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.
16/057,360	05/21/2019	10298451	120223CON6	9075

26285 7590 05/01/2019

K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

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

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

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

Michael J. Koss, Milwaukee, WI;
Koss Corporation, Milwaukee, WI;
Michael J. Pelland, Princeton, WI;
Joel L. Haynie, DeForest, WI;

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)

26285 7590 03/11/2019
K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

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.
16/057,360	08/07/2018	Michael J. Koss	120223CON6	9075

TITLE OF INVENTION: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	06/11/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
LEE, JAE YOUNG	2466	370-329000

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

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

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

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

1 K&L Gates LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: KOSS CORPORATION

(B) RESIDENCE: (CITY and STATE OR COUNTRY): MILWAUKEE, WISCONSIN

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. 02-1818

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 /Eric T. Wang/ Date April 4, 2019

Typed or printed name Eric T. Wang Registration No. 76,055

Electronic Patent Application Fee Transmittal					
Application Number:	16057360				
Filing Date:	07-Aug-2018				
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK				
First Named Inventor/Applicant Name:	Michael J. Koss				
Filer:	Eric T Wang/Autumn Vanatta				
Attorney Docket Number:	120223CON6				
Filed as Small Entity					
Filing Fees for Utility under 35 USC 111(a)					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:					
Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
Post-Allowance-and-Post-Issuance:					

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
UTILITY APPL ISSUE FEE	2501	1	500	500
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**500**

Electronic Acknowledgement Receipt	
EFS ID:	35631657
Application Number:	16057360
International Application Number:	
Confirmation Number:	9075
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Customer Number:	26285
Filer:	Eric T Wang/Autumn Vanatta
Filer Authorized By:	Eric T Wang
Attorney Docket Number:	120223CON6
Receipt Date:	04-APR-2019
Filing Date:	07-AUG-2018
Time Stamp:	16:42:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$500
RAM confirmation Number	040519INTEFSW00003560021818
Deposit Account	021818
Authorized User	Autumn Vanatta
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	04-04-2019_Issue_Fee_Transmittal.pdf	1613871 b038e48a74a50b94c19a77337a8acfb2a44592f7	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32085 bd8b90d9f14d285925b1c1fafb35d75942150ad4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1645956		

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

26285 7590 03/11/2019

K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

EXAMINER
LEE, JAE YOUNG

ART UNIT	PAPER NUMBER
2466	

DATE MAILED: 03/11/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,360	08/07/2018	Michael J. Koss	120223CON6	9075

TITLE OF INVENTION: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	06/11/2019

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

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

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

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

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

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

26285 7590 03/11/2019
K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

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.
16/057,360	08/07/2018	Michael J. Koss	120223CON6	9075

TITLE OF INVENTION: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	06/11/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
LEE, JAE YOUNG	2466	370-329000

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

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

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

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

1_____
2_____
3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

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

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

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

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

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

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

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

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.
16/057,360	08/07/2018	Michael J. Koss	120223CON6	9075

26285 7590 03/11/2019

K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

EXAMINER	
LEE, JAE YOUNG	
ART UNIT	**PAPER NUMBER**
2466	

DATE MAILED: 03/11/2019

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

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

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

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

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

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

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

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 16/057,360	Applicant(s) Koss et al.	
	Examiner JAE Y LEE	Art Unit 2466	AIA (FITF) Status No

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

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

1. ☑ This communication is responsive to filing on 17 January 2019.
   ☐ 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 See Continuation Sheet . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

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

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

   * Certified copies not received: _____ .

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

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

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

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

Attachment(s)

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

/JAE Y LEE/
Primary Examiner, Art Unit 2466

Continuation of 3. The allowed claim(s) is/are: 2-22 as re-numbered by 1-15, 17-21 and 16

Reasons for Allowance

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

Applicant's arguments filed on 01/17/2019 have been fully considered and they are persuasive. The combination of elements recited in the claims as amended is not taught or suggested by the prior art either alone or in combination. An updated search has been performed and no prior art has been found that teaches the combination of elements present in the claims. Thus, the claims are deemed allowable.

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

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae Y. Lee whose telephone number is (571) 270-3936. The examiner can normally be reached on Monday through Friday from 7:30 AM to 5:00 PM EST

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Faruk Hamza can be reached on (571) 272-7969. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/JAE Y LEE/
Primary Examiner, Art Unit 2466

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,360	Koss et al.
	Examiner	Art Unit
	JAE Y LEE	2466

CPC - Searched*		
Symbol	Date	Examiner
H04L41/0806; H04L67/42; H04W84/18	10/27/2018 (updated on 2/18/2019)	JL(JL)

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
H04L41/0806; H04L67/42; H04W84/18 (US-PGPUB;USPAT;USOCR; FPRS;EPO;JPO;DERWENT;IBM_TDB) limited by keyword search	10/27/2018 (updated on 2/18/2019)	JL(JL)
EAST (US-PGPUB;USPAT;USOCR;FPRS;EPO;JPO;DERWENT; IBM_TDB)-See Search History Printout	10/27/2018 (updated on 2/18/2019)	JL(JL)
Inventor Search	10/27/2018 (updated on 2/18/2019)	JL(JL)
NPL Search: Google, IP.com	10/27/2018 (updated on 2/18/2019)	JL(JL)

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	See Interference Search History Printout	02/18/2019	JL

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,360	Koss et al.
	Examiner	Art Unit
	JAE Y LEE	2466

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,360	Koss et al.
	Examiner	Art Unit
	JAE Y LEE	2466

CPC						
Symbol					Type	Version
H04L	/	41	/	0806	F	2013-01-01
H04W	/	24	/	02	I	2013-01-01
H04L	/	67	/	12	I	2013-01-01
H04W	/	8	/	26	I	2013-01-01
H04W	/	8	/	005	I	2013-01-01
H04L	/	67	/	125	I	2013-01-01
H04L	/	61	/	2007	I	2013-01-01
H04W	/	72	/	04	I	2013-01-01
H04W	/	76	/	10	I	2018-02-01
G06F	/	3	/	165	I	2013-01-01
H04W	/	12	/	08	I	2013-01-01
H04W	/	76	/	11	I	2018-02-01
H04W	/	84	/	18	A	2013-01-01
H04L	/	67	/	42	A	2013-01-01

CPC Combination Sets							
Symbol					Type	Set	Ranking	Version
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	21	
/JAE Y LEE/ Primary Examiner, Art Unit 2466	18 February 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20190218

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,360	Koss et al.
	Examiner	**Art Unit**
	JAE Y LEE	2466

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04L	/	12	/	24

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	21	
/JAE Y LEE/ Primary Examiner, Art Unit 2466	18 February 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20190218

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,360	Koss et al.
	Examiner	**Art Unit**
	JAE Y LEE	2466

☐ 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	9	10	19	19										
1	2	10	11	20	20										
2	3	11	12	21	21										
3	4	12	13	16	22										
4	5	13	14												
5	6	14	15												
6	7	15	16												
7	8	17	17												
8	9	18	18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	21	
/JAE Y LEE/ Primary Examiner, Art Unit 2466	18 February 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office Part of Paper No.: 20190218

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	mode SAME (ad hoc OR ad-hoc) SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME headphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L2	31	mode SAME (ad hoc OR ad-hoc) SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L3	526	mode SAME (ad hoc OR ad-hoc) SAME (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L4	16	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) SAME led AND (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L5	399	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L6	2	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone) WITH hub	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L7	57	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone) WITH player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L8	325	content$1 access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L9	47	content$1 access point AND (ad hoc OR ad-hoc)	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2019/02/18 16:30

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
L10	0	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone) WITH player SAME (ad hoc OR ad-hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L11	49	(headset OR headphone OR earphone) WITH player SAME (ad hoc OR ad-hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L12	241	(ad hoc OR ad-hoc) WITH hub WITH network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L13	29	(ad hoc OR ad-hoc) WITH hub WITH network AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L14	11	(ad hoc OR ad-hoc) (ap OR access point) WITH network AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L15	0	striva WITH content access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L16	0	striva SAME content access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L17	18	striva	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L18	0	(ad hoc OR ad-hoc) hub SAME headphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L19	0	(ad hoc OR ad-hoc) hub SAME (headset OR earphone OR	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2019/02/18 16:30

		headphone)	FPRS; EPO; JPO; DERWENT; IBM_TDB			
L20	7	(ad hoc OR ad-hoc) WITH hub SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L21	18	(ad hoc OR ad-hoc) WITH media SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L22	16	(ad hoc OR ad-hoc) WITH controller SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L23	47	(ad hoc OR ad-hoc) WITH (AP OR access point) SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L24	19	(ad hoc OR ad-hoc) WITH pairing SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L25	425	(ad hoc OR ad-hoc) WITH via WITH (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L26	0	(ad hoc OR ad-hoc) WITH hub WITH player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L27	0	(ad hoc OR ad-hoc) WITH hub SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L28	21	(ad hoc OR ad-hoc) SAME hub SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L29	36	(ad hoc OR ad-hoc) SAME (center OR hub) SAME player	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2019/02/18 16:30

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
L30	108	(ad hoc OR ad-hoc) SAME distribution SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L31	22	(ad hoc OR ad-hoc) SAME (media OR content) distribut$5 SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L32	22	(ad hoc OR ad-hoc) SAME (media OR content) distribut$5 SAME (headphone OR headset OR earphone OR player)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L33	228	(ad hoc OR ad-hoc) SAME (media OR content) distribut$5 AND (headphone OR headset OR earphone OR player)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L34	18	(ad hoc OR ad-hoc) SAME (media OR content) access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L35	0	(ad hoc OR ad-hoc) NAD (media OR content) access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L36	73	(ad hoc OR ad-hoc) AND (media OR content) access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L37	60	(ad hoc OR ad-hoc)(controller OR manager)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L38	160	(ad hoc OR ad-hoc)relay	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L39	2	(ad hoc OR ad-hoc) WITH relay$3 WITH (headphone OR headset OR	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2019/02/18 16:30

		earphone)	FPRS; EPO; JPO; DERWENT; IBM_TDB			
L40	20	(ad hoc OR ad-hoc) WITH docking WITH (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L41	20	(ad hoc OR ad-hoc) SAME docking SAME (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L42	62	(ad hoc OR ad-hoc) SAME docking AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L43	21	(ad hoc OR ad-hoc) SAME docking WITH player AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L44	20	(ad hoc OR ad-hoc) SAME docking WITH (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L45	135	(ad hoc OR ad-hoc) AND docking WITH (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L46	0	player SAME (headphone OR headset OR earphone) SAME Network A/V Receiver	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L47	23	player SAME (headphone OR headset OR earphone) SAME Network NEAR3 Receiver	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L48	3	player SAME (headphone OR headset OR earphone) SAME Receiver SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L49	78	player SAME (headphone OR headset OR earphone) SAME	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2019/02/18 16:30

		(adhoc OR ad-hoc OR ad hoc)	FPRS; EPO; JPO; DERWENT; IBM_TDB			
L50	472	player SAME (headphone OR headset OR earphone) SAME (station OR center) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L51	697	player WITH (station OR center) AND (headphone OR headset OR earphone) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L52	197	(audio OR video OR mp3) player WITH (station OR center) AND (headphone OR headset OR earphone) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L53	0	(audio OR video OR mp3) player SAME (headphone OR headset OR earphone) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth) relay	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L54	0	(audio OR video OR mp3) player SAME (headphone OR headset OR earphone) AND (adhoc OR ad-hoc OR ad hoc OR bluetooth) relay	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L55	0	(audio OR video OR mp3) player SAME (headphone OR headset OR earphone) AND (adhoc OR ad-hoc OR ad hoc OR bluetooth) relay$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L56	29	(audio OR video OR mp3) player SAME (headphone OR headset OR earphone) AND (adhoc OR ad-hoc OR ad hoc OR bluetooth) WITH relay$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:30
L57	77	(("KOSS") near3 ("Michael")).INV.	US-PGPUB; USPAT; USOCR	ADJ	OFF	2019/02/18 16:30
L58	76	(("PELLAND") near3 ("Michael")).INV.	US-PGPUB; USPAT; USOCR	ADJ	OFF	2019/02/18 16:31
L59	13	(("HAYNIE") near3 ("Joel")).INV.	US-PGPUB; USPAT; USOCR	ADJ	OFF	2019/02/18 16:31
L60	108953	(H04L41/0806; H04L67/42; H04W84/18).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L61	4	"15463559"	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2019/02/18 16:31

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
L62	66	L3 AND L60	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L63	6	("20130266152" | "8190203" | "8336080" | "9002044" | "9060288" | "9185168").PN.	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L64	8878	(credential OR password OR ssid OR encryption) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L65	462	(WLAN OR wireless LAN OR wifi OR wi-fi) NEAR2 (credential OR password OR ssid OR encryption) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L66	2468	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (credential OR password OR ssid OR encryption) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L67	240	L60 AND L66	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L68	253	(WLAN OR wireless LAN OR wifi OR wi-fi) (password OR ssid) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L69	2	(WLAN OR wireless LAN OR wifi OR wi-fi) (password OR ssid) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc) SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L70	2	"15927262"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L71	49	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) WITH (headphone OR head-phone OR earphone OR player)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L72	218	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L73	39	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode AND smartphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L74	0	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode AND (smart phone O Rsmartphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L75	57	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode AND (smart phone OR smartphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L76	0	ssid WITH bluetooth headset WITH (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L77	0	ssid SAME bluetooth headset SAME (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L78	0	ssid SAME bluetooth (earphone OR headset OR headphone) SAME (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L79	2	ssid SAME bluetooth (earphone OR headset OR headphone) AND (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L80	24	ssid SAME (earphone OR headset OR headphone) AND (smartphone OR smart phone) AND bluetooth	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L81	0	"16057360"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L82	45	"8190203"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L83	0	(adhoc OR ad-hoc OR ad hoc) WTIH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L84	238	(adhoc OR ad-hoc OR ad hoc) WITH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L85	87	(adhoc OR ad-hoc OR ad hoc) WITH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan) AND light	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L86	22	(adhoc OR ad-hoc OR ad hoc) WITH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L87	49	(adhoc OR ad-hoc OR ad hoc) SAME (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L88	189	(adhoc OR ad-hoc OR ad hoc) SAME (hot spot OR hotspot) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L89	27	(adhoc OR ad-hoc OR ad hoc) WITH via WITH (SSID OR password OR encryption) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L90	34	(adhoc OR ad-hoc OR ad hoc) WITH via WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L91	2	"13772337"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L92	2	(adhoc OR ad-hoc OR ad hoc) WITH direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L93	452	(adhoc OR ad-hoc OR ad hoc) AND direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L94	11	(adhoc OR ad-hoc OR ad hoc) SAME direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L95	42	(adhoc OR ad-hoc OR ad hoc) AND direct$2 WITH (SSID OR password OR encryption OR key) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L96	2	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH direct$2 WITH (SSID OR password OR encryption OR key) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L97	6	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L98	117	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L99	198	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH (SSID OR password OR encryption OR key)AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L100	47	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH ssid AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L101	13	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH ssid AND lighting AND server WITH ssid	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L102	156	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH ssid AND lighting AND server WITH ssid	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L103	0	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH ssid AND lighting AND server WITH ssid WTIH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L104	11	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH ssid AND lighting AND server WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L105	21	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH (password OR ssid) AND lighting AND server WITH (password OR ssid) WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L106	623	server WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L107	235	server WITH ssid WITH stor$3 AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L108	15	remot$2 WITH server WITH ssid WITH stor$3 AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L109	18	remot$2 WITH ssid WITH stor$3 AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L110	76	remot$2 WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L111	18	remot$2 WITH account WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L112	67	account WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L113	19	account WITH ssid WITH stor$3 AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L114	6	"20100081375"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L123	11	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) mode WITH (password OR ssid) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L124	281	(ad hoc OR ad-hoc) mode SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L125	95	(ad hoc OR ad-hoc) mode SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME SSID AND camera	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L126	281	(ad hoc OR ad-hoc) mode SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L127	67	(ad hoc OR ad-hoc) mode WITH (wifi OR wi-fi OR wlan OR wireless lan) WITH SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L128	37	(ad hoc OR ad-hoc) WITH configur$5 WITH (wifi OR wi-fi OR wlan OR wireless lan) WITH SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L129	234	(ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) WITH SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L130	398	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L131	134	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND camera	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L132	27	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND camera WITH (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L133	27	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND (lighting OR camera) WITH (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L134	50	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND (lighting OR camera) SAME (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L135	12147	server WITH account WITH (password OR ssid)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L136	740	server WITH account WITH (password OR ssid) AND (ad hoc OR ad-hoc OR adhoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L137	41	server WITH account WITH (password OR ssid) AND (ad hoc OR ad-hoc OR adhoc) WITH configuration	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L138	3	"20090180659"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L139	58	smartphone WITH configur$3 WITH medical device	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L140	7	smartphone WITH configur$3 WITH medical device AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L141	17	smartphone WITH configur$3 WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L142	29	smartphone WITH control$4 WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L143	29	smartphone WITH control$4 WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L144	2	smartphone WITH setting WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L145	3	smartphone WITH setting SAME medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L146	32	smartphone SAME medical SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L147	52	smartphone WITH (adhoc OR ad-hoc OR ad hoc) AND medical	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L148	220	smartphone SAME (adhoc OR ad-hoc OR ad hoc) AND medical	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L149	24	(adhoc OR ad-hoc OR ad hoc OR bluetooth OR BT) WITH (configuration OR setting) WITH medical (device OR equipement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L150	5	iot WITH (configuration OR setting) WITH medical (device OR equipement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L151	424	iot WITH medical (device OR equipement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L152	47	iot WITH medical (device OR equipement) AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L153	74	iot SAME medical (device OR equipement) AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L154	1	remot$2 WITH medical (device OR equipement) SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L155	5	"20140018068"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L156	29	remot$2 WITH medical SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L157	3	"20130316649"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L158	10	pairing WITH medical (device OR equipement) SAME smartphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L159	23	pairing WITH medical SAME smartphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2019/02/18 16:31

			IBM_TDB			
L160	2	"15927262"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:31
L161	2	"20140279122"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/02/18 16:55

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L115	38122	(H04L41/0806; H04L67/42; H04W84/18).cpc.	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L116	7443	(ad hoc OR adhoc OR ad-hoc).clm.	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L117	2883	L115 AND L116	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L118	51322	(wireless LAN OR WLAN OR wifi Or wi-fi OR wireless local area network OR wireless WAN OR wwan OR w-wan OR wireless wide area network).clm.	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L119	920	L116 AND L118	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L120	11540	media player.clm.	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L121	21338	(mp3 OR media OR video OR audio) player.clm.	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31
L122	288	L115 AND L121	US-PGPUB; USPAT	ADJ	OFF	2019/02/18 16:31

2/18/2019 5:00:33 PM
C:\Users\jlee13\Documents\EAST\Workspaces\16057360_2.wsp

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/057,360	08/07/2018	Michael J. Koss	120223CON6

CONFIRMATION NO. 9075

26285
K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

POA ACCEPTANCE LETTER

OC000000105273206

Date Mailed: 01/24/2019

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/17/2019.

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

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

/cnguyen/

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/057,360	Filing Date 08/07/2018	☐ 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	01/24/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/KIMBERLY D 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.

Application Number * 16/057,360 *	Application/Control No. 16/057,360	Applicant(s)/Patent under Reexamination Koss et al.	
	Examiner LEE, JAE YOUNG	Art Unit 2466	

Document Code - DISQ	Internal Document - DO NOT MAIL

TERMINAL DISCLAIMER	☑ APPROVED	☐ DISAPPROVED
Date Filed: 17 January 2019	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
/FELICIA D ROBERTS/ **Technology Center: OPLC** **Telephone: (571)272-0550** 10,079,717

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Koss Corporation	)	**Examiner:**	Lee, Jae Young
	)		
Inventors: Koss et al.	)	**Art Unit:**	2466
	)		
Application No.: 16/057,360	)	**Docket No.:**	120223CON6
	)		
Filing Date: August 7, 2018	)	**Confirmation No.:**	9075

Title : CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

RESPONSE TO OFFICE ACTION

K&L Gates, LLP
Pittsburgh, PA 15222
January 17, 2019

VIA ELECTRONIC FILING

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

Dear Commissioner:

In response to the Office Action mailed November 1, 2018 in connection with the above-referenced application ("the Subject Application"), Applicant responds as follows, wherein:

Listing of the Claims begin on page 2; and

Remarks begin on page 7.

Listing of the Claims

The following is a complete listing of the claims. The claims are not amended and are provided for purposes of convenience.

1. (Canceled)

2. (Previously Presented) A system comprising:

a wireless access point;

an electronic device;

a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and

one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by the wireless access point,

wherein:

the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and

the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.

3. (Previously Presented) The system of claim 2, further comprising a remote network server, wherein the after connecting to the wireless access point, the electronic device is for receiving control data from the remote network server.

4. (Previously Presented) The system of claim 2, wherein the electronic device comprises a lighting system.

5. (Previously Presented) The system of claim 2, wherein the electronic device comprises a camera.

6. (Previously Presented) The system of claim 2, wherein the electronic device comprises a medical device.

7. (Previously Presented) The system of claim 2, wherein the electronic device comprises a gaming system.

8. (Previously Presented) The system of claim 2, wherein the electronic device comprises acoustic speaker device.

9. (Previously Presented) The system of claim 8, wherein the acoustic speaker device comprises a set of earphones.

10. (Previously Presented) The system of claim 8, wherein:
the system further comprises a remote network server; and
the acoustic speaker device is further for:
after connecting to the wireless access point, streaming audio content from the remote network server via the infrastructure wireless network; and
playing the audio content streamed from the remote network server, such that the acoustic speaker device is enabled to play audio streamed via the infrastructure wireless network.

11. (Previously Presented) The system of claim 2, wherein:
the system further comprises a remote network server; and
the electronic device comprises a video player that is further for:
after connecting to the wireless access point, streaming video content from the remote network server via the infrastructure wireless network; and
playing the video content streamed from the remote network server, such that the video player is enabled to play video streamed via the infrastructure wireless network.

12. (Previously Presented) The system of claim 2, wherein the mobile computer device comprises a smartphone, and wherein the smartphone comprises a radio module for communicating wirelessly via the ad hoc wireless network with the electronic device.

13. (Previously Presented) The system of claim 2, wherein:
the infrastructure wireless network comprises an infrastructure Wi-Fi network; and
the credential data for the infrastructure Wi-Fi network comprises an identifier for the infrastructure Wi-Fi network.

14. (Previously Presented) The system of claim 13, wherein the credential data for the infrastructure Wi-Fi network additionally comprises a password for the infrastructure Wi-Fi network.

15. (Previously Presented) The system of claim 14, wherein the credential data for the infrastructure Wi-Fi network additionally comprises encryption type data for the infrastructure Wi-Fi network.

16. (Previously Presented) The system of claim 13, wherein the ad hoc wireless network comprises a Bluetooth wireless network.

17. (Previously Presented) The system of claim 2, wherein the one or more host servers host a website through which, via the mobile computer device, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user.

18. (Previously Presented) A system comprising:
an electronic device;
a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and

one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by a wireless access point,

wherein:

the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and

the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.

19. (Previously Presented) The system of claim 18, wherein the one or more host servers host a website through which, via the mobile computer device, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user.

20. (Previously Presented) The system of claim 19, wherein:

the infrastructure wireless network comprises an infrastructure Wi-Fi network;

the credential data for the infrastructure Wi-Fi network comprises:

an identifier for the infrastructure Wi-Fi network; and

a password for the infrastructure Wi-Fi network; and

the electronic device comprises an electronic device selected from the group consisting of:

an acoustic speaker;

a video player;

a lighting system;

a camera;

a medical device; and

a gaming system.

21. (Previously Presented) The system of claim 18, further comprising a remote network server, wherein the after connecting to the wireless access point, the electronic device is for receiving control data from the remote network server.

22. (Previously Presented) The system of claim 13, wherein the ad hoc wireless network comprises an ad hoc WiFi wireless network.

REMARKS

Claims 2-22 are pending in the Subject Application. In the Office Action, claims 2 and 12-19 were rejected for nonstatutory double patenting. Claims 2-22 were also rejected as being anticipated and/or obvious. Applicant traverses the rejections for the reasons set forth below.

Double Patenting

The Office Action rejected claims 2 and 12-19 on the ground of nonstatutory double patenting over claims 1-7, 9 and 18 of U.S. 10,079,717 (Koss). In response, Applicant has filed a terminal disclaimer in compliance with 37 C.F.R §1.321(b) to obviate the double patenting rejection. Accordingly, the double patenting rejection should be withdrawn.

Section 102 Rejections

Claims 2-3, 5, 8-14, and 16-21 were rejected as being anticipated by Luna (U.S. 2014/0279122) under pre-AIA 35 U.S.C. § 102(e). A published patent application, such as Luna, is only prior art under pre-AIA § 102(e) if the published patent application was filed "before the invention by the applicant for patent…" Luna has a filing date of March 13, 2013. Luna, therefore, is only prior art if the Applicant did not invent the subject matter of claims 2-3, 5, 8-14, and 16-21 prior to March 13, 2013.

The Subject Application claims priority through a series of continuation applications to a parent application, Serial No. 13/832,719, filed March 15, 2013 (hereinafter, "the Parent Application). In the Parent Application, the first named inventor of both the Parent Application and the Subject Application, Michael J. Koss, submitted a declaration ("the Koss Declaration") showing an invention date of the inventions claimed in the Parent Application at least as early as May 14, 2012, which predates Luna by more than ten (10) months. A copy of the Koss Declaration from the Parent Application is being submitted herewith as Exhibit A hereto.

Although the Koss Declaration is nominally for the claims of the Parent Application, it also demonstrates invention of the claims of the Subject Application by at least May 14, 2012 due to the similarity of the claims of the Parent and Subject Applications. The chart below shows the correspondence between claim 1 of the Parent Application and independent claim 2 of the Subject Application.

Claim 1 of Parent Application		Claim 2 of Subject Application
A system comprising:		A system comprising
a wireless device configured to receive data wirelessly;		a wireless access point; an electronic device;
a content access point that communicates with the wireless device via an ad hoc wireless network; a computer that is connectable to the content access point; and		a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link;
a remote server in communication with the computer via a communications network,		one or more host servers that are in communication with the mobile computer device via the Internet,
wherein:		
the remote server hosts a website accessible by the computer; the website permits a user of the wireless device to input via the computer credential data for at least one infrastructure wireless network; the remote server stores the credential data for the at least one infrastructure wireless network; and		wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by the wireless access point, wherein:
the content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network,		the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and
…such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network.		the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.

The chart above shows that claim 1 of the Parent Application and claim 2 of the Subject Application are very similar in scope. Indeed, claim 2 of the Subject Application is broader than claim 1 of the Parent Application because claim 2 of the Subject Application: (i) does not recite the website hosted by the remote server; and (ii) combines the content access point and computer of claim 1 of the Parent Application into the mobile computer device of claim 2 of the Subject Application. Claim 2 of the Subject Application is narrower than claim 1 of the Parent Application because claim 2 of the Subject Application recites a wireless access point, but that is an insignificant difference because: (i) infrastructure wireless networks utilize wireless access points (*see e.g.*, Subject Application at ¶ [0013]) and claim 1 of the Parent Application recites an "infrastructure wireless network"; and (ii) the press release that is Exhibit 1 of the Koss Declaration mentions that Applicant's prior invention used "available wireless access points." Exhibit 1 of the Koss Declaration at p. 1; *see also* p. 2 ("on preferred wireless access points" and "any public Wi-Fi hotspot"). Thus, the use of a wireless access point in Applicant's invention is shown at least as early as May 14, 2012.

Thus, the Koss Declaration demonstrates an invention date for claim 2 of the Subject Application prior to May 14, 2012, which pre-dates the filing date of Luna. The same reasoning applies to independent claim 18 due to its similarity to claim 2. Therefore, Luna is not prior art under pre-AIA § 102(e) to independent claims 2 and 18. For at least this reason, Luna does not anticipate claims 2 and 18 under pre-AIA § 102(e). In addition, by virtue of their dependence upon claims 2 and 18, dependent claims 3, 5, 8-14, 16-17 and 19-21 are also not anticipated by Luna under § 102(e). Accordingly, the § 102(e) rejections for claims 2-3, 5, 8-14, and 16-21 should be withdrawn.

