 may be provided with a general purpose communication module (LAN module or the like), instead of the memory card slot 26. In this case, a store salesperson may operate a PC to transmit the pieces of moving image data 50, 50, ..., and the distribution destination information 46 to the management device 20.

(3) Instruction for Reproduction of Moving Image Data

[0060] Next, discussion will be made on an operation flow until the management device 20 and the image reproduction devices 10 start reproduction of the moving image data 50.

[0061] In order to reproduce the moving image data 50, the image reproduction devices 10 and the management device 20 need to start up the decoder 151. The respective starting times of the decoders 151 in the devices are different. In order for the devices to start the reproduction of the moving image data 50 at the same time, the management device 20 instructs the image reproduction devices 10 to go into a reproduction standby state. The reproduction standby state is a state in which the decoders 151 are up.

[0062] Specifically, the management device 20 sends a reproduction standby command instructing the image reproduction device 10 to go into the reproduction standby state to each of the image reproduction devices 10 by cascade communication. The process for sending the reproduction standby command is the same as that shown in the flowchart of Fig. 7. In the payload part 53 of the communication packet 55, stored is the reproduction standby command.

[0063] When the image reproduction device 10 receives the reproduction standby command, the image reproduction device 10 starts up the decoder 151 thereof and goes into the reproduction standby state. The image reproduction device 10 notifies the management device 20, by cascade communication, that the image reproduction device 10 has been in the reproduction standby state. The management device 20 also starts up the decoder 151 thereof and goes into the reproduction standby state.

[0064] After confirming that all the image reproduction devices 10 have been in the reproduction standby state, the management device 20 generates a broadcast packet 60 including a reproduction start command 61. The management device 20 sends the broadcast packet 60 to all the image reproduction devices 10 by broadcast communication at the same time.

[0065] Fig. 10 is a view showing the broadcast communication packet 60. The broadcast packet 60 has the same constitution as that of the communication packet 55 used for the cascade communication. In the destination address part 52, however, set is "0" as an address used for the broadcast communication. In the payload part 53, stored is the reproduction start command 61.

[0066] The image reproduction device 10, receiving the broadcast packet 60, starts the reproduction of the moving image data 50 on the basis of the reproduction start command 61. After sending the broadcast packet 60, the management device 20 starts the reproduction of the moving image data 50. On starting the reproduction of the moving image data 50, the respective cumulative counter parts 153 of the image reproduction devices 10 and the management device 20 start counting the clock signal.

[0067] The timing at which all the image reproduction devices 10 receive the broadcast packet 60 and start the reproduction of the moving image data 50 is almost the same as the timing at which the management device 20 starts the reproduction of the moving image data 50. Therefore, the image reproduction devices 10 and the management device 20 start the reproduction of the moving image data 50 at the same time.

(4) Synchronized Display of Moving Image Data 50

[0068] After instructing the image reproduction devices 10 to start the reproduction, the management device 20 periodically sends the synchronization information 252 by broadcast communication.

[0069] The panel control part 16 of the management device 20 updates the frame to be displayed on the display part 210 thereof. The synchronization information transmitting part 251 records the cumulative count value of the cumulative counter part 153 at the timing for updating the frame, as the reference count information 253. The synchronization information transmitting part 251 periodically generates the synchronization information 252 including the reference count information 253 and the time stamp indicating the last frame update time and broadcasts the generated synchronization information 252 to the image reproduction devices 10.

[0070] The time interval for broadcasting the synchronization information 252 is not particularly defined. It is preferable, however, that the management device 20 should broadcast a plurality of pieces of synchronization information 252 per second. Since the difference in the frame number among the image reproduction devices 10 and the management device 20 can be thereby kept very small, it is possible to continuously display a unified video image on the whole of the display rack 4.

[0071] When the image reproduction device 10 receives the synchronization information 252 during the reproduction of the moving image data 50, the image reproduction device 10 adjusts the frame to be displayed on the display part 110 thereof on the basis of the synchronization information 252.

[0072] Fig. 11 is a flowchart showing an operation flow of the image reproduction device 10 for adjusting the

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 168
6/10/2021, EAST Version: 4.1.7.1

frame to be displayed on the display part 110 thereof by using the synchronization information 252. The image reproduction device 10 performs an operation shown in the flowchart of Fig. 11 concurrently with the reproduction of the moving image data 50.

[0073] When the synchronization information 252 is received ("Yes" in Step S21), the frame adjustment part 154 calculates a difference between the count value of the reference count information 253 included in the synchronization information 252 and the count value of the cumulative count information 155 (Step S22).

[0074] When the difference obtained in Step S22 is not smaller than a threshold value ("Yes" in Step S23), the frame adjustment part 154 rewrites the cumulative count value and the count value of the cumulative count information 155 by using the count value of the reference count information 253 (Step S24). Then, the frame adjustment part 154 specifies a frame number corresponding to the rewritten count value of the cumulative count information 155 (Step S25).

[0075] For example, the frame number can be specified by dividing the count value of the cumulative count information 155 by the update count value indicating the time interval for updating the frame. In a case where the count value of the cumulative count information 155 is "3687" and the update count value is "242, the quotient is "153.625". As a result, the frame adjustment part 154 specifies "153" as the frame number.

[0076] The frame adjustment part 154 notifies the panel control part 16 of the specified frame number. The panel control part 16 displays a frame corresponding to the notified frame number on the display part 110 (Step S26). As a result, the frame numbers of the frames displayed on the image reproduction devices 10 are synchronized with the frame number of the frame displayed on the management device 20.

[0077] The timings at which the image reproduction devices 10 receive the synchronization information 252 are almost the same. For this reason, the adjustments of the frames to be displayed on the image reproduction devices 10, on the basis of the synchronization information 252, are performed at almost the same timing. As a result, the frame numbers of the frames displayed on the image reproduction devices 10 and the management device 20 are synchronized with one another. As shown in Fig. 4C, it is possible to display a video image with a sense of unity on the whole of the display rack 4.

[0078] When the difference is smaller than the threshold value in Step S23 ("No" in Step S23), the frame adjustment part 154 does not notify the panel control part 16 of the frame number. In other words, the panel control part 16 displays the frame on the display part 110 in the order of the frame number. Since whether the frame should be changed or not is determined on the basis of the difference, the image reproduction device 10 does not need to change the frame to be displayed every time when the image reproduction device 10 receives the synchronization information 252. Therefore, it is possible to reduce the load of the image reproduction device 10.

[0079] When the reproduction of the moving image data 50 is finished ("Yes" in Step S27), the image reproduction device 10 ends the process shown in the flowchart of Fig. 11. Further, the image reproduction device 10 may end the process of Fig. 11 also when the image reproduction device 10 receives a reproduction end command from the management device 20.

[0080] Since the image reproduction devices 10 and the management device 20 individually reproduce the moving image data 50, the display system 1 does not have to distribute the frame to the image reproduction devices 10 and the management device 20. Therefore, it is possible to simplify the configuration of the display system 1 and lower the price. Further, the data size of the synchronization information 252 is much smaller than that of the frame which is distributed by the content reproduction device. For this reason, since data transfer can be performed by using RS-485 or the like with relatively low data transfer rate, it is possible to further lower the cost.

[0081] The image reproduction device 10 continues to reproduce the moving image data 50 when the image reproduction device 10 does not receive the synchronization information 252. Therefore, a video image is continuously displayed on the whole of the display rack 4 even when the synchronization information 252 is not broadcasted because of a breakdown of the management device 20, or the like. Similarly, even when a situation occurs where any one of the image reproduction devices 10 and the management device 20 cannot display any video image, the other devices continue to reproduce the moving image data 50. Thus, in the display system 1, it is possible to prevent occurrence of a situation where no video image can be displayed on the whole of the display rack 4 even when a particular device is out of order.

[0082] Further, even when a situation occurs where the synchronization of the frame numbers cannot be performed by using the synchronization information 252, only if the difference in the frame number among the image reproduction devices 10 and the management device 20 is about several frames, it is possible to maintain a video image with a sense of unity to be displayed on the whole of the display rack 4.

[0083] Thus, in the display system 1 of the preferred embodiment, one video image is displayed on the whole of the display system 1 by causing the image reproduction devices 10 and the management device 20 to individually reproduce the moving image data 50. The management device 20 distributes the moving image data 50 to the image reproduction devices 20 by cascade communication and sends the synchronization information 252 to the image reproduction devices 10 by broadcast communication. Since this eliminates the necessity of providing the content reproduction device for distributing the frames, it is possible to simplify the configuration of the display system 1.

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 169
6/10/2021, EAST Version: 4.1.7.1

[0084] Though discussion has been made on the operation of rewriting the cumulative count value and the cumulative count information 155 (Step S24) when the difference is not smaller than the threshold value ("Yes" in Step S23) in the process shown in the flowchart of Fig. 11 in the preferred embodiment, this is only one exemplary case. For example, in a case where the crystal oscillator is a PLL (Phased Locked Loop) circuit, the image reproduction devices 10 may correct the frequency of the clock signal outputted from the PLL circuit so that the count value of the cumulative count information 155 may be coincident with the count value of the reference count information 253.

[0085] Though discussion has been made on the case where the management device 20 generates the synchronization information 252 including the reference count information 253 in the preferred embodiment, this is only one exemplary case. The management device 20 may generate the synchronization information 252 by using information indicating the frame number of the frame displayed on the display part 210, instead of the reference count information 253.

[0086] If the format of the moving image data 50 is MPEG, the management device 20 may generate the synchronization information 252 by using a value of an STC (System Time Clock), instead of the reference count information 253. In this case, the cumulative counter part 153 corresponds to the STC. The image reproduction device 10 corrects the value of the STC thereof on the basis of the value of the STC included in the synchronization information 252 and adjusts the timing for displaying the frame and the timing for decoding, by using the corrected value of the STC. The management device 20 needs to synchronize the STCs of the image reproduction devices 10 and the management device 20 before the reproduction of the moving image data 50 is started.

[0087] Though discussion has been made on the case where the management device 20 broadcasts the synchronization information 252 in the preferred embodiment, this is only one exemplary case. When a state where the synchronization information 252 cannot be received from the management device 20 continues for a predetermined time period, any one of the image reproduction devices 10, instead of the management device 20, may send the synchronization information 252. For example, the image reproduction device 10 may automatically determine whether the synchronization information 252 should be broadcasted or not. Alternatively, the image reproduction device 10 may be provided with a switch indicating On/Off of the function of sending the synchronization information 252.

[0088] Though discussion has been made on the case where the cascade communication and the broadcast communication are performed by using the communication cable 30 in the preferred embodiment, this is only one exemplary case. As shown in Fig. 12, the display system 1 may comprise communication cables 31, 31, ... for cascade communication. In this case, the communication cable 30 is used for broadcast communication. Since the management device 20 does not need to perform time sharing management for the cascade communication and the broadcast communication, it is possible to reduce the load of the management device 20.

[0089] One of the communication cables 31 for cascade communication connects the management device 20 and the image reproduction device 10a to each other. Another one of the communication cables 31 connects the image reproduction device 10a and the image reproduction device 10b to each other. Still another one of the communication cables 31 connects the image reproduction device 10b and the image reproduction device 10c to each other. Still another one of the communication cables 31 connects the image reproduction device 10c and the image reproduction device 10d to each other. Yet another one of the communication cables 31 connects the image reproduction device 10d and the image reproduction device 10e to each other.

[0090] When the cascade communication is used for transmission, the management device 20 transmits the communication packet 55 to the image reproduction device 10a via the communication cable 31. When the distribution destination of the received communication packet 55 is not this device, the image reproduction device 10a transmits the communication packet 55 to the image reproduction device 10b via the communication cable 31. Thus, when the image reproduction device 10 receives the communication packet 55 whose destination is not this device, the image reproduction device 10 transmits the communication packet 55 to the next image reproduction device 10. When the image reproduction device 10 receives the communication packet 55 whose destination is this device, the image reproduction device 10 performs reception of the communication packet 55.

[0091] While the invention has been shown and described in detail, the foregoing description is in all aspects illustrative and not restrictive. It is therefore understood that numerous modifications and variations can be devised without departing from the scope of the invention.

Claims

1. A display system, including:

   a first image reproduction device (10) for reproducing first moving image data (50); and
   a second image reproduction device (20) for reproducing second moving image data (50), which can be communicated with said first image reproduction device,
   wherein said first image reproduction device (10) and said second image reproduction device (20) each comprise:

      a storage part (17) for storing therein moving image data to be reproduced by said

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 170
6/10/2021, EAST Version: 4.1.7.1

device itself;
a decoder (151) for decoding said moving image data stored in said storage part, to thereby generate a frame; and
a display part (110, 210) for displaying said frame thereon in the order of frame number,
wherein said second image reproduction device (20) further comprises:

a synchronization information transmitting part (251) for transmitting synchronization information including information specifying a frame number of a reference frame displayed on said display part (210) of said second image reproduction device (20) to said first image reproduction device by unidirectional communication,
and wherein said first image reproduction device (10) further comprises:

a frame adjustment part (154) for specifying said frame number of said reference frame on the basis of said synchronization information and displaying a frame corresponding to said frame number specified thus on said display part.

2. The display system according to claim 1, further including:

a third image reproduction device (10) for reproducing third moving image data (50),
wherein said synchronization information transmitting part (251) includes:

a broadcast communication part (18) for broadcasting said synchronization information to said first image reproduction device (10) and said third image reproduction device (10) by unidirectional communication.

3. The display system according to claim 1, wherein said first moving image data (50) and said second moving image data (50) are pieces of divided moving image data (500) into which one moving image data is divided, being different from each other.

4. The display system according to claim 1, wherein said information specifying said frame number is a frame number of said reference frame.

5. The display system according to claim 1, wherein said second image reproduction device (20) further comprises:

a first clock generation part(152) for generating a first clock signal; and
a first counter part (153) for counting said first clock signal from the time when reproduction of said second moving image data is started,
and wherein said information specifying said frame number is a count value of said first clock signal corresponding to a timing at which said reference frame is displayed on said display part of said second image reproduction device, and said frame adjustment part (154) specifies said frame number of said reference frame from said count value of said first clock signal which is included in said synchronization information.

6. The display system according to claim 5, wherein said first image reproduction device (10) further comprises:

a second clock generation part (152) for generating a second clock signal; and
a second counter part (153) for counting said second clock signal from the time when reproduction of said first moving image data is started,
and wherein said frame adjustment part (154) displays a frame corresponding to said frame number specified thus on said display part (110) when a difference between a count value of said second clock signal and said count value of said first clock signal which is included in said synchronization information is not smaller than a predetermined value.

7. The display system according to claim 2, wherein said first image reproduction device (10) further comprises:

an alternative synchronization information transmitting part (15) for generating alternative synchronization information including information specifying a frame number of a frame displayed on said display part of said device when said synchronization information cannot be received for a predetermined time period and transmitting said alternative synchronization information to said third image reproduction device by unidirectional communication.

8. The display system according to claim 1, wherein said second image reproduction device (20) further comprises:

an individual communication part (18) for instructing said first image reproduction device (10) to go into a reproduction standby state in which said first moving image data (50) can be reproduced, by one-to-one communication;
a transition part (25) for bringing said decoder and said display part (16, 21) of said device into

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 171
6/10/2021, EAST Version: 4.1.7.1

a state in which said second moving image data (50) can be reproduced; and
a reproduction instruction part (25) for instructing said first image reproduction device (10) to start reproduction of said first moving image data (50) by unidirectional communication and instructing said decoder (151) and said display part (210) of said device to start reproduction of said second moving image data (50), when information indicating that said first image reproduction device (10) has been in a reproduction standby state is received from said first image reproduction device (10).

9. The display system according to claim 1, wherein said second image reproduction device (20) further comprises:

an input part (26) for inputting a plurality of pieces of inputted moving image data and distribution destination information indicating a distribution destination of each inputted moving image data from the outside; and
a distribution part (18) for storing said inputted moving image data for said device into said storage part and distributing said inputted moving image data for said first image reproduction device to said first image reproduction device by one-to-one communication, on the basis of said distribution destination information.

10. An image reproduction device (20) connected to a first display device (10) for displaying first moving image data thereon, comprising:

a storage part (17) for storing second moving image data (50) therein;
a decoder (151) for decoding said second moving image data (50) stored in said storage part, to thereby generate a frame;
a display part (210) for displaying said frame thereon in the order of frame number; and
a synchronization information transmitting part (251) for transmitting synchronization information including information specifying a frame number of a frame displayed on said display part (210) to said first display device by unidirectional communication.

11. The image reproduction device (20) according to claim 10, wherein
said synchronization information transmitting part (251) includes:

a broadcast communication part (18) for broadcasting said synchronization information to said first display device (10) and a second display device (10) when said device is connected to said second display device (10) for displaying third moving image data (50) thereon.

12. An image reproduction device (10) connected to a display device (20) for displaying first moving image data (50) thereon, comprising:

a storage part for storing second moving image data (50) therein;
a decoder (151) for decoding said second moving image data (50) stored in said storage part, to thereby generate a frame;
a display part (110) for displaying said frame thereon in the order of frame number; and
a frame adjustment part (154) for specifying a frame number of a reference frame displayed on said display device (20) on the basis of synchronization information when said synchronization information including information specifying said frame number of said reference frame is received and displaying a frame corresponding to said frame number specified thus on said display part.

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 172
6/10/2021, EAST Version: 4.1.7.1

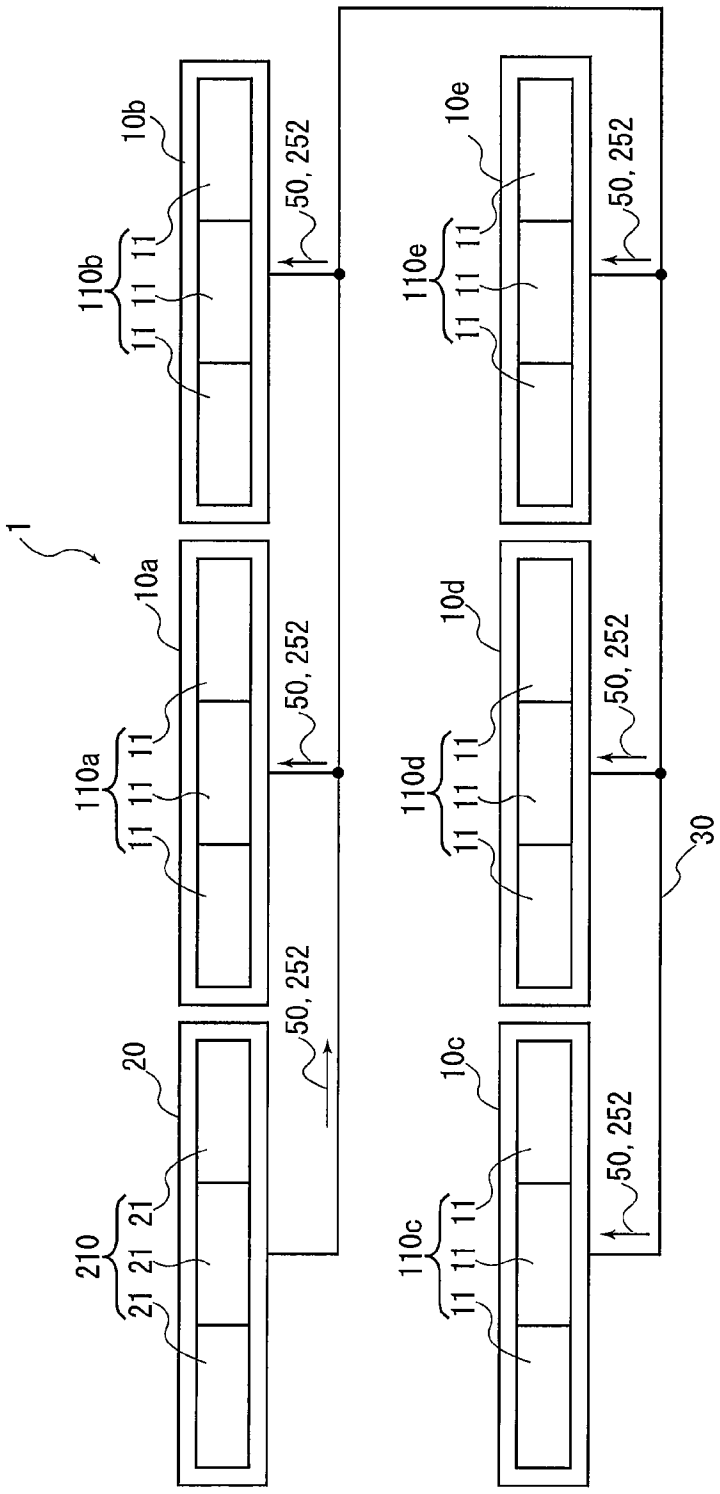
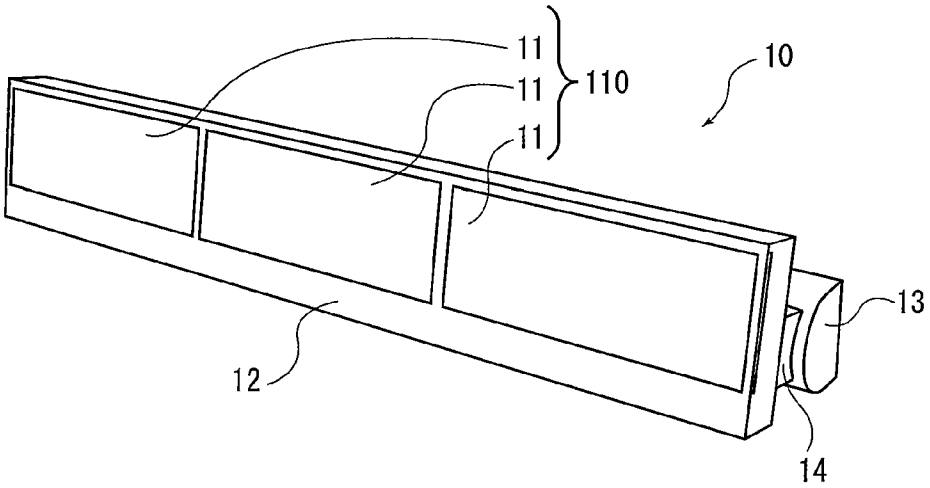