Section 103 Rejections

Dependent claims 4, 6, 7, 15, and 22 were rejected as obvious under § 103(a) over various combinations of Luna, Rosenblatt (U.S. 2010/0081375), McGrath (U.S. 2004/0204743), and Yamada (U.S. 2007/0087394). The rejections are all based on the notion that Luna qualifies as prior art, which it does not as described above. For at least this reason, dependent claims 4, 6, 7, 15 and 22 would not have been obvious in view of the cited references and the §103 rejections should be withdrawn.

CONCLUSION

The claims of the Subject Application are in condition for allowance for the reasons set forth above. The pending claims are nonobvious in view of the cited references. Accordingly, Applicant respectfully requests favorable reconsideration and allowance of the Subject Application.

This response should not be taken as acquiescence to any of the specific rejections, assertions, statements, and the like, presented in the Office Action that applicant has not explicitly addressed herein. Applicant reserves the right to specifically address all such rejections, assertions, and statements in continuing applications, subsequent responses, and/or appeal or pre-appeal proceedings, if necessary.

If the undersigned can be of assistance to the Examiner in addressing any additional issues to advance the application to a condition of allowance, please contact the undersigned at the number set forth below.

Respectfully submitted,

Date: January 17, 2019

/Mark G. Knedeisen/
Mark G. Knedeisen
Reg. No. 42,747

K&L GATES LLP
K&L Gates Center
210 Sixth Ave.
Pittsburgh, Pennsylvania 15222

Ph. (412) 355-6342
Fax (412) 355-6501
email: mark.knedeisen@klgates.com

EXHIBIT A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Koss Corporation	§		
		§		
Inventors:	Pelland et al.	§	**Examiner:**	Lee, Jae Young
		§		
Serial No.	13/832,719	§	**Art Unit:**	2466
		§		
Filing Date:	March 15, 2013	§	**Docket No.**	120223

Title: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

DECLARATION OF MICHAEL J. KOSS UNDER 37 C.F.R. § 1.131

I, Michael J. Koss, declare as follows:

1. I am one of the named inventors for the above-referenced patent application (hereinafter "the Subject Application").

2. Koss Corporation owns the Subject Application. The assignment from the inventors to Koss Corporation is recorded at Reel/Frame 031520/0608. I am the Chief Executive Office, President, and Chief Operating Office of Koss Corporation, and I am authorized to act on behalf of Koss Corporation under 37 C.F.R. § 3.73(c).

3. I make this declaration on behalf of Koss Corporation in response to the Office Action issued December 21, 2014 for the Subject Application to show invention by the applicant, Koss Corporation, and its inventors prior to the publication of "Review - Koss Striva Could Be The Next Big Platform to Enjoy Music," by Matthew Brodnick, dated May 14, 2012 (referred to in the Office Action as "Brodnick").

4. Prior to May 14, 2012, the applicant, Koss Corporation, and its inventors conceived and reduced to practice the inventions claimed in the pending claims of the Subject Application.

5. In support of the conception and reduction to practice of the inventions claimed in the pending claims of the Subject Application prior to May 14, 2012, I attach hereto as Exhibit 1

a press release by Koss Corporation, dated April 25, 2012, entitled "Koss Introduces STRIVA: World's First Wi-Fi Headphone System to Receive Music Directly from the Internet," available at www.koss.com/en/new/Introducing_STRIVA. This document describes a system that comprises:

- Wireless headphones that can "receive[] music directly from the internet without wires," which is an example of the claimed "wireless device configured to receive data wirelessly";
- The "STRIVA CAP" that "plugs into any smartphone, computer, radio or MP3 player," which are respective examples of the claimed "content access point that communicates with the wireless device via an ad hoc wireless network" and the claimed "computer that is connectable to the content access point"; and
- The "MyKoss server," which is an example of the claimed "remote server in communication with the computer via a communications network," such as the internet.

6. Exhibit 1 further explains that a user can access the MyKOSS site using a computer device to create an account, and "[o]nce an account is created, the STRIVA products are mated to the user account and sent special instructions on preferred wireless access points nearby when away from home or the office." The "special instructions on preferred wireless access points" are examples of "credential data for the at least one infrastructure wireless network" that is transmitted from the STRIVA CAP to the headphones according to claim 1 of the Subject Application.

7. In further support of the conception and reduction to practice of the inventions claimed in the pending claims of the Subject Application prior to May 14, 2012, I attach hereto as Exhibit 2 Koss Corporation's "Quick Start Guide" for the STRIVA PRO headphones, available at www.koss.com/~/media/Files/Koss/STRIVA%20Quickstart/STRIVA_Guide-pro.pdf. The "Quick Start Guide" that is Exhibit 2 was prepared prior to May 14, 2012 in connection with Koss Corporation's release of its STRIVA products in April 2012 (see Exhibit 1).

8. Exhibit 2 demonstrates how a user can enter information for a wireless hotspot at the MyKOSS website; how the STRIVA CAP is connected to the user's personal computer (or other device capable of accessing the MyKOSS website; and how the STRIVA CAP "synchs" with the headphones, which includes the step of the STRIVA CAP transmitting to the headphones the credential information for the Wi-Fi hotspot via the ad hoc wireless network established between the STRIVA CAP and headphones so that the headphones thereafter can connect to the Wi-Fi hotspot.

9. I have direct and personal knowledge of Koss Corporation's conception and reduction to practice of the inventions claimed in the pending claims of the Subject Application both because I am one of the named inventors for the Subject Application and because I am the Chief Executive Office, President, and Chief Operating Office of Koss Corporation.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on: 1.28, 2015

Michael J. Koss

EXHIBIT 1

News

Return To Articles

4/25/2012

Introducing STRIVA

FOR IMMEDIATE RELEASE

For more information:
Matt Braun, For Koss
(414) 270-8350
mbraun@hansondodge.com

Koss Introduces STRIVA: World's First Wi-Fi Headphone System To Receive Music Directly From the Internet

(Milwaukee, Wisconsin) April 25, 2012 - Koss Corporation (NASDAQ SYMBOL: KOSS), the U.S.-based creator of the world's first SP3 Stereophone in 1958, has unveiled STRIVA, a revolutionary new headphone and in-ear monitor system with Wi-Fi technology that receives music directly from the internet without wires.

"54 years ago my father revolutionized personal listening with the first Koss SP3 stereophone," Michael J. Koss, President and CEO said. "Today, thanks to the Internet, the revolution is in the air. Now all of your favorite music can be streamed directly from the Internet to our new headphones and in-ear monitors without wires using Koss STRIVA technology."

Michael Koss explained that the STRIVA development project commenced nearly four years ago and yielded three significant technological breakthroughs. They are STRIVA Core, MyKOSS online server and STRIVA CAP.

First, the STRIVA Core is a miniature battery-powered computer that functions as a web server coupled with an assortment of Wi-Fi components powerful enough to make any device wireless. The STRIVA Core's Wi-Fi engine and microprocessor components are small enough to nest on the surface of a U.S. dime. The STRIVA Core is built into all STRIVA products, including the Koss STRIVA PRO headphones and in-ear Koss STRIVA TAPs being released today.

The second breakthrough is the MyKOSS server, designed to link wirelessly with STRIVA products and connect them to remote Internet broadcasting sites. The MyKOSS platform includes proprietary software designed to scan the Internet for thousands of free streams and radio stations that deliver music and audio content. The MyKOSS server acts as a switch to direct the STRIVA headphones to the proper stream based on "listener-customized" music channels. The STRIVA-enabled headphone receives these special address instructions from the MyKOSS server and links the headphone directly to music streams using available wireless access points.

Finally, all STRIVA products include the STRIVA CAP or Content Access Point. This matchbook-sized wireless access point converts music from a smartphone, music player or computer into a digital TCP/IP stack and transmits it directly to STRIVA-enabled headphones or in-ear monitors using Wi-Fi. The STRIVA CAP can be used in conjunction with a wireless router for digital connections throughout the Internet, or it can be used to create a direct local wireless connection whenever a Wi-Fi router or hot spot is unavailable.

"The Internet has been liberating music for over 10 years," Michael Koss continued. "Now our STRIVA Wi-Fi technology will liberate music lovers who can finally cut the cord and enjoy their favorite music anywhere, anytime, without wires."

STRIVA TAP in-ear monitors and STRIVA PRO full size headphones are the first STRIVA products being introduced by Koss.

STRIVA TAP is a tiny in-ear monitor measuring only 1.5 inches in length. Unlike other in-ear cordless solutions, each pair of stereo STRIVA TAPs does not require wires concealed in a headband to connect the left and right earpieces together. Instead, microprocessors in each earpiece continually synchronize the music to ensure quality stereo sound is recreated consistently in both ears.

STRIVA TAP allows users to control their listening experience using innovative capacitive touch controls on the face of the device. Its ultra-compact size and state-of-the-art design make it ideal for those on the go.

For those that prefer an over-the-ear headphone model, Koss has introduced STRIVA PRO, which combines superior sound quality with elegant design. STRIVA PRO features gesture-based controls on the ear cup, allowing listeners to manage both channel and volume preferences with the flick of a button or swipe of a finger. STRIVA PRO also folds flat for storage and portability.

Both STRIVA PRO and STRIVA TAP include a STRIVA CAP that plugs into any headphone jack. STRIVA CAP creates an additional

local music channel for those who prefer listening to their own personal music libraries or music apps like Pandora or Spotify. The STRIVA CAP plugs into any smartphone, computer, radio or MP3 player with a headphone jack.

"We created the STRIVA system with a specific focus on personalization," Michael Koss said. "We developed a platform that allows listeners to create their own music channels, based on their preferences, using MyKOSS options to filter music by genre, artist, or decade. Once the channel is set up, listeners can simply press a button or touch a sensor to send a thumbs up or thumbs down back to the MyKOSS server to remotely 'fine tune' the content delivered to their personalized channels. Both models feature a new capacitive touch control design that allows the listener to change volume, switch channels or jump streams with a simple swipe or tap."

All STRIVA products include access to the MyKOSS music management system rolling out in Beta form at the time of the product launch.

The MyKOSS site can be accessed with any standard Internet browser like Explorer, Chrome or Safari using any smartphone, tablet, or computer that has access to the Internet. Once an account is created, the STRIVA products are mated to the user account and sent special instructions on preferred wireless access points nearby when away from home or the office.

Custom channels are created based on the listener's preferences and continue to be updated and improved every time the listener tunes in. Koss has also developed a menu of options for the headphone slide and button controls that the user can remotely modify on the product itself through the MyKOSS website. Revised firmware for the new settings is transmitted through Wi-Fi to the STRIVA products.

"There have been many claims about home systems and products that use the same radio signal band as Wi-Fi," Koss continued. "The Koss STRIVA system is the first wireless Wi-Fi system of its kind in the world. STRIVA-enabled headphones and in-ear monitors are the first products to make a direct connection to the Internet without dedicating a computer, smartphone, music player or tablet to the task of gathering and serving music to you. STRIVA Core is the first Wi-Fi enabled computer that you wear on your head, and the MyKOSS server software is the first controller system of its type to exist in the cloud. The system is not dependent on a customized bridge, transmitting device or pre-determined restricted special network. It runs on the existing Internet backbone. This means you can take your Koss STRIVA headphones – all on their own – to any public Wi-Fi hotspot and stay connected to the music you love. No strings attached. The Revolution is in the air."

Koss STRIVA products are being produced at the Koss factory in the U.S. and are available exclusively at www.koss.com.

About Koss Corporation

Headquartered in Milwaukee, Wisconsin, Koss Corporation is known worldwide for its high fidelity Stereophones and audio accessories and digital audiophile compact recordings of American orchestras on its Koss Classic Label. For more information, visit www.koss.com.

Share: Like 3 Tweet 1 +1 0 3

Hearing Is Believing®

Renowned for the invention of the original stereophones, Koss has been pioneering hi-fi since 1958 - three generations of American ingenuity, integrity and incomparable quality.

Affiliate Program | **Privacy** | **Terms of Use**

Customer Service 1-800-872-5677

© 2015 Koss Corporation. All rights reserved

Headphones

Full Size Headphones
Earbuds & In-Ear Headphones
Ear Clip Headphones
On-Ear Headphones
In-Line Microphone Headphones
Communication Headsets

Customer Support

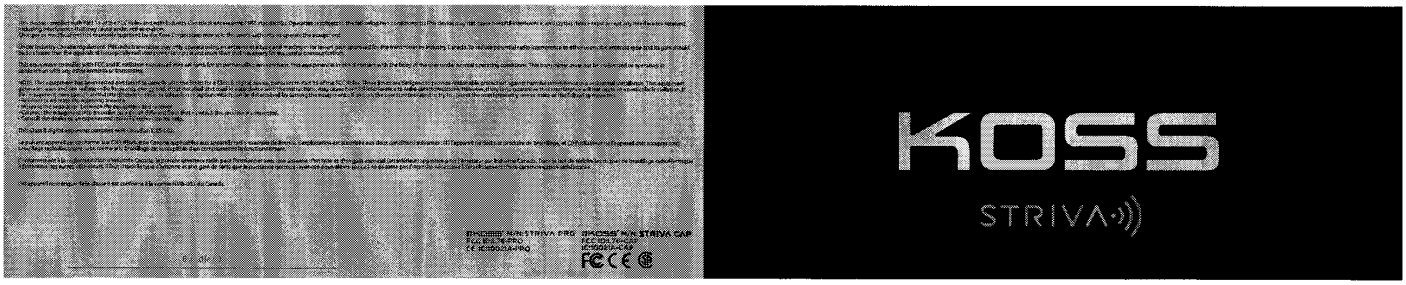
Contact Us
Choosing Headphones
Product Registration
Product Manuals
Koss Distributors
Warranty & Repair
Shipping Information
live chat is available

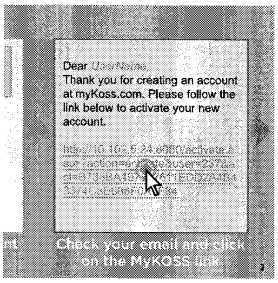
Connect With Us

Email Sign-Up

Enter your email address
United States
Subscribe

EXHIBIT 2


KOSS
STRIVA


Dear UserName,
Thank you for creating an account at myKoss.com. Please follow the link below to activate your new account.
Check your email and click on the MyKOSS link

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 11/30/2014. OMB 0651-0051
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.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

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

Application Number	16/057,360
Filing Date	August 7, 2018
First Named Inventor	Michael J. Koss
Title	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
Art Unit	2466
Examiner Name	Lee, Jae Young
Attorney Docket Number	120223CON6

SIGNATURE of Applicant or Patent Practitioner

Signature	/Mark G. Knedeisen/	Date (Optional)	January 17, 2019
Name	Mark G. Knedeisen	Registration Number	42,747
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

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

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 11/30/2014. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY BY APPLICANT

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

Application Number	Filing Date

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

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 26285

OR

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

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

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

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

Koss Corporation

☐ Inventor or Joint Inventor (title not required below)

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

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

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

SIGNATURE of Applicant for Patent

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

Signature	[signature]	Date (Optional)	JUNE 9, 2016
Name	LeVoee Lillie		
Title	Koss Corporation / VP OPERATIONS		

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

☑ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Electronic Patent Application Fee Transmittal	
Application Number:	16057360
Filing Date:	07-Aug-2018
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Filer:	Mark G. Knedeisen/Mona Cornelia
Attorney Docket Number:	120223CON6
Filed as Small Entity	

Filing Fees for Utility under 35 USC 111(a)

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
		Total in USD ($)		**160**

Electronic Acknowledgement Receipt	
EFS ID:	34885902
Application Number:	16057360
International Application Number:	
Confirmation Number:	9075
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Customer Number:	26285
Filer:	Mark G. Knedeisen/Mona Cornelia
Filer Authorized By:	Mark G. Knedeisen
Attorney Docket Number:	120223CON6
Receipt Date:	17-JAN-2019
Filing Date:	07-AUG-2018
Time Stamp:	15:43:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$160
RAM confirmation Number	011819INTEFSW00016225021818
Deposit Account	021818
Authorized User	Mona Cornelia
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	120223CON6-Amendment-Transmittal-01-17-2019.pdf	107199 a240412f3de8ff8e62664bc065c3328cfc9f35b9	no	4
Warnings:					
Information:					
2		Amendment-01-17-2019.pdf	132300 49e02e9bcd67aadf7e83e7d17e201bb899233925	yes	10

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	6
Applicant Arguments/Remarks Made in an Amendment	7	10

Warnings:					
Information:					
3	Miscellaneous Incoming Letter	Exhibit-A-Koss-Declaration.pdf	653639 b76c84062ce0df07d680e70c709e5b63c3d90eb4	no	9
Warnings:					
Information:					
4	Terminal Disclaimer Filed	Terminal-Disclaimer-01-17-2019.pdf	119674 7a5cea85478df42e67089637891e0b7efe10ab1a	no	1
Warnings:					
Information:					
5	Power of Attorney	Power-of-Attorney-01-17-2019.pdf	921734 a3613675b2a45790cb4ce8735fc16b1bfd1e1665	no	2

Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	30487 916dcebaf95b459dca55fc82657baf031c1a4034	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1965033		

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

Applicant: Koss Corporation	)	**Examiner:**	Lee, Jae Young
	)		
Inventors: Koss et al.	)	**Art Unit:**	2466
	)		
Application No.: 16/057,360	)	**Docket No.:**	120223CON6
	)		
Filing Date: August 7, 2018	)	**Confirmation No.:**	9075

Title : CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

Pittsburgh, Pennsylvania 15222

January 17, 2019

VIA ELECTRONIC FILING

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

AMENDMENT TRANSMITTAL

1. Transmitted herewith is an amendment for this application.

STATUS

2. Applicant is

☒ A statement that this filing is by a small entity is hereby asserted in accordance with the rule change effective September 8, 2000, 65 Fed. Reg. 54603.

☐ other than a small entity.

EXTENSION OF TERM

NOTE: "Extension of Time in Patent Cases (Supplement Amendments) - If a timely and complete response has been filed after a Non-Final Office Action, an extension of time is not required to permit filing and/or entry of an additional amendment after expiration of the shortened statutory period.

If a timely response has been filed after a Final Office Action, an extension of time is required to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run." Notice of December 10, 1985 (1061 O.G. 34-35).

NOTE: See 37 CFR 1.645 for extensions of time in interference proceedings, and 37 CFR 1.550(c) for extensions of time in reexamination proceedings.

3. The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply.

(complete (a) or (b), as applicable)

(a) ☐ Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

Extension (months)	Fee for other than small entity	Fee for small entity
☐ one month	$ 200.00	$ 100.00
☐ two months	$ 600.00	$ 300.00
☐ three months	$1,400.00	$ 700.00
☐ four months	$2,200.00	$1,100.00

Fee: $

If an additional **extension** of time is required, please consider this a petition therefor.

(check and complete the next item, if applicable)

☐ An extension for _____ months has already been secured and the fee paid therefor of $_____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request **$**

OR

(b) ☒ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

FEE FOR CLAIMS

4. The fee for claims (37 CFR 1.16(b)-(d) has been calculated as shown below:

(Col. 1)	(Col. 2)	(Col. 3)	SMALL ENTITY			OTHER THAN A SMALL ENTITY	
CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDIT. FEE	OR	RATE	ADDIT. FEE
TOTAL 21 •	MINUS 21 ••	= 0	X50=	$0		X100=	$0
INDEP. 2 •	MINUS 3 •••	= 0	X230=	$0		X460=	$0
☐ FIRST PRESENTATION OF MULTIPLE DEP. CLAIM			+410=	$		+820=	$0
			TOTAL ADDIT. FEE	$0	OR	TOTAL ADDIT. FEE	$0

- • If the entry in Col. 1 is less than entry in Col. 2, write "0" in Col. 3.
- •• If the "Highest No. Previously Paid for" IN THIS SPACE is less than 20, enter "20."
- ••• If the "Highest No. Previously Paid for" IN THIS SPACE is less than 3, enter "3."
  The "Highest No. Previously Paid for" (Total or indep.) is the highest number found in the appropriate box in Col. 1 of a prior amendment or the number of claims originally filed.

WARNING "After final rejection or action (§ 1.113) amendments may be made cancelling claims or complying with any requirement of form which has been made." 37 CFR § 1.116(a) (emphasis added).

Complete (c) or (d), as applicable)

(c) ☒ No additional fee for claims is required.

OR

(d) ☐ Total additional fee for claims required $_____

FEE PAYMENT

5. ☐ Attached is a check in the sum of $ _____

☐ Charge Account No. _____ sum of $_____

FEE DEFICIENCY

NOTE: If there is a fee deficiency and there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum, six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases. Authorization to charge the deposit account for any fee deficiency should be checked. See the Notice of April 7, 1986, (1065 O.G. 31-33).

6. ☒ If any additional extension and/or fee is required, charge Account No.

02-1818.

AND/OR

7. ☒ If any additional fee for claims is required, charge Account No.

02-1818.

/Mark G. Knedeisen/

SIGNATURE OF ATTORNEY

Reg. No.: 42,747

Tel. No.: (412) 355-6342

Customer No. 26285

Mark G. Knedeisen
(type or print name of attorney)

K&L Gates LLP
P.O. Address
K&L Gates Center
210 Sixth Avenue
Pittsburgh, PA 15222-2613

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

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 120223CON6

In re Application of: Michael J. Koss et al.

Application No.: 16/057,360

Filed: August 7, 2016

For: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

The applicant, Koss Corporation, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 10,079,717 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

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

Check either box 1 or 2 below, if appropriate.

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

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

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 42,747

/Mark G. Knedeisen/ — Signature
January 17, 2019 — Date

Mark G. Knedeisen — Typed or printed name

Attorney — Title
(412) 355-6342 — Telephone Number

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

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

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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.
16/057,360	08/07/2018	Michael J. Koss	120223CON6	9075

26285 7590 11/01/2018

K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

EXAMINER	
LEE, JAE YOUNG	

ART UNIT	PAPER NUMBER
2466	

NOTIFICATION DATE	DELIVERY MODE
11/01/2018	ELECTRONIC

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

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

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

USpatentmail@klgates.com

Office Action Summary	Application No. 16/057,360	Applicant(s) Koss et al.	
	Examiner JAE Y LEE	Art Unit 2466	AIA Status No

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

Period for Reply

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

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

Status

1)☑ Responsive to communication(s) filed on 7 August 2018.

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

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

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

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

Disposition of Claims*

5) ☑ Claim(s) 2-22 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) 2-22 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 7 August 2018 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 08/07/2018.

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

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

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

Double Patenting

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

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon

submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

3. **Claims 2 and 12-19** are rejected on the ground of nonstatutory double patenting over claims 1-7, 9 and 18 of U.S. Patent No. 10,079,717 (hereinafter Koss) since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows:

Regarding claim 2, although the conflicting claims are not identical, they are not patentably distinct from each other because claim 2 of instant application merely broadens the scope of the claim 1 of Koss by eliminating the elements and their functions of the claims as set forth below.

Claim 2 of Instant Application	**Claim 1 of Koss**
A system comprising: a wireless access point; an electronic device; a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by the wireless access point, wherein:	A system comprising: a wireless access point; *a remote network server;* a wireless *audio output* device *that comprises multiple acoustic transducers;* a mobile computer device that is in communication with the wireless *audio output* device via an ad hoc wireless communication link; and one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure

the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.	wireless network provided by the wireless access point, wherein: the mobile computer device is for transmitting to the wireless *audio output* device, wirelessly via the ad hoc wireless communication link between the wireless *audio output* and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and the wireless *audio output* device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device: connecting to the wireless access point via the infrastructure wireless network; *streaming audio content from the remote network server via the infrastructure wireless network; and playing, by the multiple acoustic transducers of the wireless output device, the audio content streamed from the remote network server, such that the wireless audio output device is enabled to play audio streamed via the infrastructure wireless network without having to be physically plugged into the mobile computing device.*

In view of the above, it is clear that the conflicting claims are not patentably distinct from each other because claim 2 of the instant application merely broadens the scope of the claim 1 of Koss by eliminating the italicized portion of limitation of claim 1.

Regarding claim 18, although the conflicting claims are not identical, they are not patentably distinct from each other because claim 18 of instant application merely broadens the scope of the claim 10 of Koss by eliminating the elements and their functions of the claims as set forth below.

Claim 18 of Instant Application	**Claim 10 of Koss**
A system comprising: an electronic device; a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by a wireless access point, wherein: the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and	A system comprising: a wireless *audio output* device *that comprises multiple acoustic transducers*; and a mobile computer device that is in communication with the wireless *audio output* device via an ad hoc wireless communication link; and one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by the wireless access point, wherein: the mobile computer device is for transmitting to the wireless *audio output* device, wirelessly via an ad hoc wireless communication link between the wireless audio output and the mobile computer device, the credential data for the

the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.	infrastructure wireless network stored by the one or more host servers; and the wireless *audio output* device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device: connecting to the infrastructure wireless network; *streaming audio content from a remote network server via the infrastructure wireless network; and playing, by the multiple acoustic transducers of the wireless output device, the audio content streamed from the remote network server, such that the wireless audio output device is enabled to play audio streamed via the infrastructure wireless network without having to be physically plugged into the mobile computing device.*

In view of the above, it is clear that the conflicting claims are not patentably distinct from each other because claim 18 of the instant application merely broadens the scope of the claim 10 of Koss by eliminating the italicized portion of limitation of claim 10.

Claims 12-17 and 19 of instant application is identical/similar with claims 2-7, 9 and 18 of Koss.

Claim Rejections - 35 USC § 102

4. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

5. 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 –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 2, 3, 5, 8-14 and 16-21** are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Luna (US 2014/0279122).

Regarding claim 2, Luna discloses

- **a system comprising: a wireless access point** (Fig. 1, 2A 270)**;**
- **an electronic device** (Fig. 1, 2A 100a)**;**
- **a mobile computer device** (par. 38: To that end, in FIG. 2A, scenario 200a may include media device 100a to be configured, for example, initially by user 201 using a variety of devices 202 including but not limited to a smartphone 210, a tablet 220, a laptop computer 230, a desktop PC or server 240, . . . etc.) **that is in communication with the electronic device via an ad hoc**

wireless communication link (par. 38: user 201 as part of the initialization process may have already used a Bluetooth®. menu on tablet 220 to activate the BT radio and associated software in tablet 220 to begin searching (e.g., via RF) for a BT device to pair with)**; and**

- **one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by the wireless access point** (par. 42: CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications; par. 49: APP 225 … may access 295 the CFG 125 for media device 100b from an external location, such as the Internet, the cloud, etc. as denoted by 250 where a copy of CFG 125 may be located and accessed for download into media device 100b),
- **wherein: the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device** (par. 38: after initial power up of media device 100a, controller 101 may command RF system 107 to electrically couple 224, transceiver BT 120 with antenna 124, and command BT 120 to begin listening 126 for a BT pairing signal from device)**, the credential data for the infrastructure wireless network stored by the one or more host servers** (par. 49: APP 225 … may access 295 the CFG 125 for media device 100b from an external location, such as the Internet, the cloud, etc. as denoted by 250 where a copy of CFG 125 may be located and accessed for download into media device 100b)**; and**
- **the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device** (par. 41: After the user 201 finalizes the configuration process, CFG 125 is downloaded (e.g., using BT 120 or WiFi 130) into DS system 103 in media device 100a)**, connecting to the wireless access point via the infrastructure**

wireless network using the credential data received from the mobile computer device (par. 42: CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications)**.**

Regarding claim 3, Luna discloses

- **further comprising a remote network server, wherein the after connecting to the wireless access point** (par. 42: CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications)**, the electronic device is for receiving control data from the remote network server** (par. 85: the user 201 has other media devices in his/her ecosystem and the user 201 has configured (e.g., CFG 125a) media device 800i to playback music from a playlist using media files located on a computer system (not shown) that the media device 800i accesses via its RF system 107 (e.g., via WiFi 130)).

Regarding claim 5, Luna discloses

- **wherein the electronic device comprises a camera** (par. 30: AV system 109 may include a display (DISP) 180, video device (VID) 190 (e.g., an image captured device or a web CAM, etc.))**.**

Regarding claim 8, Luna discloses

- **wherein the electronic device comprises acoustic speaker device** (par. 30: AV system 109 includes at least one audio transducer, such as a loud speaker 160, a microphone 170, or both)**.**

Regarding claim 9, Luna discloses

- **wherein the acoustic speaker device comprises a set of earphones** (par. 30: port 122 may be a 3.5 mm audio jack for connecting an external speaker, headphones, earphones, etc.)**.**

Regarding claim 10, Luna discloses

- **wherein: the system further comprises a remote network server; and the electronic device comprises a video player that is further for: after connecting to the wireless access point** (par. 85: the user 201 has other media devices in his/her ecosystem and the user 201 has configured (e.g., CFG 125a) media device 800i to playback music from a playlist using media files located on a computer system (not shown) that the media device 800i accesses via its RF system 107 (e.g., via WiFi 130)**, streaming video content from the remote network server via the infrastructure wireless network; and playing the video content streamed from the remote network server, such that the video player is enabled to play video streamed via the infrastructure wireless network** (par. 30: AV system 109 may include a display (DISP) 180, video device (VID) 190 (e.g., an image captured device or a web CAM, etc.), or both. DISP 180 may be a display and/or touch screen (e.g., a LCD, OLED, or flat panel display) for displaying video media; par. 32: Media device 100 may be used for a variety of applications including but not limited to wirelessly communicating with other wireless devices, other media devices 100, wireless networks, and the like for playback of media (e.g., streaming content), such as audio, for example)**.**

Regarding claim 11, Luna discloses

- **wherein: the system further comprises a remote network server; and the electronic device comprises a video player that is further for: after connecting to the wireless access point** (par. 85: the user 201 has other media devices in his/her ecosystem and the user 201 has configured (e.g., CFG 125a) media device 800i to playback music from a playlist using media files located on

a computer system (not shown) that the media device 800i accesses via its RF system 107 (e.g., via WiFi 130)**, streaming video content from the remote network server via the infrastructure wireless network; and playing the video content streamed from the remote network server, such that the video player is enabled to play video streamed via the infrastructure wireless network** (par. 30: AV system 109 may include a display (DISP) 180, video device (VID) 190 (e.g., an image captured device or a web CAM, etc.), or both. DISP 180 may be a display and/or touch screen (e.g., a LCD, OLED, or flat panel display) for displaying video media; par. 32: Media device 100 may be used for a variety of applications including but not limited to wirelessly communicating with other wireless devices, other media devices 100, wireless networks, and the like for playback of media (e.g., streaming content), such as audio, for example)**.**

Regarding claim 12, Luna discloses

- **wherein the mobile computer device comprises a smartphone, and wherein the smartphone** (par. 38: To that end, in FIG. 2A, scenario 200a may include media device 100a to be configured, for example, initially by user 201 using a variety of devices 202 including but not limited to a smartphone 210 . . etc) **comprises a radio module for communicating wirelessly via the ad hoc wireless network with the electronic device** (par. 38: user 201 as part of the initialization process may have already used a Bluetooth®. menu on tablet 220 to activate the BT radio and associated software in tablet 220 to begin searching (e.g., via RF) for a BT device to pair with).

Regarding claim 13, Luna discloses

- **wherein: the infrastructure wireless network comprises an infrastructure Wi-Fi network; and the credential data for the infrastructure Wi-Fi network comprises an identifier for the infrastructure Wi-Fi network** (par. 42: CFG 125 may include data such as the name and

password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications).

Regarding claim 14, Luna discloses

- **wherein the credential data for the infrastructure Wi-Fi network additionally comprises a password for the infrastructure Wi-Fi network** (par. 42: CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications).

Regarding claim 16, Luna discloses

- **wherein the ad hoc wireless network comprises a Bluetooth wireless network** (par. 38: user 201 as part of the initialization process may have already used a Bluetooth®. menu on tablet 220 to activate the BT radio and associated software in tablet 220 to begin searching (e.g., via RF) for a BT device to pair with).

Regarding claim 17, Luna discloses

- **wherein the one or more host servers host a website through which, via the mobile computer device** (par. 41: In FIG. 2A, the source for APP 225 may be obtained from a variety of locations including but not limited to: the Internet 250; a file or the like stored in the Cloud; a web site; a server farm; a FTP site; a drop box; an app store; a manufactures web site; or the like, just to name a few)**, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user** (par. 92: The purchaser (e.g., user 201) of the media devices

may interact in person (e.g., face to face) with the retailer to provide the SSID's and other user specific information for configuring the media devices to be purchased).

Regarding claim 18, Luna discloses

- **a system comprising: an electronic device** (Fig. 1, 2A 100a)**;**
- **a mobile computer device** (par. 38: To that end, in FIG. 2A, scenario 200a may include media device 100a to be configured, for example, initially by user 201 using a variety of devices 202 including but not limited to a smartphone 210, a tablet 220, a laptop computer 230, a desktop PC or server 240, . . . etc.) **that is in communication with the electronic device via an ad hoc wireless communication link** (par. 38: user 201 as part of the initialization process may have already used a Bluetooth®. menu on tablet 220 to activate the BT radio and associated software in tablet 220 to begin searching (e.g., via RF) for a BT device to pair with)**; and**
- **one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by a wireless access point** (par. 42: CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications; par. 49: APP 225 … may access 295 the CFG 125 for media device 100b from an external location, such as the Internet, the cloud, etc. as denoted by 250 where a copy of CFG 125 may be located and accessed for download into media device 100b),
- **wherein: the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device** (par. 38: after initial power up of media device 100a, controller 101 may command RF system 107 to electrically couple 224, transceiver BT 120 with antenna 124, and

command BT 120 to begin listening 126 for a BT pairing signal from device)**, the credential data for the infrastructure wireless network stored by the one or more host servers** (par. 49: APP 225 … may access 295 the CFG 125 for media device 100b from an external location, such as the Internet, the cloud, etc. as denoted by 250 where a copy of CFG 125 may be located and accessed for download into media device 100b)**; and**

- **the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device** (par. 41: After the user 201 finalizes the configuration process, CFG 125 is downloaded (e.g., using BT 120 or WiFi 130) into DS system 103 in media device 100a)**, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device** (par. 42: CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications)**.**

Regarding claim 19, Luna discloses

- **wherein the one or more host servers host a website through which, via the mobile computer device** (par. 41: In FIG. 2A, the source for APP 225 may be obtained from a variety of locations including but not limited to: the Internet 250; a file or the like stored in the Cloud; a web site; a server farm; a FTP site; a drop box; an app store; a manufactures web site; or the like, just to name a few)**, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user** (par. 92: The purchaser (e.g., user 201) of the media devices

may interact in person (e.g., face to face) with the retailer to provide the SSID's and other user specific information for configuring the media devices to be purchased).

Regarding claim 20, Yamada discloses

- **wherein: the infrastructure wireless network comprises an infrastructure Wi-Fi network; the credential data for the infrastructure Wi-Fi network comprises: an identifier for the infrastructure Wi-Fi network; and a password for the infrastructure Wi-Fi network** (par. 42: CFG 125 may include data such as the name and password for a wireless network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications)**; and the electronic device comprises an electronic device selected from the group consisting of: an acoustic speaker** (par. 30: AV system 109 includes at least one audio transducer, such as a loud speaker 160, a microphone 170, or both)**; a video player** (par. 30: AV system 109 may include a display (DISP) 180, video device (VID) 190 (e.g., an image captured device or a web CAM, etc.), or both. DISP 180 may be a display and/or touch screen (e.g., a LCD, OLED, or flat panel display) for displaying video media; par. 32: Media device 100 may be used for a variety of applications including but not limited to wirelessly communicating with other wireless devices, other media devices 100, wireless networks, and the like for playback of media (e.g., streaming content), such as audio, for example)**; a lighting system; a camera** (par. 30: AV system 109 may include a display (DISP) 180, video device (VID) 190 (e.g., an image captured device or a web CAM, etc.))**; a medical device; and a gaming system.**

Regarding claim 21, Luna discloses

- **further comprising a remote network server, wherein the after connecting to the wireless access point** (par. 42: CFG 125 may include data such as the name and password for a wireless

network (e.g., 270) so that WiFi 130 may connect with (see 226) and use the wireless network for future wireless communications)**, the electronic device is for receiving control data from the remote network server** (par. 85: the user 201 has other media devices in his/her ecosystem and the user 201 has configured (e.g., CFG 125a) media device 800i to playback music from a playlist using media files located on a computer system (not shown) that the media device 800i accesses via its RF system 107 (e.g., via WiFi 130)).

Claim Rejections - 35 USC § 103

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

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

8. **Claims 4 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Luna (US 2014/0279122) in view of Rosenblatt et al. (US 2010/0081375).

Regarding claim 4, Luna discloses all the subject matter of the claimed invention with the exception for **a wherein the electronic device comprises a lighting system**. Luna from the same or similar fields of endeavor discloses **a wherein the electronic device comprises a lighting system** (par. 92: Indeed, in one embodiment, the electronic device 10 may be an iPhone® configured as a controlling device to control one or more controllable devices, which may be computers, televisions, DVRs, optical disc players, standalone media players, satellite television or cable television receivers, audio/video (A/V) receivers, digital projectors, networkable thermostats, networkable security systems, networkable lighting, networkable garage door or security gate openers, networkable sprinkler systems, or digital

cameras, etc.; par. 118: The computer 62 may be any computer, such as a desktop computer, a server, or a notebook computer, but may also be a standalone media player or video gaming machine; par. 191: The network configuration information of block 304 may include, for example, XML messages denoting lists of network communication channels 90 accessible via the standalone media player 68 or the handheld device 40. Among other things, the network configuration information of block 304 may include known authorization keys and service set identifier (SSID). By way of example, the network configuration information may include PAN interface 28 configuration information, such as a Bluetooth serial number, MAC address, and an associated password, and/or LAN interface 30 configuration information, such as a WiFi IP address, a WiFi MAC address, and a WiFi SSID). Therefore, it would have been obvious to the person of ordinary skill in the art at the time of invention was made to modify the teaching, i.e., storing, at a server, CFG including SSID and password to be download to a media device by using smartphone over Bluetooth communication such that the media device is able to connect to AP, of Luna by transmitting, by a smartphone, WiFi IP address, WiFi MAC address and WiFi SSID, etc. to controllable device such as networkable lighting, media player, gaming machine, etc. of Rosenblatt, thereby storing, at a server, CFG including SSID, password as well as public key to be download to various controllable device such as media device, networkable lighting, media player, gaming machine, etc. by using smartphone over Bluetooth such that the controllable device is able to connect to AP. The motivation would have been to resolve the issue of initiating and establishing control of each device may involve a series of complicated, unintuitive procedures using separate remote controls (Rosenblatt par. 5) for various types of controllable devices (Rosenblatt par. 108).

Regarding claim 7, Luna discloses all the subject matter of the claimed invention with the exception for **wherein the electronic device comprises a gaming system**. Luna from the same or similar fields of endeavor discloses **wherein the electronic device comprises a gaming system** (par. 92: Indeed,

in one embodiment, the electronic device 10 may be an iPhone® configured as a controlling device to control one or more controllable devices, which may be computers, televisions, DVRs, optical disc players, standalone media players, satellite television or cable television receivers, audio/video (A/V) receivers, digital projectors, networkable thermostats, networkable security systems, networkable lighting, networkable garage door or security gate openers, networkable sprinkler systems, or digital cameras, etc.; par. 118: The computer 62 may be any computer, such as a desktop computer, a server, or a notebook computer, but may also be a standalone media player or video gaming machine; par. 191: The network configuration information of block 304 may include, for example, XML messages denoting lists of network communication channels 90 accessible via the standalone media player 68 or the handheld device 40. Among other things, the network configuration information of block 304 may include known authorization keys and service set identifier (SSID). By way of example, the network configuration information may include PAN interface 28 configuration information, such as a Bluetooth serial number, MAC address, and an associated password, and/or LAN interface 30 configuration information, such as a WiFi IP address, a WiFi MAC address, and a WiFi SSID). Therefore, it would have been obvious to the person of ordinary skill in the art at the time of invention was made to modify the teaching, i.e., storing, at a server, CFG including SSID and password to be download to a media device by using smartphone over Bluetooth communication such that the media device is able to connect to AP, of Luna by transmitting, by a smartphone, WiFi IP address, WiFi MAC address and WiFi SSID, etc. to controllable device such as networkable lighting, media player, gaming machine, etc. of Rosenblatt, thereby storing, at a server, CFG including SSID, password as well as public key to be download to various controllable device such as media device, networkable lighting, media player, gaming machine, etc. by using smartphone over Bluetooth such that the controllable device is able to connect to AP. The motivation would have been to resolve the issue of initiating and establishing control of each device

may involve a series of complicated, unintuitive procedures using separate remote controls (Rosenblatt par. 5) for various types of controllable devices (Rosenblatt par. 108).

9. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Luna (US 2014/0279122) in view of McGrath et al. (US 2004/0204743).

Regarding claim 6, Luna discloses all the subject matter of the claimed invention with the exception for **wherein the electronic device comprises a medical device**. McGrath from the same or similar fields of endeavor discloses **wherein the electronic device comprises a medical device** (par. 26: remote device 12 and defibrillator 14 may be previously unknown to each other, and may establish an ad hoc network according to one of these specification sets. The ability to establish an ad hoc network allows computing devices, such as remote device 12 to control external medical devices, such as defibrillator 14, that are unknown to each other; par. 53: remote device 12 is a computer such as a tablet computer. Remote device 12 wirelessly controls an external medical device, such as defibrillator 14 by sending one or more of control commands 48 to defibrillator 14 via a wireless communication medium)**.** Therefore, it would have been obvious to the person of ordinary skill in the art at the time of invention was made to modify the teaching, i.e., storing, at a server, CFG including SSID and password to be download to a media device by using smartphone over Bluetooth communication such that the media device is able to connect to AP, of Luna, by controlling, by a tablet, external medical device via Ad Hoc communication of McGrath, thereby storing, at a server, CFG including SSID, password as well as public key to be download to a medical device by using smartphone over Bluetooth such that the medical device is able to connect to AP. The motivation would have been to remotely operating an external medical device (McGrath par. 7).

10. **Claims 15 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Luna (US 2014/0279122) in view of Yamada et al. (US 2007/0086394).

Regarding claim 15, Luna discloses all the subject matter of the claimed invention with the exception for **wherein the credential data for the infrastructure Wi-Fi network additionally comprises encryption type data for the infrastructure Wi-Fi network**. Yamada from the same or similar fields of endeavor discloses **wherein the credential data for the infrastructure Wi-Fi network additionally comprises encryption type data for the infrastructure Wi-Fi network** (par. 26: An electronic certificate issued by the authentication server 40 and a secret key corresponding to a public key contained in the electronic certificate are written into a storage unit of the Internet radio receiver 20 in a manufacturing stage. Additionally, the electronic certificate contains an address (URL: Uniform Resource Locator) of the authentication server 40 on the Internet 100 as well as the public key; par. 27: The Internet radio receiver 20 connects to the Internet 100 via the wireless LAN access point router 30, and receives a streaming distribution of audio contents such as music from a radio station (not shown) existing on the Internet 100; par. 38: PC 10 and the Internet radio receiver 20 are wirelessly connected to each other in the Ad-Hoc mode; par. 41: par. 41: When authentication of the Internet radio receiver 20 is successfully performed, the PC 10 encrypts its own SSID and WEP key used for wireless communications with the wireless LAN access point router 30 through use of the public key extracted from the electronic certificate. The encrypted SSID and WEP key are transmitted to the Internet radio receiver). Therefore, it would have been obvious to the person of ordinary skill in the art at the time of invention was made to modify the teaching, i.e., storing, at a server, CFG including SSID and password to be download to a media device by using smartphone over Bluetooth communication such that the media device is able to

connect to AP, of Luna, by storing, at a server, electronic certificate including public key and encrypting, by a PC, encrypts own SSID and WEP key used for wireless communications with the wireless LAN access point router through use of the public key extracted from the electronic certificate and transmitting them to Internet radio receiver in Ad-Hoc mode to receive audio streaming via AP of Yamada, thereby storing, at a server, CFG including SSID, password as well as public key to be download to a media device by using smartphone over Bluetooth or Ad-Hoc such that the media device is able to connect to AP. The motivation would have been to provide a wireless communication terminal and a connection information setting method that make it easy to set connection information to a wireless communication terminal with no character input interface (Yamada par. 5).

Regarding claim 22, Luna discloses all the subject matter of the claimed invention with the exception for **wherein the ad hoc wireless network comprises an ad hoc WiFi wireless network**. Yamada from the same or similar fields of endeavor discloses **wherein the ad hoc wireless network comprises an ad hoc WiFi wireless network** (par. 26: An electronic certificate issued by the authentication server 40 and a secret key corresponding to a public key contained in the electronic certificate are written into a storage unit of the Internet radio receiver 20 in a manufacturing stage. Additionally, the electronic certificate contains an address (URL: Uniform Resource Locator) of the authentication server 40 on the Internet 100 as well as the public key; par. 27: The Internet radio receiver 20 connects to the Internet 100 via the wireless LAN access point router 30, and receives a streaming distribution of audio contents such as music from a radio station (not shown) existing on the Internet 100; par. 38: PC 10 and the Internet radio receiver 20 are wirelessly connected to each other in the Ad-Hoc mode; par. 41: par. 41: When authentication of the Internet radio receiver 20 is successfully performed, the PC 10 encrypts its own SSID and WEP key used for wireless communications with the wireless LAN access point router 30 through use of the public key extracted from the electronic

certificate. The encrypted SSID and WEP key are transmitted to the Internet radio receiver). Therefore, it would have been obvious to the person of ordinary skill in the art at the time of invention was made to modify the teaching, i.e., storing, at a server, CFG including SSID and password to be download to a media device by using smartphone over Bluetooth communication such that the media device is able to connect to AP, of Luna, by storing, at a server, electronic certificate including public key and encrypting, by a PC, encrypts own SSID and WEP key used for wireless communications with the wireless LAN access point router through use of the public key extracted from the electronic certificate and transmitting them to Internet radio receiver in Ad-Hoc mode to receive audio streaming via AP of Yamada, thereby storing, at a server, CFG including SSID, password as well as public key to be download to a media device by using smartphone over Bluetooth or Ad-Hoc such that the media device is able to connect to AP. The motivation would have been to provide a wireless communication terminal and a connection information setting method that make it easy to set connection information to a wireless communication terminal with no character input interface (Yamada par. 5).

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae Y. Lee whose telephone number is (571) 270-3936. The examiner can normally be reached on Monday through Friday from 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Faruk Hamza can be reached on (571) 272-7969. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAE Y LEE/
Primary Examiner, Art Unit 2466

Notice of References Cited	Application/Control No. 16/057,360	Applicant(s)/Patent Under Reexamination	
	Examiner JAE Y LEE	Art Unit 2466	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-20140279122-A1	09-2014	Luna; Michael Edward Smith	G06Q30/0601	705/26.1
*	B	US-20100081375-A1	04-2010	Rosenblatt; Michael	G08C17/02	455/41.1
*	C	US-20040204743-A1	10-2004	McGrath, Thomas J.	A61N1/08	607/5
*	D	US-20070086394-A1	04-2007	Yamada; Tomohiro	H04L63/061	370/338
	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.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,360	Koss et al.
	Examiner	**Art Unit**
	JAE Y LEE	2466

✓	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	10/27/2018								
	1	-								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								
	21	✓								
	22	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,360	Koss et al.
	Examiner	Art Unit
	JAE Y LEE	2466

CPC - Searched*		
Symbol	Date	Examiner
H04L41/0806; H04L67/42; H04W84/18	10/27/2018	JL

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
H04L41/0806; H04L67/42; H04W84/18 (US-PGPUB;USPAT;USOCR; FPRS;EPO;JPO;DERWENT;IBM_TDB) limited by keyword search	10/27/2018	JL
EAST (US-PGPUB;USPAT;USOCR;FPRS;EPO;JPO;DERWENT; IBM_TDB)-See Search History Printout	10/27/2018	JL
Inventor Search	10/27/2018	JL
NPL Search: Google, IP.com	10/27/2018	JL

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

PTO/SB/08a (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(*use as many sheets as necessary*)

Sheet | 1 | of | 3

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Not Yet Assigned
First Named Inventor	Michael J. Koss
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	120223CON6

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number - Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2010/0081375 A1	04-01-2010	Rosenblatt et al.	
		2010/0115262 A1	05-06-2010	Suyama et al.	
		2013/0266152 A1	10-10-2013	Haynie et al.	
		2014/0064511 A1	03-06-2014	Desai	
		2017/0195175 A1	07-06-2017	Koss et al.	
		8,190,203 B2	05-29-2012	Pelland et al.	
		8,320,410 B2	11-27-2012	Agren	
		8,336,080 B2	12-18-2012	Herrod	
		9,002,044 B2	04-07-2015	Dinescu et al.	
		9,060,288 B2	06-16-2015	Pelland et al.	
		9,185,168 B2	11-10-2015	Pelland et al.	
		9,326,304 B2	04-26-2016	Pelland et al.	
		9,629,190 B1	04-18-2017	Koss et al.	

Examiner Signature	/JAE Y LEE/	Date Considered	10/27/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

501732836 v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.Y.L/

PTO/SB/08a (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(*use as many sheets as necessary*)

Sheet 2 of 3

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Not Yet Assigned
First Named Inventor	Michael J. Koss
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	120223CON6

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		WO 2013/151878 A1	10-10-2013	Haynie et al.		

Examiner Signature	/JAE Y LEE/	Date Considered	10/27/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.Y.L/

PTO/SB/08b (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (*use as many sheets as necessary*) Sheet 3 of 3	***Complete if Known***	
	Application Number	Not Yet Assigned
	Filing Date	Not Yet Assigned
	First Named Inventor	Michael J. Koss
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	120223CON6

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		BRODNICK, M., "Review - Koss Striva could be the next big platform to enjoy music," http://www.brightsideofnews.com/2012/05/14/review-koss-striva-could-be-the-next-big-platform-to-enjoy-music/, May 14, 2012.	
		ROBSON, W., "Koss STRIVA MyKoss Wi-Fi Streaming - Tips and Tricks," http://www.audioholics.com/headphone-reviews/koss-striva-pro-wi-fi-headphone-review/mykoss-wi-fi-streaming-2013-tips-and-tricks/, July 3, 2012.	
		ROBSON, W., "Interview: Michael J. Koss Introduces STRIVA Wi-Fi Headphones," http://www.audioholics.com/editorials/michael-j.-koss-striva/, June 7, 2012.	

Examiner Signature	/JAE Y LEE/	Date Considered	10/27/2018

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

[1] Applicant's unique citation designation number (optional). [2] Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SENDTO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.Y.L/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	197	smartphone SAME (adhoc OR ad-hoc OR ad hoc) AND medical	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:01
L4	23	(adhoc OR ad-hoc OR ad hoc OR bluetooth OR BT) WITH (configuration OR setting) WITH medical (device OR equipement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:08
L5	3	iot WITH (configuration OR setting) WITH medical (device OR equipement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:13
L6	364	iot WITH medical (device OR equipement)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:13
L7	35	iot WITH medical (device OR equipement) AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:13
L8	59	iot SAME medical (device OR equipement) AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:14
L9	1	remot$2 WITH medical (device OR equipement) SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:14
L10	5	"20140018068"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:15
L11	27	remot$2 WITH medical SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2018/10/27 18:18

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
L12	3	"20130316649"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:22
L13	8	pairing WITH medical (device OR equipement) SAME smartphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:24
L14	20	pairing WITH medical SAME smartphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:24
L15	2	"15927262"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 18:47
S1	0	mode SAME (ad hoc OR ad-hoc) SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME headphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S2	29	mode SAME (ad hoc OR ad-hoc) SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S3	502	mode SAME (ad hoc OR ad-hoc) SAME (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S4	16	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) SAME led AND (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S5	379	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S6	2	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2018/10/24 09:44

		wireless lan) AND (headset OR headphone OR earphone) WITH hub	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S7	57	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone) WITH player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S8	320	content$1 access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S9	46	content$1 access point AND (ad hoc OR ad-hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:44
S10	0	mode SAME (ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) AND (headset OR headphone OR earphone) WITH player SAME (ad hoc OR ad-hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S11	48	(headset OR headphone OR earphone) WITH player SAME (ad hoc OR ad-hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S12	235	(ad hoc OR ad-hoc) WITH hub WITH network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S13	29	(ad hoc OR ad-hoc) WITH hub WITH network AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S14	9	(ad hoc OR ad-hoc) (ap OR access point) WITH network AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S15	0	striva WITH content access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S16	0	striva SAME content access point	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2018/10/24 09:45

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S17	18	striva	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S18	0	(ad hoc OR ad-hoc) hub SAME headphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S19	0	(ad hoc OR ad-hoc) hub SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S20	7	(ad hoc OR ad-hoc) WITH hub SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S21	18	(ad hoc OR ad-hoc) WITH media SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S22	15	(ad hoc OR ad-hoc) WITH controller SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S23	44	(ad hoc OR ad-hoc) WITH (AP OR access point) SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S24	19	(ad hoc OR ad-hoc) WITH pairing SAME (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S25	414	(ad hoc OR ad-hoc) WITH via WITH (headset OR earphone OR headphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S26	0	(ad hoc OR ad-hoc) WITH hub WITH player	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2018/10/24 09:45

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S27	0	(ad hoc OR ad-hoc) WITH hub SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S28	21	(ad hoc OR ad-hoc) SAME hub SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S29	36	(ad hoc OR ad-hoc) SAME (center OR hub) SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S30	103	(ad hoc OR ad-hoc) SAME distribution SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S31	22	(ad hoc OR ad-hoc) SAME (media OR content) distribut$5 SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S32	22	(ad hoc OR ad-hoc) SAME (media OR content) distribut$5 SAME (headphone OR headset OR earphone OR player)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S33	224	(ad hoc OR ad-hoc) SAME (media OR content) distribut$5 AND (headphone OR headset OR earphone OR player)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S34	18	(ad hoc OR ad-hoc) SAME (media OR content) access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S35	0	(ad hoc OR ad-hoc) NAD (media OR content) access point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S36	71	(ad hoc OR ad-hoc) AND (media OR content) access point	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2018/10/24 09:45

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S37	53	(ad hoc OR ad-hoc)(controller OR manager)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S38	158	(ad hoc OR ad-hoc)relay	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S39	2	(ad hoc OR ad-hoc) WITH relay$3 WITH (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S40	20	(ad hoc OR ad-hoc) WITH docking WITH (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S41	20	(ad hoc OR ad-hoc) SAME docking SAME (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S42	60	(ad hoc OR ad-hoc) SAME docking AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S43	21	(ad hoc OR ad-hoc) SAME docking WITH player AND (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S44	20	(ad hoc OR ad-hoc) SAME docking WITH (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S45	129	(ad hoc OR ad-hoc) AND docking WITH (headphone OR headset OR earphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S46	0	player SAME (headphone OR headset OR earphone) SAME	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2018/10/24 09:45

		Network A/V Receiver	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S47	20	player SAME (headphone OR headset OR earphone) SAME Network NEAR3 Receiver	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S48	3	player SAME (headphone OR headset OR earphone) SAME Receiver SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S49	77	player SAME (headphone OR headset OR earphone) SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S50	466	player SAME (headphone OR headset OR earphone) SAME (station OR center) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S51	668	player WITH (station OR center) AND (headphone OR headset OR earphone) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S52	183	(audio OR video OR mp3) player WITH (station OR center) AND (headphone OR headset OR earphone) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S53	0	(audio OR video OR mp3) player SAME (headphone OR headset OR earphone) SAME (adhoc OR ad-hoc OR ad hoc OR bluetooth) relay	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S54	0	(audio OR video OR mp3) player SAME (headphone OR headset OR earphone) AND (adhoc OR ad-hoc OR ad hoc OR bluetooth) relay	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S55	0	(audio OR video OR mp3) player SAME (headphone OR headset OR earphone) AND (adhoc OR ad-hoc OR ad hoc OR bluetooth) relay$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S56	29	(audio OR video OR mp3) player SAME (headphone OR headset OR	US-PGPUB; USPAT; USOCR;	ADJ	OFF	2018/10/24 09:45

		earphone) AND (adhoc OR ad-hoc OR ad hoc OR bluetooth) WITH relay$3	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S57	75	(("KOSS") near3 ("Michael")).INV.	US-PGPUB; USPAT; USOCR	ADJ	OFF	2018/10/24 09:45
S58	74	(("PELLAND") near3 ("Michael")).INV.	US-PGPUB; USPAT; USOCR	ADJ	OFF	2018/10/24 09:45
S59	13	(("HAYNIE") near3 ("Joel")).INV.	US-PGPUB; USPAT; USOCR	ADJ	OFF	2018/10/24 09:45
S60	104171	(H04L41/0806; H04L67/42; H04W84/18).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S61	4	"15463559"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S62	66	S3 AND S60	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S63	6	("20130266152" | "8190203" | "8336080" | "9002044" | "9060288" | "9185168").PN.	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S64	8486	(credential OR password OR ssid OR encryption) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S65	433	(WLAN OR wireless LAN OR wifi OR wi-fi) NEAR2 (credential OR password OR ssid OR encryption) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S66	2339	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (credential OR password OR ssid OR encryption) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S67	233	S60 AND S66	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S68	238	(WLAN OR wireless LAN OR wifi OR wi-fi) (password OR ssid) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/24 09:45