FIG. 1

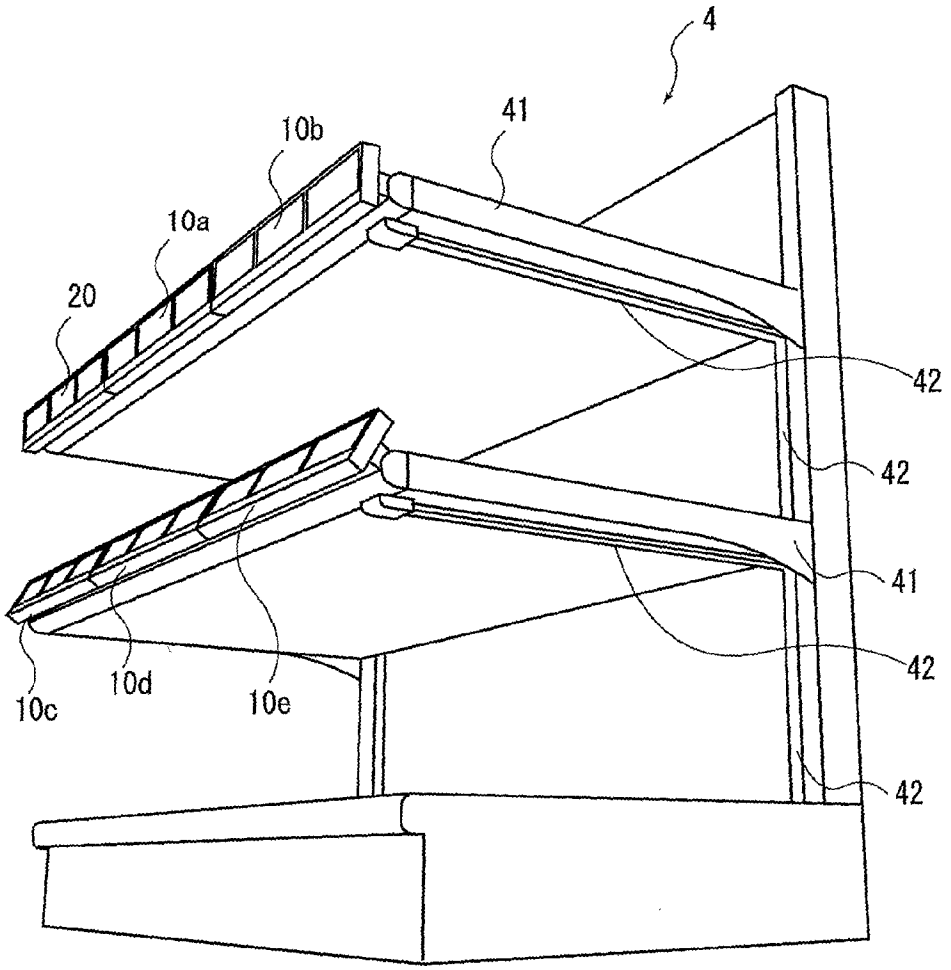
HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 173
6/10/2021, EAST Version: 4.1.7.1

FIG. 2



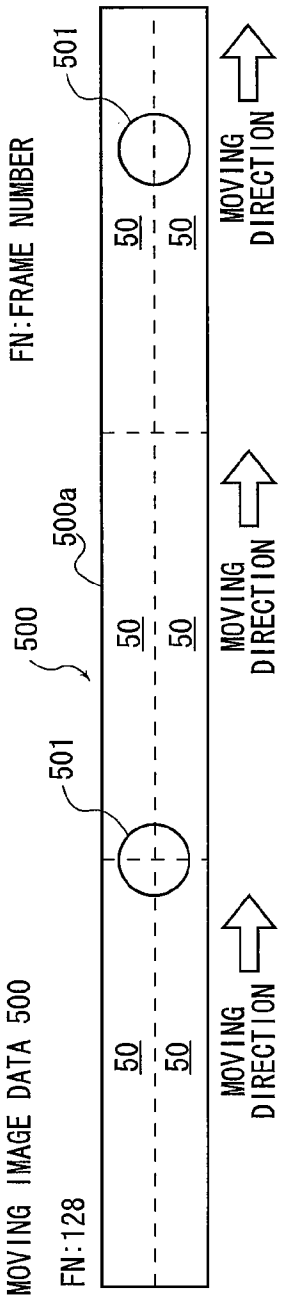
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Ex. 1002, page 174
6/10/2021, EAST Version: 4.1.7.1

FIG. 3



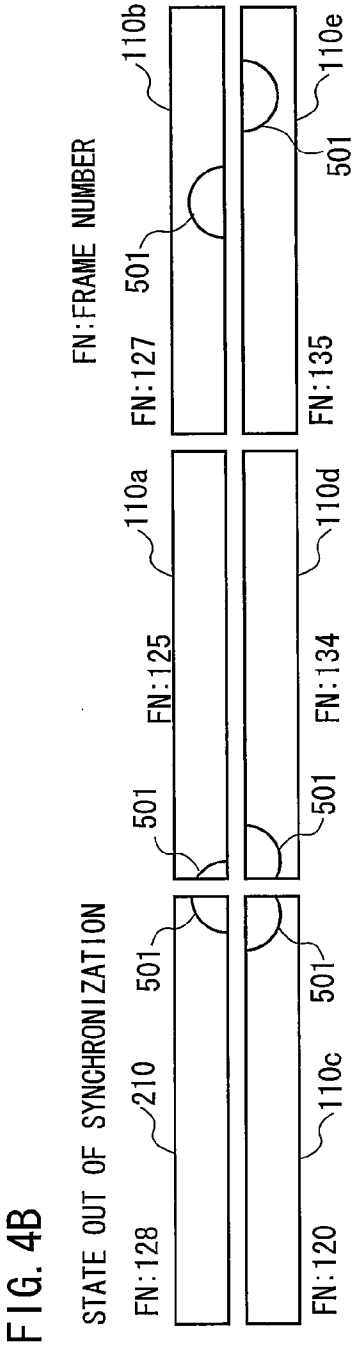
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Ex. 1002, page 175
6/10/2021, EAST Version: 4.1.7.1

FIG. 4A



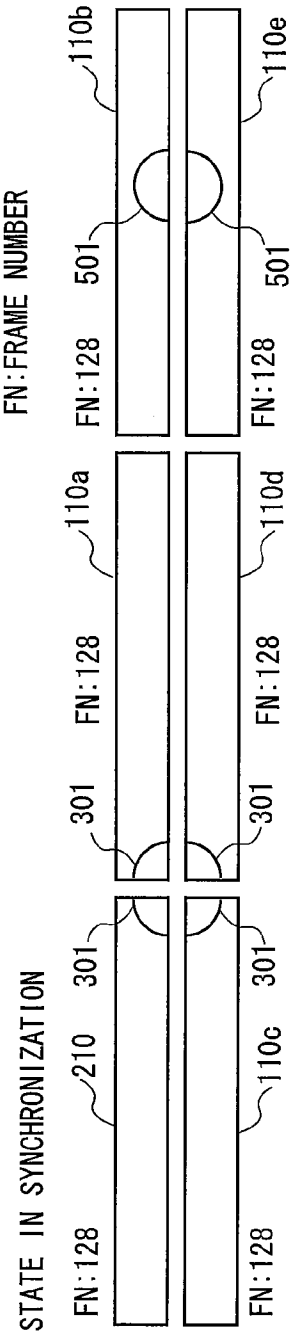
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Ex. 1002, page 176
6/10/2021, EAST Version: 4.1.7.1

FIG. 4B



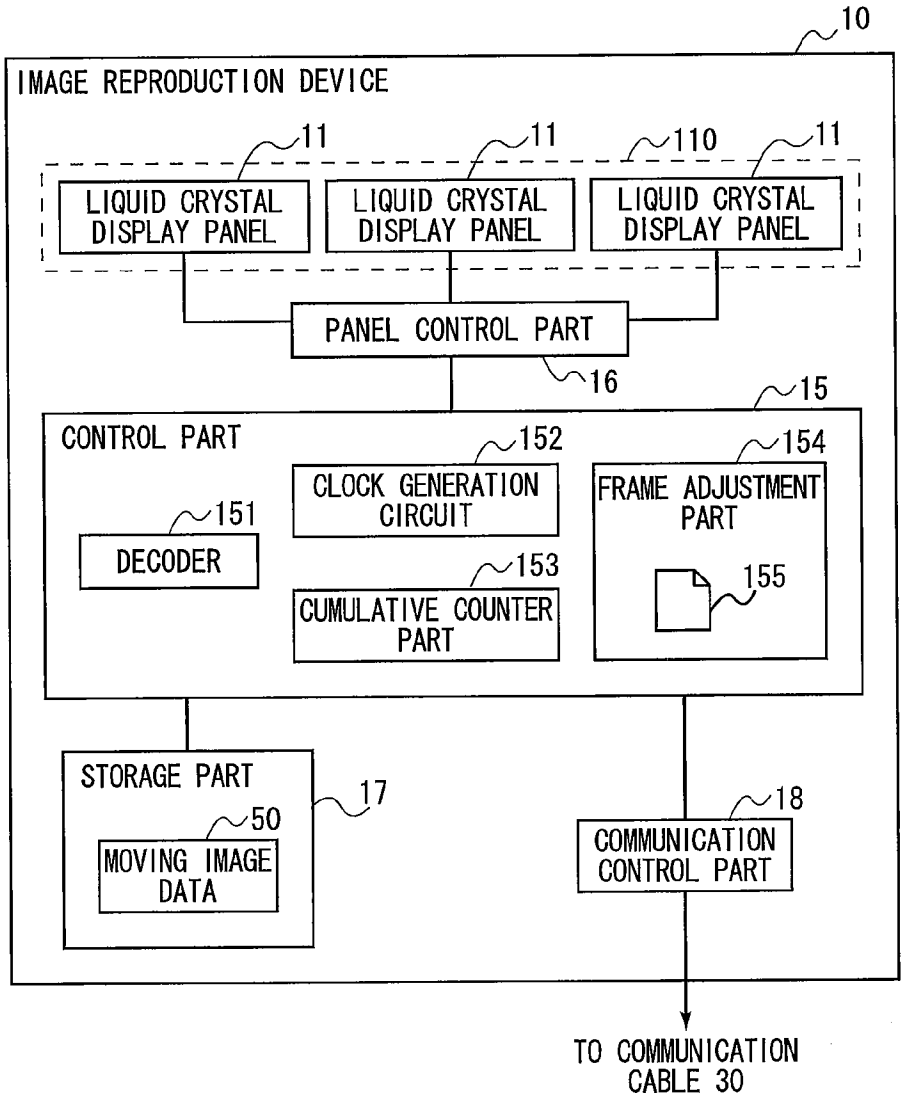
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Ex. 1002, page 177
6/10/2021, EAST Version: 4.1.7.1

FIG. 4C



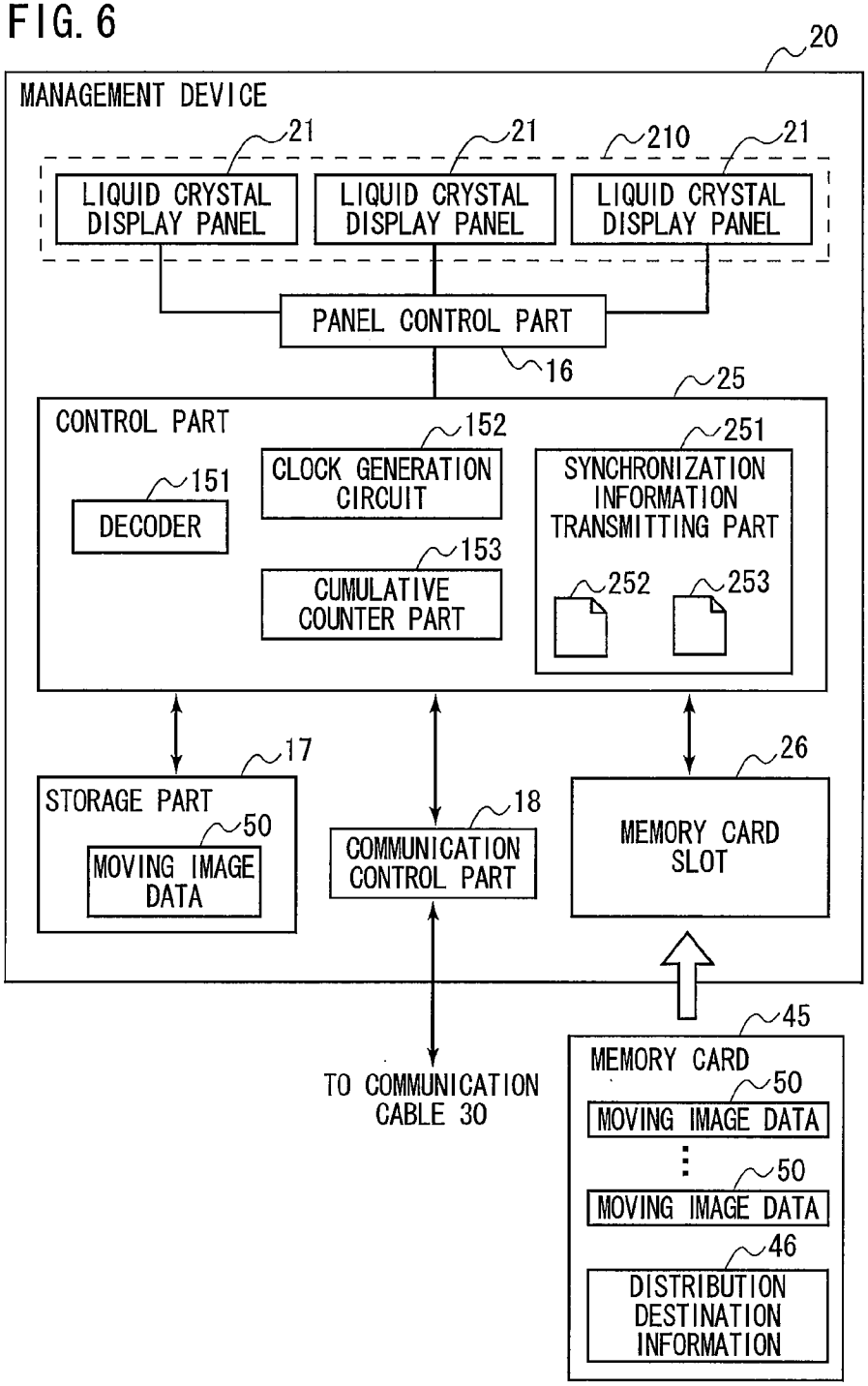
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Ex. 1002, page 178
6/10/2021, EAST Version: 4.1.7.1

FIG. 5



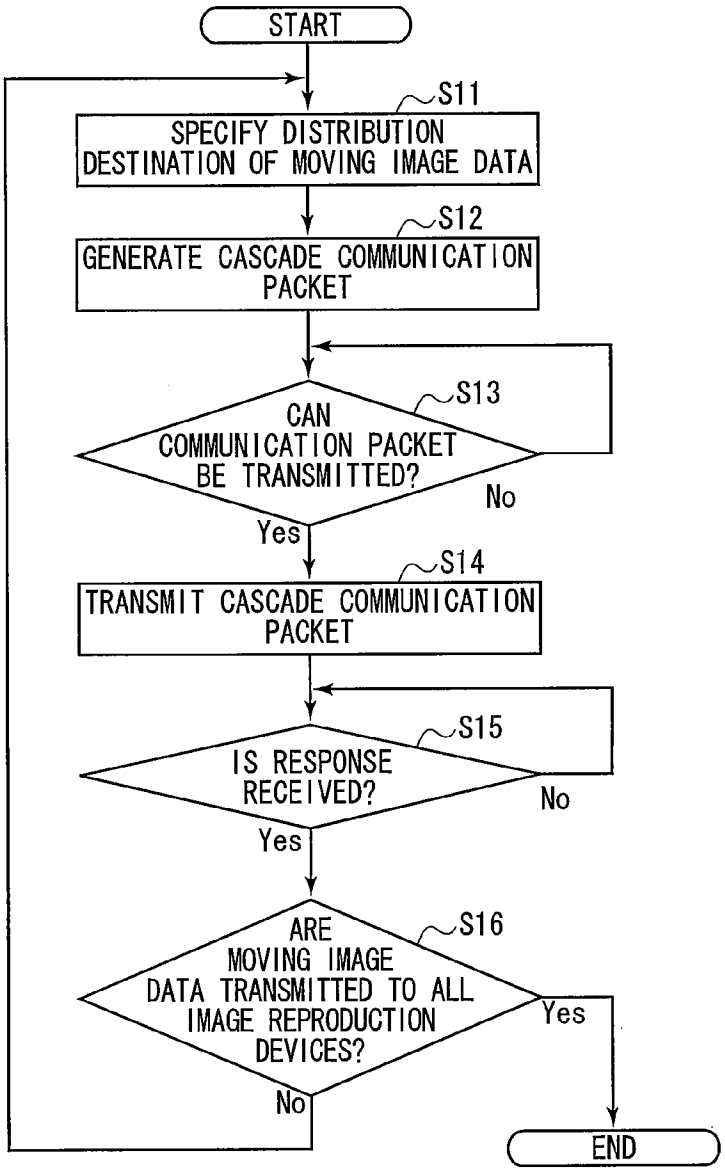
HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 179
6/10/2021, EAST Version: 4.1.7.1

FIG. 6



HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 180
6/10/2021, EAST Version: 4.1.7.1

FIG. 7



HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 181
6/10/2021, EAST Version: 4.1.7.1

FIG. 8

DISTRIBUTION DESTINATION INFORMATION 46

FILE NAME	IDENTIFYING INFORMATION
fileA.mpg	10a
fileB.mpg	10b
fileC.mpg	10c
fileD.mpg	10d
fileE.mpg	10e
fileF.mpg	20

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 182
6/10/2021, EAST Version: 4.1.7.1

FIG. 9

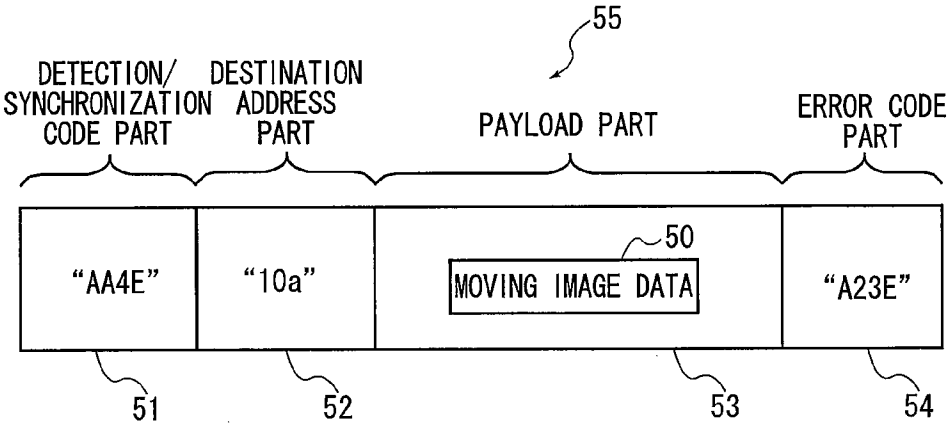
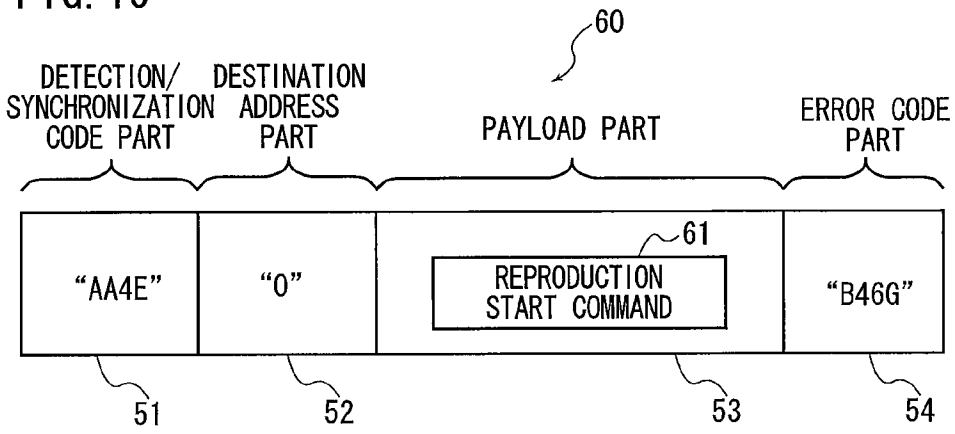
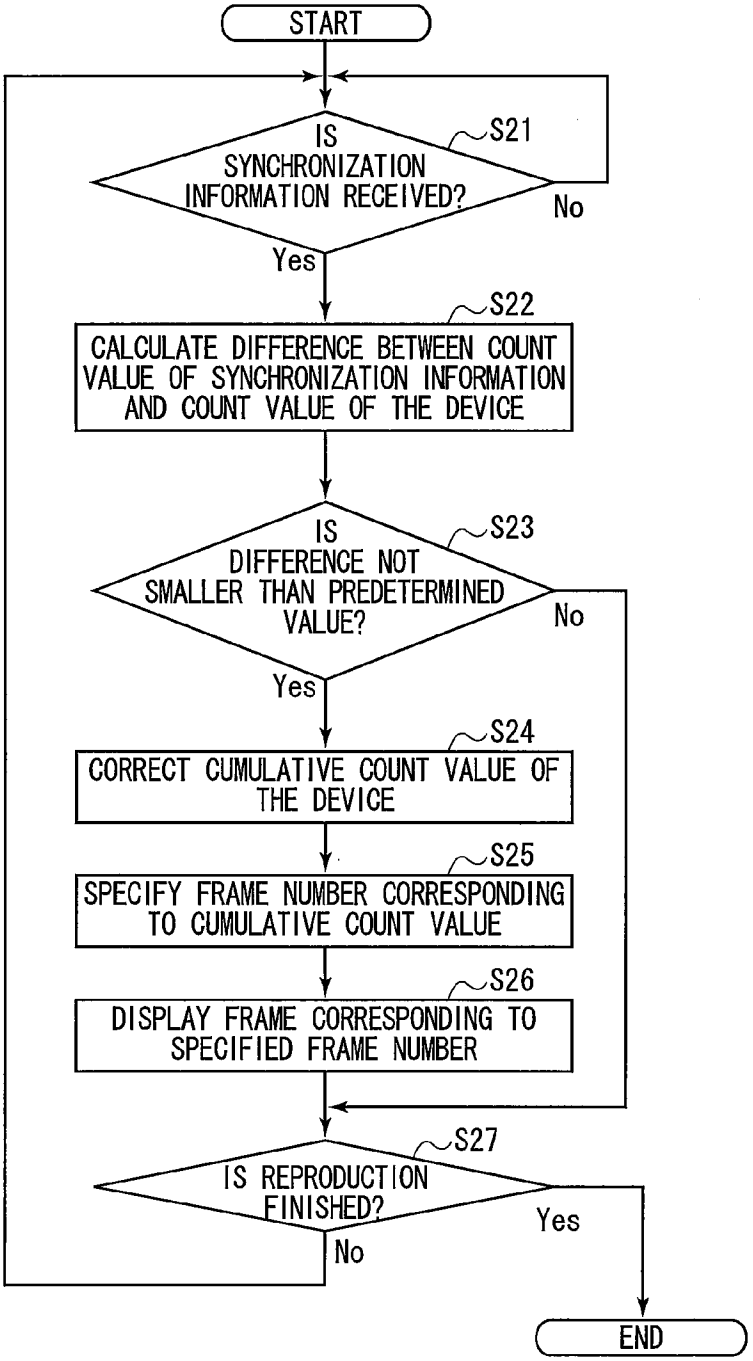