			IBM_TDB			
S69	2	(WLAN OR wireless LAN OR wifi OR wi-fi) (password OR ssid) WITH (bluetooth OR adhoc OR ad-hoc OR ad hoc) SAME player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S70	2	"15927262"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S71	47	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) WITH (headphone OR head-phone OR earphone OR player)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S72	208	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S73	33	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode AND smartphone	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S74	0	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode AND (smart phone O Rsmartphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S75	49	(WLAN OR wireless LAN OR wifi OR wi-fi) WITH (password OR ssid) SAME infrastructure mode AND (smart phone OR smartphone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S76	0	ssid WITH bluetooth headset WITH (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S77	0	ssid SAME bluetooth headset SAME (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S78	0	ssid SAME bluetooth (earphone OR headset OR headphone) SAME (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/24 09:45

			IBM_TDB			
S79	2	ssid SAME bluetooth (earphone OR headset OR headphone) AND (smartphone OR smart phone)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S80	23	ssid SAME (earphone OR headset OR headphone) AND (smartphone OR smart phone) AND bluetooth	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 09:45
S81	0	"16057360"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:21
S82	43	"8190203"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:34
S83	0	(adhoc OR ad-hoc OR ad hoc) WTIH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:44
S84	235	(adhoc OR ad-hoc OR ad hoc) WITH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:44
S85	86	(adhoc OR ad-hoc OR ad hoc) WITH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan) AND light	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:45
S86	22	(adhoc OR ad-hoc OR ad hoc) WITH (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:45
S87	45	(adhoc OR ad-hoc OR ad hoc) SAME (SSID OR password OR encryption) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:46
S88	189	(adhoc OR ad-hoc OR ad hoc) SAME (hot spot OR hotspot) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/24 10:49

			IBM_TDB			
S89	25	(adhoc OR ad-hoc OR ad hoc) WITH via WITH (SSID OR password OR encryption) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:49
S90	32	(adhoc OR ad-hoc OR ad hoc) WITH via WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:49
S91	2	"13772337"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:51
S92	1	(adhoc OR ad-hoc OR ad hoc) WITH direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:53
S93	412	(adhoc OR ad-hoc OR ad hoc) AND direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:53
S94	7	(adhoc OR ad-hoc OR ad hoc) SAME direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:54
S95	41	(adhoc OR ad-hoc OR ad hoc) AND direct$2 WITH (SSID OR password OR encryption OR key) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 10:54
S96	2	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH direct$2 WITH (SSID OR password OR encryption OR key) WITH (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:20
S97	5	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH direct$2 WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:20
S98	109	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH (SSID OR password OR encryption OR key) AND (wifi OR wi-fi OR wlan) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/24 11:20

			IBM_TDB			
S99	189	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH (SSID OR password OR encryption OR key)AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:21
S100	44	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH ssid AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:25
S101	12	(adhoc OR ad-hoc OR ad hoc OR p2p) WITH ssid AND lighting AND server WITH ssid	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:39
S102	154	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH ssid AND lighting AND server WITH ssid	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:40
S103	0	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH ssid AND lighting AND server WITH ssid WTIH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:40
S104	11	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH ssid AND lighting AND server WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:41
S105	20	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) WITH (password OR ssid) AND lighting AND server WITH (password OR ssid) WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:41
S106	592	server WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:42
S107	219	server WITH ssid WITH stor$3 AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:42
S108	15	remot$2 WITH server WITH ssid WITH stor$3 AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/24 11:43

			IBM_TDB			
S109	18	remot$2 WITH ssid WITH stor$3 AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:43
S110	74	remot$2 WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:44
S111	18	remot$2 WITH account WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:44
S112	65	account WITH ssid WITH stor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:46
S113	19	account WITH ssid WITH stor$3 AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 11:57
S114	6	"20100081375"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/24 12:00
S123	11	(adhoc OR ad-hoc OR ad hoc OR p2p OR point-2-point OR point-to-point) mode WITH (password OR ssid) AND lighting	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/25 18:57
S124	270	(ad hoc OR ad-hoc) mode SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/25 19:02
S125	89	(ad hoc OR ad-hoc) mode SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME SSID AND camera	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/25 19:03
S126	270	(ad hoc OR ad-hoc) mode SAME (wifi OR wi-fi OR wlan OR wireless lan) SAME SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/25 19:32

			IBM_TDB			
S127	63	(ad hoc OR ad-hoc) mode WITH (wifi OR wi-fi OR wlan OR wireless lan) WITH SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/25 19:32
S128	35	(ad hoc OR ad-hoc) WITH configur$5 WITH (wifi OR wi-fi OR wlan OR wireless lan) WITH SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 15:38
S129	229	(ad hoc OR ad-hoc) WITH (wifi OR wi-fi OR wlan OR wireless lan) WITH SSID	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 19:30
S130	392	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 19:30
S131	132	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND camera	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 19:30
S132	25	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND camera WITH (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 19:30
S133	25	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND (lighting OR camera) WITH (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 19:31
S134	48	(ad hoc OR ad-hoc) WITH SSID SAME (wifi OR wi-fi OR wlan OR wireless lan) AND (lighting OR camera) SAME (wifi OR wi-fi OR wlan OR wireless lan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 19:31
S135	11782	server WITH account WITH (password OR ssid)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 20:44
S136	717	server WITH account WITH (password OR ssid) AND (ad hoc OR ad-hoc OR adhoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/26 20:45

			IBM_TDB			
S138	36	server WITH account WITH (password OR ssid) AND (ad hoc OR ad-hoc OR adhoc) WITH configuration	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 20:45
S139	3	"20090180659"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/26 20:58
S140	54	smartphone WITH configur$3 WITH medical device	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:19
S141	7	smartphone WITH configur$3 WITH medical device AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:19
S142	17	smartphone WITH configur$3 WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:20
S143	26	smartphone WITH control$4 WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:26
S144	26	smartphone WITH control$4 WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:27
S145	2	smartphone WITH setting WITH medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:27
S146	3	smartphone WITH setting SAME medical AND (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:28
S147	32	smartphone SAME medical SAME (adhoc OR ad-hoc OR ad hoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	ADJ	OFF	2018/10/27 16:28

			IBM_TDB			
S148	47	smartphone WITH (adhoc OR ad-hoc OR ad hoc) AND medical	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2018/10/27 16:29

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S115	36594	(H04L41/0806; H04L67/42; H04W84/18).cpc.	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S116	7326	(ad hoc OR adhoc OR ad-hoc).clm.	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S117	2834	S115 AND S116	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S118	49274	(wireless LAN OR WLAN OR wifi Or wi-fi OR wireless local area network OR wireless WAN OR wwan OR w-wan OR wireless wide area network).clm.	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S119	899	S116 AND S118	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S120	11342	media player.clm.	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S121	20937	(mp3 OR media OR video OR audio) player.clm.	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45
S122	280	S115 AND S121	US-PGPUB; USPAT	ADJ	OFF	2018/10/24 09:45

10/27/2018 7:15:07 PM
C:\Users\jlee13\Documents\EAST\Workspaces\16057360_1.wsp

Bibliographic Data

Application No: 16/057,360

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /JAE Y LEE/ Examiner's Signature | Initials

Title: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
08/07/2018	370	2466	120223CON6
RULE			

APPLICANTS

Koss Corporation, Milwaukee, WI,

INVENTORS

Michael J. Koss Milwaukee, WI, UNITED STATES

Michael J. Pelland Princeton, WI, UNITED STATES

Joel L. Haynie DeForest, WI, UNITED STATES

CONTINUING DATA

This application is a CON of 15927262 03/21/2018 PAT 10079717

15927262 is a CON of 15463559 03/20/2017 PAT 9992061

15463559 is a CON of 15080940 03/25/2016 PAT 9629190

15080940 is a CON of 14850508 09/10/2015 PAT 9326304

14850508 is a CON of 14702316 05/01/2015 PAT 9185168

14702316 is a CON of 13832719 03/15/2013 PAT 9060288

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

09/19/2018

**** SMALL ENTITY ****

STATE OR COUNTRY

UNITED STATES

ADDRESS

K&L GATES LLP-Pittsburgh

210 SIXTH AVENUE

PITTSBURGH, PA 15222-2613

UNITED STATES

FILING FEE RECEIVED

$2,855

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.
16/057,360	08/07/2018	Michael J. Koss	120223CON6	9075

26285 7590 10/10/2018

K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

EXAMINER	
NGO, RICKY QUOC	

ART UNIT	PAPER NUMBER
2464	

NOTIFICATION DATE	DELIVERY MODE
10/10/2018	ELECTRONIC

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

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

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

USpatentmail@klgates.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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

Doc Code:
TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 16/057,360

1. THE REQUEST FILED August 7, 2018 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination
- A. ☒ for an original nonprovisional application (Track I).
- B. ☐ for an application undergoing continued examination (RCE).

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

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

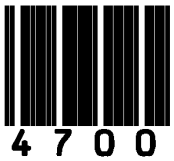
Telephone inquiries with regard to this decision should be directed to Diane Goodwyn at (571) 272-6735, Office of Petitions. In his/her absence, calls may be directed to JoAnne Burke, (571) 272-4584.

/JoAnne L Burke/
[*Signature*]

Paralegal Specialist, Office of Petitions
(Title)

U.S. Patent and Trademark Office
PTO-2298 (Rev. 02-2012)

Office of Petitions: Routing Sheet



Application No. 16057360

This application is being forwarded to your office for further processing. A decision has been rendered on a petition filed in this application, as indicated below. For details of this decision, please see the document PET.OP.DEC filed on the same date as this document.

- [X] **GRANTED**
- [ ] **DISMISSED**
- [ ] **DENIED**

Office of Petitions: Decision Count Sheet

Mailing Month 10

Application No. 16057360

16057360

For US serial numbers: enter number only, no slashes or commas. Ex: 10123456
For PCT: enter "51+single digit of year of filing+last 5 numbers", Ex. for PCT/US05/12345, enter 51512345

Deciding Official: Goodwyn, Diane

Count (1) - Palm Credit 16057360

Decision: GRANT

FINANCE WORK NEEDED
☐ Select Check Box for YES

GRANT

Decision Type: 643 - Track One request

643

Notes:

Count (2)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Count (3)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Initials of Approving Official (if required)

If more than 3 decisions, attach 2nd count sheet & mark this box ☐

Printed on: 10/3/2018

Office of Petitions Internal Document - Ver. 5.0

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/057,360	08/07/2018	2642	835	120223CON6	21	2

CONFIRMATION NO. 9075

UPDATED FILING RECEIPT

26285
K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

Date Mailed: 09/28/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Michael J. Koss, Milwaukee, WI;
Michael J. Pelland, Princeton, WI;
Joel L. Haynie, DeForest, WI;

Applicant(s)

Koss Corporation, Milwaukee, WI;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 15/927,262 03/21/2018 PAT 10079717
which is a CON of 15/463,559 03/20/2017 PAT 9992061
which is a CON of 15/080,940 03/25/2016 PAT 9629190
which is a CON of 14/850,508 09/10/2015 PAT 9326304
which is a CON of 14/702,316 05/01/2015 PAT 9185168
which is a CON of 13/832,719 03/15/2013 PAT 9060288

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: 09/19/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/057,360**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

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

CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

Preliminary Class

455

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).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/057,360

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	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1	x 50 =	50	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	x 230 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	835		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

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

AMENDMENT B

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Koss Corporation	§ **Examiner:**	TBD
		§	
Inventors:	Michael J. Koss *et al.*	§ **Art Unit:**	2642
		§	
Serial No.:	16/057,360	§ **Atty. Docket No.**:	120223CON6
		§	
Filing Date:	August 7, 2018	§ **Confirmation No.:**	9075

Title: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

REPLY TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

VIA EFS (WEB)

Mail Stop Missing Parts
Commissioner for Patents
Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In reply to the Notice to File Corrected Application Papers for the above-captioned application, mailed September 21, 2018, Applicant herewith files (1) a substitute specification excluding claims and with markings and (2) a "clean" version of the substitute specification. The substitute specification incorporates all prior amendments to the specification to date and nothing more. Accordingly, the substitute specification contains no new matter.

A representative of the Office is invited to contact the undersigned with any questions regarding this application.

Respectfully submitted,

Date: September 26, 2018

/Mark G. Knedeisen/
Mark G. Knedeisen
Reg. No. 42,747

K&L GATES LLP
K&L Gates Center
210 Sixth Ave.
Pittsburgh, Pennsylvania 15222

Ph. (412) 355-6342
Fax (412) 355-6501
email: mark.knedeisen@klgates.com

SUBSTITUTE SPECIFICATION SHOWING CHANGES

PATENT
Docket No. 120223CON6

UNITED STATES UTILITY PATENT APPLICATION FOR

CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

Inventors: Michael J. Koss, Michael J. Pelland, Joel L. Haynie

PRIORITY CLAIM

[0001] The present application claims priority under 35 U.S.C. § 120 as a continuation application to United States nonprovisional patent application Serial No. 15/927,262, filed March 21, 2018, which is a continuation of United States nonprovisional patent application Serial No. 15/463,559, filed March 20, 2017, now U.S. Patent 9,992,061, issued June 5, 2018, which is a continuation of United States nonprovisional patent application Serial No. 15/080,940, filed March 25, 2016, now U.S. Patent 9,629,190, issued April 18, 2017, which is a continuation of United States nonprovisional patent application Serial No. 14/850,508, filed September 10, 2015, now U.S. Patent 9,326,304, issued April 26, 2016, which is a continuation of U.S. nonprovisional patent application Serial No. 14/702,316, filed May 1, 2015, now U.S. Patent 9,185,168, issued November 10, 2015, which is a continuation of U.S. nonprovisional patent application Serial No. 13/832,719, filed March 15, 2013, now U.S. Patent 9,060,288, issued June 16, 2015, both of which are incorporated herein by reference in their entirety.

BACKGROUND

[0002] Wireless earphones that stream digital-audio content from sources are known. For example, U.S. Patent 8,190,203, which is incorporated herein by reference in its entirety, describes a wireless earphone pair where each earphone is capable of receiving and playing digital-audio streamed over ad-hoc or infrastructure Wi-Fi networks. This patent also describes that the source of the digital-audio content could be a wireless network adapter that plugs into an audio player (such as a personal digital audio player (DAP)) and transmits the audio from the audio player to the earphones via a Wi-Fi ad hoc network. Also, the earphones may connect to, and stream digital-audio content from, a remote server through the Internet via an infrastructure Wi-Fi network.

SUMMARY

[0003] In various embodiments, the present invention is directed to systems and methods for configuring a wireless device to receive data wirelessly via an infrastructure wireless network, without physically connecting the wireless device to a computer in order to configure it, and without having a have an existing infrastructure wireless network for the wireless device to connect to. The wireless device could be for example a wireless media player (such as an audio player or a video player), a wireless controller for electronic equipment, or any device that receives wireless data.

[0004] According to various embodiments, a system according to the present invention comprises: the wireless device configured to receive data wirelessly; a content access point that communicates with the wireless device via an ad hoc wireless network; a computer that is connectable to the content access point; and a remote server in communication with the computer via a communications network (e.g., the Internet). The remote server hosts a website, accessible by the computer, through which a user of the wireless device inputs, via the computer, credential data for at least one infrastructure wireless network, and the remote server stores the credential data. Also, the content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network, such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network. That way, the wireless device can connect to the infrastructure wireless network without having to have been plugged into the computer, and without having to have been connected to another, different infrastructure wireless network.

[0005] In another general aspect, the present invention is directed to a method of configuring a wireless media player to communicate via an infrastructure wireless network. In various implementations, the method comprises, prior to connecting the wireless media player to the infrastructure wireless network, the steps of: storing an IP address for the wireless media player in a non-volatile memory of a separate content access point device; connecting the content access point device to a computer that is configured to communicate with a remote server via the Internet; uploading the IP address for the wireless media player stored in the non-volatile memory of the content access point device to the remote server from the computer and the Internet; receiving by the remote server credential data for the infrastructure wireless network

from a user; and transmitting, by the content access point, the credential data for the infrastructure wireless network to the wireless media player via an ad hoc wireless network between the content access point device and the wireless media player. The inventive method further comprises, after the wireless media player receives the credential data for the infrastructure wireless network from the content access point device via the ad hoc wireless network, the step of the wireless media player connecting to the infrastructure wireless network using the received credential data for the infrastructure wireless network.

[0006] These and other benefits and aspects of the present invention are described below.

BRIEF DESCRIPTION OF THE FIGURES

[0007] Various embodiments of the present invention are described herein by way of example in conjunction with the following figures, wherein:

[0008] Figures 1, 4 and 5 are diagrams of systems according to various embodiments of the present invention;

[0009] Figure 2 is simplified block diagram of the content access point according to various embodiments of the present invention; and

[0010] Figure 3 is a flow chart depicting a process of a system according to various embodiments of the present invention.

DESCRIPTION

[0011] Various embodiments of the present invention are directed to systems and methods for configuring a wireless device to communicate via an infrastructure wireless network, such as an infrastructure Wi-Fi network, without having to physically plug the wireless device into a computer to configure it, and without having to have an existing infrastructure wireless connection for the wireless device. In the description to follow, the wireless device is usually described as a wireless audio player, e.g., a set of earphones, although it should be recognized that the present invention is not so limited. The wireless device could be another type of media player, such as a wireless video player, or another type of device that receives data wirelessly. For example, the wireless device could be a controller for electronic equipment, such as a controller for lighting systems, cameras, machinery, gaming equipment, etc., that receives control data via a wireless communication link.

[0012] Figure 1 is a diagram of a system 10 according to various embodiments of the present invention. The system 10 comprises an earphone set 12 comprising a pair of earphones 14, one for each ear of a user. One or both of the earphones 14 may communicate wirelessly with a content access point (CAP) 16 via an ad hoc communication link 18, which is preferably an ad hoc Wi-Fi link (e.g., IEEE 802.11a/b/g/n), although in other embodiments different wireless communication protocols may be used, such as WiMAX (IEEE 802.16), Bluetooth, Zigbee, UWB, etc. The ad hoc communication link 18 is an ad hoc wireless network because it is a point-to-point network (in this case, the CAP 16 to the wireless device 14) that does not utilize preexisting infrastructure, such as wireless access points. In such an ad hoc network, the devices (e.g., the CAP 16 and the wireless device 14) may have equal status on the network.

[0013] The CAP 16 is connectable, through, for example, a wired connection, to a source of digital audio that stores and plays digital audio files, such as MP3, FLAC, etc. files. The source may be, as shown in Figure 1, a personal DAP 20 or a computer 22, for example, although in other embodiments other media source devices may be used. The personal DAP 20 may be a personal MP3 player, iPod, iPhone, etc., or any other personal electronic device capable of storing and playing digital audio files. The computer 22 may be any suitable computer device, such as a personal computer, laptop computer, tablet computer, smart phone, etc., and preferably has a browser to facilitate initializing the CAP 16 and earphones 14, as described further below. The CAP 16 may connect to the DAP 20 via a USB connector (not shown) that connects to a USB port (e.g., conventional, mini, and micro) of the CAP 16 and to an audio jack on the DAP 20, such as a 3.5mm TRS or TRRS audio jack. The CAP 16 may connect to the computer 22 via a USB connection (not shown). Also, the CAP 16 may be an integral part of the DAP 20 or the computer 22. As shown in Figure 1, the earphones 14 may also connect to a wireless access point 24 via a wireless infrastructure communication link 26, that is again preferably a Wi-Fi link, although other wireless protocols could be used. The wireless infrastructure communication link 26 may be part of an infrastructure wireless network because it utilizes a wireless access point 24 and connects to an Internet service provider (e.g., a Wi-Fi hotspot).

[0014] Both the computer 22 and the wireless access point 24 may be connected to a communications network 28, which is preferably an electronic, packet-switched, data communications network, such as a TCP/IP network, such as the Internet. Numerous servers are connected to the Internet; one remote server system 30 is shown in Figure 1. As described

further below, a user may connect to the remote server system 30 to provision or initialize the user's CAP 16 and earphones 14 for initial use, and to otherwise manage the CAP 16 and earphones 14. The remote server system 30 may also stream digital audio content to the earphones 14 via the infrastructure wireless network 26, although the earphones 14 may also stream digital content from other servers connected to the communications network 28 once configured to communicate via the infrastructure wireless network 26, as described below.

[0015] In Figure 1, the earphone set 12 includes a headband 32 connecting the earphones 14. In such an embodiment, one earphone 14 may receive the wireless digital content and transmit it to the other earphone 14 for synchronized playing via a wire that runs through the head band to connect the earphones 14. In other embodiments, both earphones 14 may receive wirelessly and play synchronously the streaming digital content. In such an embodiment, a headband between the earphones is not necessary. More details regarding such wireless earphone pairs are described in the following patents and patent applications, which are incorporated herein by reference in their entirety: U.S. Patent 8,190,203; U.S. Pub. No. 2012/0230510 A1; and U.S. nonprovisional application Serial No. 13/441,476, filed April 6, 2012, now Pub. No. 2013/0266152. These patents and patent applications also include simplified block diagrams of the earphones 14 according to various embodiments. As disclosed in these patents and patent applications, the earphones 14 have one or more acoustic transducers for producing sound.

[0016] Figure 2 is simplified block diagram of the CAP 16 according to various embodiments of the present invention. As shown in Figure 2, the CAP 16 may comprise a processor 40, a volatile memory 42, a nonvolatile memory 44, a RF (or radio or Wi-Fi) module 46 and a USB port 48 or other suitable external interface that allows the CAP 16 to connect to an external device, such as the DAP 20 or the computer 22. The CAP 16 may also include a chargeable power source (not shown) for powering the components of the CAP 16. The RF module 46 may handle radio/wireless communications by the CAP 16. For example, the RF module 46 may allow the CAP to communicate via a wireless communication protocol, preferably Wi-Fi, with the earphones 14 or the wireless access point 24. The memory units 42, 44 may store software instructions for execution by the processor 40 that control the function and operation of the CAP 16. In addition, in various embodiments, the earphones 14 and CAP 16 are part of a conjoined assembly, such that the CAP 16 is configured at manufacture to know the identifiers for the

earphones 14. That is, the non-volatile memory 44 may store addresses (e.g., IP addresses) for the earphones 14.

[0017] In various embodiments, in order to initially operate the earphones 14 (e.g., "out of the box"), the CAP 16 may be plugged into the desired media device (e.g., the DAP 20 or the computer 22) as described above, which may power the CAP 16 and cause the CAP 16 to transmit (or stream) wirelessly the content output by the media device, which can be received (via the ad hoc wireless communication link 18) and played by the earphones 14 (assuming the earphones 14 are turned on), since the CAP 16 is initially configured to store the addresses for the earphones 14, as described above.

[0018] As described above, the earphones 14 can, when properly configured, also receive wireless content via infrastructure networks. Figure 3 is a flow chart of a process for setting up and customizing the channels and streams for the earphones 14, including adding and managing wireless networks (e.g., Wi-Fi hotspots) according to various embodiments. At step 60, the user (e.g., a user of the earphones 14), using the Internet-enabled computer 22 with a browser, logs into a website associated with the earphones 14, hosted by the remote server(s) 30, and sets up an account (if the user does not already have one). At the website the user can, for example, add Wi-Fi hotspots and specify content channels (e.g., Internet radio stations or other servers connected to the Internet that serve content). To add a Wi-Fi hotspot at step 62, the user may click (or otherwise activate) a link on the website that indicates a desire to add a Wi-Fi hotspot. In various embodiments, a JAVA applet from the website may be used by the computer 22 to search for nearby Wi-Fi hotspots, which, upon detection, may be displayed for the user on the website. The user may then click on (or otherwise select) the desired Wi-Fi hotspot to add. If applicable, the website may then prompt the user to enter a password and/or encryption type (e.g., WPA or WPA2) for the selected Wi-Fi hotspot. The SSID, password, and encryption type for the Wi-Fi hotspot is stored for the user's account by the remote server(s) 30. This process could be repeated as necessary to add as many Wi-Fi hotspots as desired by the user.

[0019] Next, at step 64, a user device, e.g., the earphone set 12, may be added to the user's account. The user may do this, according to various embodiments, by plugging the CAP 16 into the computer 22. Using a JAVA applet, for example, the IDs for the CAP 16, as well as the IDs for the earphones 14, stored in the non-volatile memory 44 of the CAP 16, are uploaded to the remote server(s) 30 and stored at the remote server(s) 30 as part of the user's account

information. Next, at step 66, the user may update the earphones 14 with the Wi-Fi hotspot credentials (e.g., SSID, password if one is used for the hotspot, and/or encryption type). The user may do this by clicking on or otherwise selecting a link on the website to update the earphones 14. Upon clicking the link, the CAP 16 transmits the credentials (e.g., SSID, password, encryption type) for each of the added Wi-Fi hotspots to the earphones 14, via the ad hoc wireless communication link 18. This process allows the earphones 14 to be configured for infrastructure network (and Internet) access without having to physically connect the earphones 14 to the computer 22 to configure them and without having an existing, different infrastructure network that the earphones 14 need to connect to.

[0020] The user may also set up channels for the earphones 14 at step 68 through the website. The user may do this by clicking on or otherwise selecting a link or option provided by the website to add channels. The channels may be digital content streams, such as digital audio. The remote server(s) 30 may host a number of such content streams that the user could select via the website. These selections may be stored by the remote server(s) 30 as part of the user's account information. Also, the user could enter an address for a channel(s), associated with another server(s) connected to the network 28, such as the URL for channel's server. These addresses may also be stored by the remote server(s) 30 as part of the user's account information.

[0021] The earphones 14 may have one or more multi-function user controls (e.g., buttons, touch interfaces, etc.) and indicators (e.g., LEDs) that allow the user to select and transition through various modes of operation. For example, using the user control(s) of the earphones 14, the user could select an ad hoc mode, whereby the earphones stream and play content from the CAP 16 (and hence the device to which the CAP 16 is connected, such as the DAP 20 or the computer 22). Also, the user could select the infrastructure (e.g., Wi-Fi) mode using the user control(s) in order to stream content via Wi-Fi hotspot. The user may also cycle through or otherwise select the desired channel (stored in step 68) using the user-control.

[0022] It should be noted that the some steps of Figure 3 could be performed in different orders than as shown in Figure 3. For example, the user's channels could be set up before the Wi-Fi hotspots are added or before the user's earphones 14 are added. However, the earphones 14 could not be updated with the Wi-Fi hotspot credentials (step 66) until the Wi-Fi hotspot(s) and earphones are added (steps 62 and 64).

[0023] Although the above embodiments were described in the context of wireless earphones for receiving and playing digital audio content, in other embodiments different types of the digital content could be streamed to the wireless device in a similar manner. For example, instead of earphones, a video player 80, as shown in Figure 4 could be used instead. The video player 80 may be any video player capable of receiving and playing received digital video content, such as MPEG video, for example. The video player 80 may stream the video content from the CAP 16 (and hence the media source connected to the CAP 16) via the ad hoc wireless communication link 18 or via the infrastructure wireless communication link 26, as described above. Also, the video player 80 could be configured with the Wi-Fi hotspot credentials as described above in connection with Figure 3.

[0024] Similarly, as shown in Figure 5, the wireless device could be a controller 82 that controls the operation and/or function of electronic equipment 84, such as lighting system(s), camera(s), manufacturing equipment, medical device(s), gaming systems, or any other suitable controllable electronic equipment. The controller 82 may receive control data via either the ad hoc or infrastructure wireless networks, depending on which mode the controller 82 is in. As described above, the controller 82 may be configured to connect to the infrastructure wireless network 26 by receiving the credential data for the infrastructure wireless network 26 via the ad hoc wireless network 18.

[0025] In one general aspect, the present invention is directed to a system that comprises: the wireless device configured to receive data wirelessly; a content access point that communicates with the wireless device via an ad hoc wireless network; a computer that is connectable to the content access point; and a remote server in communication with the computer via a communications network. The remote server hosts a website accessible by the computer. The website permits a user of the wireless device to input via the computer credential data for at least one infrastructure wireless network, and the remote server stores the credential data for the at least one infrastructure wireless network. Also, the content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network, such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network.

[0026] In various implementations, the wireless device comprises a wireless media player, such as an audio player or a video player. The wireless media player may be configured to receive and play digital media data received via the ad hoc wireless network when in a first mode (an ad hoc mode), and is configured to receive and play digital media data received via the infrastructure wireless network when in a second mode (an infrastructure mode). In other embodiments, the wireless device may comprise a wireless controller that controls electronic equipment. The wireless controller may be configured to receive digital control data received via the ad hoc wireless network when in a first mode (an ad hoc mode), and is configured to receive digital control data received via the infrastructure wireless network when in a second mode (an infrastructure mode). In various embodiments, the ad hoc wireless network comprises an ad hoc Wi-Fi network, and the infrastructure wireless network comprises an infrastructure Wi-Fi network. The credential data for the at least one infrastructure wireless network may comprise: an identifier for the at least one infrastructure wireless network; a password for the at least one infrastructure wireless network; and/or encryption type data for the at least one infrastructure wireless network.

[0027] It will be apparent to one of ordinary skill in the art that at least some of the embodiments described herein may be implemented in many different embodiments of software, firmware, and/or hardware. The software and firmware code may be executed by a processor circuit or any other similar computing device. The software code or specialized control hardware that may be used to implement embodiments is not limiting. For example, embodiments described herein may be implemented in computer software using any suitable computer software language type, using, for example, conventional or object-oriented techniques. Such software may be stored on any type of suitable computer-readable medium or media, such as, for example, a magnetic or optical storage medium. The operation and behavior of the embodiments may be described without specific reference to specific software code or specialized hardware components. The absence of such specific references is feasible, because it is clearly understood that artisans of ordinary skill would be able to design software and control hardware to implement the embodiments based on the present description with no more than reasonable effort and without undue experimentation.

[0028] Moreover, the processes associated with the present embodiments may be executed by programmable equipment, such as computers or computer systems and/or processors. Software

that may cause programmable equipment to execute processes may be stored in any storage device, such as, for example, a computer system (nonvolatile) memory, an optical disk, magnetic tape, or magnetic disk. Furthermore, at least some of the processes may be programmed when the computer system is manufactured or stored on various types of computer-readable media.

[0029] It can also be appreciated that certain process aspects described herein may be performed using instructions stored on a computer-readable medium or media that direct a computer system to perform the process steps. A computer-readable medium may include, for example, memory devices such as diskettes, compact discs (CDs), digital versatile discs (DVDs), optical disk drives, or hard disk drives. A computer-readable medium may also include memory storage that is physical, virtual, permanent, temporary, semipermanent, and/or semitemporary.

[0030] A "computer," "computer system," "host," "server," or "processor" may be, for example and without limitation, a processor, microcomputer, minicomputer, server, mainframe, laptop, personal data assistant (PDA), wireless e-mail device, cellular phone, pager, processor, fax machine, scanner, or any other programmable device configured to transmit and/or receive data over a network. Computer systems and computer-based devices disclosed herein may include memory for storing certain software modules or engines used in obtaining, processing, and communicating information. It can be appreciated that such memory may be internal or external with respect to operation of the disclosed embodiments. The memory may also include any means for storing software, including a hard disk, an optical disk, floppy disk, ROM (read only memory), RAM (random access memory), PROM (programmable ROM), EEPROM (electrically erasable PROM) and/or other computer-readable media. The software modules and engines described herein can be executed by the processor (or processors as the case may be) of the computer devices that access the memory storing the modules.

[0031] In various embodiments disclosed herein, a single component may be replaced by multiple components and multiple components may be replaced by a single component to perform a given function or functions. Except where such substitution would not be operative, such substitution is within the intended scope of the embodiments. Any servers described herein, for example, may be replaced by a "server farm" or other grouping of networked servers (such as server blades) that are located and configured for cooperative functions. It can be appreciated that a server farm may serve to distribute workload between/among individual components of the farm and may expedite computing processes by harnessing the collective and cooperative power

of multiple servers. Such server farms may employ load-balancing software that accomplishes tasks such as, for example, tracking demand for processing power from different machines, prioritizing and scheduling tasks based on network demand and/or providing backup contingency in the event of component failure or reduction in operability.

[0032] The computer systems may comprise one or more processors in communication with memory (e.g., RAM or ROM) via one or more data buses. The data buses may carry electrical signals between the processor(s) and the memory. The processor and the memory may comprise electrical circuits that conduct electrical current. Charge states of various components of the circuits, such as solid state transistors of the processor(s) and/or memory circuit(s), may change during operation of the circuits.

[0033] While various embodiments have been described herein, it should be apparent that various modifications, alterations, and adaptations to those embodiments may occur to persons skilled in the art with attainment of at least some of the advantages. The disclosed embodiments are therefore intended to include all such modifications, alterations, and adaptations without departing from the scope of the embodiments as set forth herein.

PATENT
Docket No. 120223CON6

UNITED STATES UTILITY PATENT APPLICATION FOR

CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

Inventors: Michael J. Koss, Michael J. Pelland, Joel L. Haynie

PRIORITY CLAIM

[0001] The present application claims priority under 35 U.S.C. § 120 as a continuation application to United States nonprovisional patent application Serial No. 15/927,262, filed March 21, 2018, which is a continuation of United States nonprovisional patent application Serial No. 15/463,559, filed March 20, 2017, now U.S. Patent 9,992,061, issued June 5, 2018, which is a continuation of United States nonprovisional patent application Serial No. 15/080,940, filed March 25, 2016, now U.S. Patent 9,629,190, issued April 18, 2017, which is a continuation of United States nonprovisional patent application Serial No. 14/850,508, filed September 10, 2015, now U.S. Patent 9,326,304, issued April 26, 2016, which is a continuation of U.S. nonprovisional patent application Serial No. 14/702,316, filed May 1, 2015, now U.S. Patent 9,185,168, issued November 10, 2015, which is a continuation of U.S. nonprovisional patent application Serial No. 13/832,719, filed March 15, 2013, now U.S. Patent 9,060,288, issued June 16, 2015, both of which are incorporated herein by reference in their entirety.

BACKGROUND

[0002] Wireless earphones that stream digital-audio content from sources are known. For example, U.S. Patent 8,190,203, which is incorporated herein by reference in its entirety, describes a wireless earphone pair where each earphone is capable of receiving and playing digital-audio streamed over ad-hoc or infrastructure Wi-Fi networks. This patent also describes that the source of the digital-audio content could be a wireless network adapter that plugs into an audio player (such as a personal digital audio player (DAP)) and transmits the audio from the audio player to the earphones via a Wi-Fi ad hoc network. Also, the earphones may connect to, and stream digital-audio content from, a remote server through the Internet via an infrastructure Wi-Fi network.

SUMMARY

[0003] In various embodiments, the present invention is directed to systems and methods for configuring a wireless device to receive data wirelessly via an infrastructure wireless network, without physically connecting the wireless device to a computer in order to configure it, and without having a have an existing infrastructure wireless network for the wireless device to connect to. The wireless device could be for example a wireless media player (such as an audio player or a video player), a wireless controller for electronic equipment, or any device that receives wireless data.

[0004] According to various embodiments, a system according to the present invention comprises: the wireless device configured to receive data wirelessly; a content access point that communicates with the wireless device via an ad hoc wireless network; a computer that is connectable to the content access point; and a remote server in communication with the computer via a communications network (e.g., the Internet). The remote server hosts a website, accessible by the computer, through which a user of the wireless device inputs, via the computer, credential data for at least one infrastructure wireless network, and the remote server stores the credential data. Also, the content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network, such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network. That way, the wireless device can connect to the infrastructure wireless network without having to have been plugged into the computer, and without having to have been connected to another, different infrastructure wireless network.

[0005] In another general aspect, the present invention is directed to a method of configuring a wireless media player to communicate via an infrastructure wireless network. In various implementations, the method comprises, prior to connecting the wireless media player to the infrastructure wireless network, the steps of: storing an IP address for the wireless media player in a non-volatile memory of a separate content access point device; connecting the content access point device to a computer that is configured to communicate with a remote server via the Internet; uploading the IP address for the wireless media player stored in the non-volatile memory of the content access point device to the remote server from the computer and the Internet; receiving by the remote server credential data for the infrastructure wireless network

from a user; and transmitting, by the content access point, the credential data for the infrastructure wireless network to the wireless media player via an ad hoc wireless network between the content access point device and the wireless media player. The inventive method further comprises, after the wireless media player receives the credential data for the infrastructure wireless network from the content access point device via the ad hoc wireless network, the step of the wireless media player connecting to the infrastructure wireless network using the received credential data for the infrastructure wireless network.

[0006] These and other benefits and aspects of the present invention are described below.

BRIEF DESCRIPTION OF THE FIGURES

[0007] Various embodiments of the present invention are described herein by way of example in conjunction with the following figures, wherein:

[0008] Figures 1, 4 and 5 are diagrams of systems according to various embodiments of the present invention;

[0009] Figure 2 is simplified block diagram of the content access point according to various embodiments of the present invention; and

[0010] Figure 3 is a flow chart depicting a process of a system according to various embodiments of the present invention.

DESCRIPTION

[0011] Various embodiments of the present invention are directed to systems and methods for configuring a wireless device to communicate via an infrastructure wireless network, such as an infrastructure Wi-Fi network, without having to physically plug the wireless device into a computer to configure it, and without having to have an existing infrastructure wireless connection for the wireless device. In the description to follow, the wireless device is usually described as a wireless audio player, e.g., a set of earphones, although it should be recognized that the present invention is not so limited. The wireless device could be another type of media player, such as a wireless video player, or another type of device that receives data wirelessly. For example, the wireless device could be a controller for electronic equipment, such as a controller for lighting systems, cameras, machinery, gaming equipment, etc., that receives control data via a wireless communication link.

[0012] Figure 1 is a diagram of a system 10 according to various embodiments of the present invention. The system 10 comprises an earphone set 12 comprising a pair of earphones 14, one for each ear of a user. One or both of the earphones 14 may communicate wirelessly with a content access point (CAP) 16 via an ad hoc communication link 18, which is preferably an ad hoc Wi-Fi link (e.g., IEEE 802.11a/b/g/n), although in other embodiments different wireless communication protocols may be used, such as WiMAX (IEEE 802.16), Bluetooth, Zigbee, UWB, etc. The ad hoc communication link 18 is an ad hoc wireless network because it is a point-to-point network (in this case, the CAP 16 to the wireless device 14) that does not utilize preexisting infrastructure, such as wireless access points. In such an ad hoc network, the devices (e.g., the CAP 16 and the wireless device 14) may have equal status on the network.

[0013] The CAP 16 is connectable, through, for example, a wired connection, to a source of digital audio that stores and plays digital audio files, such as MP3, FLAC, etc. files. The source may be, as shown in Figure 1, a personal DAP 20 or a computer 22, for example, although in other embodiments other media source devices may be used. The personal DAP 20 may be a personal MP3 player, iPod, iPhone, etc., or any other personal electronic device capable of storing and playing digital audio files. The computer 22 may be any suitable computer device, such as a personal computer, laptop computer, tablet computer, smart phone, etc., and preferably has a browser to facilitate initializing the CAP 16 and earphones 14, as described further below. The CAP 16 may connect to the DAP 20 via a USB connector (not shown) that connects to a USB port (e.g., conventional, mini, and micro) of the CAP 16 and to an audio jack on the DAP 20, such as a 3.5mm TRS or TRRS audio jack. The CAP 16 may connect to the computer 22 via a USB connection (not shown). Also, the CAP 16 may be an integral part of the DAP 20 or the computer 22. As shown in Figure 1, the earphones 14 may also connect to a wireless access point 24 via a wireless infrastructure communication link 26, that is again preferably a Wi-Fi link, although other wireless protocols could be used. The wireless infrastructure communication link 26 may be part of an infrastructure wireless network because it utilizes a wireless access point 24 and connects to an Internet service provider (e.g., a Wi-Fi hotspot).

[0014] Both the computer 22 and the wireless access point 24 may be connected to a communications network 28, which is preferably an electronic, packet-switched, data communications network, such as a TCP/IP network, such as the Internet. Numerous servers are connected to the Internet; one remote server system 30 is shown in Figure 1. As described

further below, a user may connect to the remote server system 30 to provision or initialize the user's CAP 16 and earphones 14 for initial use, and to otherwise manage the CAP 16 and earphones 14. The remote server system 30 may also stream digital audio content to the earphones 14 via the infrastructure wireless network 26, although the earphones 14 may also stream digital content from other servers connected to the communications network 28 once configured to communicate via the infrastructure wireless network 26, as described below.

[0015] In Figure 1, the earphone set 12 includes a headband 32 connecting the earphones 14. In such an embodiment, one earphone 14 may receive the wireless digital content and transmit it to the other earphone 14 for synchronized playing via a wire that runs through the head band to connect the earphones 14. In other embodiments, both earphones 14 may receive wirelessly and play synchronously the streaming digital content. In such an embodiment, a headband between the earphones is not necessary. More details regarding such wireless earphone pairs are described in the following patents and patent applications, which are incorporated herein by reference in their entirety: U.S. Patent 8,190,203; U.S. Pub. No. 2012/0230510 A1; and U.S. nonprovisional application Serial No. 13/441,476, filed April 6, 2012, now Pub. No. 2013/0266152. These patents and patent applications also include simplified block diagrams of the earphones 14 according to various embodiments. As disclosed in these patents and patent applications, the earphones 14 have one or more acoustic transducers for producing sound.

[0016] Figure 2 is simplified block diagram of the CAP 16 according to various embodiments of the present invention. As shown in Figure 2, the CAP 16 may comprise a processor 40, a volatile memory 42, a nonvolatile memory 44, a RF (or radio or Wi-Fi) module 46 and a USB port 48 or other suitable external interface that allows the CAP 16 to connect to an external device, such as the DAP 20 or the computer 22. The CAP 16 may also include a chargeable power source (not shown) for powering the components of the CAP 16. The RF module 46 may handle radio/wireless communications by the CAP 16. For example, the RF module 46 may allow the CAP to communicate via a wireless communication protocol, preferably Wi-Fi, with the earphones 14 or the wireless access point 24. The memory units 42, 44 may store software instructions for execution by the processor 40 that control the function and operation of the CAP 16. In addition, in various embodiments, the earphones 14 and CAP 16 are part of a conjoined assembly, such that the CAP 16 is configured at manufacture to know the identifiers for the

earphones 14. That is, the non-volatile memory 44 may store addresses (e.g., IP addresses) for the earphones 14.

[0017] In various embodiments, in order to initially operate the earphones 14 (e.g., "out of the box"), the CAP 16 may be plugged into the desired media device (e.g., the DAP 20 or the computer 22) as described above, which may power the CAP 16 and cause the CAP 16 to transmit (or stream) wirelessly the content output by the media device, which can be received (via the ad hoc wireless communication link 18) and played by the earphones 14 (assuming the earphones 14 are turned on), since the CAP 16 is initially configured to store the addresses for the earphones 14, as described above.

[0018] As described above, the earphones 14 can, when properly configured, also receive wireless content via infrastructure networks. Figure 3 is a flow chart of a process for setting up and customizing the channels and streams for the earphones 14, including adding and managing wireless networks (e.g., Wi-Fi hotspots) according to various embodiments. At step 60, the user (e.g., a user of the earphones 14), using the Internet-enabled computer 22 with a browser, logs into a website associated with the earphones 14, hosted by the remote server(s) 30, and sets up an account (if the user does not already have one). At the website the user can, for example, add Wi-Fi hotspots and specify content channels (e.g., Internet radio stations or other servers connected to the Internet that serve content). To add a Wi-Fi hotspot at step 62, the user may click (or otherwise activate) a link on the website that indicates a desire to add a Wi-Fi hotspot. In various embodiments, a JAVA applet from the website may be used by the computer 22 to search for nearby Wi-Fi hotspots, which, upon detection, may be displayed for the user on the website. The user may then click on (or otherwise select) the desired Wi-Fi hotspot to add. If applicable, the website may then prompt the user to enter a password and/or encryption type (e.g., WPA or WPA2) for the selected Wi-Fi hotspot. The SSID, password, and encryption type for the Wi-Fi hotspot is stored for the user's account by the remote server(s) 30. This process could be repeated as necessary to add as many Wi-Fi hotspots as desired by the user.

[0019] Next, at step 64, a user device, e.g., the earphone set 12, may be added to the user's account. The user may do this, according to various embodiments, by plugging the CAP 16 into the computer 22. Using a JAVA applet, for example, the IDs for the CAP 16, as well as the IDs for the earphones 14, stored in the non-volatile memory 44 of the CAP 16, are uploaded to the remote server(s) 30 and stored at the remote server(s) 30 as part of the user's account

information. Next, at step 66, the user may update the earphones 14 with the Wi-Fi hotspot credentials (e.g., SSID, password if one is used for the hotspot, and/or encryption type). The user may do this by clicking on or otherwise selecting a link on the website to update the earphones 14. Upon clicking the link, the CAP 16 transmits the credentials (e.g., SSID, password, encryption type) for each of the added Wi-Fi hotspots to the earphones 14, via the ad hoc wireless communication link 18. This process allows the earphones 14 to be configured for infrastructure network (and Internet) access without having to physically connect the earphones 14 to the computer 22 to configure them and without having an existing, different infrastructure network that the earphones 14 need to connect to.

[0020] The user may also set up channels for the earphones 14 at step 68 through the website. The user may do this by clicking on or otherwise selecting a link or option provided by the website to add channels. The channels may be digital content streams, such as digital audio. The remote server(s) 30 may host a number of such content streams that the user could select via the website. These selections may be stored by the remote server(s) 30 as part of the user's account information. Also, the user could enter an address for a channel(s), associated with another server(s) connected to the network 28, such as the URL for channel's server. These addresses may also be stored by the remote server(s) 30 as part of the user's account information.

[0021] The earphones 14 may have one or more multi-function user controls (e.g., buttons, touch interfaces, etc.) and indicators (e.g., LEDs) that allow the user to select and transition through various modes of operation. For example, using the user control(s) of the earphones 14, the user could select an ad hoc mode, whereby the earphones stream and play content from the CAP 16 (and hence the device to which the CAP 16 is connected, such as the DAP 20 or the computer 22). Also, the user could select the infrastructure (e.g., Wi-Fi) mode using the user control(s) in order to stream content via Wi-Fi hotspot. The user may also cycle through or otherwise select the desired channel (stored in step 68) using the user-control.

[0022] It should be noted that the some steps of Figure 3 could be performed in different orders than as shown in Figure 3. For example, the user's channels could be set up before the Wi-Fi hotspots are added or before the user's earphones 14 are added. However, the earphones 14 could not be updated with the Wi-Fi hotspot credentials (step 66) until the Wi-Fi hotspot(s) and earphones are added (steps 62 and 64).

[0023] Although the above embodiments were described in the context of wireless earphones for receiving and playing digital audio content, in other embodiments different types of the digital content could be streamed to the wireless device in a similar manner. For example, instead of earphones, a video player 80, as shown in Figure 4 could be used instead. The video player 80 may be any video player capable of receiving and playing received digital video content, such as MPEG video, for example. The video player 80 may stream the video content from the CAP 16 (and hence the media source connected to the CAP 16) via the ad hoc wireless communication link 18 or via the infrastructure wireless communication link 26, as described above. Also, the video player 80 could be configured with the Wi-Fi hotspot credentials as described above in connection with Figure 3.

[0024] Similarly, as shown in Figure 5, the wireless device could be a controller 82 that controls the operation and/or function of electronic equipment 84, such as lighting system(s), camera(s), manufacturing equipment, medical device(s), gaming systems, or any other suitable controllable electronic equipment. The controller 82 may receive control data via either the ad hoc or infrastructure wireless networks, depending on which mode the controller 82 is in. As described above, the controller 82 may be configured to connect to the infrastructure wireless network 26 by receiving the credential data for the infrastructure wireless network 26 via the ad hoc wireless network 18.

[0025] In one general aspect, the present invention is directed to a system that comprises: the wireless device configured to receive data wirelessly; a content access point that communicates with the wireless device via an ad hoc wireless network; a computer that is connectable to the content access point; and a remote server in communication with the computer via a communications network. The remote server hosts a website accessible by the computer. The website permits a user of the wireless device to input via the computer credential data for at least one infrastructure wireless network, and the remote server stores the credential data for the at least one infrastructure wireless network. Also, the content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network, such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network.

[0026] In various implementations, the wireless device comprises a wireless media player, such as an audio player or a video player. The wireless media player may be configured to receive and play digital media data received via the ad hoc wireless network when in a first mode (an ad hoc mode), and is configured to receive and play digital media data received via the infrastructure wireless network when in a second mode (an infrastructure mode). In other embodiments, the wireless device may comprise a wireless controller that controls electronic equipment. The wireless controller may be configured to receive digital control data received via the ad hoc wireless network when in a first mode (an ad hoc mode), and is configured to receive digital control data received via the infrastructure wireless network when in a second mode (an infrastructure mode). In various embodiments, the ad hoc wireless network comprises an ad hoc Wi-Fi network, and the infrastructure wireless network comprises an infrastructure Wi-Fi network. The credential data for the at least one infrastructure wireless network may comprise: an identifier for the at least one infrastructure wireless network; a password for the at least one infrastructure wireless network; and/or encryption type data for the at least one infrastructure wireless network.

[0027] It will be apparent to one of ordinary skill in the art that at least some of the embodiments described herein may be implemented in many different embodiments of software, firmware, and/or hardware. The software and firmware code may be executed by a processor circuit or any other similar computing device. The software code or specialized control hardware that may be used to implement embodiments is not limiting. For example, embodiments described herein may be implemented in computer software using any suitable computer software language type, using, for example, conventional or object-oriented techniques. Such software may be stored on any type of suitable computer-readable medium or media, such as, for example, a magnetic or optical storage medium. The operation and behavior of the embodiments may be described without specific reference to specific software code or specialized hardware components. The absence of such specific references is feasible, because it is clearly understood that artisans of ordinary skill would be able to design software and control hardware to implement the embodiments based on the present description with no more than reasonable effort and without undue experimentation.

[0028] Moreover, the processes associated with the present embodiments may be executed by programmable equipment, such as computers or computer systems and/or processors. Software

that may cause programmable equipment to execute processes may be stored in any storage device, such as, for example, a computer system (nonvolatile) memory, an optical disk, magnetic tape, or magnetic disk. Furthermore, at least some of the processes may be programmed when the computer system is manufactured or stored on various types of computer-readable media.

[0029] It can also be appreciated that certain process aspects described herein may be performed using instructions stored on a computer-readable medium or media that direct a computer system to perform the process steps. A computer-readable medium may include, for example, memory devices such as diskettes, compact discs (CDs), digital versatile discs (DVDs), optical disk drives, or hard disk drives. A computer-readable medium may also include memory storage that is physical, virtual, permanent, temporary, semipermanent, and/or semitemporary.

[0030] A "computer," "computer system," "host," "server," or "processor" may be, for example and without limitation, a processor, microcomputer, minicomputer, server, mainframe, laptop, personal data assistant (PDA), wireless e-mail device, cellular phone, pager, processor, fax machine, scanner, or any other programmable device configured to transmit and/or receive data over a network. Computer systems and computer-based devices disclosed herein may include memory for storing certain software modules or engines used in obtaining, processing, and communicating information. It can be appreciated that such memory may be internal or external with respect to operation of the disclosed embodiments. The memory may also include any means for storing software, including a hard disk, an optical disk, floppy disk, ROM (read only memory), RAM (random access memory), PROM (programmable ROM), EEPROM (electrically erasable PROM) and/or other computer-readable media. The software modules and engines described herein can be executed by the processor (or processors as the case may be) of the computer devices that access the memory storing the modules.

[0031] In various embodiments disclosed herein, a single component may be replaced by multiple components and multiple components may be replaced by a single component to perform a given function or functions. Except where such substitution would not be operative, such substitution is within the intended scope of the embodiments. Any servers described herein, for example, may be replaced by a "server farm" or other grouping of networked servers (such as server blades) that are located and configured for cooperative functions. It can be appreciated that a server farm may serve to distribute workload between/among individual components of the farm and may expedite computing processes by harnessing the collective and cooperative power

of multiple servers. Such server farms may employ load-balancing software that accomplishes tasks such as, for example, tracking demand for processing power from different machines, prioritizing and scheduling tasks based on network demand and/or providing backup contingency in the event of component failure or reduction in operability.

[0032] The computer systems may comprise one or more processors in communication with memory (e.g., RAM or ROM) via one or more data buses. The data buses may carry electrical signals between the processor(s) and the memory. The processor and the memory may comprise electrical circuits that conduct electrical current. Charge states of various components of the circuits, such as solid state transistors of the processor(s) and/or memory circuit(s), may change during operation of the circuits.

[0033] While various embodiments have been described herein, it should be apparent that various modifications, alterations, and adaptations to those embodiments may occur to persons skilled in the art with attainment of at least some of the advantages. The disclosed embodiments are therefore intended to include all such modifications, alterations, and adaptations without departing from the scope of the embodiments as set forth herein.

Electronic Acknowledgement Receipt

EFS ID:	33834068
Application Number:	16057360
International Application Number:	
Confirmation Number:	9075
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Customer Number:	26285
Filer:	Mark G. Knedeisen/Autumn Vanatta
Filer Authorized By:	Mark G. Knedeisen
Attorney Docket Number:	120223CON6
Receipt Date:	26-SEP-2018
Filing Date:	07-AUG-2018
Time Stamp:	14:16:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	09-26-2018_Reply_Corrected_Application_Papers.pdf	89627 a1b06d5ec554020a44cb0bb6b942ed3e2be56395	no	1

Warnings:

Information:					
2	Specification	09-26-2018_Markedup_Specification.pdf	127160 b1ff5e49def06db5779702233635084f576bd3de	no	11
Warnings:					
Information:					
3	Specification	09-26-2018_Clean_Specification.pdf	141419 0d0921efb395d429589e67a99af2fd4229893d46	no	11
Warnings:					
Information:					
			Total Files Size (in bytes):	358206	

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

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/057,360	08/07/2018	2642	835	120223CON6	21	2

CONFIRMATION NO. 9075

26285
K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

FILING RECEIPT

Date Mailed: 09/21/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Michael J. Koss, Milwaukee, WI;
Michael J. Pelland, Princeton, WI;
Joel L. Haynie, DeForest, WI;

Applicant(s)

Koss Corporation, Milwaukee, WI;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 15/927,262 03/21/2018 PAT 10079717
which is a CON of 15/463,559 03/20/2017 PAT 9992061
which is a CON of 15/080,940 03/25/2016 PAT 9629190
which is a CON of 14/850,508 09/10/2015 PAT 9326304
which is a CON of 14/702,316 05/01/2015 PAT 9185168
which is a CON of 13/832,719 03/15/2013 PAT 9060288

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: 09/19/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/057,360**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

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

CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

Preliminary Class

455

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).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/057,360

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	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1	x 50 =	50	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	x 230 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	835		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

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

AMENDMENT B

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/057,360	08/07/2018	Michael J. Koss	120223CON6

CONFIRMATION NO. 9075

26285
K&L GATES LLP-Pittsburgh
210 SIXTH AVENUE
PITTSBURGH, PA 15222-2613

FORMALITIES LETTER

OC000000102451195

Date Mailed: 09/21/2018

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- A substitute specification excluding claims in compliance with 37 CFR 1.52, 1.121(b)(3), and 1.125 is required. The substitute specification must be submitted with markings and be accompanied by a clean version (without markings) as set forth in 37 CFR 1.125(c) and a statement that the substitute specification contains no new matter (see 37 CFR 1.125(b)). Since a preliminary amendment was present on the filing date of the application and such amendment is part of the original disclosure of the application, the substitute specification must include all of the desired changes made in the preliminary amendment. See 37 CFR 1.115 and 1.215.