FIG. 10



HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 183
6/10/2021, EAST Version: 4.1.7.1

FIG. 11



HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 184
6/10/2021, EAST Version: 4.1.7.1

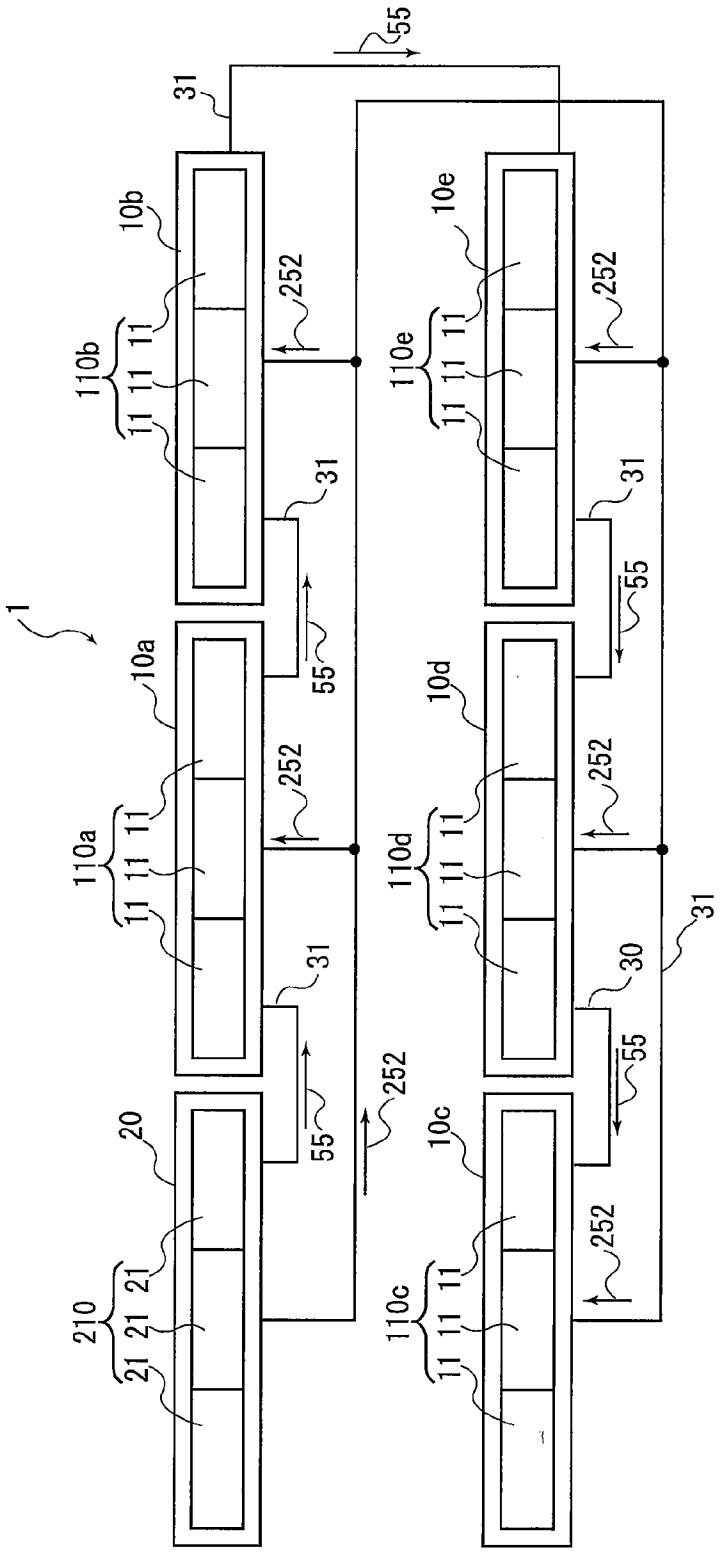


FIG. 12

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 185
6/10/2021, EAST Version: 4.1.7.1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/060135

A. CLASSIFICATION OF SUBJECT MATTER
H04N7/173(2006.01)i, *G09G5/00*(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04N7/173, G09G5/00

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2010
Kokai Jitsuyo Shinan Koho	1971-2010	Toroku Jitsuyo Shinan Koho	1994-2010

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 2009-122412 A (Seiko Epson Corp.), 04 June 2009 (04.06.2009), claim 1; paragraphs [0008], [0018]; fig. 4 (Family: none)	1-4,7-12 5-6
A	JP 2005-086592 A (Hitachi, Ltd.), 31 March 2005 (31.03.2005), paragraph [0009]; fig. 1 (Family: none)	1-12
A	JP 10-260665 A (Fujitsu Ltd.), 29 September 1998 (29.09.1998), claims 1 to 4 (Family: none)	1-12

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
01 July, 2010 (01.07.10)	13 July, 2010 (13.07.10)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 186
6/10/2021, EAST Version: 4.1.7.1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/060135

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2003-030641 A (NEC System Technologies, Ltd.), 31 January 2003 (31.01.2003), claims 1 to 2 & US 2003/0016223 A1 & EP 1278158 A2	1-12
A	JP 2000-330535 A (Seiko Epson Corp.), 30 November 2000 (30.11.2000), paragraph [0007]; fig. 4 & US 6839061 B1 & EP 1102237 A1 & EP 1895403 A2 & WO 2000/072298 A1 & CN 1318186 A	1-12

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HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 187
6/10/2021, EAST Version: 4.1.7.1

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- JP 2001100683 A **[0003]**
- JP 2007289636 A **[0003]**

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 188
6/10/2021, EAST Version: 4.1.7.1

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/762,709	05/08/2020	Jan OOSTHOEK	24010-10166689PF

CONFIRMATION NO. 5709

12271
Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

PUBLICATION NOTICE

OC000000126222616

Title:SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

Publication No.US-2021-0176505-A1
Publication Date:06/10/2021

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 189

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

U.S. APPLICATION NO.	FIRST NAMED INVENTOR	ATTY. DOCKET NO.
16/762,709	Jan OOSTHOEK	24010-10166689PF

12271
Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

INTERNATIONAL APPLICATION NO.	
PCT/EP2017/078844	
I.A. FILING DATE	PRIORITY DATE
11/10/2017	

CONFIRMATION NO. 5709
371 ACCEPTANCE LETTER

OC000000125780333

Date Mailed: 05/25/2021

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

05/08/2020
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Indication of Small Entity Status
- Copy of the International Application filed on 05/08/2020
- Copy of the International Search Report filed on 05/08/2020
- Preliminary Amendments filed on 05/08/2020
- Inventor's Oath or Declaration filed on 05/04/2021
- Small Entity Statement filed on 05/08/2020
- U.S. Basic National Fees filed on 05/08/2020
- Authorize Access to Search Results filed on 05/08/2020
- Priority Documents filed on 05/08/2020
- Power of Attorney filed on 05/08/2020
- Specification filed on 05/08/2020
- Claims filed on 05/08/2020
- Abstracts filed on 05/08/2020
- Drawings filed on 05/08/2020
- Authorization to Permit Access filed on 05/08/2020
- Application Data Sheet (37 CFR 1.76) filed on 05/08/2020

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Ex. 1002, page 190

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

LAMONT M HUNTER

Telephone: (571) 272-0308

FORM PCT/DO/EO/903 (371 Acceptance Notice)

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/762,709

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	160		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	16 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 240 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	830		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/762,709	05/08/2020	2425	870	24010-10166689PF	16	1

CONFIRMATION NO. 5709

UPDATED FILING RECEIPT

12271
Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606



Date Mailed: 05/25/2021

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

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

Inventor(s)

Jan OOSTHOEK, Landsmeer, NETHERLANDS;

Applicant(s)

SES-Imagotag GmbH, Fernitz-Mellach, AUSTRIA;

Power of Attorney: The patent practitioners associated with Customer Number 12271

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/EP2017/078844 11/10/2017

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 03/02/2021

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/762,709**

Projected Publication Date: 06/10/2021

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

Preliminary Class

725

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

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

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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

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

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

NOT GRANTED

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

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24010-10166689PF PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Jan Oosthoek,	)	Examiner: Not Yet Assigned
	)	
	)	Art Unit: Not Yet Assigned
Serial No.: 16/762,709	)	
	)	
Conf. No. 5709	)	
	)	
Filed: May 8, 2020	)	
	)	
For: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	)	

RESPONSE TO NOTICATION OF INSUFFICIENCY

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

Dear Sir:

Enclosed in response to the Notification of Insufficiency Under 37 CFR 1.492, dated March 5, 2021, in connection with the above identified application please find:

[X] Properly executed inventor's oaths or declarations for Jan Oosthoek; and
[X] Surcharge for late filing of oath/declaration.

Respectfully submitted,
Dennemeyer & Associates, LLC.

/Daniel M. Gurfinkel/

Daniel M. Gurfinkel
Reg. No. 34,177

4 May 2021
Dennemeyer & Associates, LLC
2 N. Riverside Plaza, Suite 1500
Chicago, Illinois 60606
Telephone: 312-380-6500

PTO/AIA/01 (08-12)
Approved for use through 11/30/2020. 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.

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

Title of Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☒ United States application or PCT international application number PCT/EP2017/078844 filed on 10-November-2017.

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

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

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

WARNING:

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

LEGAL NAME OF INVENTOR

Inventor: Jan OOSTHOEK Date (Optional): _____

Signature: _____

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

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Electronic Patent Application Fee Transmittal

Application Number:	16762709
Filing Date:	08-May-2020
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan OOSTHOEK
Filer:	Daniel Michael Gurfinkel
Attorney Docket Number:	24010-10166689PF

Filed as Small 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:				
OATH/DECL > 30 MOS FROM 371 COMMENCEMENT	2617	1	80	80
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**80**

Electronic Acknowledgement Receipt

EFS ID:	42628289
Application Number:	16762709
International Application Number:	
Confirmation Number:	5709
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan OOSTHOEK
Customer Number:	12271
Filer:	Daniel Michael Gurfinkel
Filer Authorized By:	
Attorney Docket Number:	24010-10166689PF
Receipt Date:	04-MAY-2021
Filing Date:	08-MAY-2020
Time Stamp:	10:21:18
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	$80
RAM confirmation Number	E202154A21360191
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	Applicant Response to Pre-Exam Formalities Notice	resp_insuf.pdf	3995 e0065e784e17d8062ae2932f416e89942f33f590	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	declaration.pdf	749363 b8ef8cf442f6183c9ea77ced770cb431906ecdfc	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30679 b044c22362bea33c15450c25b7cdf2619079d596	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	784037		

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.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

Substitute for Form PTO-1360
(For use with Form PTO/SB/06)

Application Number	Filing Date
16762709	

Applicant(s) Jan OOSTHOEK

* May be used for additional claims or amendments

CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT	
	Indep	Depend	Indep	Depend	Indep	Depend
1	1		1			
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Total Indep	1		1		0	
Total Depend	15	↵	15	↵	0	↵
Total Claims	16		16		0	

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/762,709	05/08/2020		790	24010-10166689PF	16	1

CONFIRMATION NO. 5709

FILING RECEIPT

12271
Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

OC000000123767238

Date Mailed: 03/05/2021

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

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

Inventor(s)

Jan OOSTHOEK, Landsmeer, NETHERLANDS;

Applicant(s)

SES-Imagotag GmbH, Fernitz-Mellach, AUSTRIA;

Power of Attorney: The patent practitioners associated with Customer Number 12271

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/EP2017/078844 11/10/2017

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

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Ex. 1002, page 203

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/762,709**

Projected Publication Date: 06/10/2021

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

Preliminary Class

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/762,709

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	160		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	16 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 240 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	830		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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U.S. APPLICATION NO.	FIRST NAMED INVENTOR	ATTY. DOCKET NO.
16/762,709	Jan OOSTHOEK	24010-10166689PF

12271
Dennemeyer & Associates, LLC
2 North Riverside Plaza
Suite 1500
Chicago, IL 60606

INTERNATIONAL APPLICATION NO.	
PCT/EP2017/078844	
I.A. FILING DATE	PRIORITY DATE
11/10/2017	

CONFIRMATION NO. 5709
371 FORMALITIES LETTER

OC000000123767239

Date Mailed: 03/05/2021

Notification of Insufficiency Under 37 CFR 1.492 and/or 1.495 (DO/EO/US)

The following items have been submitted by the applicant or the International Bureau to the United States Patent and Trademark Office as a Designated / Elected Office (37 CFR 1.495).

- Indication of Small Entity Status
- Copy of the International Application filed on 05/08/2020
- Copy of the International Search Report filed on 05/08/2020
- Preliminary Amendments filed on 05/08/2020
- Small Entity Statement filed on 05/08/2020
- U.S. Basic National Fees filed on 05/08/2020
- Authorize Access to Search Results filed on 05/08/2020
- Priority Documents filed on 05/08/2020
- Power of Attorney filed on 05/08/2020
- Specification filed on 05/08/2020
- Claims filed on 05/08/2020
- Abstracts filed on 05/08/2020
- Drawings filed on 05/08/2020
- Authorization to Permit Access filed on 05/08/2020
- Application Data Sheet (37 CFR 1.76) filed on 05/08/2020

The following items **MUST** be furnished within the period set forth below:

- To avoid abandonment, a surcharge (for late submission of search fee, examination fee or inventor's oath or declaration) as set forth in 37 CFR 1.492(h) of $80 for a small entity in compliance with 37 CFR 1.27 , must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fees required for this application is $**80** for a Small Entity:

- $**80** Surcharge.

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.495(c).

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- Properly executed inventor's oath or declaration for the following inventor(s) has not been submitted: **Jan OOSTHOEK**

ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

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

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

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

LAMONT M HUNTER

Telephone: (571) 272-0308

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Ex. 1002, page 208

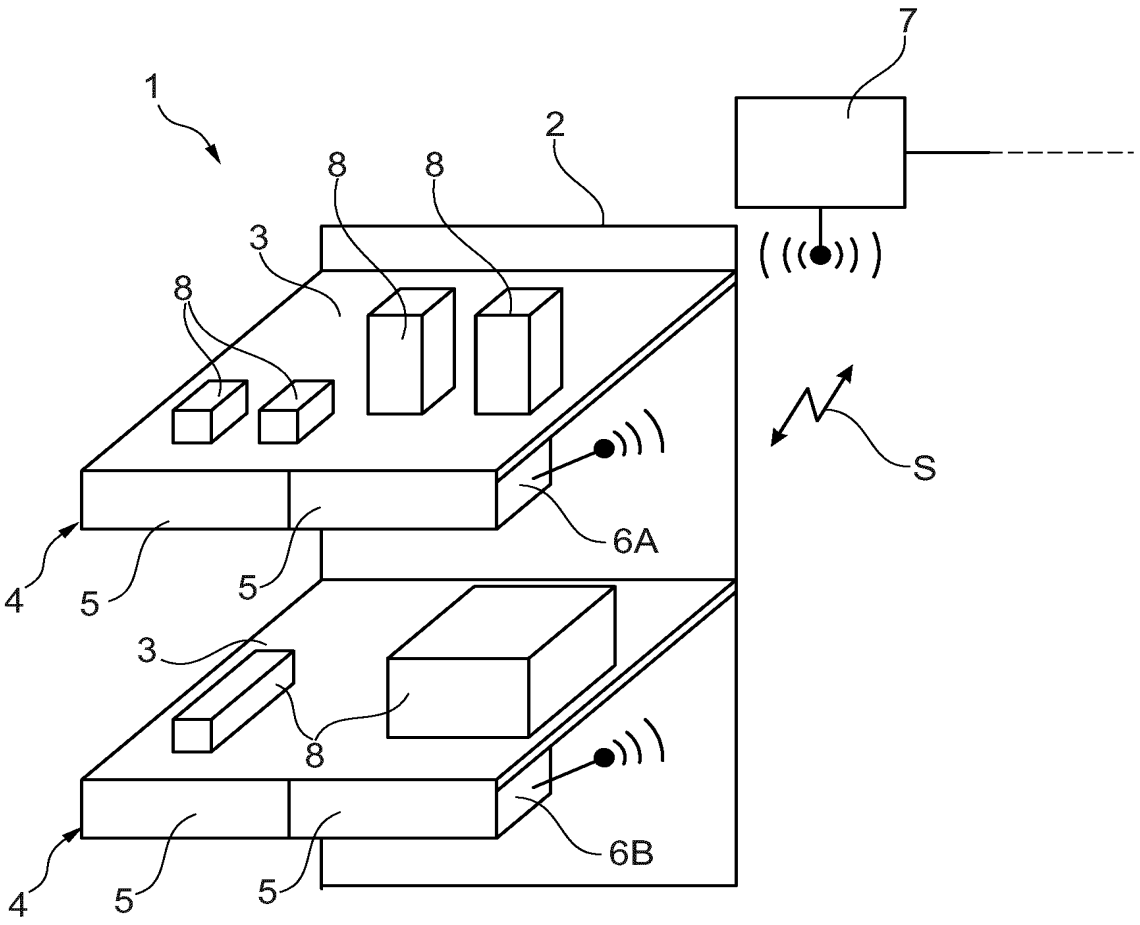


Fig. 1

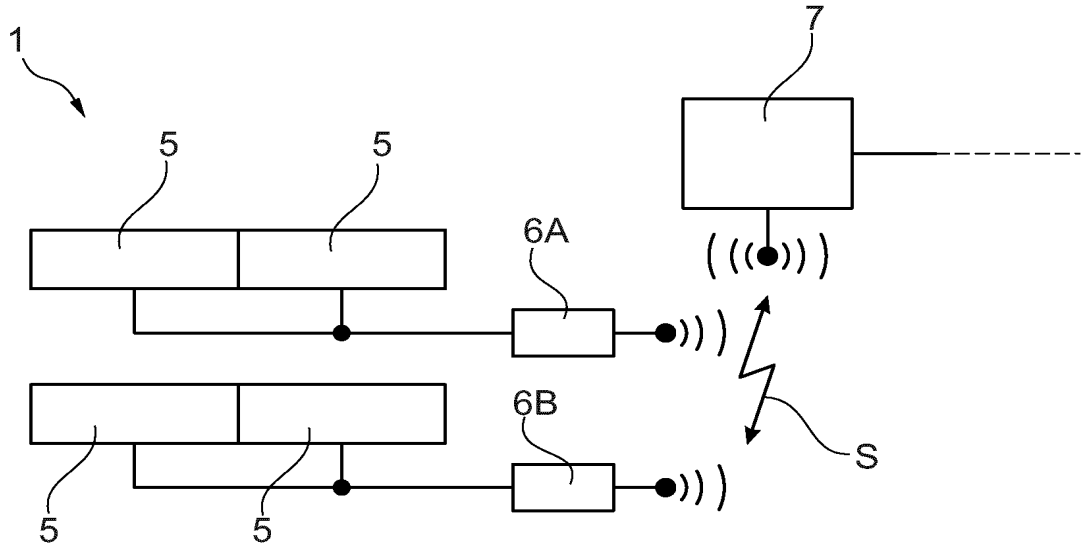


Fig. 2

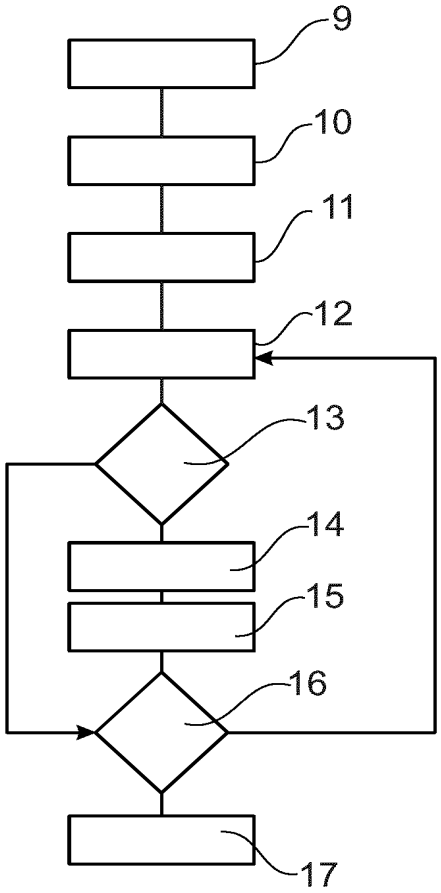


Fig. 3

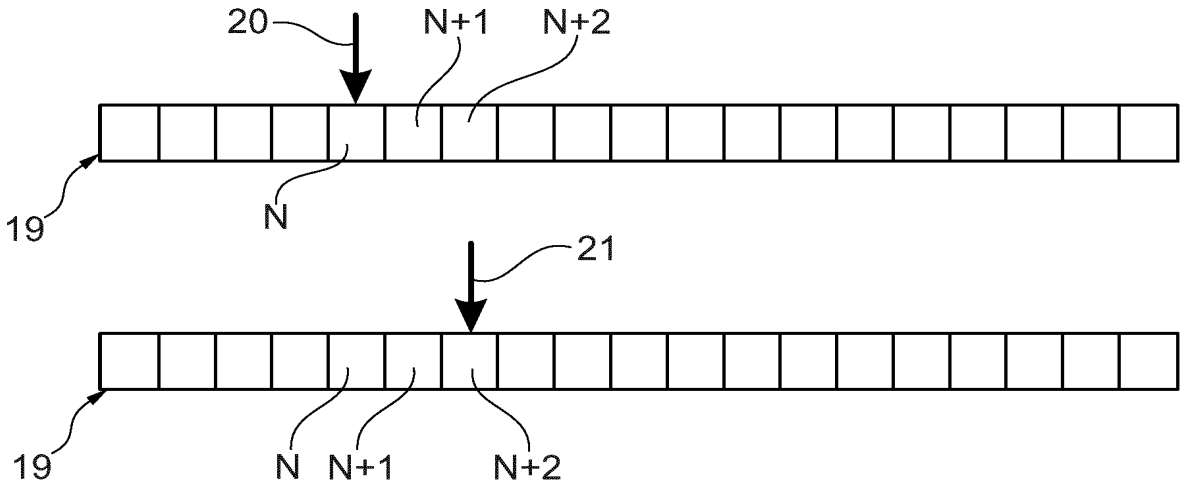


Fig. 4

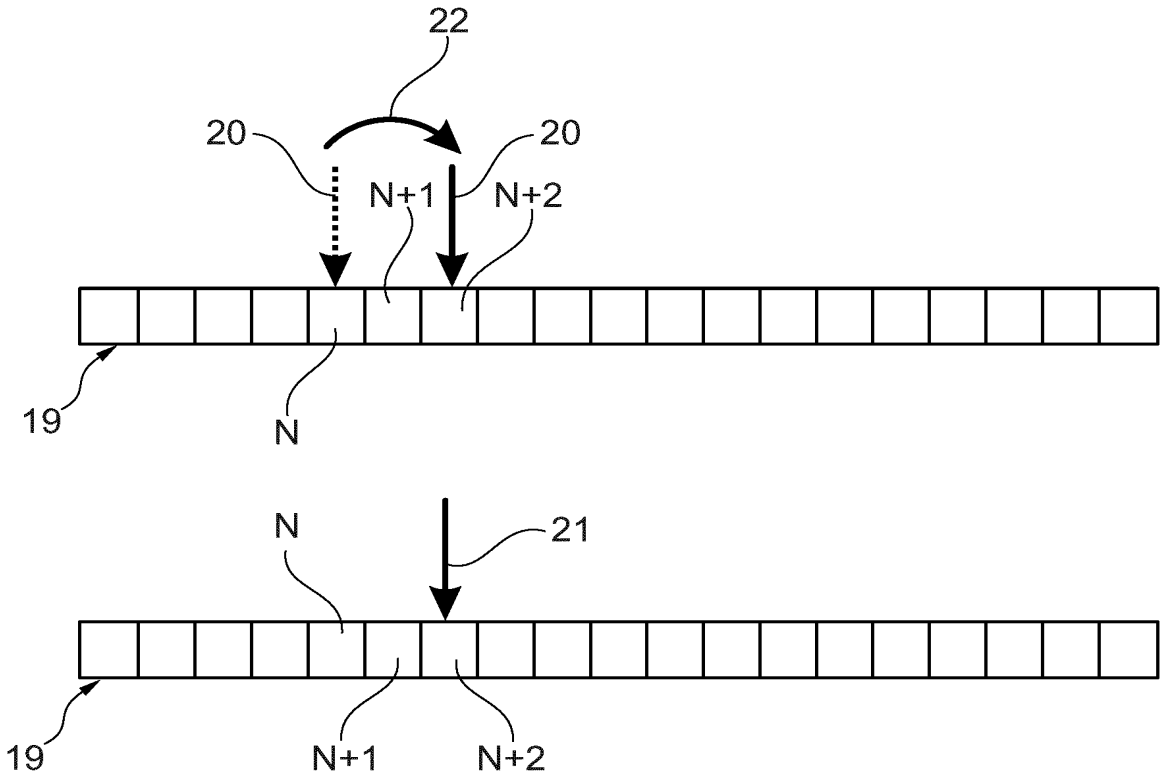


Fig. 5

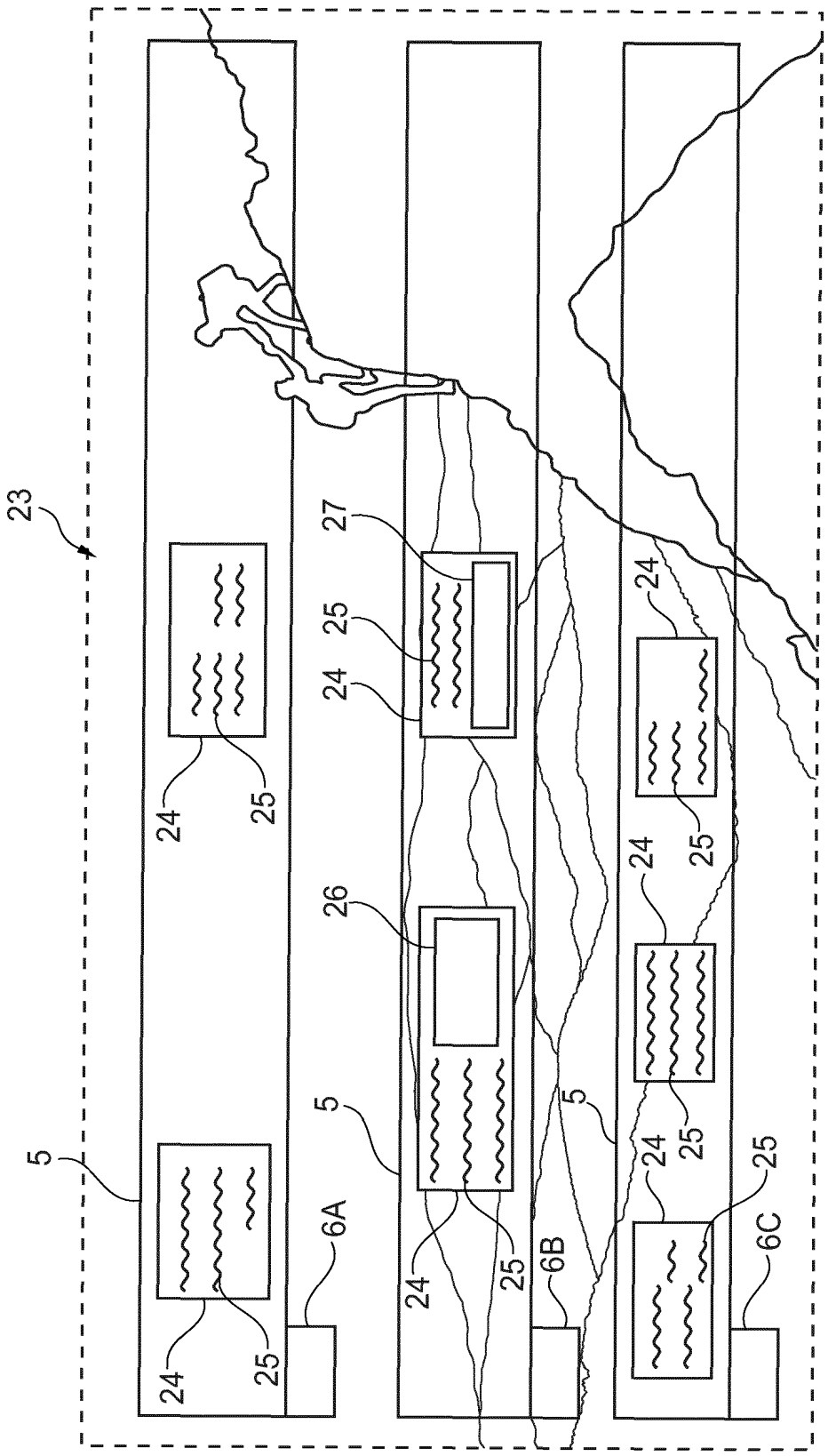


Fig. 6

CLAIMS

1. A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5),
each playback device (6A, 6B) comprises
- a memory to store video data (9) representing said video, and
- a communication stage to communicate data with each other,
wherein the devices (6A, 6B) are designed
+ to transmit video playback progress-data via the communication stage to the other device (6B, 6A) and
+ to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A).

2. The system (1) according to claim 1, comprising a video distribution server (7) for distribution of the video data (9) to the devices (6A, 6B), in particular the entire video data (9) of a video upfront to playback start at the devices (6A, 6B).

3. The system (1) according to any of the preceding claims, wherein the devices (6A, 6B) are designed to determine independently from a video distribution server (7) which distributed the video data (9) to the devices (6A, 6B) that they are in a synchronous or asynchronous playback progress.

4. The system (1) according to any of the preceding claims wherein the devices (6A, 6B) are designed
+ to playback compressed video data (9) that are structured in frames labeled by frame numbers, and

+ to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted.

5. The system (1) according to claim 4, wherein each device (6A, 6B) is designed to compare a frame number received with a frame number of the frame currently played back at the device (6A, 6B) and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value.

6. The system (1) according to any of the preceding claims, wherein each device (6A, 6B) is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second.

7. The system (1) according to any of the preceding claims, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices (6A, 6B) over its communication stage if it detects an asynchronous playback progress.

8. The system (1) according to claim 7, wherein each device (6A, 6B) is designed to embed the adjustment data in a synchronization command.

9. The system (1) according to any of the claims 7-8, wherein each device (6A, 6B) is designed
- to receive the adjustment data and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with

the frame number received in the broadcast of the adjustment data.

10. The system (1) according to any of the preceding claims, wherein the communication stage is designed to use UDP multicast data packets for the communication.

11. The system (1) according to any of the preceding claims, wherein each display device (6A, 6B)
+ comprises its screen (5) or a number of screens (5), or
+ is connected to its external screen (5) or a number of screens (5)
to be controlled by it.

12. The system (1) according to any of the preceding claims, wherein said screen (5) is designed
+ to realize a shelf rail (4) or a part of it, or
+ to cover a front of a shelf rail (4) or a part of it to which it is attachable.

13. The system (1) according to any of the preceding claims, wherein the system realizes a video playback enabled electronic shelf label system.

14. The system (1) according to any of the preceding claims, wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

15. A use of the system (1) according to any of the preceding claims as video playback enabled

electronic shelf label system for the playback of synchronized video content for a number of shelf rails (4), wherein each of said shelfs rails (4) is realized by a screen (5) or carries a screen (5).

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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16 May 2019 (16.05.2019)

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10 November 2017 (10.11.2017)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant: **SES-IMAGOTAG GMBH** [AT/AT]; St. Peter Gürtel 10b, 8042 Graz (AT).

(72) Inventor: **OOSTHOEK, Jan**; Waterlandse Hof 9, 1121 RB Landsmeer (NL).

(74) Agent: **SCHNEIDER, Michael**; Schulweg 8/3/8, 2340 Mödling (AT).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*

(54) **Title:** SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

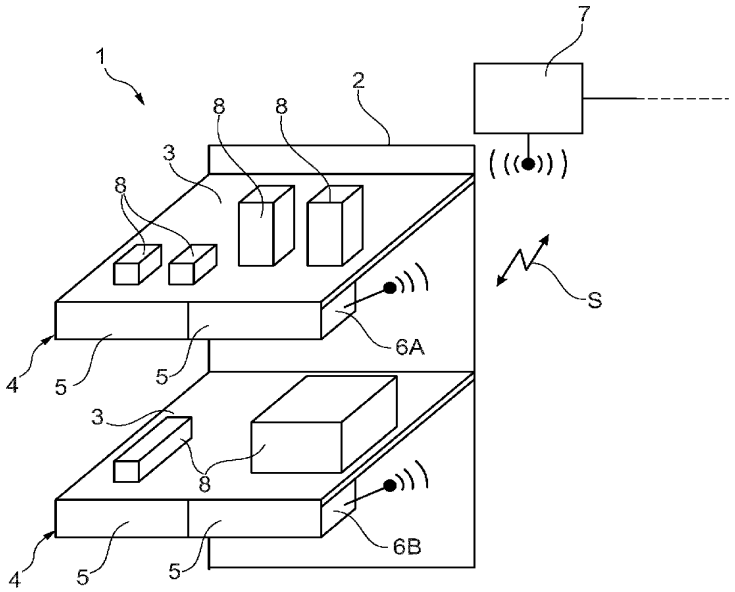


Fig. 1

(57) **Abstract:** A video playback system, comprising a number of playback devices to playback a video on their screens, each playback device comprises a memory to store video data representing said video, and a communication stage to communicate data with each other, wherein the devices are designed to transmit video playback progress-data via the communication stage to the other device and to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices.

WO 2019/091565 A1

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(43) International Publication Date
16 May 2019 (16.05.2019)

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(71) Applicant: **SES-IMAGOTAG GMBH** [AT/AT]; St. Peter Gürtel 10b, 8042 Graz (AT).

(72) Inventor: **OOSTHOEK, Jan**; Waterlandse Hof 9, 1121 RB Landsmeer (NL).

(74) Agent: **SCHNEIDER, Michael**; Schulweg 8/3/8, 2340 Mödling (AT).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*

(54) Title: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES

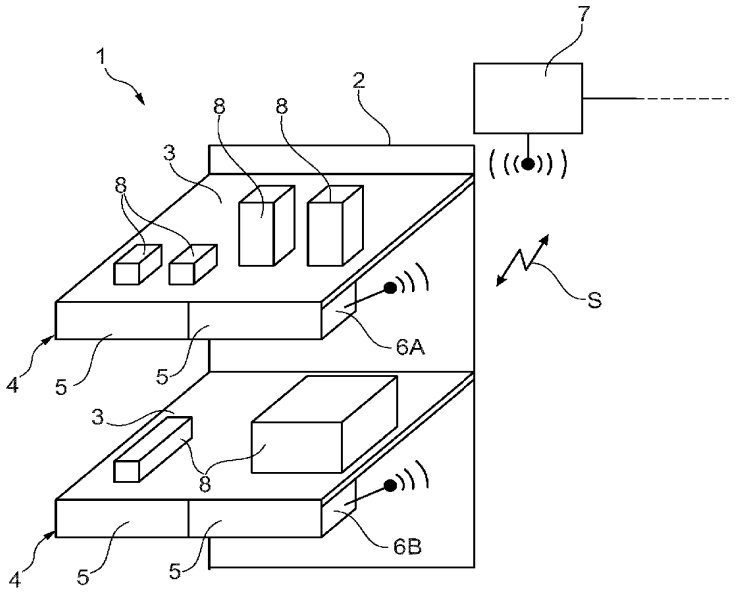


Fig. 1

(57) Abstract: A video playback system, comprising a number of playback devices to playback a video on their screens, each playback device comprises a memory to store video data representing said video, and a communication stage to communicate data with each other, wherein the devices are designed to transmit video playback progress-data via the communication stage to the other device and to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices.

WO 2019/091565 A1

TITLE

System for synchronized video playback on a number of playback devices

DESCRIPTION

TECHNICAL FIELD

The invention relates to a system for synchronized video playback on a number of playback devices.

BACKGROUND

A known video play back system comprises a central server for distributing a video stream to a number of devices. Synchronized playback of the video content by all playback devices is achieved by controlling the playback at the playback devices with a highly precise and system wide timing signal delivered by the server or by a system wide synchronized clock signal available within the playback devices.

The known system shows the drawback that it requires high bandwidth for the just in time distribution of the video content to the video playback devices. Further to this, fast and therefore expensive hardware of the playback devices is required to receive the streamed video, buffering it and to synchronously playback the video content on the individual playback devices in accordance to the timing determined either by the timing signal delivered by the server or the system wide synchronized clock signal.

The object of the invention is to provide a system that avoids the problems discussed above and that is capable of playing back synchronized video on a number of devices comprised of relatively inexpensive hardware.

SUMMARY OF THE INVENTION

This object is achieved by a system according to claim 1. Therefore, the subject matter of the invention is a video playback system, comprising a number of playback devices to playback a video on their screens, each playback device comprises a memory to store video data representing said video, and a communication stage to communicate data with each other, wherein the devices are designed to transmit (broadcast) video playback progress-data via the communication stage to the other device and to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices.

The object is also achieved according to claim 15. Therefore, the subject matter of the invention is a use of the system according to the invention as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails, wherein each of said shelf rails is realized by a screen or carries a screen.

The measures according to the invention provide the advantage that each individual display device can independently detect an asynchronous playback progress within the group of display devices. This is achieved by a simple and fast comparison of the playback progress of another device or of other devices with its own playback progress. In fact, the group of display device establishes an autonomous, distributed detection system for detecting an asynchronous playback progress within this group. No super-efficient and expensive hardware is required to achieve this, which is of particular importance for the targeted use case of the video playback system for synchronized shelf rail video playback, which is explained in detail later. In this use case (application) a very large number of shelf

rails must typically display synchronized video sequences. Hence the number of display devices controlling the screens is also high and therefore must be realized as inexpensive as possible in order to be accepted by the target group of customers.

Further particularly advantageous designs and extensions of the invention arise from the dependent claims and the following description.

For the system, it is of particular advantage that it comprises a video distribution server for distribution of the video data to the devices, in particular the entire video data of a video upfront to playback start at the devices. In particular the server may use the same communication stage for downloading the video data to the devices, which is thereafter used for the transmission of playback progress-data. Advantageously, after download of the video data is completed, the communication channel / medium used for downloading the video data to the device is fully available for the communication of the devices with each other. Hence, no high payload causing communication protocols or negotiation processes between the devices are necessary to transmit the playback progress-data.

According to a fundamental aspect of the invention, it is of particular advantage that the devices are designed to determine independently from a video distribution server, which distributed the video data to the devices, that they are in a synchronous or asynchronous playback progress.

For the sake of clarity, it is mentioned that the communication between the server and the devices as well as the communication between the devices may be realized either by means of wires, e.g. two wire or bus systems, or radio signals.

The devices are designed to playback compressed video data that are structured in frames labeled by frame numbers.

The progress-data may be any indicator that allows to represent the currently played back part of the video or to measure the already elapsed playback time since playback start or to indicate the remaining playback time until the end of the video or the like, e.g. measured in milliseconds or seconds or percentage.

However, according to a preferred embodiment of the invention the devices are designed to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted. This provides the advantage that a representation of the playback progress is used, which is inherently available on all devices without any further computation.

Further to this, each device is designed to compare a frame number received with a frame number of the frame currently played back at the device and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value. Dependent on the actual playback parameters, the threshold may be set to 100, which is programmed upfront to processing into all devices. In this example, a device that currently plays back frame 2500 will determine an asynchronous playback progress if the frame number received from another device is 2602.

In order to keep the information of playback progress permanently updated within the group of devices, each device is designed to repeatedly transmit the progress-data. The exact moment in time the individual device transmits its individual progress-data may be arbitrary, e.g. defined by random within a certain time window or the like. The transmission may also take place every time a new frame of a compressed

video is processed. According to a preferred embodiment the transmission is performed in a periodic manner. Experiments performed during the design and development phase of the system revealed that a periodic transmission every second showed good results in terms of keeping the playback synchronous over the devices. The exact parameter for a particular realization is of course dependent on parameters (speed, accuracy, oscillator drift …) of the hardware used.

The device that detects an asynchronous playback process may influence its individual playback progress so to establish a synchronous playback progress. However, this would not guarantee that its particular measures solve the playback drift of other devices. The result may even be a larger diverging of other devices' playback progress from a synchronous playback progress. Therefore, it is of advantage to use the device that detects the asynchronous playback progress to influence the playback progress all other devices - and also its own playback progress if necessary. According to this finding each device is designed to broadcast adjustment data for adjusting the playback progress of the devices over its communication stage if it detects an asynchronous playback progress.

In a preferred embodiment, advantageously each device is designed to embed the adjustment data in a synchronization command that is broadcasted if it detects an asynchronous playback progress. This allows an unambiguous detection of the adjustment data on the side of the devices receiving the transmission.

In order to properly and rapidly react on the detected asynchronous playback progress, each device is designed to receive the adjustment data (embedded in said synchronization command that is decoded / detected when received) and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are

structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data. In this preferred embodiment, immediately after detection of the asynchronous playback progress the detecting device (the device that detected the asynchronous playback progress) defines the frame number at which playback shall continue and instructs all the other devices to switch to said defined frame number. All other devices follow this instruction with immediate effect upon receipt of the synchronization command. The continuation of the playback at the defined frame number may be delayed for a short period (so short that it is practically invisible by the viewer) so that all devices can timely follow the instruction to switch their playback progress to said defined frame number. This provides a highly efficient system behavior that requires very little communication bandwidth and processing power in order to secure a synchronous playback progress over the entire group of devices.

The communication between the devices may be performed according to various protocol implementations. In order to keep the communication highly efficient in an environment with up to a few thousand devices it is of particular advantage that the communication stage is designed to use UDP multicast data packets for the communication. Here UDP stand for "User Datagram Protocol" and multicast means a transmission of a message from one device to a number of devices.

According to an embodiment of the invention each display device may comprise its screen or a number of screens to be controlled by it. Regarding its resolution, a screen may be a standard definition, high definition or even ultra-height video panel. According to a further embodiment of the invention each device may be connected to its external screen or a number of

screens to be controlled by it. In addition, also mixed configurations may be envisaged. In this configuration video data processing is performed in the device that in turn submit display data or display signals to the screen, where the data or signals are converted into visible images.

In a preferred embodiment said screen is designed to realize a shelf rail or a part of it, or to cover a front of a shelf rail or a part of it to which it is attachable. Such a screen typically shows large width measured along the shelf rail length in comparison to little height measured perpendicular thereto.

In such a configuration, the system realizes a video playback enabled electronic shelf label system.

Here it is of particular advantage that the display devices are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's display area overlapping with a video content or substituting a video content of said section.

Further to this, the devices may be designed to playback a plurality of videos simultaneously. For example, a background video may be played back on a number of shelf rails while at the same time an advertisement video may be played back on the same shelf rails but in a spatially limited video window within the screen areas of the individual screens. In this video window, it overlaps or replaces the background video. Also in this scenario, the measures of the invention can be applied to each video (the background video and the advertisement video) in order to keep its playback synchronized over all involved devices. The additional – e.g. advertisement related – video may be played back independently from the aforementioned virtual electronic shelf labels or as an element of the content of said virtual self labels.

Given the fact that in a large retail store a huge number of shelf rails may exist, it is of utmost economic benefit to utilize inexpensive hardware for the installation of such video playback enabled electronic shelf labels throughout the entire store. Here the measures according to the invention enable a stable and synchronous video playback on all shelf rails by means of a very simple and inexpensive display device hardware without any server interaction to guarantee synchronism in the playback progress. Advantageously, also the payload e.g. in the radio channel used to keep the display devices in synchronism with each other is so low that hardly any or even no other communication processes between other devices in the ecosystem of the retail store are disturbed.

The features of the invention may be realized by means of pure hardware or of programmable hardware on which a software is executed, e.g. microprocessors, microcontrollers or application specific circuits with memory devices to store the software are to be considered.

The devices and their screens are supplied with electric power by means of a centralized power supply or distributed power supplies. Electric power is supplied by means of cables. Also battery powered systems are possible.

These and other aspects of the invention are obtained from the figures discussed below.