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

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

Replies should be mailed to:

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

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

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

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

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

/tnguyen/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Koss Corporation	§	**Examiner:**	TBD
		§		
Inventors:	Michael J. Koss *et al.*	§	**Art Unit:**	2642
		§		
Serial No.:	16/057,360	§	**Atty. Docket No**.:	120223CON6
		§		
Filing Date:	August 7, 2018	§	**Confirmation No.:**	9075

Title: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

SECOND PRELIMINARY AMENDMENT

K&L Gates, LLP
Pittsburgh, PA 15222
August 21, 2018

VIA EFS (WEB)

Commissioner for Patents
Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Prior to examination, please amend the above-referenced application ("the Subject Application") as follows, wherein:

Amendments to the Claims begin on page 2; and

Remarks begin on page 7.

Electronic Patent Application Fee Transmittal

Application Number:	16057360
Filing Date:	
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Filer:	Mark G. Knedeisen/Bonnie Petros
Attorney Docket Number:	120223CON6

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	2202	1	50	50
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**50**

Electronic Acknowledgement Receipt	
EFS ID:	33491578
Application Number:	16057360
International Application Number:	
Confirmation Number:	9075
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Customer Number:	26285
Filer:	Mark G. Knedeisen/Bonnie Petros
Filer Authorized By:	Mark G. Knedeisen
Attorney Docket Number:	120223CON6
Receipt Date:	21-AUG-2018
Filing Date:	
Time Stamp:	17:04:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$50
RAM confirmation Number	082218INTEFSW00010004021818
Deposit Account	021818
Authorized User	Bonnie Petros
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	120223CON6_Amendment_Transmittal.pdf	107918 37a7d30748d46121784e10987ec056a83f022a4	no	4
Warnings:					
Information:					
2		120223CON6_Second_Preliminary_Amendment.pdf	130610 9ccfc6fd8375916691d5e3d84199806f20953e56	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Applicant Arguments/Remarks Made in an Amendment	7	7
	Claims	2	6
	Preliminary Amendment	1	1

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30046 67a275e98ca06463cea9e57e46504665c57e60a1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	268574		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Koss Corporation	§	**Examiner:**	TBD
		§		
Inventors:	Michael J. Koss *et al.*	§	**Art Unit:**	2642
		§		
Serial No.:	16/057,360	§	**Atty. Docket No.:**	120223CON6
		§		
Filing Date:	August 7, 2018	§	**Confirmation No.:**	9075

Title: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

VIA EFS-Web

K&L Gates, LLP
Pittsburgh, PA 15222
August 21, 2018

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

AMENDMENT TRANSMITTAL

1. Transmitted herewith is an amendment for this application.

STATUS

2. Applicant is

☒ A statement that this filing is by a small entity is hereby asserted in accordance with the rule change effective September 8, 2000, 65 Fed. Reg. 54603.

☐ other than a small entity.

501789882 v1

EXTENSION OF TERM

NOTE: "Extension of Time in Patent Cases (Supplement Amendments) - If a timely and complete response has been filed after a Non-Final Office Action, an extension of time is not required to permit filing and/or entry of an additional amendment after expiration of the shortened statutory period.

If a timely response has been filed after a Final Office Action, an extension of time is required to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run." Notice of December 10, 1985 (1061 O.G. 34-35).

NOTE: See 37 CFR 1.645 for extensions of time in interference proceedings, and 37 CFR 1.550(c) for extensions of time in reexamination proceedings.

3. The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply.

(complete (a) or (b), as applicable)

(a) ☐ Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

Extension (months)	Fee for other than small entity	Fee for small entity
☐ one month	$ 200.00	$ 100.00
☐ two months	$ 600.00	$ 300.00
☐ three months	$1,400.00	$ 700.00
☐ four months	$2,200.00	$ 1,100.00

Fee: $

If an additional **extension** of time is required, please consider this a petition therefor.

(check and complete the next item, if applicable)

☐ An extension for _____ months has already been secured and the fee paid therefor of $_____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request **$**

OR

(b) ☒ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

FEE FOR CLAIMS

4. The fee for claims (37 CFR 1.16(b)-(d) has been calculated as shown below:

(Col. 1)	(Col. 2)	(Col. 3)	SMALL ENTITY			OTHER THAN A SMALL ENTITY	
CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDIT. FEE	OR	RATE	ADDIT. FEE
TOTAL 21•	MINUS 20••	=1	X50=	$50		X100=	$0
INDEP. 3•	MINUS 3•••	=0	X230=	$0		X460=	$0
☐ FIRST PRESENTATION OF MULTIPLE DEP. CLAIM			+410=	$0		+820=	$0
			TOTAL ADDIT. FEE	$50	OR	TOTAL ADDIT. FEE	$0

- • If the entry in Col. 1 is less than entry in Col. 2, write ")" in Col. 3.
- •• If the "Highest No. Previously Paid for" IN THIS SPACE is less than 20, enter "20."
- ••• If the "Highest No. Previously Paid for" IN THIS SPACE is less than 3, enter "3."
  The "Highest No. Previously Paid for" (Total or indep.) is the highest number found in the appropriate box in Col. 1 of a prior amendment or the number of claims originally filed.

WARNING "After final rejection or action (§ 1.113) amendments may be made cancelling claims or complying with any requirement of form which has been made." 37 CFR § 1.116(a) (emphasis added).

Complete (c) or (d), as applicable)

(c) ☐ No additional fee for claims is required.

OR

(d) ☒ Total additional fee for claims required $ 50.00

FEE PAYMENT

5. ☐ Attached is a check in the sum of $ _____

☒ Charge Account No. 02-1818 the sum of $ 50.00

FEE DEFICIENCY

NOTE: If there is a fee deficiency and there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum, six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases. Authorization to charge the deposit account for any fee deficiency should be checked. See the Notice of April 7, 1986, (1065 O.G. 31-33).

6. ☒ If any additional extension and/or fee is required, charge Account No.

02-1818.

AND/OR

7. ☒ If any additional fee for claims is required, charge Account No.

02-1818.

/Mark G. Knedeisen/
SIGNATURE OF ATTORNEY

Reg. No.: 42,747

Mark G. Knedeisen
(type or print name of attorney)

Tel. No.: 412-355-6342

Customer No. 26285

K&L Gates LLP
P.O. Address
K&L Gates Center
210 Sixth Avenue
Pittsburgh, PA 15222-2613

REMARKS

Applicant files this amendment to (i) correct a typographical error in claim 6; and (ii) to add new dependent claim 22. Support for new claim 22 may be found throughout the application as originally filed, such as at ¶ [0012], for example; no new matter is added.

Applicant filed a Request for Track One prioritized examination with the filing of the Subject Application and Applicant submits that Subject Application, upon entry of the present amendments, continues to qualify for Track One prioritized examination. The Subject Application as amended: is an original nonprovisional utility application filed under 35 U.S.C. § 111(a); does not contain more than four independent claims (it has two independent claims—claims 2 and 18); does not contain more than thirty total claims (it now has twenty-one claims); and does not contain any multiple dependent claims.

The Office is hereby authorized to charge any fees necessary for consideration of this amendment to Deposit Account Number 02-1818.

If the undersigned can be of assistance to the Examiner in addressing any additional issues to advance the application to a condition of allowance, please contact the undersigned at the number set forth below.

Respectfully submitted,

Date: August 21, 2018

/Mark G. Knedeisen/
Mark G. Knedeisen
Reg. No. 42,747

K&L GATES LLP
K&L Gates Center
210 Sixth Ave.
Pittsburgh, Pennsylvania 15222

Ph. (412) 355-6342
Fax (412) 355-6501
email: mark.knedeisen@klgates.com

Amendments to the Claims

Please amend the claims as follows. The following listing of the claims replaces all prior listing(s) of the claims in the Subject Application.

1. (Canceled)

2. (Previously Presented) A system comprising:

a wireless access point;

an electronic device;

a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and

one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by the wireless access point,

wherein:

the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and

the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.

3. (Previously Presented) The system of claim 2, further comprising a remote network server, wherein the after connecting to the wireless access point, the electronic device is for receiving control data from the remote network server.

4. (Previously Presented) The system of claim 2, wherein the electronic device comprises a lighting system.

5. (Previously Presented) The system of claim 2, wherein the electronic device comprises a camera.

6. (Currently Amended) The system of claim 2, wherein the electronic device comprises a ~~medial~~ medical device.

7. (Previously Presented) The system of claim 2, wherein the electronic device comprises a gaming system.

8. (Previously Presented) The system of claim 2, wherein the electronic device comprises acoustic speaker device.

9. (Previously Presented) The system of claim 8, wherein the acoustic speaker device comprises a set of earphones.

10. (Previously Presented) The system of claim 8, wherein:
the system further comprises a remote network server; and
the acoustic speaker device is further for:
after connecting to the wireless access point, streaming audio content from the remote network server via the infrastructure wireless network; and
playing the audio content streamed from the remote network server, such that the acoustic speaker device is enabled to play audio streamed via the infrastructure wireless network.

11. (Previously Presented) The system of claim 2, wherein:
the system further comprises a remote network server; and
the electronic device comprises a video player that is further for:
after connecting to the wireless access point, streaming video content from the remote network server via the infrastructure wireless network; and
playing the video content streamed from the remote network server, such that the video player is enabled to play video streamed via the infrastructure wireless network.

12. (Previously Presented) The system of claim 2, wherein the mobile computer device comprises a smartphone, and wherein the smartphone comprises a radio module for communicating wirelessly via the ad hoc wireless network with the electronic device.

13. (Previously Presented) The system of claim 2, wherein:
the infrastructure wireless network comprises an infrastructure Wi-Fi network; and
the credential data for the infrastructure Wi-Fi network comprises an identifier for the infrastructure Wi-Fi network.

14. (Previously Presented) The system of claim 13, wherein the credential data for the infrastructure Wi-Fi network additionally comprises a password for the infrastructure Wi-Fi network.

15. (Previously Presented) The system of claim 14, wherein the credential data for the infrastructure Wi-Fi network additionally comprises encryption type data for the infrastructure Wi-Fi network.

16. (Previously Presented) The system of claim 13, wherein the ad hoc wireless network comprises a Bluetooth wireless network.

17. (Previously Presented) The system of claim 2, wherein the one or more host servers host a website through which, via the mobile computer device, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user.

18. (Previously Presented) A system comprising:
an electronic device;
a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and

one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by a wireless access point,

wherein:

the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and

the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.

19. (Previously Presented) The system of claim 18, wherein the one or more host servers host a website through which, via the mobile computer device, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user.

20. (Previously Presented) The system of claim 19, wherein:

the infrastructure wireless network comprises an infrastructure Wi-Fi network;

the credential data for the infrastructure Wi-Fi network comprises:

an identifier for the infrastructure Wi-Fi network; and

a password for the infrastructure Wi-Fi network; and

the electronic device comprises an electronic device selected from the group consisting of:

an acoustic speaker;

a video player;

a lighting system;

a camera;

a medical device; and

a gaming system.

21. (Previously Presented) The system of claim 18, further comprising a remote network server, wherein the after connecting to the wireless access point, the electronic device is for receiving control data from the remote network server.

22. (New) The system of claim 13, wherein the ad hoc wireless network comprises an ad hoc WiFi wireless network.

PTO/AIA/15 (10-17)
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.

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	120223CON6
First Named Inventor	Michael J. Koss
Title	CONFIGURING WIRELESS DEVICES FOR ...
Priority Mail Express® Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✓] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [✓] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [ ] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✓] **Specification** [*Total Pages* 13] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✓] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 4]
6. **Inventor's Oath or Declaration** [*Total Pages* 3] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [ ] Newly executed (original or copy)
   b. [✓] A copy from a prior application (37 CFR 1.63(d))
7. [✓] **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. [ ] Computer Readable Form (CRF)
   b. [ ] Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s)) Name of Assignee
11. [ ] **37 CFR 3.73(c) Statement** (*when there is an assignee*) [ ] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [✓] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [✓] Copies of citations attached
14. [✓] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [✓] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [✓] **Other:** Certification and Request for Prioritized Examination (Track 1) - PTO/AIA/424 form

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

[✓] The address associated with Customer Number: 26285 **OR** [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/Mark G. Knedeisen/	Date	August 7, 2018
Name (Print/Type)	Mark G. Knedeisen	Registration No. (Attorney/Agent)	42,747

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

PTO/SB/17 (01-18)
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

FEE TRANSMITTAL

Complete if known	
Application Number	
Filing Date	
First Named Inventor	Michael J. Koss
Examiner Name	
Art Unit	
Practitioner Docket No.	120223CON6

[■] Applicant asserts small entity status. See 37 CFR 1.27.

[ ] Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

TOTAL AMOUNT OF PAYMENT ($) 2,855.00

METHOD OF PAYMENT (check all that apply)

[ ] Check [ ] Credit Card [ ] Money Order [ ] None [ ] Other (please identify): _____

[■] Deposit Account Deposit Account Number: 02-1818 Deposit Account Name: K&L Gates LLP

For the above-identified deposit account, the Director is hereby authorized to (check all that apply):

[■] Charge fee(s) indicated below [ ] Charge fee(s) indicated below, **except for the filing fee**

[■] Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 [■] Credit any overpayment of fee(s)

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

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES (U = undiscounted fee; S = small entity fee; M = micro entity fee)

	FILING FEES			SEARCH FEES			EXAMINATION FEES			
Application Type	U ($)	S ($)	M ($)	U ($)	S ($)	M ($)	U ($)	S ($)	M ($)	Fees Paid ($)
Utility	300	150*	75	660	330	165	760	380	190	$785.00
Design	200	100	50	160	80	40	600	300	150	
Plant	200	100	50	420	210	105	620	310	155	
Reissue	300	150	75	660	330	165	2,200	1,100	550	
Provisional	280	140	70	0	0	0	0	0	0	

* The $150 small entity status filing fee for a utility application is further reduced to $75 for a small entity status applicant who files the application via EFS-Web.

2. EXCESS CLAIM FEES

Fee Description	Undiscounted Fee ($)	Small Entity Fee ($)	Micro Entity Fee ($)
Each claim over 20 (including Reissues)	100	50	25
Each independent claim over 3 (including Reissues)	460	230	115
Multiple dependent claims	820	410	205

Total Claims		Extra Claims		Fee ($)		Fee Paid ($)
20	-20 or HP =	0	x	-0-	=	-0-

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		Extra Claims		Fee ($)		Fee Paid ($)
2	-3 or HP =	0	x	-0-	=	-0-

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims		
	Fee ($)	Fee Paid ($)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $400 ($200 for small entity) ($100 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
_____	- 100 =	_____	/ 50 =	_____	(round **up** to a whole number) x	_____	=	_____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English specification, $130 fee (no small or micro entity discount)	
Non-electronic filing fee under 37 CFR 1.16(t) for a utility application, $400 fee ($200 small or micro entity)	
Other (e.g., late filing surcharge): Track 1 Processing fee: $70, Prioritized Examination Fee: $2,000	$2,070.00

SUBMITTED BY

Signature	/Mark G. Knedeisen/	Registration No. (Attorney/Agent) 42,747	Telephone (412) 355-6342
Name (Print/Type)	Mark G. Knedeisen		Date August 7, 2018

This collection of information is required by 37 CFR 1.136. 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, 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.

COPY

PTO/AIA/01 (05-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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

Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

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 13/832,719

filed on March 15, 2013.

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: Michael J. Koss Date (Optional): 4-9-13

Signature: Michael J. Koss

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.

COPY

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

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 13/832,719

filed on March 15, 2013

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: Michael J. Pelland 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.

COPY

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

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 13/832,719 filed on March 15, 2013.

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: Joel L. Haynie Date (Optional): 09/24/2013

Signature: Joel L Haynie

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.

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

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
	Michael	J.	Koss	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Milwaukee	WI	US

Mailing Address of Inventor:

Address 1	4129 North Port Washington Avenue
Address 2	

City	State/Province	Postal Code	Country
Milwaukee	WI	53212	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Michael	J.	Pelland	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Princeton	WI	US

Mailing Address of Inventor:

Address 1	N4626 Wildwood Lane
Address 2	

City	State/Province	Postal Code	Country
Princeton	WI	54968	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Joel	L.	Haynie	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

City	DeForest	State/Province	WI	Country of Residence	US

Mailing Address of Inventor:

Address 1	6858 Moonstone Court		
Address 2			
City	DeForest	State/Province	WI
Postal Code	53532	Country	US

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

Correspondence Information:

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

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

Customer Number	26285		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK		
Attorney Docket Number	120223CON6	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	Suggested Figure for Publication (if any)	

Filing By Reference:

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

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

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

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.

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

Representative Information:

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

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	26285		

Domestic Benefit/National Stage Information:

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

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15/927262	2018-03-21

Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/927262	Continuation of	15/463559	2017-03-20	9992061	2018-06-05

Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/463559	Continuation of	15/080940	2016-03-25	9629190	2017-04-18

Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15/080940	Continuation of	14/850508	2015-09-10	9326304	2016-04-26

Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14/850508	Continuation of	14/702316	2015-05-01	9185168	2015-11-10

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14/702316	Continuation of	13/832719	2013-03-15	9060288	2015-06-16

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

Foreign Priority Information:

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

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

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

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

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

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

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

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

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

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

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

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	Koss Corporation		
Mailing Address Information For Applicant:			
Address 1	4129 North Port Washington Avenue		
Address 2			
City	Milwaukee	**State/Province**	WI
Country	US	Postal Code	53212-1052
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

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

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

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

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

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

Signature	/Mark G. Knedeisen/			Date (YYYY-MM-DD)	2018-08-07
First Name	Mark	Last Name	Knedeisen	Registration Number	42747

Additional Signature may be generated within this form by selecting the Add button. Add

PTO/AIA/14 (02-18)
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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	120223CON6
	Application Number	
Title of Invention	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

PTO/SB/35 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

NONPUBLICATION REQUEST UNDER 35 U.S.C. 122(b)(2)(B)(i)

First Named Inventor	Michael J. Koss
Title	CONFIGURING WIRELESS DEVICES FOR ...
Attorney Docket Number	120223CON6

I hereby 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.

I hereby request that the attached application not be published under 35 U.S.C. 122(b).

/Mark G. Knedeisen/	August 7, 2018
Signature	Date
Mark G. Knedeisen	42,747
Typed or printed name	Registration Number, if applicable
(412) 355-6342	
Telephone Number	

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing.**

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing, the applicant **must** notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such foreign or international application. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

This collection of information is required by 37 CFR 1.213(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

UNITED STATES UTILITY PATENT APPLICATION FOR

CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

Inventors: Michael J. Koss, Michael J. Pelland, Joel L. Haynie

PRIORITY CLAIM

[0001] The present application claims priority under 35 U.S.C. § 120 as a continuation application to United States nonprovisional patent application Serial No. 15/463,559, filed March 20, 2017, which is a continuation of United States nonprovisional patent application Serial No. 15/080,940, filed March 25, 2016, now U.S. Patent 9,629,190, issued April 18, 2017, which is a continuation of United States nonprovisional patent application Serial No. 14/850,508, filed September 10, 2015, now U.S. Patent 9,326,304, issued April 26, 2016, which is a continuation of U.S. nonprovisional patent application Serial No. 14/702,316, filed May 1, 2015, now U.S. Patent 9,185,168, issued November 10, 2015, which is a continuation of U.S. nonprovisional patent application Serial No. 13/832,719, filed March 15, 2013, now U.S. Patent 9,060,288, issued June 16, 2015, both of which are incorporated herein by reference in their entirety.

BACKGROUND

[0002] Wireless earphones that stream digital-audio content from sources are known. For example, U.S. Patent 8,190,203, which is incorporated herein by reference in its entirety, describes a wireless earphone pair where each earphone is capable of receiving and playing digital-audio streamed over ad-hoc or infrastructure Wi-Fi networks. This patent also describes that the source of the digital-audio content could be a wireless network adapter that plugs into an audio player (such as a personal digital audio player (DAP)) and transmits the audio from the audio player to the earphones via a Wi-Fi ad hoc network. Also, the earphones may connect to, and stream digital-audio content from, a remote server through the Internet via an infrastructure Wi-Fi network.

SUMMARY

[0003] In various embodiments, the present invention is directed to systems and methods for configuring a wireless device to receive data wirelessly via an infrastructure wireless network,

without physically connecting the wireless device to a computer in order to configure it, and without having a have an existing infrastructure wireless network for the wireless device to connect to. The wireless device could be for example a wireless media player (such as an audio player or a video player), a wireless controller for electronic equipment, or any device that receives wireless data.

[0004] According to various embodiments, a system according to the present invention comprises: the wireless device configured to receive data wirelessly; a content access point that communicates with the wireless device via an ad hoc wireless network; a computer that is connectable to the content access point; and a remote server in communication with the computer via a communications network (e.g., the Internet). The remote server hosts a website, accessible by the computer, through which a user of the wireless device inputs, via the computer, credential data for at least one infrastructure wireless network, and the remote server stores the credential data. Also, the content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network, such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network. That way, the wireless device can connect to the infrastructure wireless network without having to have been plugged into the computer, and without having to have been connected to another, different infrastructure wireless network.

[0005] In another general aspect, the present invention is directed to a method of configuring a wireless media player to communicate via an infrastructure wireless network. In various implementations, the method comprises, prior to connecting the wireless media player to the infrastructure wireless network, the steps of: storing an IP address for the wireless media player in a non-volatile memory of a separate content access point device; connecting the content access point device to a computer that is configured to communicate with a remote server via the Internet; uploading the IP address for the wireless media player stored in the non-volatile memory of the content access point device to the remote server from the computer and the Internet; receiving by the remote server credential data for the infrastructure wireless network from a user; and transmitting, by the content access point, the credential data for the infrastructure wireless network to the wireless media player via an ad hoc wireless network between the content access point device and the wireless media player. The inventive method

further comprises, after the wireless media player receives the credential data for the infrastructure wireless network from the content access point device via the ad hoc wireless network, the step of the wireless media player connecting to the infrastructure wireless network using the received credential data for the infrastructure wireless network.

[0006] These and other benefits and aspects of the present invention are described below.

BRIEF DESCRIPTION OF THE FIGURES

[0007] Various embodiments of the present invention are described herein by way of example in conjunction with the following figures, wherein:

[0008] Figures 1, 4 and 5 are diagrams of systems according to various embodiments of the present invention;

[0009] Figure 2 is simplified block diagram of the content access point according to various embodiments of the present invention; and

[0010] Figure 3 is a flow chart depicting a process of a system according to various embodiments of the present invention.

DESCRIPTION

[0011] Various embodiments of the present invention are directed to systems and methods for configuring a wireless device to communicate via an infrastructure wireless network, such as an infrastructure Wi-Fi network, without having to physically plug the wireless device into a computer to configure it, and without having to have an existing infrastructure wireless connection for the wireless device. In the description to follow, the wireless device is usually described as a wireless audio player, e.g., a set of earphones, although it should be recognized that the present invention is not so limited. The wireless device could be another type of media player, such as a wireless video player, or another type of device that receives data wirelessly. For example, the wireless device could be a controller for electronic equipment, such as a controller for lighting systems, cameras, machinery, gaming equipment, etc., that receives control data via a wireless communication link.

[0012] Figure 1 is a diagram of a system 10 according to various embodiments of the present invention. The system 10 comprises an earphone set 12 comprising a pair of earphones 14, one for each ear of a user. One or both of the earphones 14 may communicate wirelessly with a

content access point (CAP) 16 via an ad hoc communication link 18, which is preferably an ad hoc Wi-Fi link (e.g., IEEE 802.11a/b/g/n), although in other embodiments different wireless communication protocols may be used, such as WiMAX (IEEE 802.16), Bluetooth, Zigbee, UWB, etc. The ad hoc communication link 18 is an ad hoc wireless network because it is a point-to-point network (in this case, the CAP 16 to the wireless device 14) that does not utilize preexisting infrastructure, such as wireless access points. In such an ad hoc network, the devices (e.g., the CAP 16 and the wireless device 14) may have equal status on the network.

[0013] The CAP 16 is connectable, through, for example, a wired connection, to a source of digital audio that stores and plays digital audio files, such as MP3, FLAC, etc. files. The source may be, as shown in Figure 1, a personal DAP 20 or a computer 22, for example, although in other embodiments other media source devices may be used. The personal DAP 20 may be a personal MP3 player, iPod, iPhone, etc., or any other personal electronic device capable of storing and playing digital audio files. The computer 22 may be any suitable computer device, such as a personal computer, laptop computer, tablet computer, smart phone, etc., and preferably has a browser to facilitate initializing the CAP 16 and earphones 14, as described further below. The CAP 16 may connect to the DAP 20 via a USB connector (not shown) that connects to a USB port (e.g., conventional, mini, and micro) of the CAP 16 and to an audio jack on the DAP 20, such as a 3.5mm TRS or TRRS audio jack. The CAP 16 may connect to the computer 22 via a USB connection (not shown). As shown in Figure 1, the earphones 14 may also connect to a wireless access point 24 via a wireless infrastructure communication link 26, that is again preferably a Wi-Fi link, although other wireless protocols could be used. The wireless infrastructure communication link 26 may be part of an infrastructure wireless network because it utilizes a wireless access point 24 and connects to an Internet service provider (e.g., a Wi-Fi hotspot).

[0014] Both the computer 22 and the wireless access point 24 may be connected to a communications network 28, which is preferably an electronic, packet-switched, data communications network, such as a TCP/IP network, such as the Internet. Numerous servers are connected to the Internet; one remote server system 30 is shown in Figure 1. As described further below, a user may connect to the remote server system 30 to provision or initialize the user's CAP 16 and earphones 14 for initial use, and to otherwise manage the CAP 16 and earphones 14. The remote server system 30 may also stream digital audio content to the

earphones 14 via the infrastructure wireless network 26, although the earphones 14 may also stream digital content from other servers connected to the communications network 28 once configured to communicate via the infrastructure wireless network 26, as described below.

[0015] In Figure 1, the earphone set 12 includes a headband 32 connecting the earphones 14. In such an embodiment, one earphone 14 may receive the wireless digital content and transmit it to the other earphone 14 for synchronized playing via a wire that runs through the head band to connect the earphones 14. In other embodiments, both earphones 14 may receive wirelessly and play synchronously the streaming digital content. In such an embodiment, a headband between the earphones is not necessary. More details regarding such wireless earphone pairs are described in the following patents and patent applications, which are incorporated herein by reference in their entirety: U.S. Patent 8,190,203; U.S. Pub. No. 2012/0230510 A1; and U.S. nonprovisional application Serial No. 13/441,476, filed April 6, 2012, now Pub. No. 2013/0266152. These patents and patent applications also include simplified block diagrams of the earphones 14 according to various embodiments. As disclosed in these patents and patent applications, the earphones 14 have one or more acoustic transducers for producing sound.

[0016] Figure 2 is simplified block diagram of the CAP 16 according to various embodiments of the present invention. As shown in Figure 2, the CAP 16 may comprise a processor 40, a volatile memory 42, a nonvolatile memory 44, a RF (or radio or Wi-Fi) module 46 and a USB port 48 or other suitable external interface that allows the CAP 16 to connect to an external device, such as the DAP 20 or the computer 22. The CAP 16 may also include a chargeable power source (not shown) for powering the components of the CAP 16. The RF module 46 may handle radio/wireless communications by the CAP 16. For example, the RF module 46 may allow the CAP to communicate via a wireless communication protocol, preferably Wi-Fi, with the earphones 14 or the wireless access point 24. The memory units 42, 44 may store software instructions for execution by the processor 40 that control the function and operation of the CAP 16. In addition, in various embodiments, the earphones 14 and CAP 16 are part of a conjoined assembly, such that the CAP 16 is configured at manufacture to know the identifiers for the earphones 14. That is, the non-volatile memory 44 may store addresses (e.g., IP addresses) for the earphones 14.

[0017] In various embodiments, in order to initially operate the earphones 14 (e.g., "out of the box"), the CAP 16 may be plugged into the desired media device (e.g., the DAP 20 or the

computer 22) as described above, which may power the CAP 16 and cause the CAP 16 to transmit (or stream) wirelessly the content output by the media device, which can be received (via the ad hoc wireless communication link 18) and played by the earphones 14 (assuming the earphones 14 are turned on), since the CAP 16 is initially configured to store the addresses for the earphones 14, as described above.

[0018] As described above, the earphones 14 can, when properly configured, also receive wireless content via infrastructure networks. Figure 3 is a flow chart of a process for setting up and customizing the channels and streams for the earphones 14, including adding and managing wireless networks (e.g., Wi-Fi hotspots) according to various embodiments. At step 60, the user (e.g., a user of the earphones 14), using the Internet-enabled computer 22 with a browser, logs into a website associated with the earphones 14, hosted by the remote server(s) 30, and sets up an account (if the user does not already have one). At the website the user can, for example, add Wi-Fi hotspots and specify content channels (e.g., Internet radio stations or other servers connected to the Internet that serve content). To add a Wi-Fi hotspot at step 62, the user may click (or otherwise activate) a link on the website that indicates a desire to add a Wi-Fi hotspot. In various embodiments, a JAVA applet from the website may be used by the computer 22 to search for nearby Wi-Fi hotspots, which, upon detection, may be displayed for the user on the website. The user may then click on (or otherwise select) the desired Wi-Fi hotspot to add. If applicable, the website may then prompt the user to enter a password and/or encryption type (e.g., WPA or WPA2) for the selected Wi-Fi hotspot. The SSID, password, and encryption type for the Wi-Fi hotspot is stored for the user's account by the remote server(s) 30. This process could be repeated as necessary to add as many Wi-Fi hotspots as desired by the user.

[0019] Next, at step 64, a user device, e.g., the earphone set 12, may be added to the user's account. The user may do this, according to various embodiments, by plugging the CAP 16 into the computer 22. Using a JAVA applet, for example, the IDs for the CAP 16, as well as the IDs for the earphones 14, stored in the non-volatile memory 44 of the CAP 16, are uploaded to the remote server(s) 30 and stored at the remote server(s) 30 as part of the user's account information. Next, at step 66, the user may update the earphones 14 with the Wi-Fi hotspot credentials (e.g., SSID, password if one is used for the hotspot, and/or encryption type). The user may do this by clicking on or otherwise selecting a link on the website to update the earphones 14. Upon clicking the link, the CAP 16 transmits the credentials (e.g., SSID,

password, encryption type) for each of the added Wi-Fi hotspots to the earphones 14, via the ad hoc wireless communication link 18. This process allows the earphones 14 to be configured for infrastructure network (and Internet) access without having to physically connect the earphones 14 to the computer 22 to configure them and without having an existing, different infrastructure network that the earphones 14 need to connect to.

[0020] The user may also set up channels for the earphones 14 at step 68 through the website. The user may do this by clicking on or otherwise selecting a link or option provided by the website to add channels. The channels may be digital content streams, such as digital audio. The remote server(s) 30 may host a number of such content streams that the user could select via the website. These selections may be stored by the remote server(s) 30 as part of the user's account information. Also, the user could enter an address for a channel(s), associated with another server(s) connected to the network 28, such as the URL for channel's server. These addresses may also be stored by the remote server(s) 30 as part of the user's account information.

[0021] The earphones 14 may have one or more multi-function user controls (e.g., buttons, touch interfaces, etc.) and indicators (e.g., LEDs) that allow the user to select and transition through various modes of operation. For example, using the user control(s) of the earphones 14, the user could select an ad hoc mode, whereby the earphones stream and play content from the CAP 16 (and hence the device to which the CAP 16 is connected, such as the DAP 20 or the computer 22). Also, the user could select the infrastructure (e.g., Wi-Fi) mode using the user control(s) in order to stream content via Wi-Fi hotspot. The user may also cycle through or otherwise select the desired channel (stored in step 68) using the user-control.

[0022] It should be noted that the some steps of Figure 3 could be performed in different orders than as shown in Figure 3. For example, the user's channels could be set up before the Wi-Fi hotspots are added or before the user's earphones 14 are added. However, the earphones 14 could not be updated with the Wi-Fi hotspot credentials (step 66) until the Wi-Fi hotspot(s) and earphones are added (steps 62 and 64).

[0023] Although the above embodiments were described in the context of wireless earphones for receiving and playing digital audio content, in other embodiments different types of the digital content could be streamed to the wireless device in a similar manner. For example, instead of earphones, a video player 80, as shown in Figure 4 could be used instead. The video player 80 may be any video player capable of receiving and playing received digital video content, such as

MPEG video, for example. The video player 80 may stream the video content from the CAP 16 (and hence the media source connected to the CAP 16) via the ad hoc wireless communication link 18 or via the infrastructure wireless communication link 26, as described above. Also, the video player 80 could be configured with the Wi-Fi hotspot credentials as described above in connection with Figure 3.

[0024] Similarly, as shown in Figure 5, the wireless device could be a controller 82 that controls the operation and/or function of electronic equipment 84, such as lighting system(s), camera(s), manufacturing equipment, medical device(s), gaming systems, or any other suitable controllable electronic equipment. The controller 82 may receive control data via either the ad hoc or infrastructure wireless networks, depending on which mode the controller 82 is in. As described above, the controller 82 may be configured to connect to the infrastructure wireless network 26 by receiving the credential data for the infrastructure wireless network 26 via the ad hoc wireless network 18.

[0025] In one general aspect, the present invention is directed to a system that comprises: the wireless device configured to receive data wirelessly; a content access point that communicates with the wireless device via an ad hoc wireless network; a computer that is connectable to the content access point; and a remote server in communication with the computer via a communications network. The remote server hosts a website accessible by the computer. The website permits a user of the wireless device to input via the computer credential data for at least one infrastructure wireless network, and the remote server stores the credential data for the at least one infrastructure wireless network. Also, the content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network, such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network.

[0026] In various implementations, the wireless device comprises a wireless media player, such as an audio player or a video player. The wireless media player may be configured to receive and play digital media data received via the ad hoc wireless network when in a first mode (an ad hoc mode), and is configured to receive and play digital media data received via the infrastructure wireless network when in a second mode (an infrastructure mode). In other embodiments, the wireless device may comprise a wireless controller that controls electronic

equipment. The wireless controller may be configured to receive digital control data received via the ad hoc wireless network when in a first mode (an ad hoc mode), and is configured to receive digital control data received via the infrastructure wireless network when in a second mode (an infrastructure mode). In various embodiments, the ad hoc wireless network comprises an ad hoc Wi-Fi network, and the infrastructure wireless network comprises an infrastructure Wi-Fi network. The credential data for the at least one infrastructure wireless network may comprise: an identifier for the at least one infrastructure wireless network; a password for the at least one infrastructure wireless network; and/or encryption type data for the at least one infrastructure wireless network.

[0027] It will be apparent to one of ordinary skill in the art that at least some of the embodiments described herein may be implemented in many different embodiments of software, firmware, and/or hardware. The software and firmware code may be executed by a processor circuit or any other similar computing device. The software code or specialized control hardware that may be used to implement embodiments is not limiting. For example, embodiments described herein may be implemented in computer software using any suitable computer software language type, using, for example, conventional or object-oriented techniques. Such software may be stored on any type of suitable computer-readable medium or media, such as, for example, a magnetic or optical storage medium. The operation and behavior of the embodiments may be described without specific reference to specific software code or specialized hardware components. The absence of such specific references is feasible, because it is clearly understood that artisans of ordinary skill would be able to design software and control hardware to implement the embodiments based on the present description with no more than reasonable effort and without undue experimentation.

[0028] Moreover, the processes associated with the present embodiments may be executed by programmable equipment, such as computers or computer systems and/or processors. Software that may cause programmable equipment to execute processes may be stored in any storage device, such as, for example, a computer system (nonvolatile) memory, an optical disk, magnetic tape, or magnetic disk. Furthermore, at least some of the processes may be programmed when the computer system is manufactured or stored on various types of computer-readable media.

[0029] It can also be appreciated that certain process aspects described herein may be performed using instructions stored on a computer-readable medium or media that direct a computer system

to perform the process steps. A computer-readable medium may include, for example, memory devices such as diskettes, compact discs (CDs), digital versatile discs (DVDs), optical disk drives, or hard disk drives. A computer-readable medium may also include memory storage that is physical, virtual, permanent, temporary, semipermanent, and/or semitemporary.

[0030] A "computer," "computer system," "host," "server," or "processor" may be, for example and without limitation, a processor, microcomputer, minicomputer, server, mainframe, laptop, personal data assistant (PDA), wireless e-mail device, cellular phone, pager, processor, fax machine, scanner, or any other programmable device configured to transmit and/or receive data over a network. Computer systems and computer-based devices disclosed herein may include memory for storing certain software modules or engines used in obtaining, processing, and communicating information. It can be appreciated that such memory may be internal or external with respect to operation of the disclosed embodiments. The memory may also include any means for storing software, including a hard disk, an optical disk, floppy disk, ROM (read only memory), RAM (random access memory), PROM (programmable ROM), EEPROM (electrically erasable PROM) and/or other computer-readable media. The software modules and engines described herein can be executed by the processor (or processors as the case may be) of the computer devices that access the memory storing the modules.

[0031] In various embodiments disclosed herein, a single component may be replaced by multiple components and multiple components may be replaced by a single component to perform a given function or functions. Except where such substitution would not be operative, such substitution is within the intended scope of the embodiments. Any servers described herein, for example, may be replaced by a "server farm" or other grouping of networked servers (such as server blades) that are located and configured for cooperative functions. It can be appreciated that a server farm may serve to distribute workload between/among individual components of the farm and may expedite computing processes by harnessing the collective and cooperative power of multiple servers. Such server farms may employ load-balancing software that accomplishes tasks such as, for example, tracking demand for processing power from different machines, prioritizing and scheduling tasks based on network demand and/or providing backup contingency in the event of component failure or reduction in operability.

[0032] The computer systems may comprise one or more processors in communication with memory (e.g., RAM or ROM) via one or more data buses. The data buses may carry electrical

signals between the processor(s) and the memory. The processor and the memory may comprise electrical circuits that conduct electrical current. Charge states of various components of the circuits, such as solid state transistors of the processor(s) and/or memory circuit(s), may change during operation of the circuits.

[0033] While various embodiments have been described herein, it should be apparent that various modifications, alterations, and adaptations to those embodiments may occur to persons skilled in the art with attainment of at least some of the advantages. The disclosed embodiments are therefore intended to include all such modifications, alterations, and adaptations without departing from the scope of the embodiments as set forth herein.

CLAIMS

What is claimed is:

1. A system comprising:

a wireless access point;

a remote network server;

a wireless audio output device that comprises multiple acoustic transducers; and

a mobile computer device that is in communication with the wireless audio output device via an ad hoc wireless communication link,

wherein:

the mobile computer device is for transmitting to the wireless audio output device, wirelessly via the ad hoc wireless communication link between the wireless audio output and the mobile computer device, credential data for an infrastructure wireless network; and

the wireless audio output device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device:

connecting to the wireless access point via the infrastructure wireless network;

streaming audio content from the remote network server via the infrastructure wireless network; and

playing, by the multiple acoustic transducers of the wireless output device, the audio content streamed from the remote network server, such that the wireless audio output device is enabled to play audio streamed via the infrastructure wireless network without having to be physically plugged into the mobile computing device.

ABSTRACT

Systems and methods permit a wireless device to receive data wirelessly via an infrastructure wireless network, without physically connecting the wireless device to a computer in order to configure it, and without having an existing infrastructure wireless network for the wireless device to connect to. A remote server hosts a website that permits a user of the wireless device to input via a computer credential data for at least one infrastructure wireless network. The content access point transmits the credential data for the at least one infrastructure wireless network to the wireless device via the ad hoc wireless network, such that, upon receipt of the credential data for the at least one infrastructure wireless network, the wireless device is configured to connect to the at least one infrastructure wireless network.

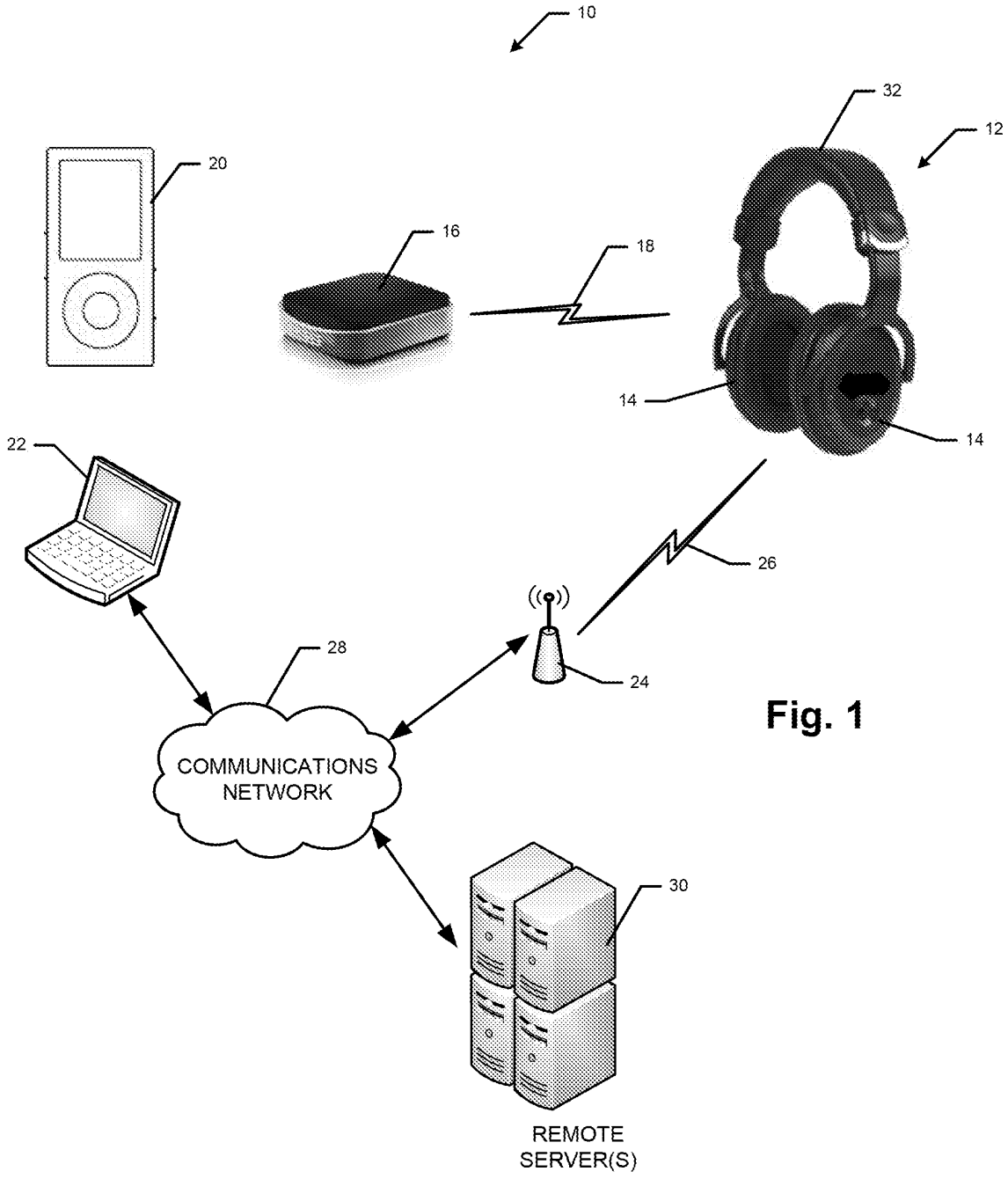

10
32
12
20
16
18
14
14
22
26
28
24
COMMUNICATIONS NETWORK
30
REMOTE SERVER(S)

Fig. 1

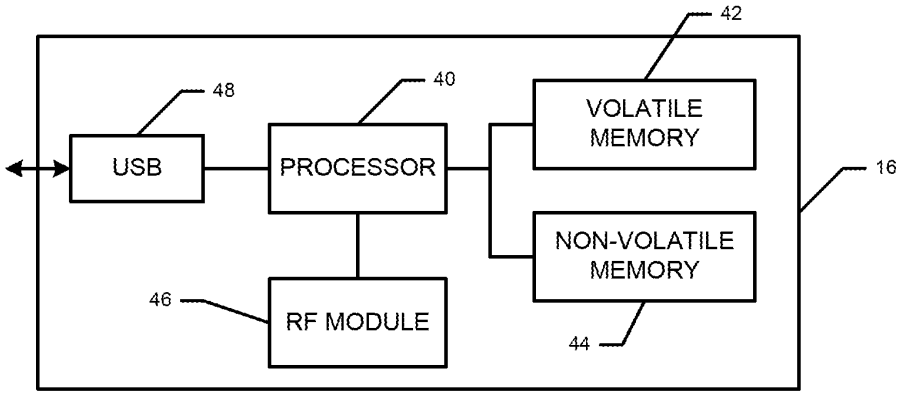

42
48
40
VOLATILE MEMORY
USB
PROCESSOR
16
NON-VOLATILE MEMORY
46
RF MODULE
44

Fig. 2

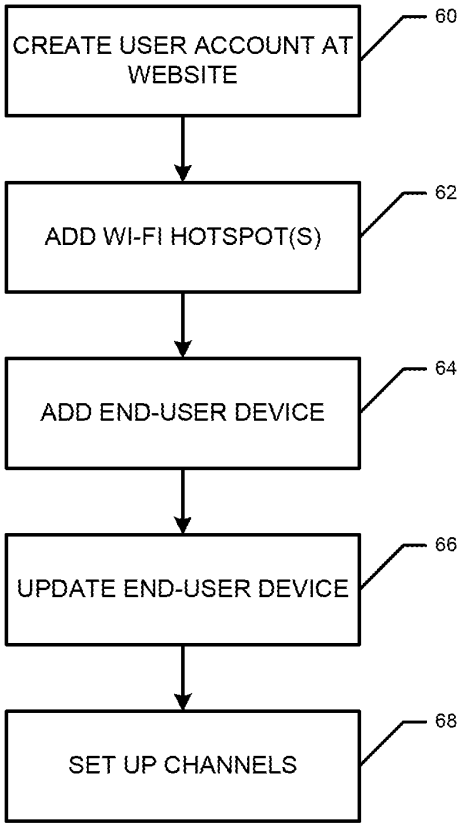

CREATE USER ACCOUNT AT WEBSITE
60
ADD WI-FI HOTSPOT(S)
62
ADD END-USER DEVICE
64
UPDATE END-USER DEVICE
66
SET UP CHANNELS
68

Fig. 3

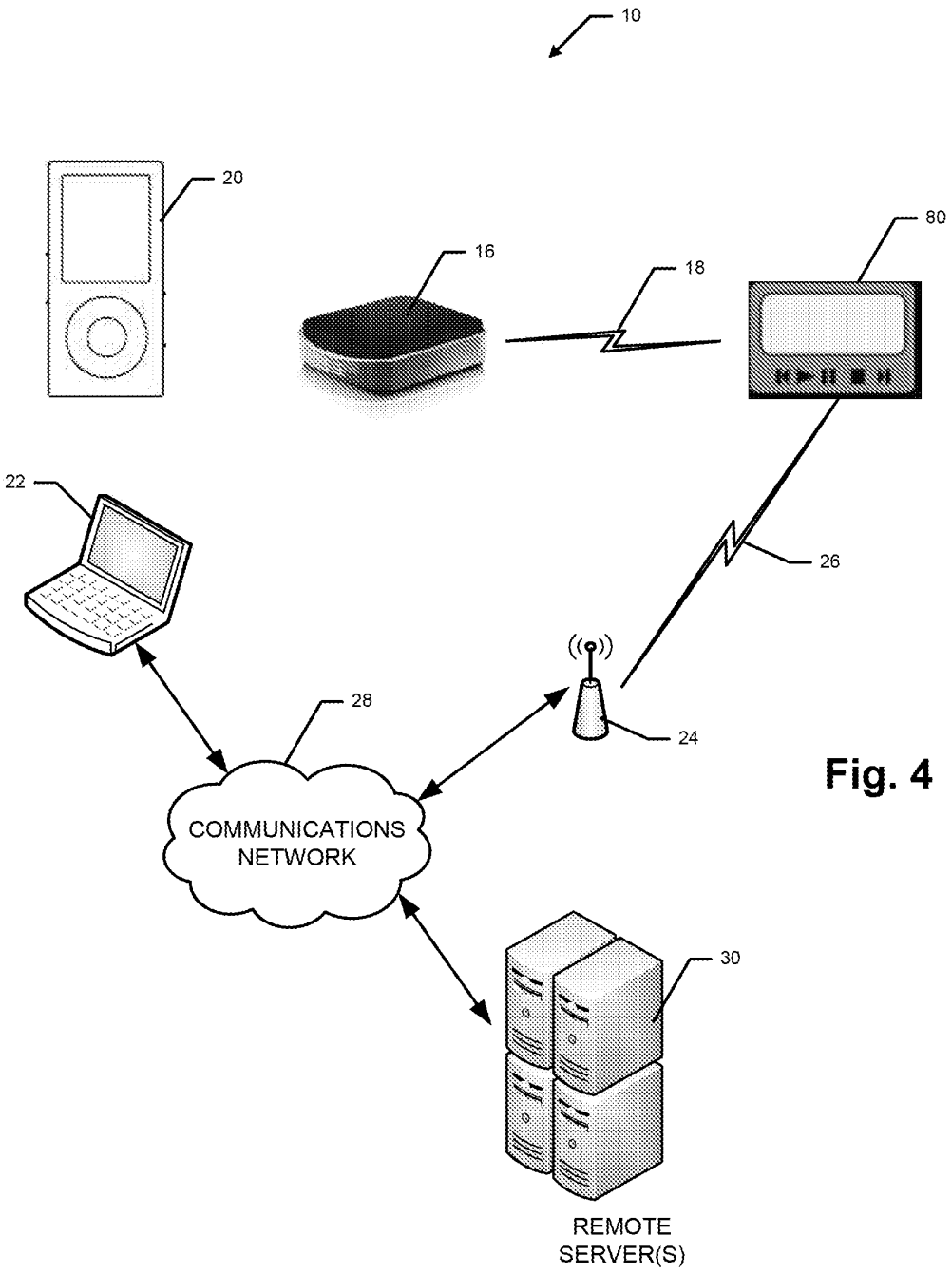

10
20
16
18
80
22
26
28
24
COMMUNICATIONS NETWORK
30
REMOTE SERVER(S)

Fig. 4

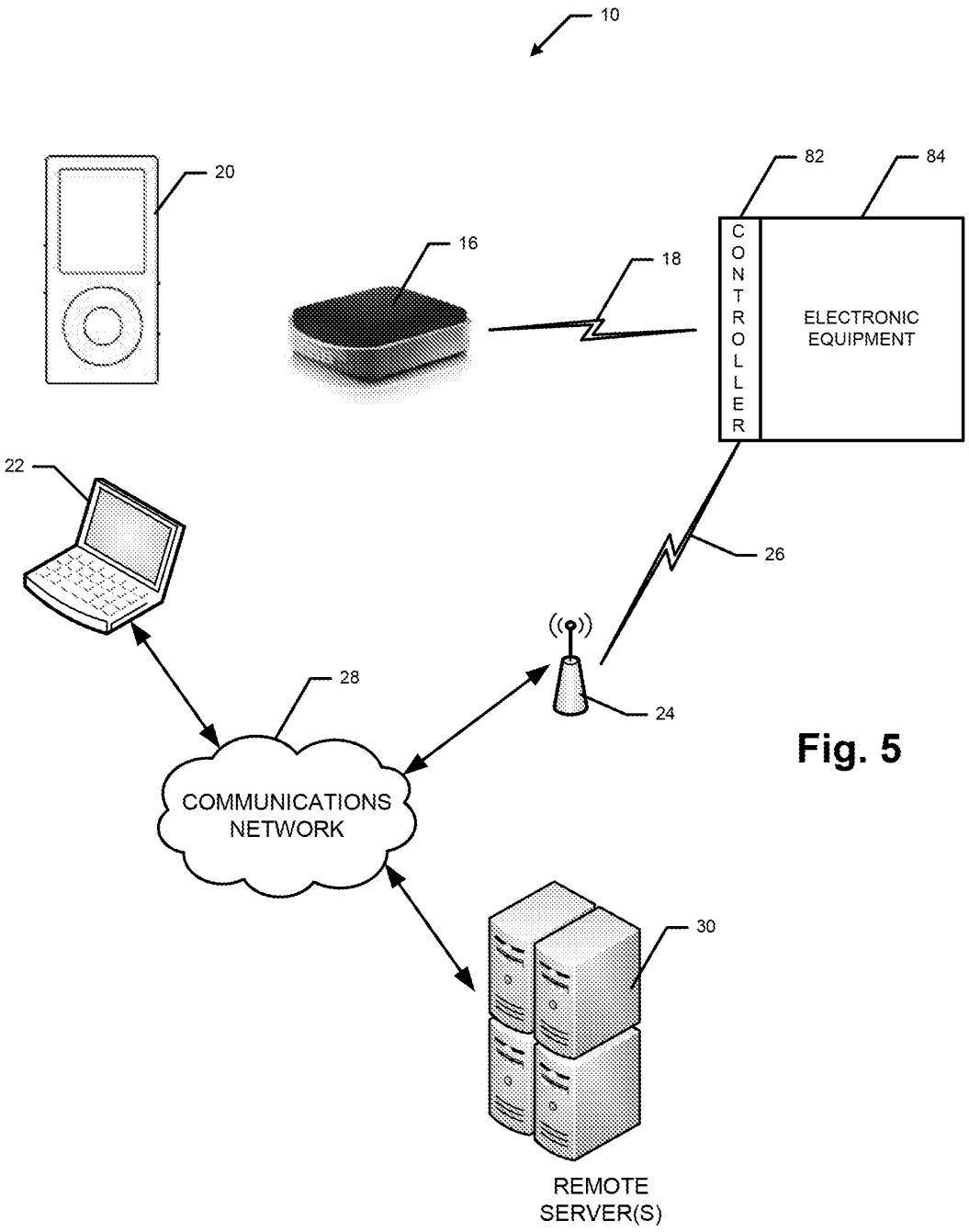

10
20
16
18
82
84
CONTROLLER
ELECTRONIC EQUIPMENT
22
26
28
24
COMMUNICATIONS NETWORK
30
REMOTE SERVER(S)

Fig. 5

PATENT
Attorney Docket No. 120223CON6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Koss Corporation	:	Examiner: Not Yet Assigned
Inventors: Michael J. Koss et al.	:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
Group Art Unit No. Not Yet Assigned	:	
Serial No.: Not Yet Assigned	:	Filing Date: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT

VIA ELECTRONIC FILING

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

Dear Commissioner:

Applicant, in accordance with the duty of disclosure pursuant to 37 C.F.R. § 1.56, hereby advises the United States Patent and Trademark Office of the references listed on the accompanying forms PTO/SB/08a and PTO/SB/08b (substitute for 1449/PTO) *Information Disclosure Statement by Applicant*. A copy of each of the non-U.S. patent references cited therein is herewith enclosed.

Applicant notes that although the cited references may be relevant to the examination of the above-referenced application, under 37 C.F.R. § 1.97(h), the filing of this *Information Disclosure Statement* "shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in § 1.56(b)."

Applicant submits that no fee is necessary for consideration of this *Information Disclosure Statement* under 37 C.F.R. §1.97(b)(1). Nevertheless, the Office is hereby authorized to charge Account No. 02-1818 for any fees necessary for consideration of this *Information Disclosure Statement.*

Respectfully submitted,

Date: August 7, 2018

/Mark G. Knedeisen/
Mark G. Knedeisen
Reg. No. 42,747

K&L GATES LLP
K&L Gates Center
210 Sixth Avenue
Pittsburgh, Pennsylvania 15222

Ph. (412) 355-6342
Fax (412) 355-6501
email: mark.knedeisen@klgates.com

501732827

PTO/SB/08a (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(*use as many sheets as necessary*)

Sheet | 1 | of | 3

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Not Yet Assigned
First Named Inventor	Michael J. Koss
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	120223CON6

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number - Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2010/0081375 A1	04-01-2010	Rosenblatt et al.	
		2010/0115262 A1	05-06-2010	Suyama et al.	
		2013/0266152 A1	10-10-2013	Haynie et al.	
		2014/0064511 A1	03-06-2014	Desai	
		2017/0195175 A1	07-06-2017	Koss et al.	
		8,190,203 B2	05-29-2012	Pelland et al.	
		8,320,410 B2	11-27-2012	Agren	
		8,336,080 B2	12-18-2012	Herrod	
		9,002,044 B2	04-07-2015	Dinescu et al.	
		9,060,288 B2	06-16-2015	Pelland et al.	
		9,185,168 B2	11-10-2015	Pelland et al.	
		9,326,304 B2	04-26-2016	Pelland et al.	
		9,629,190 B1	04-18-2017	Koss et al.	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

PTO/SB/08a (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	Not Yet Assigned
				Filing Date	Not Yet Assigned
				First Named Inventor	Michael J. Koss
				Art Unit	Not Yet Assigned
(*use as many sheets as necessary*)				Examiner Name	Not Yet Assigned
Sheet	2	of	3	Attorney Docket Number	120223CON6

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		WO 2013/151878 A1	10-10-2013	Haynie et al.		