BRIEF DESCRIPTION OF THE FIGURES

The invention is explained again hereafter with reference to the attached figures and on the basis of exemplary embodiments, which nevertheless do not limit the scope of the invention. In the different figures the same components are labelled with identical reference numbers. They show in schematic fashion in:

Fig. 1 a system according to the invention installed in a retail store;

Fig. 2 a schematic view of components of the system;

Fig. 3 a method according to the invention;

Fig. 4 - 5 two video data streams structured in frames;

Fig. 6 a visualization of an application of the invention.

DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

Shown on Fig. 1 as a video playback system 1 according to the invention. The system 1 is installed in a retail shop of which only a shelf 2 is shown. The shelf 2 has two shelf floors 3 on which goods 8 are placed. At its front, each shelf floors 3 comprises a shelf rail 4 (not shown in detail) to which two video screens 5 are attached along its entire length. Further to this two identical playback devices 6A and 6B are shown. The first device 6A is connected to the screens 5 on the upper floor 3 and the second device 6B is connected to the screens 5 on the lower floor 3.

The video content (film) to be displayed on the screens 5 is supplied by a server 7 via a radio signal 8 to both devices 6A and 6B. The video content is delivered in form of compressed video data that are structured in frames labeled by frame numbers.

Figure 2 shows the connection of the components in form of a block diagram. Here a wire-based connection of the devices 6A and 6B with their displays 5 is shown.

In the following the operation of the system 1 is explained by a method of synchronizing the playback of the video over both devices 6A and 6B. As a result, the video playback on both shelf rails is synchronized with

each other. The method is now explained by the aid of a flow diagram shown in Figure 3.

The method starts in block 9. In block 10 the server sends out the video to the devices 6A, 6B. In block 11 the devices 6a, 6B start playing back the video.

In block 12 each device 6A and 6B attends the lapse of one second of its own clock. After one second has lapsed, the respective device 6A, 6B transmits the playback progress-data, which represent the frame number of the correctly used frame in the respective device 6A, 6B. The transmission of the playback progress-data of the device 6A is received at the device 6B and vice versa.

In block 13 the devices 6A, 6B compare the received frame number with the frame number currently in use in its own playback process.

Irrespective of the question which of the two devices 6A, 8B detects a difference of more than 2 frames at first, the device 6A or 6B that detected the difference sends out a synchronization commend immediately, which happens in block 14. The argument of the synchronization command is the higher fame number of the two frame numbers compared with each other.

In the following this method is explained by the aid of Figure 4 and Figure 5 that visualize frame structured video data 19. The upper video data 19 are processed by the first device 6A while the lower video data 19 are processed by the second device 6B. Both video data 19 and 20 are identical and were submitted as initially mentioned by the server. Figure 4 also shows an asynchronous playback progress because a first processing pointer 20 indicates the frame number N that is currently processed by the first device 6A while at the same time the second device 6B processes frame number N+2 which is shown with a second processing pointer 21.

Here frame number N+2, which is the higher number of the two frames compared with each other, is the argument of the synchronization command.

In the present example, it is assumed that the first device 6A has detected the asynchronous playback progress at first and sends out the synchronization command.

Going now back to Figure 3, in block 15 both devices 6A and 6B are re-synchronized by continuing their playback at frame number N+2. Also Figure 5 shows the re-synchronization of the playback progress. In particular it shows that the first processing pointer 20 is moved forward to frame number N+2 (indicated by arrow 22) while the second processing pointer 21 remained at frame number N+2.

Now at frame number N+2 both devices continue to playback the video, which in Figure 3 is associated with block 15.

In block 16 a check is performed if the video has reached its end. If the end is not reached the method branches to block 12 in order to attend the lapse of said one second interval bevor the check for synchronism is repeated.

If in block 16 the end of the video is detected the method ends in block 17. It is to mention that the video can also be repeated by loop play.

If in block 13 no difference greater than 2 is detected, the method branches to block 16.

Although the method of the invention was so far explained by only two display devices 6A and 6B, it is to mention that in a system with a relatively high number of display devices (e.g. a few thousands) a significant number of devices may operate for longer periods in synchronism with each other before a single asynchronous event is detected by one of the devices. This detected event of asynchronous playback progress then causes all the other devices to adjust to the

frame number dictated by the device that detected the asynchronous playback progress.

In the following the operation of the system 1 is now explained by the aid of Fig. 6. Fig. 6 shows a snapshot of a video 23 that was distributed to three display devices 6A, 6B, 6C by the server 7 before playback started on said devices 6A – 6C. According to this embodiment each device 6A - 6C drives a single screen 5.

Although the shelf 2 on which the screens 5 are installed is not shown in Figure 6, it is mentioned for the sake of clarity that each of the devices 6A – 6C controls the playback of its individual screen 5. Each of the screens 5 covers one of the shelf rails 4. Each shelf rail 4 forms the front of a shelf floor 3 on which in the present case mountaineering products (not shown) are presented. The three shelf floors 3 are arranged one above the other as part of the shelf 2.

The devices 6A, 6B, 6C were programmed by the server 7 to playback only a part of the entire content of the video 23 with individual zoom settings. Here the zoom for the upper screen 5 mounted on the upper shelf rail 4 is set to an upper part of the video 23 that shows in the snapshot two climbers reaching the top of a mountain. The zoom for the screen 5 on the middle shelf rail 4 was set to the center part of the video 23 showing in the snapshot the leg of one of the climbers just before moving upwards. The zoom of the screen 5 on the bottom shelf rail 4 shows on its left side the view into the distant landscape while on its right part rocks in the foreground are visible in the snapshot.

The zoom on the individual sections of the video is realized e.g. by the aid of a well-known video-feature called “viewbox”. The video content outside the three individual zoom settings is simply not shown on the screens 5. However, in the spatial arrangement of

the shelf 2 this area between the screens 5 is used to present products related to mountaineering.

This allows to spatial distribute the synchronized video experience over the three screens 5, in fact over the three shelf rails 4. Due to the spatial distribution of the mountaineer video 23 over the three shelf rails 4, the mountaineering products are now presented in the appropriate context.

In addition to this, Fig. 6 also shows electronic shelf label content 24 (of virtual electronic shelf labels) displayed at the appropriate position where sais mountaineering products are located on the shelf floors 3. This content is embedded into to the video 23 and also supplied by the server 7 to the individual devices 6A – 6C. The content 24 may comprise static (textual) information related to product and / or price information indicated by wavy lines 25. The content 24 may also comprise individual video sequences 25 and 26 which are assigned to particular electronic shelf label 24 (see for example the middle screen 5).

Further to this, also the entire electronic shelf label content 24 or even individual areas of the screens 5 may be used to display an advertisement video that was initially distributed to the individual playback devices 6A – 6C and then played back distributed over the three shelf rail screens 5. Similar to the (background) video 23 the entire advertisement experience assembles from the distributed display of individual advertisement elements of the advertisement video played back in synchronous mode on the different screens 5. In this mode in fact two different videos - on the one hand the (background) video 23 and on the other hand said advertisement video – are played back simultaneously by the display devices 6A – 6C. Also in this simultaneous playback mode, the devices 6A – 6C make use of the measures according to the invention to keep playback on the different display

devices 6A – 6C for the two individual videos (the background video 23 and the advertisement video) synchronized.

This concept may also be applied to a higher number of videos.

The measures according to the invention may also be applied in a configuration where the video 23 (and optionally together with other advertisement videos as mentioned above) is e.g. played back in synchronized mode on display devices 6A, 6B, 6C, …, distributed over two or more shelfs 2, e.g. located side by side or stacked over each other.

Hence, for all the various video experiences that are achievable by distributed video playback over a number of shelfs rails 4 the measures according to the invention to keep video playback synchronized can be advantageously applied.

In summary, the method and the system of the invention provide a robust and reliable, instantaneous re-synchronization of the playback progress over the entire group of playback devices. This feature can be realized with relatively cheap hardware and do not require any high sophisticated communication protocols to be executed.

Finally, let it be noted once again that the figures described in detail above only involve exemplary embodiments, which the expert can modify in a wide variety of ways without departing from the area of the invention. For the sake of completeness, let it also be stated that use of the indeterminate article "a" or "an" does not mean that the respective features cannot be present multiple times.

CLAIMS

1. A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5),
each playback device (6A, 6B) comprises
- a memory to store video data (9) representing said video, and
- a communication stage to communicate data with each other,
wherein the devices (6A, 6B) are designed
+ to transmit video playback progress-data via the communication stage to the other device (6B, 6A) and
+ to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A).

2. The system (1) according to claim 1, comprising a video distribution server (7) for distribution of the video data (9) to the devices (6A, 6B), in particular the entire video data (9) of a video upfront to playback start at the devices (6A, 6B).

3. The system (1) according to any of the preceding claims, wherein the devices (6A, 6B) are designed to determine independently from a video distribution server (7) which distributed the video data (9) to the devices (6A, 6B) that they are in a synchronous or asynchronous playback progress.

4. The system (1) according to any of the preceding claims wherein the devices (6A, 6B) are designed
+ to playback compressed video data (9) that are structured in frames labeled by frame numbers, and

+ to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted.

5. The system (1) according to claim 4, wherein each device (6A, 6B) is designed to compare a frame number received with a frame number of the frame currently played back at the device (6A, 6B) and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value.

6. The system (1) according to any of the preceding claims, wherein each device (6A, 6B) is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second.

7. The system (1) according to any of the preceding claims, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices (6A, 6B) over its communication stage if it detects an asynchronous playback progress.

8. The system (1) according to claim 7, wherein each device (6A, 6B) is designed to embed the adjustment data in a synchronization command.

9. The system (1) according to any of the claims 7-8, wherein each device (6A, 6B) is designed
- to receive the adjustment data and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with

the frame number received in the broadcast of the adjustment data.

10. The system (1) according to any of the preceding claims, wherein the communication stage is designed to use UDP multicast data packets for the communication.

11. The system (1) according to any of the preceding claims, wherein each display device (6A, 6B)
+ comprises its screen (5) or a number of screens (5), or
+ is connected to its external screen (5) or a number of screens (5)
to be controlled by it.

12. The system (1) according to any of the preceding claims, wherein said screen (5) is designed
+ to realize a shelf rail (4) or a part of it, or
+ to cover a front of a shelf rail (4) or a part of it to which it is attachable.

13. The system (1) according to any of the preceding claims, wherein the system realizes a video playback enabled electronic shelf label system.

14. The system (1) according to any of the preceding claims, wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

15. A use of the system (1) according to any of the preceding claims as video playback enabled

electronic shelf label system for the playback of synchronized video content for a number of shelf rails (4), wherein each of said shelfs rails (4) is realized by a screen (5) or carries a screen (5).

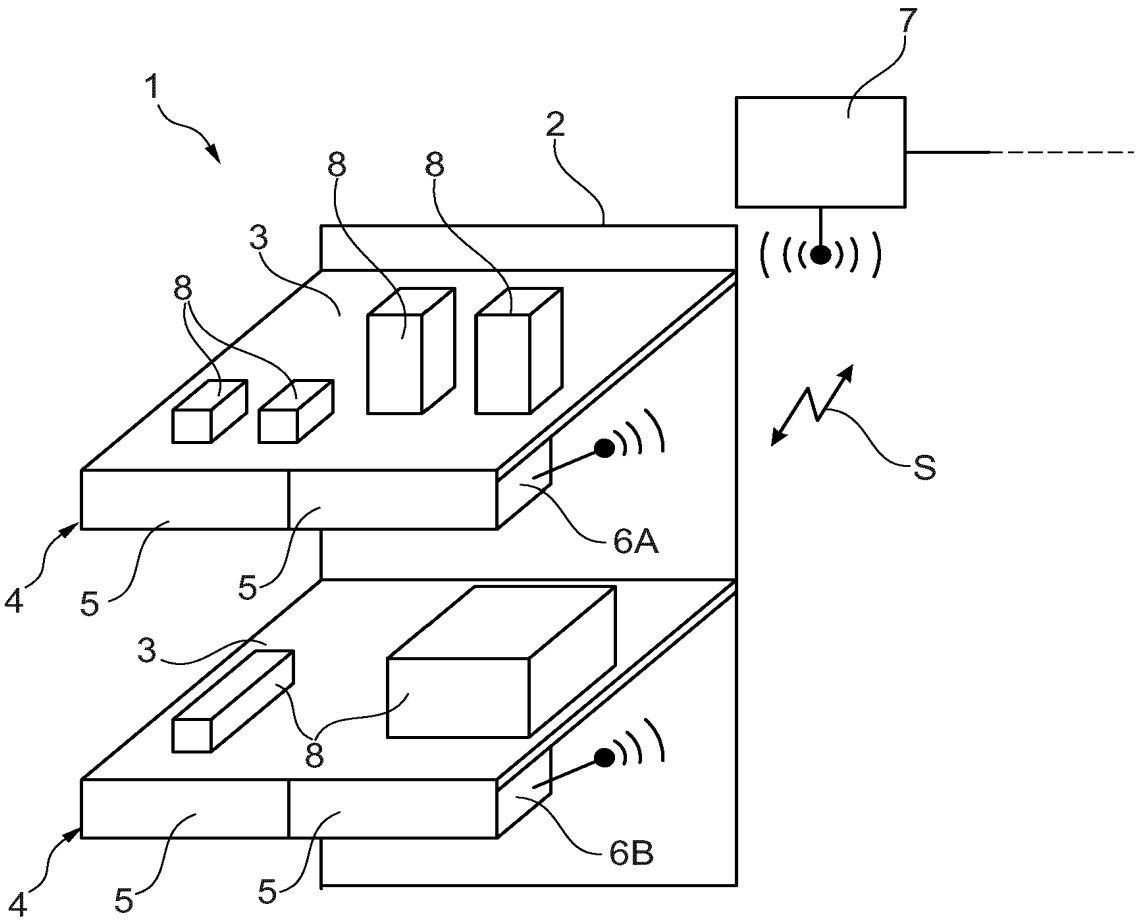


Fig. 1

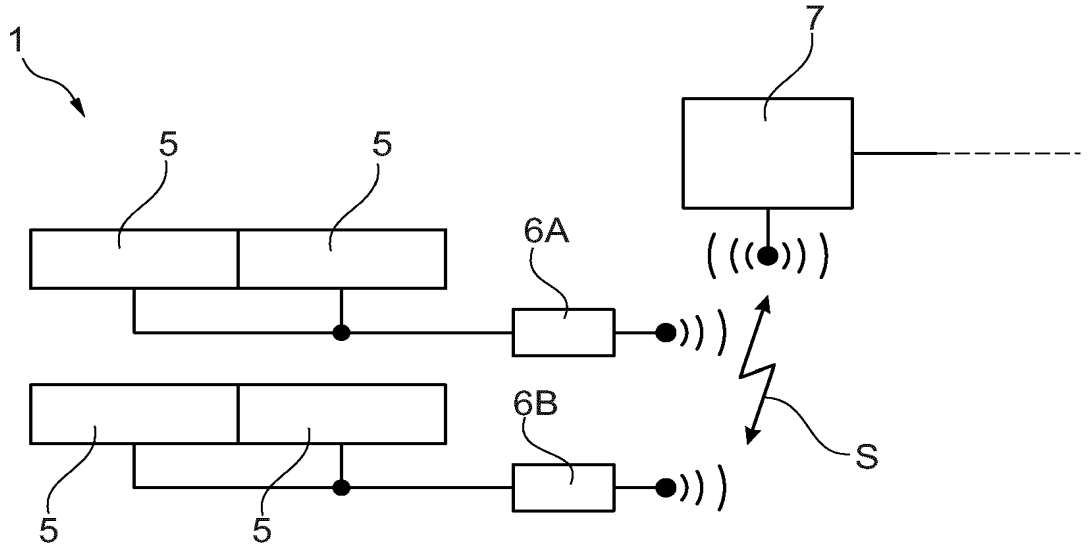


Fig. 2

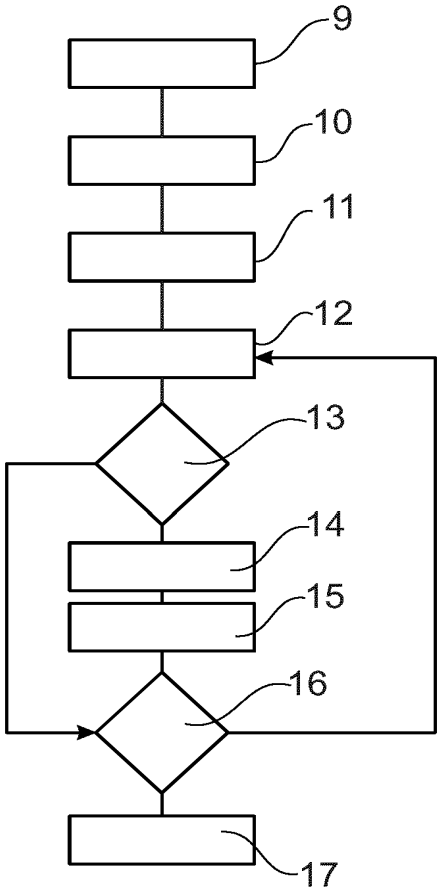


Fig. 3

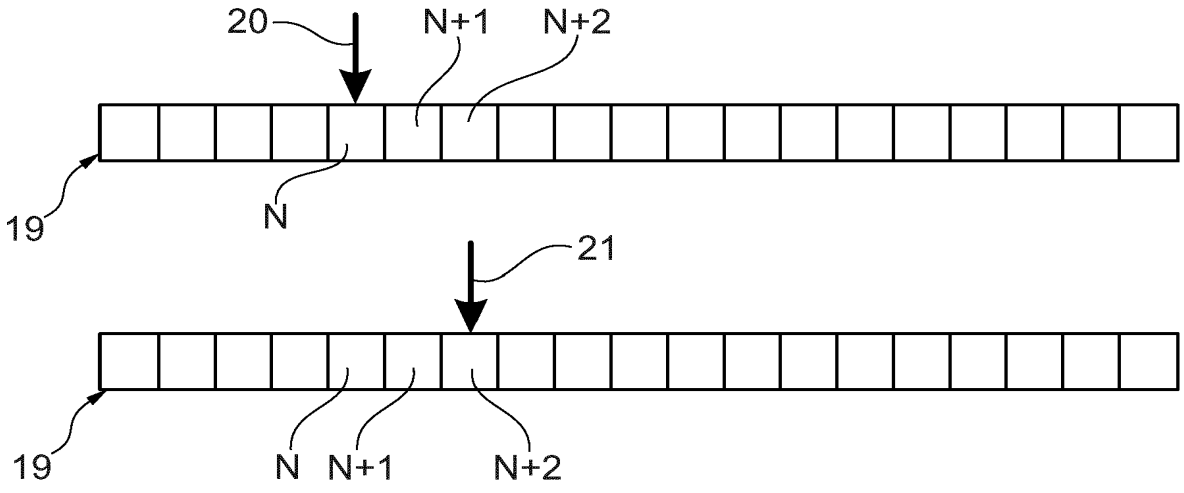


Fig. 4

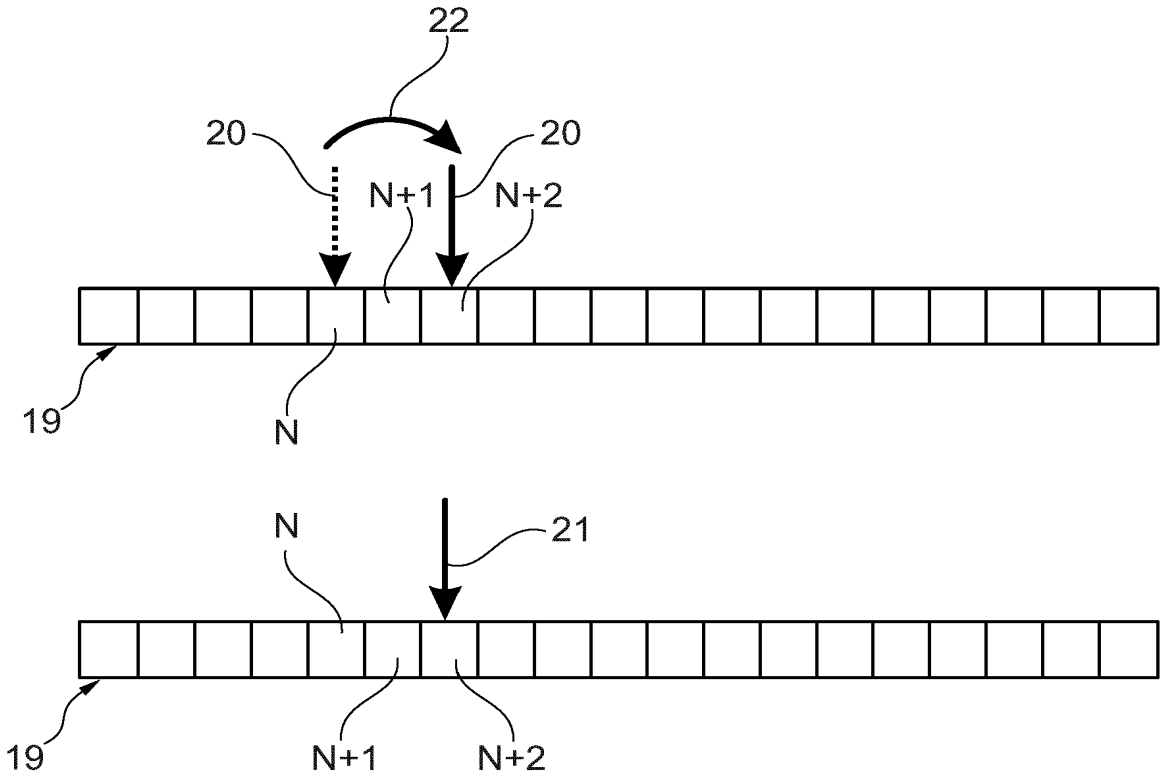


Fig. 5

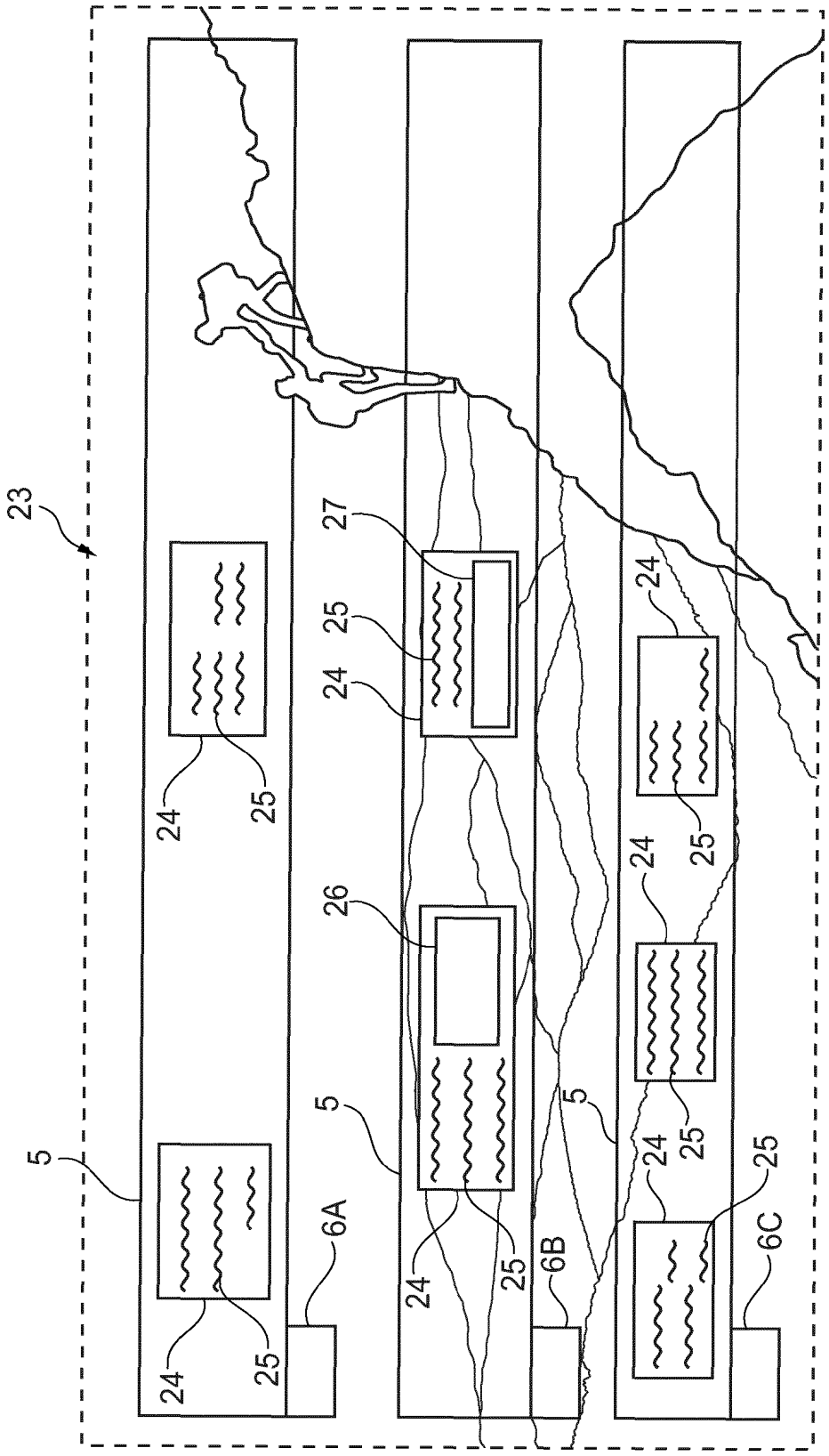


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/078844

A. CLASSIFICATION OF SUBJECT MATTER
INV. G09G5/12
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G09G G06F

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP 2 347 682 A1 (SEIKO INSTR INC [JP]) 27 July 2011 (2011-07-27) paragraph [0008] - paragraph [0126]	1-15
X	US 2014/029910 A1 (MARUYAMA KIYOYASU [JP] ET AL) 30 January 2014 (2014-01-30)	1-11
A	paragraph [0011] - paragraph [0225]	12-15
X	US 2012/075334 A1 (POURBIGHARAZ FARIBORZ [CA] ET AL) 29 March 2012 (2012-03-29)	1-11
A	paragraph [0016] - paragraph [0085]	12-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 December 2017	03/01/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Horn, Ralph

2

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2017/078844

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		WO 2012044703 A1	05-04-2012

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 242

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan Oosthoek
Filer:	Daniel Michael Gurfinkel
Attorney Docket Number:	24010-10166689PF

Filed as Small Entity

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
BASIC NATIONAL STAGE FEE	2631	1	150	150
NATL STAGE SEARCH FEE - REPORT PROVIDED	2642	1	260	260
NATL STAGE EXAM FEE - ALL OTHER CASES	2633	1	380	380
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**790**

Electronic Acknowledgement Receipt

EFS ID:	39391906
Application Number:	16762709
International Application Number:	PCT/EP2017/078844
Confirmation Number:	5709
Title of Invention:	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES
First Named Inventor/Applicant Name:	Jan Oosthoek
Customer Number:	12271
Filer:	Daniel Michael Gurfinkel
Filer Authorized By:	
Attorney Docket Number:	24010-10166689PF
Receipt Date:	08-MAY-2020
Filing Date:	
Time Stamp:	15:06:21
Application Type:	U.S. National Stage under 35 USC 371

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Payment Type	CARD
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RAM confirmation Number	E202058F07270856
Deposit Account	
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	ADS_89.pdf	1256086 4c888764586c49a365640bd9d77f8be8e84ebbac	no	8
Warnings:					
Information:					
2		spec_claims_abs_89.pdf	95640 6a70f53a2ead77355ca6bba35718e3b81dcd0f21	yes	19

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	14
Claims	15	18
Abstract	19	19

Warnings:					
Information:					
3	Drawings-only black and white line drawings	drawings_89.pdf	444385 a34bc7baea950ab765a1be4e79f94da8982e0a59	no	4
Warnings:					
Information:					
4	Preliminary Amendment	Prel_amend_89.pdf	2671922 1ebe38bb6885ebd2aed6bad0db7b4e8bfe4f131c	no	8
Warnings:					
Information:					
5	Documents submitted with 371 Applications	PCT_papers_89.pdf	1333163 2fc402c4c320445e62337f1552a5f3bb0f05f877	no	25

Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	35352 8555772fcf005d71dacbe2430dfdf36d2159d197	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	5836548	

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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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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24010-10166689PF
	Application Number	
Title of Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jan		OOSTHOEK	

Residence Information (Select One) US Residency ● Non US Residency Active US Military Service

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Mailing Address of Inventor:

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Address 2	

City	Landsmeer	State/Province	
Postal Code	1121 RB	**Country** i	NL

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

Correspondence Information:

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

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

Customer Number	12271		
Email Address	docket@dennemeyer-law.com	Add Email	Remove Email

Application Information:

Title of the Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES		
Attorney Docket Number	24010-10166689PF	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	**Suggested Figure for Publication (if any)**	1

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24010-10166689PF
	Application Number	
Title of Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	

Filing By Reference:

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

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

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

Publication Information:

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

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

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
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Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	12271		

Domestic Benefit/National Stage Information:

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

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	a 371 of international	PCT/EP2017/078844	2017-11-10

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24010-10166689PF
	Application Number	
Title of Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	

Foreign Priority Information:

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

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Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24010-10166689PF
	Application Number	
Title of Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	

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

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

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24010-10166689PF
	Application Number	
Title of Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	

Applicant Information:

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

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	SES-Imagotag GmbH		
Mailing Address Information For Applicant:			
Address 1	Kalsdorferstraße 12		
Address 2			
City	Fernitz-Mellach	**State/Province**	
Country	AT	Postal Code	A-8072
Phone Number		Fax Number	
Email Address			

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Assignee Information including Non-Applicant Assignee Information:

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Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
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Signature:

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

Signature	/Daniel M. Gurfinkel/			Date (YYYY-MM-DD)	2020-05-08
First Name	Daniel	Last Name	Gurfinkel	Registration Number	34177

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	24010-10166689PF
	Application Number	
Title of Invention	SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	

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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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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.

TP0352

TITLE

System for synchronized video playback on a number of playback devices

DESCRIPTION

TECHNICAL FIELD

The invention relates to a system for synchronized video playback on a number of playback devices.

BACKGROUND

A known video play back system comprises a central server for distributing a video stream to a number of devices. Synchronized playback of the video content by all playback devices is achieved by controlling the playback at the playback devices with a highly precise and system wide timing signal delivered by the server or by a system wide synchronized clock signal available within the playback devices.

The known system shows the drawback that it requires high bandwidth for the just in time distribution of the video content to the video playback devices. Further to this, fast and therefore expensive hardware of the playback devices is required to receive the streamed video, buffering it and to synchronously playback the video content on the individual playback devices in accordance to the timing determined either by the timing signal delivered by the server or the system wide synchronized clock signal.

The object of the invention is to provide a system that avoids the problems discussed above and that is capable of playing back synchronized video on a number of devices comprised of relatively inexpensive hardware.

SUMMARY OF THE INVENTION

This object is achieved by a system according to claim 1. Therefore, the subject matter of the invention is a video playback system, comprising a number of playback devices to playback a video on their screens, each playback device comprises a memory to store video data representing said video, and a communication stage to communicate data with each other, wherein the devices are designed to transmit (broadcast) video playback progress-data via the communication stage to the other device and to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices.

The object is also achieved according to claim 15. Therefore, the subject matter of the invention is a use of the system according to the invention as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails, wherein each of said shelf rails is realized by a screen or carries a screen.

The measures according to the invention provide the advantage that each individual display device can independently detect an asynchronous playback progress within the group of display devices. This is achieved by a simple and fast comparison of the playback progress of another device or of other devices with its own playback progress. In fact, the group of display device establishes an autonomous, distributed detection system for detecting an asynchronous playback progress within this group. No super-efficient and expensive hardware is required to achieve this, which is of particular importance for the targeted use case of the video playback system for synchronized shelf rail video playback, which is explained in detail later. In this use case (application) a very large number of shelf

rails must typically display synchronized video sequences. Hence the number of display devices controlling the screens is also high and therefore must be realized as inexpensive as possible in order to be accepted by the target group of customers.

Further particularly advantageous designs and extensions of the invention arise from the dependent claims and the following description.

For the system, it is of particular advantage that it comprises a video distribution server for distribution of the video data to the devices, in particular the entire video data of a video upfront to playback start at the devices. In particular the server may use the same communication stage for downloading the video data to the devices, which is thereafter used for the transmission of playback progress-data. Advantageously, after download of the video data is completed, the communication channel / medium used for downloading the video data to the device is fully available for the communication of the devices with each other. Hence, no high payload causing communication protocols or negotiation processes between the devices are necessary to transmit the playback progress-data.

According to a fundamental aspect of the invention, it is of particular advantage that the devices are designed to determine independently from a video distribution server, which distributed the video data to the devices, that they are in a synchronous or asynchronous playback progress.

For the sake of clarity, it is mentioned that the communication between the server and the devices as well as the communication between the devices may be realized either by means of wires, e.g. two wire or bus systems, or radio signals.

The devices are designed to playback compressed video data that are structured in frames labeled by frame numbers.

The progress-data may be any indicator that allows to represent the currently played back part of the video or to measure the already elapsed playback time since playback start or to indicate the remaining playback time until the end of the video or the like, e.g. measured in milliseconds or seconds or percentage.

However, according to a preferred embodiment of the invention the devices are designed to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted. This provides the advantage that a representation of the playback progress is used, which is inherently available on all devices without any further computation.

Further to this, each device is designed to compare a frame number received with a frame number of the frame currently played back at the device and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value. Dependent on the actual playback parameters, the threshold may be set to 100, which is programmed upfront to processing into all devices. In this example, a device that currently plays back frame 2500 will determine an asynchronous playback progress if the frame number received from another device is 2602.

In order to keep the information of playback progress permanently updated within the group of devices, each device is designed to repeatedly transmit the progress-data. The exact moment in time the individual device transmits its individual progress-data may be arbitrary, e.g. defined by random within a certain time window or the like. The transmission may also take place every time a new frame of a compressed

video is processed. According to a preferred embodiment the transmission is performed in a periodic manner. Experiments performed during the design and development phase of the system revealed that a periodic transmission every second showed good results in terms of keeping the playback synchronous over the devices. The exact parameter for a particular realization is of course dependent on parameters (speed, accuracy, oscillator drift …) of the hardware used.

The device that detects an asynchronous playback process may influence its individual playback progress so to establish a synchronous playback progress. However, this would not guarantee that its particular measures solve the playback drift of other devices. The result may even be a larger diverging of other devices' playback progress from a synchronous playback progress. Therefore, it is of advantage to use the device that detects the asynchronous playback progress to influence the playback progress all other devices – and also its own playback progress if necessary. According to this finding each device is designed to broadcast adjustment data for adjusting the playback progress of the devices over its communication stage if it detects an asynchronous playback progress.

In a preferred embodiment, advantageously each device is designed to embed the adjustment data in a synchronization command that is broadcasted if it detects an asynchronous playback progress. This allows an unambiguous detection of the adjustment data on the side of the devices receiving the transmission.

In order to properly and rapidly react on the detected asynchronous playback progress, each device is designed to receive the adjustment data (embedded in said synchronization command that is decoded / detected when received) and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are

structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data. In this preferred embodiment, immediately after detection of the asynchronous playback progress the detecting device (the device that detected the asynchronous playback progress) defines the frame number at which playback shall continue and instructs all the other devices to switch to said defined frame number. All other devices follow this instruction with immediate effect upon receipt of the synchronization command. The continuation of the playback at the defined frame number may be delayed for a short period (so short that it is practically invisible by the viewer) so that all devices can timely follow the instruction to switch their playback progress to said defined frame number. This provides a highly efficient system behavior that requires very little communication bandwidth and processing power in order to secure a synchronous playback progress over the entire group of devices.

The communication between the devices may be performed according to various protocol implementations. In order to keep the communication highly efficient in an environment with up to a few thousand devices it is of particular advantage that the communication stage is designed to use UDP multicast data packets for the communication. Here UDP stand for “User Datagram Protocol” and multicast means a transmission of a message from one device to a number of devices.

According to an embodiment of the invention each display device may comprise its screen or a number of screens to be controlled by it. Regarding its resolution, a screen may be a standard definition, high definition or even ultra-height video panel. According to a further embodiment of the invention each device may be connected to its external screen or a number of

screens to be controlled by it. In addition, also mixed configurations may be envisaged. In this configuration video data processing is performed in the device that in turn submit display data or display signals to the screen, where the data or signals are converted into visible images.

In a preferred embodiment said screen is designed to realize a shelf rail or a part of it, or to cover a front of a shelf rail or a part of it to which it is attachable. Such a screen typically shows large width measured along the shelf rail length in comparison to little height measured perpendicular thereto.

In such a configuration, the system realizes a video playback enabled electronic shelf label system.

Here it is of particular advantage that the display devices are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's display area overlapping with a video content or substituting a video content of said section.

Further to this, the devices may be designed to playback a plurality of videos simultaneously. For example, a background video may be played back on a number of shelf rails while at the same time an advertisement video may be played back on the same shelf rails but in a spatially limited video window within the screen areas of the individual screens. In this video window, it overlaps or replaces the background video. Also in this scenario, the measures of the invention can be applied to each video (the background video and the advertisement video) in order to keep its playback synchronized over all involved devices. The additional – e.g. advertisement related – video may be played back independently from the aforementioned virtual electronic shelf labels or as an element of the content of said virtual self labels.

Given the fact that in a large retail store a huge number of shelf rails may exist, it is of utmost economic benefit to utilize inexpensive hardware for the installation of such video playback enabled electronic shelf labels throughout the entire store. Here the measures according to the invention enable a stable and synchronous video playback on all shelf rails by means of a very simple and inexpensive display device hardware without any server interaction to guarantee synchronism in the playback progress. Advantageously, also the payload e.g. in the radio channel used to keep the display devices in synchronism with each other is so low that hardly any or even no other communication processes between other devices in the ecosystem of the retail store are disturbed.

The features of the invention may be realized by means of pure hardware or of programmable hardware on which a software is executed, e.g. microprocessors, microcontrollers or application specific circuits with memory devices to store the software are to be considered.

The devices and their screens are supplied with electric power by means of a centralized power supply or distributed power supplies. Electric power is supplied by means of cables. Also battery powered systems are possible.

These and other aspects of the invention are obtained from the figures discussed below.

BRIEF DESCRIPTION OF THE FIGURES

The invention is explained again hereafter with reference to the attached figures and on the basis of exemplary embodiments, which nevertheless do not limit the scope of the invention. In the different figures the same components are labelled with identical reference numbers. They show in schematic fashion in:

Fig. 1 a system according to the invention installed in a retail store;
Fig. 2 a schematic view of components of the system;
Fig. 3 a method according to the invention;
Fig. 4 - 5 two video data streams structured in frames;
Fig. 6 a visualization of an application of the invention.

DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

Shown on Fig. 1 as a video playback system 1 according to the invention. The system 1 is installed in a retail shop of which only a shelf 2 is shown. The shelf 2 has two shelf floors 3 on which goods 8 are placed. At its front, each shelf floors 3 comprises a shelf rail 4 (not shown in detail) to which two video screens 5 are attached along its entire length. Further to this two identical playback devices 6A and 6B are shown. The first device 6A is connected to the screens 5 on the upper floor 3 and the second device 6B is connected to the screens 5 on the lower floor 3.

The video content (film) to be displayed on the screens 5 is supplied by a server 7 via a radio signal 8 to both devices 6A and 6B. The video content is delivered in form of compressed video data that are structured in frames labeled by frame numbers.

Figure 2 shows the connection of the components in form of a block diagram. Here a wire-based connection of the devices 6A and 6B with their displays 5 is shown.

In the following the operation of the system 1 is explained by a method of synchronizing the playback of the video over both devices 6A and 6B. As a result, the video playback on both shelf rails is synchronized with

each other. The method is now explained by the aid of a flow diagram shown in Figure 3.

The method starts in block 9. In block 10 the server sends out the video to the devices 6A, 6B. In block 11 the devices 6a, 6B start playing back the video.

In block 12 each device 6A and 6B attends the lapse of one second of its own clock. After one second has lapsed, the respective device 6A, 6B transmits the playback progress-data, which represent the frame number of the correctly used frame in the respective device 6A, 6B. The transmission of the playback progress-data of the device 6A is received at the device 6B and vice versa.

In block 13 the devices 6A, 6B compare the received frame number with the frame number currently in use in its own playback process.

Irrespective of the question which of the two devices 6A, 8B detects a difference of more than 2 frames at first, the device 6A or 6B that detected the difference sends out a synchronization commend immediately, which happens in block 14. The argument of the synchronization command is the higher fame number of the two frame numbers compared with each other.

In the following this method is explained by the aid of Figure 4 and Figure 5 that visualize frame structured video data 19. The upper video data 19 are processed by the first device 6A while the lower video data 19 are processed by the second device 6B. Both video data 19 and 20 are identical and were submitted as initially mentioned by the server. Figure 4 also shows an asynchronous playback progress because a first processing pointer 20 indicates the frame number N that is currently processed by the first device 6A while at the same time the second device 6B processes frame number N+2 which is shown with a second processing pointer 21.

Here frame number N+2, which is the higher number of the two frames compared with each other, is the argument of the synchronization command.

In the present example, it is assumed that the first device 6A has detected the asynchronous playback progress at first and sends out the synchronization command.

Going now back to Figure 3, in block 15 both devices 6A and 6B are re-synchronized by continuing their playback at frame number N+2. Also Figure 5 shows the re-synchronization of the playback progress. In particular it shows that the first processing pointer 20 is moved forward to frame number N+2 (indicated by arrow 22) while the second processing pointer 21 remained at frame number N+2.

Now at frame number N+2 both devices continue to playback the video, which in Figure 3 is associated with block 15.

In block 16 a check is performed if the video has reached its end. If the end is not reached the method branches to block 12 in order to attend the lapse of said one second interval bevor the check for synchronism is repeated.

If in block 16 the end of the video is detected the method ends in block 17. It is to mention that the video can also be repeated by loop play.

If in block 13 no difference greater than 2 is detected, the method branches to block 16.

Although the method of the invention was so far explained by only two display devices 6A and 6B, it is to mention that in a system with a relatively high number of display devices (e.g. a few thousands) a significant number of devices may operate for longer periods in synchronism with each other before a single asynchronous event is detected by one of the devices. This detected event of asynchronous playback progress then causes all the other devices to adjust to the

frame number dictated by the device that detected the asynchronous playback progress.

In the following the operation of the system 1 is now explained by the aid of Fig. 6. Fig. 6 shows a snapshot of a video 23 that was distributed to three display devices 6A, 6B, 6C by the server 7 before playback started on said devices 6A – 6C. According to this embodiment each device 6A - 6C drives a single screen 5.

Although the shelf 2 on which the screens 5 are installed is not shown in Figure 6, it is mentioned for the sake of clarity that each of the devices 6A – 6C controls the playback of its individual screen 5. Each of the screens 5 covers one of the shelf rails 4. Each shelf rail 4 forms the front of a shelf floor 3 on which in the present case mountaineering products (not shown) are presented. The three shelf floors 3 are arranged one above the other as part of the shelf 2.

The devices 6A, 6B, 6C were programmed by the server 7 to playback only a part of the entire content of the video 23 with individual zoom settings. Here the zoom for the upper screen 5 mounted on the upper shelf rail 4 is set to an upper part of the video 23 that shows in the snapshot two climbers reaching the top of a mountain. The zoom for the screen 5 on the middle shelf rail 4 was set to the center part of the video 23 showing in the snapshot the leg of one of the climbers just before moving upwards. The zoom of the screen 5 on the bottom shelf rail 4 shows on its left side the view into the distant landscape while on its right part rocks in the foreground are visible in the snapshot.

The zoom on the individual sections of the video is realized e.g. by the aid of a well-known video-feature called “viewbox”. The video content outside the three individual zoom settings is simply not shown on the screens 5. However, in the spatial arrangement of

the shelf 2 this area between the screens 5 is used to present products related to mountaineering.

This allows to spatial distribute the synchronized video experience over the three screens 5, in fact over the three shelf rails 4. Due to the spatial distribution of the mountaineer video 23 over the three shelf rails 4, the mountaineering products are now presented in the appropriate context.

In addition to this, Fig. 6 also shows electronic shelf label content 24 (of virtual electronic shelf labels) displayed at the appropriate position where sais mountaineering products are located on the shelf floors 3. This content is embedded into to the video 23 and also supplied by the server 7 to the individual devices 6A – 6C. The content 24 may comprise static (textual) information related to product and / or price information indicated by wavy lines 25. The content 24 may also comprise individual video sequences 25 and 26 which are assigned to particular electronic shelf label 24 (see for example the middle screen 5).

Further to this, also the entire electronic shelf label content 24 or even individual areas of the screens 5 may be used to display an advertisement video that was initially distributed to the individual playback devices 6A – 6C and then played back distributed over the three shelf rail screens 5. Similar to the (background) video 23 the entire advertisement experience assembles from the distributed display of individual advertisement elements of the advertisement video played back in synchronous mode on the different screens 5. In this mode in fact two different videos - on the one hand the (background) video 23 and on the other hand said advertisement video – are played back simultaneously by the display devices 6A – 6C. Also in this simultaneous playback mode, the devices 6A – 6C make use of the measures according to the invention to keep playback on the different display

devices 6A – 6C for the two individual videos (the background video 23 and the advertisement video) synchronized.

This concept may also be applied to a higher number of videos.

The measures according to the invention may also be applied in a configuration where the video 23 (and optionally together with other advertisement videos as mentioned above) is e.g. played back in synchronized mode on display devices 6A, 6B, 6C, …, distributed over two or more shelfs 2, e.g. located side by side or stacked over each other.

Hence, for all the various video experiences that are achievable by distributed video playback over a number of shelfs rails 4 the measures according to the invention to keep video playback synchronized can be advantageously applied.

In summary, the method and the system of the invention provide a robust and reliable, instantaneous re-synchronization of the playback progress over the entire group of playback devices. This feature can be realized with relatively cheap hardware and do not require any high sophisticated communication protocols to be executed.

Finally, let it be noted once again that the figures described in detail above only involve exemplary embodiments, which the expert can modify in a wide variety of ways without departing from the area of the invention. For the sake of completeness, let it also be stated that use of the indeterminate article “a” or “an” does not mean that the respective features cannot be present multiple times.

CLAIMS

1. A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5),
each playback device (6A, 6B) comprises
- a memory to store video data (9) representing said video, and
- a communication stage to communicate data with each other,
wherein the devices (6A, 6B) are designed
+ to transmit video playback progress-data via the communication stage to the other device (6B, 6A) and
+ to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A).

2. The system (1) according to claim 1, comprising a video distribution server (7) for distribution of the video data (9) to the devices (6A, 6B), in particular the entire video data (9) of a video upfront to playback start at the devices (6A, 6B).

3. The system (1) according to any of the preceding claims, wherein the devices (6A, 6B) are designed to determine independently from a video distribution server (7) which distributed the video data (9) to the devices (6A, 6B) that they are in a synchronous or asynchronous playback progress.

4. The system (1) according to any of the preceding claims wherein the devices (6A, 6B) are designed
+ to playback compressed video data (9) that are structured in frames labeled by frame numbers, and

+ to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted.

5. The system (1) according to claim 4, wherein each device (6A, 6B) is designed to compare a frame number received with a frame number of the frame currently played back at the device (6A, 6B) and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value.

6. The system (1) according to any of the preceding claims, wherein each device (6A, 6B) is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second.

7. The system (1) according to any of the preceding claims, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices (6A, 6B) over its communication stage if it detects an asynchronous playback progress.

8. The system (1) according to claim 7, wherein each device (6A, 6B) is designed to embed the adjustment data in a synchronization command.

9. The system (1) according to any of the claims 7-8, wherein each device (6A, 6B) is designed
- to receive the adjustment data and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with

the frame number received in the broadcast of the adjustment data.

10. The system (1) according to any of the preceding claims, wherein the communication stage is designed to use UDP multicast data packets for the communication.

11. The system (1) according to any of the preceding claims, wherein each display device (6A, 6B)
+ comprises its screen (5) or a number of screens (5), or
+ is connected to its external screen (5) or a number of screens (5)
to be controlled by it.

12. The system (1) according to any of the preceding claims, wherein said screen (5) is designed
+ to realize a shelf rail (4) or a part of it, or
+ to cover a front of a shelf rail (4) or a part of it to which it is attachable.

13. The system (1) according to any of the preceding claims, wherein the system realizes a video playback enabled electronic shelf label system.

14. The system (1) according to any of the preceding claims, wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

15. A use of the system (1) according to any of the preceding claims as video playback enabled

electronic shelf label system for the playback of synchronized video content for a number of shelf rails (4), wherein each of said shelfs rails (4) is realized by a screen (5) or carries a screen (5).

ABSTRACT

A video playback system, comprising a number of playback devices to playback a video on their screens, each playback device comprises a memory to store video data representing said video, and a communication stage to communicate data with each other, wherein the devices are designed to transmit video playback progress-data via the communication stage to the other device and to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices.

(Fig. 1)

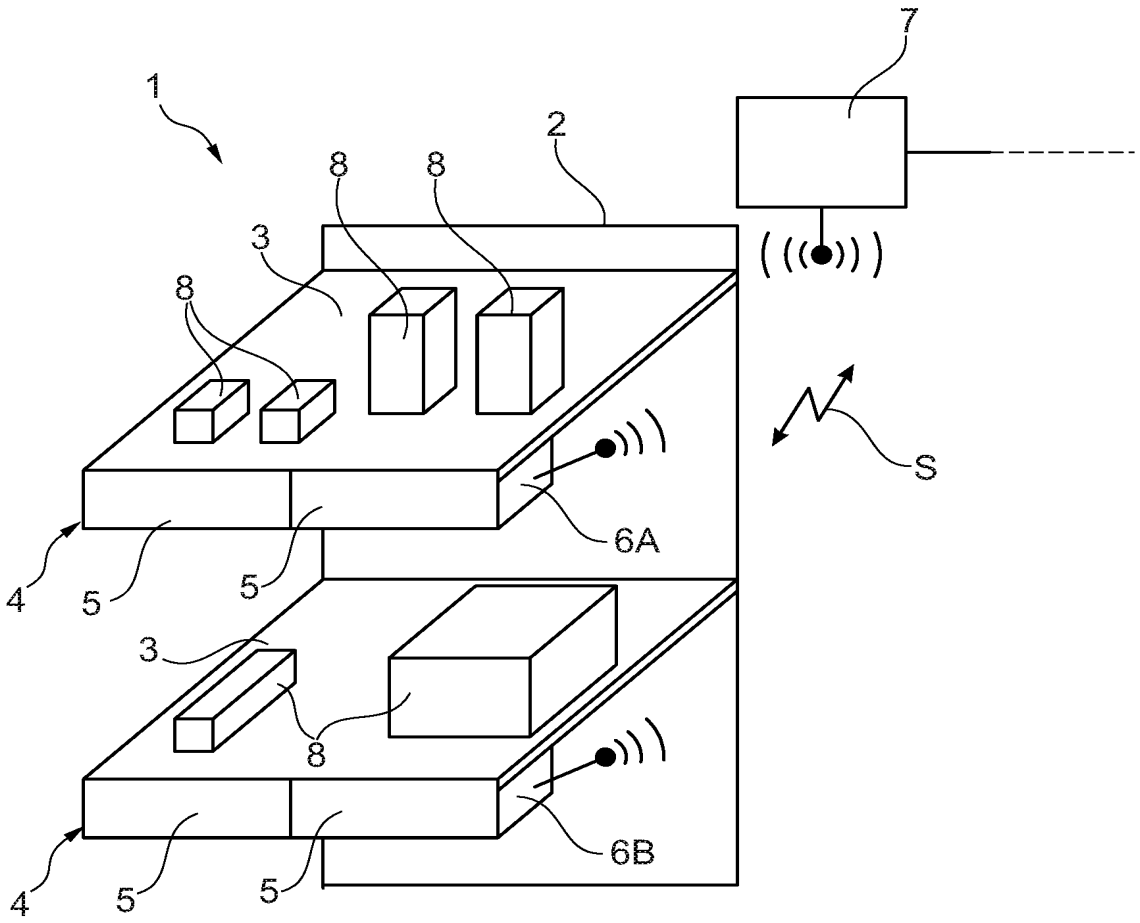


Fig. 1

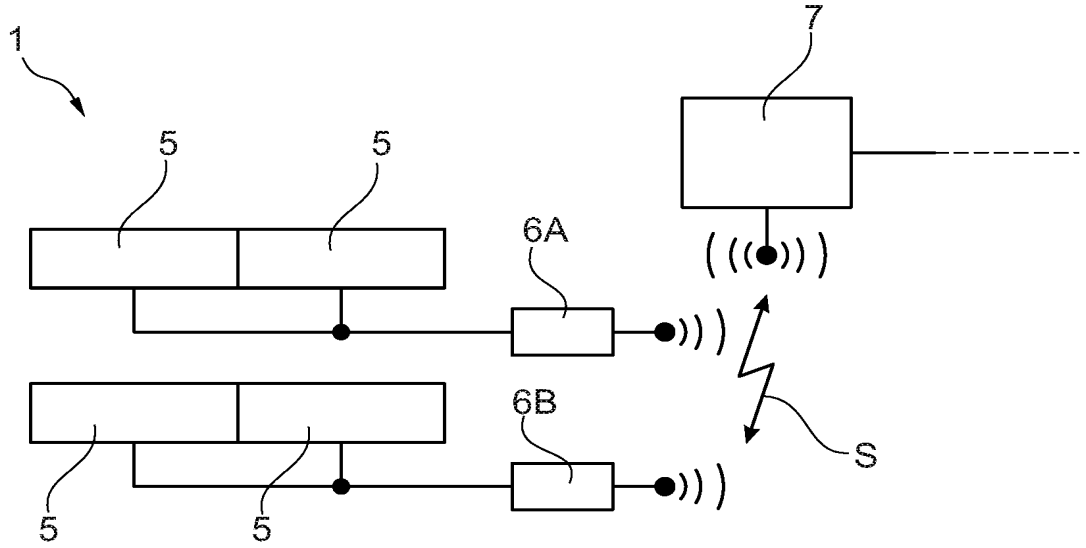


Fig. 2

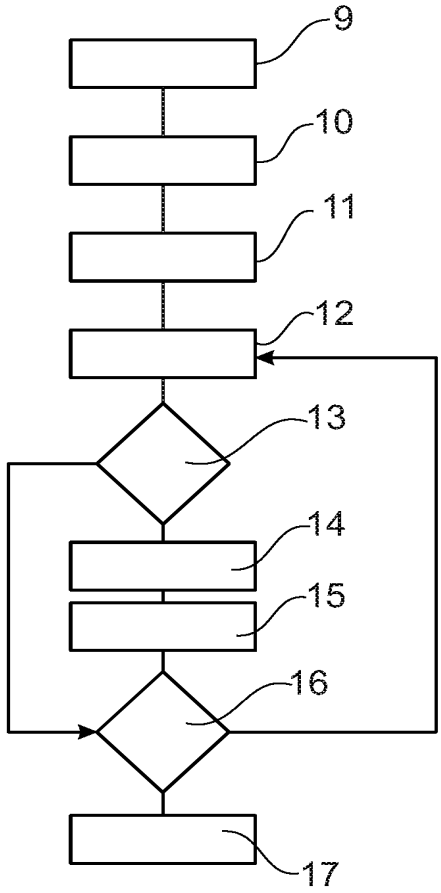


Fig. 3

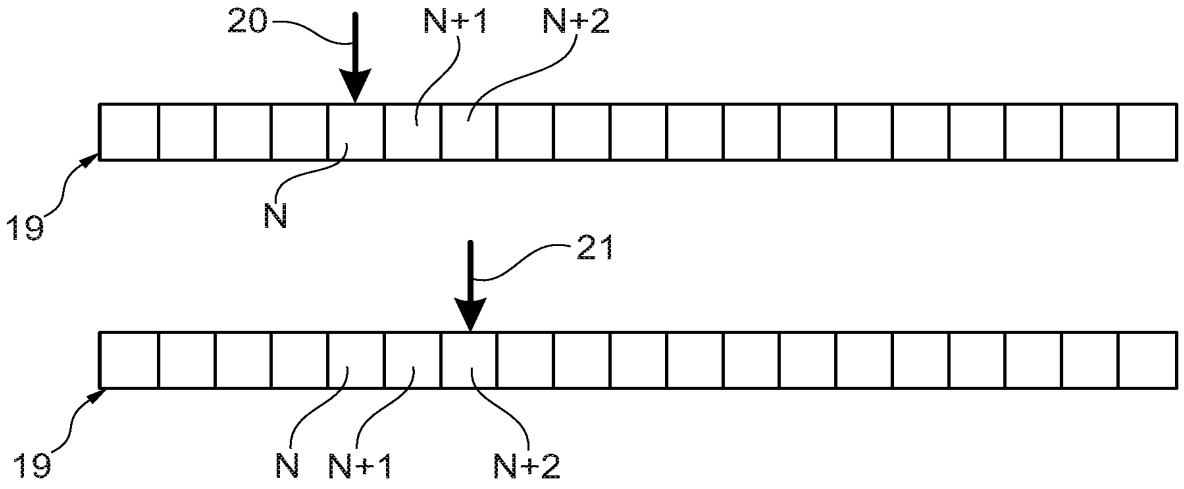


Fig. 4

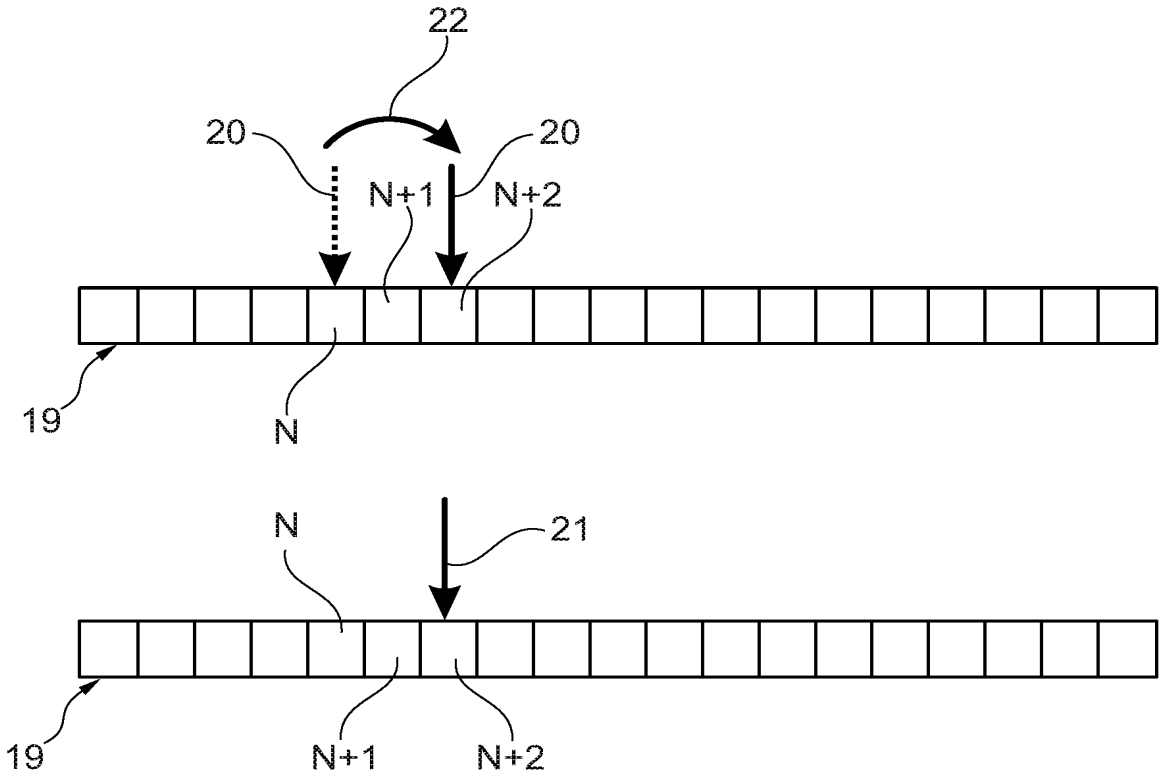


Fig. 5

HANSHOW AMERICA INC. and HANSHOW TECHNOLOGY CO., LTD.
Ex. 1002, page 278

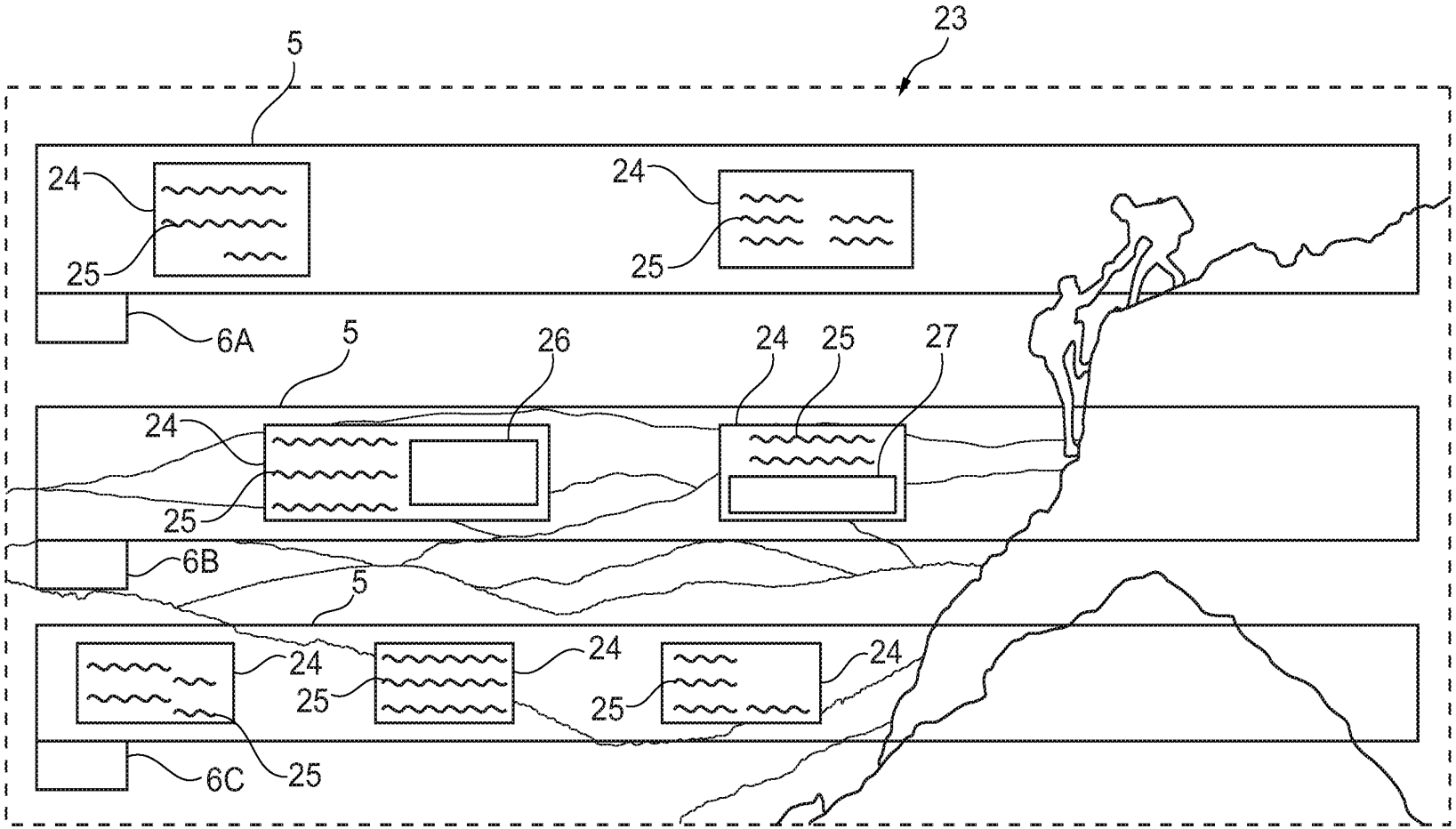


Fig. 6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Jan Oosthoek	)	Examiner: Not Yet Assigned
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	)	Art Unit: Not Yet Assigned
Serial No.: Not Yet Assigned	)	
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Conf. No. Not Yet Assigned	)	
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Filed: Herewith	)	
	)	
For: SYSTEM FOR SYNCHRONIZED VIDEO PLAYBACK ON A NUMBER OF PLAYBACK DEVICES	)	

PRELIMINARY AMENDMENT

BOX PATENT APPLICATION
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-0001

INTRODUCTION

This communication is a preliminary amendment for the above-identified patent application. Please enter this preliminary amendment prior to calculation of any fees or consideration on the merits.

Amendments to the Specification begin on page 2.

Amendments to the Claims begin on page 3.

Remarks begin on page 7.

SPECIFICATION

Please amend the specification as follows:

On page 1, after the title, please insert the following header and paragraph:

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a 35 U.S.C. 371 National Stage Patent Application of International Application No. PCT/EP2017/078844, filed November 10, 2017 which is hereby incorporated by reference in its entirety.

IN THE CLAIMS:

A listing of all claims filed with the present application follows; please amend the claims as shown.

1. (original) A video playback system (1), comprising a number of playback devices (6A, 6B) to playback a video on their screens (5) ,
each playback device (6A, 6B) comprises
a memory to store video data (9) representing said video, and
a communication stage to communicate data with each other,
wherein the devices (6A, 6B) are designed
+ to transmit video playback progress-data via the communication stage to the other device
(6B, 6A) and
+ to determine based on the received progress- data whether it is in a synchronous or asynchronous playback progress with the other devices (6B, 6A) .

2. (original) The system (1) according to claim 1, comprising a video distribution server (7) for distribution of the video data (9) to the devices (6A, 6B) , in particular the entire video data (9) of a video upfront to playback start at the devices (6A, 6B) .

3. (currently amended) The system (1) according ~~to any of the preceding claims~~claim 1, wherein the devices (6A, 6B) are designed to determine independently from a video distribution server (7) which distributed the video data (9) to the devices (6A, 6B) that they are in a synchronous or asynchronous playback progress .

4. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1 wherein the devices (6A, 6B) are designed + to playback compressed video data (9) that are structured in frames labeled by frame numbers, and + to utilize a frame

number that labels the frame that is currently played back as the progress-data to be transmitted.

5. (original) The system (1) according to claim 4, wherein each device (6A, 6B) is designed to compare a frame number received with a frame number of the frame currently played back at the device (6A, 6B) and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value .

6. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1, wherein each device (6A, 6B) is designed to repeatedly transmit the progress-data, preferred in a periodic manner, more preferred every second.

7. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1, wherein each device is designed to broadcast adjustment data for adjusting the playback progress of the devices (6A, 6B) over its communication stage if it detects an asynchronous playback progress.

8. (original) The system (1) according to claim 7, wherein each device (6A, 6B) is designed to embed the adjustment data in a synchronization command.

9. (currently amended) The system (1) according to ~~any of the claims 7-8~~claim 7, wherein each device (6A, 6B) is designed
- to receive the adjustment data and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

10. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1, wherein the communication stage is designed to use UDP multicast data packets for the communication .

11. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1, wherein each display device (6A, 6B)
+ comprises its screen (5) or a number of screens (5), or
+ is connected to its external screen (5) or a number of screens (5)
to be controlled by it.

12. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1, wherein said screen (5) is designed
+ to realize a shelf rail (4) or a part of it, or
+ to cover a front of a shelf rail (4) or a part of it to which it is attachable.

13. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1, wherein the system realizes a video playback enabled electronic shelf label system.

14. (currently amended) The system (1) according to ~~any of the preceding claims~~claim 1, wherein the display devices (6A, 6B) are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's (5) display area overlapping with a video content or substituting a video content of said section.

15. (currently amended) A use of the system (1) according to ~~any of the preceding claims~~claim 1 as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails (4), wherein each of said shelfs rails (4) is realized by a screen (5) or carries a screen (5) .

16. (new) The system (1) according to claim 8, wherein each device (6A, 6B) is designed

- to receive the adjustment data and
- to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data.

REMARKS

Review and consideration of the claims as presented herein are respectfully requested. The amendments herein are directed to the addition of a section referencing related applications, to the removal of the multiple dependent nature of some of the claims and are intended to put this application in condition for allowance. No new matter has been added. Claims 1-16 are in the application.

Applicant reserves the right to add claims during prosecution to regain subject matter which may have been removed through this amendment. Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, no acquiescence, disclaimer or estoppel is intended or should be implied thereby. Applicant is not conceding in this application that previously pending claims are not patentable over any reference. Rather, any alterations or characterizations are being made only to expedite prosecution of the present application and are without prejudice to the presentation or assertion, in the future, of claims relating to the same or similar subject matter. Applicant also reserves the right to pursue at a later date any previously pending, withdrawn or other broader or narrower claims that capture any subject matter supported by the present disclosure and to submit additional arguments of patentability. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimer or disavowal of any subject matter supported by the present application.

The filing fee of this application is based on the claims as amended herein. The filing fee was paid by credit card at the time of the filing of the application.

Applicant believes the present application is in condition for allowance.

Respectfully submitted,

/Daniel M. Gurfinkel/

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May 8, 2020

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Atty. Docket No. 24010-10166689PF

TITLE

System for synchronized video playback on a number of playback devices

DESCRIPTION

TECHNICAL FIELD

The invention relates to a system for synchronized video playback on a number of playback devices.

BACKGROUND

A known video play back system comprises a central server for distributing a video stream to a number of devices. Synchronized playback of the video content by all playback devices is achieved by controlling the playback at the playback devices with a highly precise and system wide timing signal delivered by the server or by a system wide synchronized clock signal available within the playback devices.

The known system shows the drawback that it requires high bandwidth for the just in time distribution of the video content to the video playback devices. Further to this, fast and therefore expensive hardware of the playback devices is required to receive the streamed video, buffering it and to synchronously playback the video content on the individual playback devices in accordance to the timing determined either by the timing signal delivered by the server or the system wide synchronized clock signal.

The object of the invention is to provide a system that avoids the problems discussed above and that is capable of playing back synchronized video on a number of devices comprised of relatively inexpensive hardware.

SUMMARY OF THE INVENTION

This object is achieved by a system according to claim 1. Therefore, the subject matter of the invention is a video playback system, comprising a number of playback devices to playback a video on their screens, each playback device comprises a memory to store video data representing said video, and a communication stage to communicate data with each other, wherein the devices are designed to transmit (broadcast) video playback progress-data via the communication stage to the other device and to determine based on the received progress-data whether it is in a synchronous or asynchronous playback progress with the other devices.

The object is also achieved according to claim 15. Therefore, the subject matter of the invention is a use of the system according to the invention as video playback enabled electronic shelf label system for the playback of synchronized video content for a number of shelf rails, wherein each of said shelf rails is realized by a screen or carries a screen.

The measures according to the invention provide the advantage that each individual display device can independently detect an asynchronous playback progress within the group of display devices. This is achieved by a simple and fast comparison of the playback progress of another device or of other devices with its own playback progress. In fact, the group of display device establishes an autonomous, distributed detection system for detecting an asynchronous playback progress within this group. No super-efficient and expensive hardware is required to achieve this, which is of particular importance for the targeted use case of the video playback system for synchronized shelf rail video playback, which is explained in detail later. In this use case (application) a very large number of shelf

rails must typically display synchronized video sequences. Hence the number of display devices controlling the screens is also high and therefore must be realized as inexpensive as possible in order to be accepted by the target group of customers.

Further particularly advantageous designs and extensions of the invention arise from the dependent claims and the following description.

For the system, it is of particular advantage that it comprises a video distribution server for distribution of the video data to the devices, in particular the entire video data of a video upfront to playback start at the devices. In particular the server may use the same communication stage for downloading the video data to the devices, which is thereafter used for the transmission of playback progress-data. Advantageously, after download of the video data is completed, the communication channel / medium used for downloading the video data to the device is fully available for the communication of the devices with each other. Hence, no high payload causing communication protocols or negotiation processes between the devices are necessary to transmit the playback progress-data.

According to a fundamental aspect of the invention, it is of particular advantage that the devices are designed to determine independently from a video distribution server, which distributed the video data to the devices, that they are in a synchronous or asynchronous playback progress.

For the sake of clarity, it is mentioned that the communication between the server and the devices as well as the communication between the devices may be realized either by means of wires, e.g. two wire or bus systems, or radio signals.

The devices are designed to playback compressed video data that are structured in frames labeled by frame numbers.

The progress-data may be any indicator that allows to represent the currently played back part of the video or to measure the already elapsed playback time since playback start or to indicate the remaining playback time until the end of the video or the like, e.g. measured in milliseconds or seconds or percentage.

However, according to a preferred embodiment of the invention the devices are designed to utilize a frame number that labels the frame that is currently played back as the progress-data to be transmitted. This provides the advantage that a representation of the playback progress is used, which is inherently available on all devices without any further computation.

Further to this, each device is designed to compare a frame number received with a frame number of the frame currently played back at the device and to determine an asynchronous playback progress if the difference in the frame numbers compared with each other exceeds a pre-determined threshold value. Dependent on the actual playback parameters, the threshold may be set to 100, which is programmed upfront to processing into all devices. In this example, a device that currently plays back frame 2500 will determine an asynchronous playback progress if the frame number received from another device is 2602.

In order to keep the information of playback progress permanently updated within the group of devices, each device is designed to repeatedly transmit the progress-data. The exact moment in time the individual device transmits its individual progress-data may be arbitrary, e.g. defined by random within a certain time window or the like. The transmission may also take place every time a new frame of a compressed

video is processed. According to a preferred embodiment the transmission is performed in a periodic manner. Experiments performed during the design and development phase of the system revealed that a periodic transmission every second showed good results in terms of keeping the playback synchronous over the devices. The exact parameter for a particular realization is of course dependent on parameters (speed, accuracy, oscillator drift …) of the hardware used.

The device that detects an asynchronous playback process may influence its individual playback progress so to establish a synchronous playback progress. However, this would not guarantee that its particular measures solve the playback drift of other devices. The result may even be a larger diverging of other devices' playback progress from a synchronous playback progress. Therefore, it is of advantage to use the device that detects the asynchronous playback progress to influence the playback progress all other devices - and also its own playback progress if necessary. According to this finding each device is designed to broadcast adjustment data for adjusting the playback progress of the devices over its communication stage if it detects an asynchronous playback progress.

In a preferred embodiment, advantageously each device is designed to embed the adjustment data in a synchronization command that is broadcasted if it detects an asynchronous playback progress. This allows an unambiguous detection of the adjustment data on the side of the devices receiving the transmission.

In order to properly and rapidly react on the detected asynchronous playback progress, each device is designed to receive the adjustment data (embedded in said synchronization command that is decoded / detected when received) and to adjust its playback progress according to the adjustment data, in particular to continue its playback of compressed video data that are

structured in frames labeled by frame numbers with the frame number received in the broadcast of the adjustment data. In this preferred embodiment, immediately after detection of the asynchronous playback progress the detecting device (the device that detected the asynchronous playback progress) defines the frame number at which playback shall continue and instructs all the other devices to switch to said defined frame number. All other devices follow this instruction with immediate effect upon receipt of the synchronization command. The continuation of the playback at the defined frame number may be delayed for a short period (so short that it is practically invisible by the viewer) so that all devices can timely follow the instruction to switch their playback progress to said defined frame number. This provides a highly efficient system behavior that requires very little communication bandwidth and processing power in order to secure a synchronous playback progress over the entire group of devices.

The communication between the devices may be performed according to various protocol implementations. In order to keep the communication highly efficient in an environment with up to a few thousand devices it is of particular advantage that the communication stage is designed to use UDP multicast data packets for the communication. Here UDP stand for "User Datagram Protocol" and multicast means a transmission of a message from one device to a number of devices.

According to an embodiment of the invention each display device may comprise its screen or a number of screens to be controlled by it. Regarding its resolution, a screen may be a standard definition, high definition or even ultra-height video panel. According to a further embodiment of the invention each device may be connected to its external screen or a number of

screens to be controlled by it. In addition, also mixed configurations may be envisaged. In this configuration video data processing is performed in the device that in turn submit display data or display signals to the screen, where the data or signals are converted into visible images.

In a preferred embodiment said screen is designed to realize a shelf rail or a part of it, or to cover a front of a shelf rail or a part of it to which it is attachable. Such a screen typically shows large width measured along the shelf rail length in comparison to little height measured perpendicular thereto.

In such a configuration, the system realizes a video playback enabled electronic shelf label system.

Here it is of particular advantage that the display devices are designed to display product information or product price related information by means of virtual electronic shelf labels displayed within a section of a screen's display area overlapping with a video content or substituting a video content of said section.

Further to this, the devices may be designed to playback a plurality of videos simultaneously. For example, a background video may be played back on a number of shelf rails while at the same time an advertisement video may be played back on the same shelf rails but in a spatially limited video window within the screen areas of the individual screens. In this video window, it overlaps or replaces the background video. Also in this scenario, the measures of the invention can be applied to each video (the background video and the advertisement video) in order to keep its playback synchronized over all involved devices. The additional – e.g. advertisement related – video may be played back independently from the aforementioned virtual electronic shelf labels or as an element of the content of said virtual self labels.

Given the fact that in a large retail store a huge number of shelf rails may exist, it is of utmost economic benefit to utilize inexpensive hardware for the installation of such video playback enabled electronic shelf labels throughout the entire store. Here the measures according to the invention enable a stable and synchronous video playback on all shelf rails by means of a very simple and inexpensive display device hardware without any server interaction to guarantee synchronism in the playback progress. Advantageously, also the payload e.g. in the radio channel used to keep the display devices in synchronism with each other is so low that hardly any or even no other communication processes between other devices in the ecosystem of the retail store are disturbed.

The features of the invention may be realized by means of pure hardware or of programmable hardware on which a software is executed, e.g. microprocessors, microcontrollers or application specific circuits with memory devices to store the software are to be considered.

The devices and their screens are supplied with electric power by means of a centralized power supply or distributed power supplies. Electric power is supplied by means of cables. Also battery powered systems are possible.

These and other aspects of the invention are obtained from the figures discussed below.

BRIEF DESCRIPTION OF THE FIGURES

The invention is explained again hereafter with reference to the attached figures and on the basis of exemplary embodiments, which nevertheless do not limit the scope of the invention. In the different figures the same components are labelled with identical reference numbers. They show in schematic fashion in:

Fig. 1 a system according to the invention installed in a retail store;

Fig. 2 a schematic view of components of the system;

Fig. 3 a method according to the invention;

Fig. 4 - 5 two video data streams structured in frames;

Fig. 6 a visualization of an application of the invention.

DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

Shown on Fig. 1 as a video playback system 1 according to the invention. The system 1 is installed in a retail shop of which only a shelf 2 is shown. The shelf 2 has two shelf floors 3 on which goods 8 are placed. At its front, each shelf floors 3 comprises a shelf rail 4 (not shown in detail) to which two video screens 5 are attached along its entire length. Further to this two identical playback devices 6A and 6B are shown. The first device 6A is connected to the screens 5 on the upper floor 3 and the second device 6B is connected to the screens 5 on the lower floor 3.

The video content (film) to be displayed on the screens 5 is supplied by a server 7 via a radio signal 8 to both devices 6A and 6B. The video content is delivered in form of compressed video data that are structured in frames labeled by frame numbers.

Figure 2 shows the connection of the components in form of a block diagram. Here a wire-based connection of the devices 6A and 6B with their displays 5 is shown.

In the following the operation of the system 1 is explained by a method of synchronizing the playback of the video over both devices 6A and 6B. As a result, the video playback on both shelf rails is synchronized with

each other. The method is now explained by the aid of a flow diagram shown in Figure 3.

The method starts in block 9. In block 10 the server sends out the video to the devices 6A, 6B. In block 11 the devices 6a, 6B start playing back the video.

In block 12 each device 6A and 6B attends the lapse of one second of its own clock. After one second has lapsed, the respective device 6A, 6B transmits the playback progress-data, which represent the frame number of the correctly used frame in the respective device 6A, 6B. The transmission of the playback progress-data of the device 6A is received at the device 6B and vice versa.

In block 13 the devices 6A, 6B compare the received frame number with the frame number currently in use in its own playback process.

Irrespective of the question which of the two devices 6A, 8B detects a difference of more than 2 frames at first, the device 6A or 6B that detected the difference sends out a synchronization commend immediately, which happens in block 14. The argument of the synchronization command is the higher fame number of the two frame numbers compared with each other.

In the following this method is explained by the aid of Figure 4 and Figure 5 that visualize frame structured video data 19. The upper video data 19 are processed by the first device 6A while the lower video data 19 are processed by the second device 6B. Both video data 19 and 20 are identical and were submitted as initially mentioned by the server. Figure 4 also shows an asynchronous playback progress because a first processing pointer 20 indicates the frame number N that is currently processed by the first device 6A while at the same time the second device 6B processes frame number N+2 which is shown with a second processing pointer 21.

Here frame number N+2, which is the higher number of the two frames compared with each other, is the argument of the synchronization command.

In the present example, it is assumed that the first device 6A has detected the asynchronous playback progress at first and sends out the synchronization command.

Going now back to Figure 3, in block 15 both devices 6A and 6B are re-synchronized by continuing their playback at frame number N+2. Also Figure 5 shows the re-synchronization of the playback progress. In particular it shows that the first processing pointer 20 is moved forward to frame number N+2 (indicated by arrow 22) while the second processing pointer 21 remained at frame number N+2.

Now at frame number N+2 both devices continue to playback the video, which in Figure 3 is associated with block 15.

In block 16 a check is performed if the video has reached its end. If the end is not reached the method branches to block 12 in order to attend the lapse of said one second interval bevor the check for synchronism is repeated.

If in block 16 the end of the video is detected the method ends in block 17. It is to mention that the video can also be repeated by loop play.

If in block 13 no difference greater than 2 is detected, the method branches to block 16.

Although the method of the invention was so far explained by only two display devices 6A and 6B, it is to mention that in a system with a relatively high number of display devices (e.g. a few thousands) a significant number of devices may operate for longer periods in synchronism with each other before a single asynchronous event is detected by one of the devices. This detected event of asynchronous playback progress then causes all the other devices to adjust to the

frame number dictated by the device that detected the asynchronous playback progress.

In the following the operation of the system 1 is now explained by the aid of Fig. 6. Fig. 6 shows a snapshot of a video 23 that was distributed to three display devices 6A, 6B, 6C by the server 7 before playback started on said devices 6A – 6C. According to this embodiment each device 6A - 6C drives a single screen 5.

Although the shelf 2 on which the screens 5 are installed is not shown in Figure 6, it is mentioned for the sake of clarity that each of the devices 6A – 6C controls the playback of its individual screen 5. Each of the screens 5 covers one of the shelf rails 4. Each shelf rail 4 forms the front of a shelf floor 3 on which in the present case mountaineering products (not shown) are presented. The three shelf floors 3 are arranged one above the other as part of the shelf 2.

The devices 6A, 6B, 6C were programmed by the server 7 to playback only a part of the entire content of the video 23 with individual zoom settings. Here the zoom for the upper screen 5 mounted on the upper shelf rail 4 is set to an upper part of the video 23 that shows in the snapshot two climbers reaching the top of a mountain. The zoom for the screen 5 on the middle shelf rail 4 was set to the center part of the video 23 showing in the snapshot the leg of one of the climbers just before moving upwards. The zoom of the screen 5 on the bottom shelf rail 4 shows on its left side the view into the distant landscape while on its right part rocks in the foreground are visible in the snapshot.

The zoom on the individual sections of the video is realized e.g. by the aid of a well-known video-feature called “viewbox”. The video content outside the three individual zoom settings is simply not shown on the screens 5. However, in the spatial arrangement of

the shelf 2 this area between the screens 5 is used to present products related to mountaineering.

This allows to spatial distribute the synchronized video experience over the three screens 5, in fact over the three shelf rails 4. Due to the spatial distribution of the mountaineer video 23 over the three shelf rails 4, the mountaineering products are now presented in the appropriate context.

In addition to this, Fig. 6 also shows electronic shelf label content 24 (of virtual electronic shelf labels) displayed at the appropriate position where sais mountaineering products are located on the shelf floors 3. This content is embedded into to the video 23 and also supplied by the server 7 to the individual devices 6A – 6C. The content 24 may comprise static (textual) information related to product and / or price information indicated by wavy lines 25. The content 24 may also comprise individual video sequences 25 and 26 which are assigned to particular electronic shelf label 24 (see for example the middle screen 5).

Further to this, also the entire electronic shelf label content 24 or even individual areas of the screens 5 may be used to display an advertisement video that was initially distributed to the individual playback devices 6A – 6C and then played back distributed over the three shelf rail screens 5. Similar to the (background) video 23 the entire advertisement experience assembles from the distributed display of individual advertisement elements of the advertisement video played back in synchronous mode on the different screens 5. In this mode in fact two different videos - on the one hand the (background) video 23 and on the other hand said advertisement video – are played back simultaneously by the display devices 6A – 6C. Also in this simultaneous playback mode, the devices 6A – 6C make use of the measures according to the invention to keep playback on the different display

devices 6A – 6C for the two individual videos (the background video 23 and the advertisement video) synchronized.

This concept may also be applied to a higher number of videos.

The measures according to the invention may also be applied in a configuration where the video 23 (and optionally together with other advertisement videos as mentioned above) is e.g. played back in synchronized mode on display devices 6A, 6B, 6C, …, distributed over two or more shelfs 2, e.g. located side by side or stacked over each other.

Hence, for all the various video experiences that are achievable by distributed video playback over a number of shelfs rails 4 the measures according to the invention to keep video playback synchronized can be advantageously applied.

In summary, the method and the system of the invention provide a robust and reliable, instantaneous re-synchronization of the playback progress over the entire group of playback devices. This feature can be realized with relatively cheap hardware and do not require any high sophisticated communication protocols to be executed.

Finally, let it be noted once again that the figures described in detail above only involve exemplary embodiments, which the expert can modify in a wide variety of ways without departing from the area of the invention. For the sake of completeness, let it also be stated that use of the indeterminate article "a" or "an" does not mean that the respective features cannot be present multiple times.

PCT REQUEST

Print Out (Original in Electronic Form)

0	**For receiving Office use only**	
0-1	International Application No.	**PCT/EP2017/078844**
0-2	International Filing Date	**10 NOV 2017 (10.11.2017)**
0-3	Name of receiving Office and "PCT International Application"	**RO/EP**

0-4	**Form PCT/RO/101 PCT Request**	
0-4-1	Prepared Using	PCT Online Filing Version 3.5.000.251e MT/FOP 20141031/0.20.5.20
0-5	**Petition** The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	**Receiving Office (specified by the applicant)**	European Patent Office (EPO) (RO/EP)
0-7	**Applicant's or agent's file reference**	TP0352
I	**Title of Invention**	System for synchronized video playback on a number of playback devices
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PCT REQUEST

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IV-1	**Agent or common representative; or address for correspondence**		
	The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	Agent	
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IV-1-5(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	as advance copies followed by paper notifications	
V	**DESIGNATIONS**		
V-1	**The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.**		
VI-1	**Priority Claim**	NONE	
VII-1	**International Searching Authority Chosen**	European Patent Office (EPO) (ISA/EP)	
VIII	**Declarations**	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	–	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	–	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	–	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	–	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	–	

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IX	Check list	Number of sheets	Electronic file(s) attached
IX-1	Request (including declaration sheets)	3	✓
IX-2	Description	14	✓
IX-3	Claims	4	✓
IX-4	Abstract	1	✓
IX-5	Drawings	4	✓
IX-7	TOTAL	26	
	Accompanying Items	Paper document(s) attached	Electronic file(s) attached
IX-8	Fee calculation sheet	–	✓
IX-19	Other	Pre-conversion archive	✓
IX-20	**Figure of the drawings which should accompany the abstract**	1	
IX-21	**Language of filing of the international application**	English	
X-1	**Signature of applicant, agent or common representative**	(PKCS7 Digital Signature)	
X-1-1	Name (LAST, First)	Schneider, Michael	
X-1-3	Capacity (if such capacity is not obvious from reading the request)	(Representative)	

FOR RECEIVING OFFICE USE ONLY

10-1	**Date of actual receipt of the purported international application**	**10 NOV 2017 (10.11.2017)**
10-2	**Drawings:**	✓
10-2-1	Received	
10-2-2	Not received	
10-3	**Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application**	
10-4	**Date of timely receipt of the required corrections under PCT Article 11(2)**	
10-5	**International Searching Authority**	ISA/EP
10-6	**Transmittal of search copy delayed until search fee is paid**	

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11-1	**Date of receipt of the record copy by the International Bureau**	

ADVANCE E-MAIL

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PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92*bis*.1 and Administrative Instructions, Section 422)

To:

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Date of mailing *(day/month/year)*
30 January 2020 (30.01.2020)

Applicant's or agent's file reference
TP0352

IMPORTANT NOTIFICATION

International application No.
PCT/EP2017/078844

International filing date *(day/month/year)*
10 November 2017 (10.11.2017)

1. The following indications appeared on record concerning:

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Ex. 1002, page 304

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NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92*bis*.1 and Administrative Instructions, Section 422)

To:

SCHNEIDER, Michael
Schulweg 8/3/8
2340 Mödling
AUTRICHE

Date of mailing *(day/month/year)*
16 August 2019 (16.08.2019)

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IMPORTANT NOTIFICATION

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10 November 2017 (10.11.2017)

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3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office
☐ the International Searching Authority
☐ the Authority(ies) specified for supplementary search
☒ the International Preliminary Examining Authority
☐ the designated Offices concerned
☒ the elected Offices concerned
☐ other:

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Ex. 1002, page 305