PTO/SB/08b (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (*use as many sheets as necessary*)				***Complete if Known***	
				Application Number	Not Yet Assigned
				Filing Date	Not Yet Assigned
				First Named Inventor	Michael J. Koss
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	3	of	3	Attorney Docket Number	120223CON6

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		BRODNICK, M., "Review - Koss Striva could be the next big platform to enjoy music," http://www.brightsideofnews.com/2012/05/14/review-koss-striva-could-be-the-next-big-platform-to-enjoy-music/, May 14, 2012.	
		ROBSON, W., "Koss STRIVA MyKoss Wi-Fi Streaming - Tips and Tricks," http://www.audioholics.com/headphone-reviews/koss-striva-pro-wi-fi-headphone-review/mykoss-wi-fi-streaming-2013-tips-and-tricks/, July 3, 2012.	
		ROBSON, W., "Interview: Michael J. Koss Introduces STRIVA Wi-Fi Headphones," http://www.audioholics.com/editorials/michael-j.-koss-striva/, June 7, 2012.	

Examiner Signature		Date Considered	

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

[1] Applicant's unique citation designation number (optional). [2] Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SENDTO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 October 2013 (10.10.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/151878 A1

(51) International Patent Classification:
H04R 5/033 (2006.01)

(21) International Application Number:
PCT/US2013/034542

(22) International Filing Date:
29 March 2013 (29.03.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
13/441,476 6 April 2012 (06.04.2012) US

(71) Applicant: **KOSS CORPORATION** [US/US]; 4129 North Port Washington Avenue, Milwaukee, WI 53212-1052 (US).

(72) Inventors: **HAYNIE, Joel, L.**; 6858 Moonstone Court, DeForest, WI 53532 (US). **ALIHASSAN, Bytham**; 2148 Crossroads Drive, Suite 1400, Madison, WI 53718 (US). **WAWRZYNCZAK, Timothy**; 2743 Tarayton Circle, Stoughton, WI 53589 (US).

(74) Agents: **KNEDEISEN, Mark, G.** et al.; K&L Gates LLP, K&L Gates Center, 210 Sixth Avenue, Pittsburgh, PA 15222-2613 (US).

(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, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, 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, 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, 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,

[Continued on next page]

(54) Title: SYNCHRONIZING WIRELESS EARPHONES

(57) Abstract: Various embodiments are directed to systems and methods involving first and second acoustic speaker devices for synchronizing playback of a common audio playback signal by the first and second acoustic speaker devices. The first acoustic speaker device may transmit wirelessly a first message comprising a first checksum set comprising a plurality of checksums indicating units of the common audio playback signal in a playback queue of the first acoustic speaker device. The second acoustic speaker device may receive and compare the first checksum set to a second checksum set comprising a plurality of checksums indicating units of the common audio playback signal in a playback queue of the second acoustic speaker device. The presence or absence of a match between the first and second checksum sets, as well as an offset, if any, of the match may indicate which acoustic speaker device is behind and by how many units.

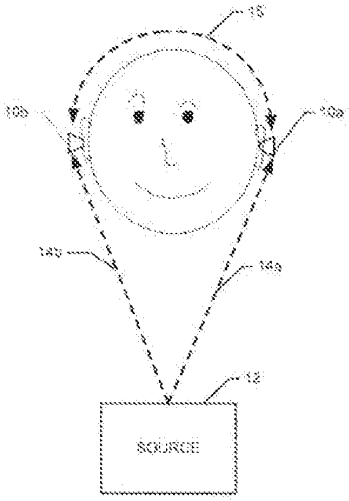


Fig. 1

WO 2013/151878 A1

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, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

SYNCHRONIZING WIRELESS EARPHONES

BACKGROUND

Wireless earphones or headsets are known. For example, PCT application PCT/US09/39754, which is incorporated herein by reference in its entirety, discloses a wireless earphone that receives and plays streaming digital audio. When a user wears wireless earphones in both of his/her ears, the playing of the digital audio stream preferably is synchronized to reduce or eliminate the Haas effect. The Haas effect is a psychoacoustic effect related to a group of auditory phenomena known as the Precedence Effect or law of the first wave front. These effects, in conjunction with sensory reaction(s) to other physical differences (such as phase differences) between perceived sounds, are responsible for the ability of listeners with two ears to localize accurately sounds coming from around them. When two identical sounds (*e.g.*, identical sound waves of the same perceived intensity) originate from two sources at different distances from the listener, the sound created at the closest location is heard (arrives) first. To the listener, this creates the impression that the sound comes from that location alone due to a phenomenon that may be described as "involuntary sensory inhibition" in that one's perception of later arrivals is suppressed. The Haas effect can occur when arrival times of the sounds differ by as little as 5 milliseconds. As the arrival time (in respect to the listener) of the two audio sources increasingly differ, the sounds will begin to be heard as distinct. This is not a desirous effect when listening to audio in a pair of earphones.

SUMMARY

In one general aspect, the present invention is directed to systems and methods involving first and second acoustic speaker devices, such as earphones, for synchronizing playback of a common audio playback signal. The first acoustic speaker device may wirelessly transmit to the second acoustic speaker device a first message comprising a first checksum set. The first checksum set may comprise a plurality of checksums indicating units of the common audio playback signal in a playback queue of the first acoustic speaker device. The second acoustic speaker device compares the first checksum set to a second checksum set comprising a plurality of checksums indicating units of the common audio playback signal in a playback queue of the second acoustic speaker device. The presence or absence of a match between the first and second

checksum sets, as well as an offset, if any, of the match indicates which acoustic speaker device is behind and by how many units. The acoustic speaker device that is behind may "catch-up" by dropping a number of units equivalent to the offset. Where there is no match between the checksum sets, an extended synchronization mode may be used, as described herein, to identify and correct offset synchronization.

FIGURES

Various embodiments of the present invention are described herein by way of example in connection with the following figures, wherein:

Figure 1 illustrates a pair of wireless earphone according to various embodiments of the present invention.

Figure 2 is a block diagram of a wireless earphone according to various embodiments of the present invention.

Figure 3 is a flow chart showing an example process flow, according to various embodiments, for converting received audio data to sound utilizing one of the earphones of Figure 1.

Figure 4 is a flow chart showing an example process flow, according to various embodiments, for synchronizing the system clocks of the earphones of Figure 1.

Figure 5 is a state diagram showing an example state flow, according to various embodiments, for synchronizing the system clocks of the earphones of Figure 1.

Figure 6 is a flow chart showing an example process flow, according to various embodiments, for synchronizing audio data playback.

Figures 7A and 7B are block diagrams showing comparisons between example master checksum sets and example slave checksum sets, according to various embodiments.

Figure 8 is a flow chart showing an example process flow, according to various embodiments, for implementing the extended synchronization mode of the process flow of Figure 6.

Figure 9 is a bounce diagram showing synchronization of the earphones in an example situation where the slave earphone is behind the master earphone, but by a number of units small enough to avoid the extended synchronization mode of the process flow of Figure 8.

Figure 10 is a bounce diagram showing synchronization of the earphones in an example situation where the master earphone is behind the slave earphone, but by a number of units small enough to avoid the extended synchronization mode.

Figure 11 is a bounce diagram showing synchronization of the earphones in an example situation where the slave is behind by a number of units large enough to implicate the extended synchronization mode.

Figure 12 is a bounce diagram showing synchronization of the earphones in an example situation where the master earphone is behind by a number of units large enough to implicate the extended synchronization mode.

Figure 13 is a bounce diagram showing synchronization of the earphones in an example embodiment where the slave earphone is behind by a number of units large enough to implicate the extended synchronization mode, but where both earphones find the other's synchronization marker.

Figure 14 is a bounce diagram showing synchronization of the earphones in another example embodiment where the master earphone is behind by a number of units large enough to implicate the extended synchronization mode, but where both earphones find the other's synchronization marker.

Figure 15 is a state diagram showing an example state flow, according to various embodiments, for synchronizing a playback (*e.g.*, according to the process flows of Figures 6 and 8 and incorporating concepts from the example bounce diagrams of Figures 9-14).

DESCRIPTION

Various embodiments of the present invention are directed to electroacoustical speaker devices that exchange synchronization data so that the speaker devices synchronously play audio received from a source. Various embodiments of the present invention are described herein with reference to wireless earphones as the speaker devices, although it should be recognized that the invention is not so limited and that different types of speakers besides earphones could be used in other embodiments. In addition, the earphones (or other types of speakers) do not need to be wireless.

Figure 1 is a diagram of a user wearing two wireless earphones 10a, 10b – one in each ear. As described herein, the earphones 10a, 10b may receive and synchronously play digital audio data, such as streaming or non-streaming digital audio. The earphones 10a, 10b may receive digital audio data from a digital audio source via respective communication links 14a, 14b. The communication links 14a, 14b may be wireless or wired communication links. The earphones 10a, 10b may exchange synchronization data (*e.g.*, clock and audio synchronization data) via a wireless communication link 15. The two earphones 10a, 10b may play the audio nearly synchronously for the user, *e.g.*, preferably with a difference in arrival times between the two

earphones small enough that the Haas effect is not observed (*e.g.*, between five (5) milliseconds or less and about forty (40) milliseconds or less). Herein, some processing is described as being performed by a slave earphone 10b, while other processing is described as being performed by a master earphone 10a. It will be appreciated that, depending on the embodiment and unless otherwise indicated, any of the processing described herein as being performed by the master 10a may also be performed by the slave 10b in addition to or instead of by the master 10a and any processing described as being performed by the slave 10b may be performed by the master 10a in addition to or instead of by the slave 10b.

In various embodiments, as described in PCT application PCT/US09/39754, which is incorporated herein by reference in its entirety, the source 12 may be a digital audio player (DAP), such as an mp3 player or an iPod, or any other suitable source of digital audio, such as a laptop or a personal computer, that stores and/or plays digital audio files, and that communicates with the earphones 10a, 10b via the data communication links 14a, 14b. For embodiments where one or more of the data communication links 14a, 14b are wireless, any suitable wireless communication protocol may be used. Preferably, the wireless links 14a, 14b are Wi-Fi (*e.g.*, IEEE 802.11a/b/g/n) communication links, although in other embodiments different wireless communication protocols may be used, such as WiMAX (IEEE 802.16), Bluetooth, Zigbee, UWB, *etc.* For embodiments where one or more of the data communication links 14a, 14b are wired links, any suitable communication protocol may be used, such as Ethernet. Also, the source 12 may be a remote server, such as a (streaming or non-streaming) digital audio content server connected on the Internet, that connects to the earphones 10a, 10b, such as via an access point of a wireless network or via a wired connection. For embodiments where one or more of the data communication links 14a, 14b are wireless, the wireless communication link 15 between the master earphone 10a and the slave earphone 10b may use the same network protocol as the wireless communication link or links 14a, 14b.

The synchronization methods and systems described herein may be applied to any suitable earphones or other acoustic speaker devices of any shape and/or style. In some example embodiments, the shape and style of the earphones may be as described in the following published patent applications, all of which are incorporated herein by reference in their entirety: U.S. Patent Application Publication No. 2011/0103609; U.S. Patent Application Publication No. 2011/0103636; and WO 2009/086555. Of course, in other embodiments, different earphone styles and shapes may be used.

Figure 2 is a block diagram of one of the earphones 10a, 10b according to various embodiments of the present invention. In various embodiments, the components of the earphones

10a, 10b may be the same. In the illustrated embodiment, the earphone 10 comprises a transceiver circuit 100 and related peripheral components. The peripheral components of the earphone 10 may comprise a power source 102, one or more acoustic transducers 106 (*e.g.*, speakers), and one or more antennas 108. The transceiver circuit 100 and some of the peripheral components (such as the power source 102 and the acoustic transducers 106) may be housed within a body of the earphone 10. In other embodiments, the earphone may comprise additional peripheral components, such as a microphone, for example.

In various embodiments, the transceiver circuit 100 may be implemented as a single integrated circuit (IC), such as a system-on-chip (SoC), which is conducive to miniaturizing the components of the earphone 10, which is advantageous if the earphone 10 is to be relatively small in size, such as an in-ear earphone. In alternative embodiments, however, the components of the transceiver circuit 100 could be realized with two or more discrete ICs, such as separate ICs for the processors, memory, and Wi-Fi module, for example. For example, one or more of the discrete IC's making up the transceiver circuit 100 may be off-the-shelf components sold separately or as a chip set.

The power source 102 may comprise, for example, a rechargeable or non-rechargeable battery (or batteries). In other embodiments, the power source 102 may comprise one or more ultracapacitors (sometimes referred to as supercapacitors) that are charged by a primary power source. In embodiments where the power source 102 comprises a rechargeable battery cell or an ultracapacitor, the battery cell or ultracapacitor, as the case may be, may be charged for use, for example, when the earphone 10 is connected to a docking station, in either a wired or wireless connection. The docking station may be connected to or part of a computer device, such as a laptop computer or PC. In addition to charging the rechargeable power source 102, the docking station may facilitate downloading of data to and/or from the earphone 10. For example, the docking station may facilitate the downloading and uploading to and from the earphone 10 of configuration data, such as data describing a role of the earphone 10 (*e.g.*, master or slave as described herein). In other embodiments, the power source 102 may comprise capacitors passively charged with RF radiation, such as described in U.S. Patent No. 7,027,311. The power source 102 may be coupled to a power source control module 103 of the transceiver circuit 100 that controls and monitors the power source 102.

The acoustic transducer(s) 106 may be the speaker element(s) for conveying the sound to the user of the earphone 10. According to various embodiments, the earphone 10 may comprise one or more acoustic transducers 106. For embodiments having more than one transducer, one transducer may be larger than the other transducer, and a crossover circuit (not shown) may

transmit the higher frequencies to the smaller transducer and may transmit the lower frequencies to the larger transducer. More details regarding dual element earphones are provided in U.S. Patent 5,333,206, assigned to Koss Corporation, which is incorporated herein by reference in its entirety.

The antenna 108 may receive the wireless signals from the source 12 via the communication link 14a or 14b. The antenna 108 may also radiate signals to and/or receive signals from the opposite earphone 10a, 10b (*e.g.*, synchronization signals) via the wireless communication link 15. In other embodiments, separate antennas may be used for the different communication links 14a, 14b, 15.

For embodiments where one or more of the communication links 14a, 14b, 15 are wireless links, an RF module 110 of the transceiver circuit 100 in communication with the antenna 108 may, among other things, modulate and demodulate the signals transmitted from and received by the antenna 108. The RF module 110 communicates with a baseband processor 112, which performs other functions necessary for the earphone 10 to communicate using the Wi-Fi (or other communication) protocol. In various embodiments, the RF module 110 may be and/or comprise an off-the-shelf hardware component available from any suitable manufacturer such as, for example, MICROCHIP, NANORADIO, H&D WIRELESS, TEXAS INSTRUMENTS, INC., *etc.*

The baseband processor 112 may be in communication with a processor unit 114, which may comprise a microprocessor 116 and a digital signal processor (DSP) 118. The microprocessor 116 may control the various components of the transceiver circuit 100. The DSP 118 may, for example, perform various sound quality enhancements to the digital audio signal received by the baseband processor 112, including noise cancellation and sound equalization. The processor unit 114 may be in communication with a volatile memory unit 120 and a non-volatile memory unit 122. A memory management unit 124 may control the processor unit's access to the memory units 120, 122. The volatile memory 120 may comprise, for example, a random access memory (RAM) circuit. The non-volatile memory unit 122 may comprise a read only memory (ROM) and/or flash memory circuits. The memory units 120, 122 may store firmware that is executed by the processor unit 114. Execution of the firmware by the processor unit 114 may provide various functionalities for the earphone 10, including those described herein, including synchronizing the playback of the audio between the pair of earphones.

A digital-to-analog converter (DAC) 125 may convert the digital audio signals from the processor unit 114 to analog form for coupling to the acoustic transducer(s) 106. An I^2S interface 126 or other suitable serial or parallel bus interface may provide the interface between the processor unit 114 and the DAC 125. Various digital components of the transceiver circuit 100

may receive a clock signal from an oscillator circuit 111, which may include, for example, a crystal or other suitable oscillator. Clock signals received from the oscillator circuit 111 may be used to maintain a system clock. For example, the processor unit 114 may increment a clock counter upon the receipt of each clock signal from the oscillator circuit 111.

The transceiver circuit 100 also may comprise a USB or other suitable interface 130 that allows the earphone 10 to be connected to an external device via a USB cable or other suitable link. In various embodiments, the functionality of various components including, for example, the microprocessor 116, the DSP 118, the baseband processor 112, the DAC 125, *etc.*, may be combined in a single component for the processor unit 114 such as, for example, the AS 3536 MOBILE ENTERTAINMENT IC available from AUSTRIAMICROSYSTEMS. Also, optionally, one or more of the components of the transceiver circuit 100 may be omitted. For example, the functionalities of the microprocessor 116 and DSP 118 may be performed by a single processor. In various embodiments, the transceiver circuit 100 may implement a digital audio decoder. The decoder decodes received digital audio from a compressed format to a format suitable for analog conversion by the DAC 125. The compressed format may be any suitable compressed audio format including, for example, MPEG-1 or MPEG-2, audio layer III. The format suitable for analog conversion may be any format including, for example, pulse code modulated (PCM) format. The digital audio decoder may be a distinct hardware block (*e.g.*, in a separate chip or in a common chip with the processor unit). In some embodiments, the digital audio decoder may be a software unit executed by the microprocessor 116, the DSP 118 or both. In some embodiments, the decoder is included as a hardware component, such as the decoder hardware component licensed from WIPRO and included with the AS 3536 MOBILE ENTERTAINMENT IC.

Figure 3 is a flow chart showing an example process flow for converting received audio data to sound utilizing the earphone 10. The audio data may be received in an RF format, such as, for example, a Wi-Fi format. The received audio data may be streamed and/or non-streamed. The audio data may be received by the earphone 10 via communication channel 14 as an RF signal in any suitable format (*e.g.*, in Wi-Fi format). The RF module 110 (*e.g.*, in conjunction with the baseband processor 112) may demodulate the RF signal to a baseband compressed digital audio signal 304. In some embodiments, the RF module 110 also decodes the RF signal to remove protocol-oriented features including protocol wrappers such as, for example, Wi-Fi wrappers, Ethernet wrappers, *etc.* For example, the audio signal 304 may have been compressed at the source 12 or other compression location according to any suitable compression format including, for example, MPEG-1 or MPEG-2 audio layer III. In various embodiments, the

compression format may be expressed as a series of frames, with each frame corresponding to a number of samples (*e.g.*, samples of an analog signal) and each sample corresponding to a duration (*e.g.*, determined by the sampling rate). For example, an MPEG-1, audio layer III frame sampled at about 44 kHz may correspond to 1,152 samples and 26 milliseconds (ms), though any suitable frame size and/or duration may be used. In addition to audio data (*e.g.*, the samples), each frame may include header data describing various features of the frame. The header data may include, for example, a bit rate of the compression, synchronization data relating the frame to other frames in the audio file, a time stamp, *etc.* Audio organized according to a frame format may comprise encoded as well as non-encoded streams and files.

The compressed digital audio 304 may be provided to the decoder 305. The decoder 305 may decode the compressed audio signal 304 to form a decompressed audio signal 306. The decompressed audio signal 306 may be expressed in a format suitable for digital-to-analog conversion (*e.g.*, PCM format). In various embodiments, the decompressed audio signal 306 may also have a frame format. For example, the decompressed audio signal 306 may be divided into frames, with each frame representing a set number of samples or duration. Frames in the decompressed signal may or may not have frame headers. For example, in some embodiments, the frame format of the decompressed audio signal 306 may be tracked by the processing unit 114. For example, the processing unit may count samples or other digital units of the decompressed audio signal 306 as they are provided to the DAC 125. A predetermined number of samples may correspond to the size of the decompressed audio frames either in number of samples, duration, or both. Upon receiving the decompressed audio signal 306 (*e.g.* via the I^2S interface 126), the DAC 125 may generate an analog signal 308, that may be provided to the transducer 106 to generate sound. It will be appreciated that various amplification and filtering of the analog signal 308 may be performed in some embodiments prior to its conversion to sound by the transducer 106.

According to various embodiments, each earphone 10a, 10b may separately receive and play a common audio playback signal received from the source 12, for example, as described by the process flow 300. To achieve synchronized playback, the earphones 10a, 10b may synchronize their respective system clocks and/or directly synchronize audio playback. Synchronizing system clocks between the earphones 10a, 10b may involve correcting for any difference and/or drift between the respective system clocks. For example, the earphone 10a or 10b determined to have a faster system clock may drop one or more system clocks ticks. Synchronizing audio playback may involve attempting to calibrate playback of the audio data such that each earphone 10a, 10b is playing the same unit of the audio (*e.g.*, frame, sample, *etc.*)

at approximately the same time, or preferably, within 5-40 milliseconds of each other. For example, the earphone 10a or 10b determined to be behind may drop one or more units of the audio data in order to catch up. Units may be dropped at any suitable stage of the playback process, as illustrated by Figure 3 including, for example, as compressed audio 304, decompressed audio 306 (*e.g.*, PCM data), or analog audio 308. In various embodiments, one of the earphones 10a may act as a master for synchronization purposes, while the other 10b may act as a slave. The master 10a may initiate synchronization communications between the earphones 10a, 10b, for example, as described herein, for clock synchronization and/or audio playback synchronization. In some embodiments, one earphone may be a master 10a for clock synchronization while the other may be a master for audio playback synchronization.

The earphones 10a, 10b may achieve synchronized playback of digital audio data by synchronizing their internal or system clocks and using the synchronized clocks to commence playback at a common scheduled time. If playback is started at the same time the earphones 10a, 10b will stay in synchronization because their internal clocks are kept synchronized for the duration of the playback. For the purposes of synchronizing digital audio playback, the clocks may be considered synchronized if the time difference between them is less than 30 ms but preferably less than 500 micro seconds (μs). In some embodiments, it is desirable for the time difference to be 100 μs or lower. For example, in some embodiments, the time difference target may be 10 μs or less.

Clock synchronization may be achieved by the use of a digital or analog "heartbeat" radio pulse or signal, which is to be broadcast at a frequency higher than the desired time difference between the two clocks (preferably by an order of magnitude) – by an external source or by one of the earphones. In one example embodiment the heartbeat signal may be transmitted by the same radio module 110 used to transmit audio data between the earphones, but in other embodiments each earphone may comprise a second radio module – one for the heartbeat signal and one for the digital audio. The radio module for the heartbeat signal preferably is a low-power consumption, low bandwidth radio module, and preferably is short range. In various embodiments, the master earphone 10a may send a heartbeat signal to the slave earphone 10b on the second radio channel provided by the second radio module (*e.g.*, link 15), which is different from the Wi-Fi radio channel (*e.g.*, channel 14a, 14b).

Figure 4 is a flow chart showing an example process flow 400 for synchronizing the system clocks of the earphones 10a, 10b. At step 402, the master 10a may generate an edge event (*e.g.*, based on its system clock) and transmit the edge event to the slave 10b (*e.g.*, via communication link 15). In some embodiments, the edge event at 402 is generated by an actor

other than the master 10a including, for example, a source or other third-party to the communication, the slave, *etc.* In various embodiments, however, only one actor in the communication generates edge events. At the time that the edge event is sent, the master 10a may generate and store a unique identifier for the edge event and a timestamp based on the master's system clock (*e.g.*, a master timestamp). The timestamp may indicate the time at the occurrence of the edge event and/or the time that the edge event is transmitted to the slave 10b. The unique identifier of the edge event may be transmitted to the slave 10b. In some embodiments, however, the master timestamp is not transmitted and is kept in storage at the master 10a. At step 404, the slave 10b may receive the edge event, and timestamp its arrival based on the slave's own system clock (*e.g.*, a slave timestamp).

The slave 10b may re-transmit the edge event, including the slave timestamp, to the master 10a at step 406. The master 10a and slave 10b may store a record of the edge event and the associated timestamps of the master and slave 10a, 10b. The difference, if any, between the master timestamp and the slave timestamp for the edge event is indicative of drift between the respective system clocks, as well as other factors such as jitter, propagation delay, *etc.* To cancel out any non-drift-related factors affecting the offset between the master and slave timestamps, a second edge event may be generated by the master 10a at step 408. The slave 10b may receive the second edge event and timestamp it at step 410. At step 412, the slave 10b may transmit the second edge event to the master at step 412.

It may be assumed that the propagation delay (*e.g.*, the time it takes for the edge event to be transmitted from the master 10a to the slave 10b) is constant. Accordingly, when the respective system clocks are synchronized, the differences between the master and slave timestamps for successive edge events should be constant, subject to jitter. Drift in the timestamp difference among successive edge events may indicate drift in the respective system clocks 10a, 10b. Upon exchanging two or more edge events, as described herein, the master 10a and/or slave 10b may be able to calculate any drift that is present. To correct for drift, the earphone 10a or 10b having a faster system clock may drop clock ticks at step 414. To drop ticks, the dropping earphone 10a, 10b may, for example, deliberately fail to increment its system clock upon receipt of one or more clock signals from the oscillator circuit 111. The dropping earphone 10a, 10b may, in various embodiments, drop all necessary clock ticks at once, or may spread the ticks to be dropped over a larger period. This may make the dropped ticks less audibly perceptible to the listener. Also, in some embodiments, the drift between the respective system clocks may be calculated as a rate of drift. The dropping earphone 10a, 10b may be configured to periodically

drop ticks based on the calculated rate of drift. The rate of drift may be updated (*e.g.*, upon the exchange of a new edge event).

The edge events described herein may be communicated between the earphones 10a, 10b in any suitable manner (*e.g.*, via communications link 15, via an out-of-band channel, *etc.*). For example, the master 10a may communicate the edge events in a broadcast and/or multicast manner according to any suitable protocol such as User Datagram Protocol (UDP). Any suitable Internet Protocol (IP) address may be used for the multicast including, for example, IP addresses set aside specifically for multicast. According to various embodiments, communications from the slave 10b to the master 10a may be handled according to a separate multicast channel (*e.g.*, utilizing a different multicast address or according to a different protocol). Both channels (*e.g.*, slave 10b to master 10a and master 10a to slave 10b) may generally be considered part of the communication link 15.

The earphones 10a, 10b may also timestamp the various edge events in any suitable manner. In some embodiments, edge events may be time-stamped by the RF module 110 as this module may be the last component of the earphones 10a, 10b to process the edge event before it is transmitted sent from master 10a to slave 10b and the first to process the edge event as it is received at the slave 10a. For example, the RF module 110 may comprise hardware and/or software that may execute on the master 10a to timestamp edge events (*e.g.*, at steps 402 and 408) before the respective edge events are transmitted to the slave 10b. Time-stamping may involve capturing a current value of the master's system clock and appending an indication of the current value to the edge event before it is transmitted (and or storing the current clock value locally as described). On the receiving end, the RF module 110 of the slave 10b may also be programmed to timestamp a received edge event. For example, the RF module 110 of the slave 10b may comprise hardware and/or software for capturing a current value of the slave's system clock upon receipt of the edge event and subsequently appending the captured value to the edge event for return to the master 10a. In various embodiments, the RF module 110 of the slave 10b may be configured, upon receipt of an edge event, to generate an interrupt to one or more components of the processor unit 114. The processor unit 114 may service the interrupt by capturing the current value of the slave's system clock and appending it to the edge event. In other embodiments, the RF module 110 of the slave 10b may be configured to capture a current value of the system clock itself upon receipt of the edge event from the master 10a. This may be desirable, for example, in embodiments using LINUX or another operating system that does not necessarily handle interrupts in a real-time manner.

Although the process flow 400 of Figure 4 describes edge events originated by the master 10a, it will be appreciated that edge events may be originated by any suitable component including, for example, the source 12 or another non-earphone (or non-speaker) component. For example, in some embodiments, the source 12 or other suitable component may include a wireless beacon (*e.g.*, Wi-Fi beacon) as a part of the transmitted digital audio signal. The beacon may include a timestamp based on the system clock of the originating source. The earphones 10a, 10b may be configured to assume that the propagation from the source 12 to each earphone 10a, 10b is the same and, therefore, may synchronize their own system clocks based on the timestamp of the received beacon. Also, in some embodiments, edge events transmitted between the earphones 10a, 10b may travel by way of an access point (not shown). Such edge events may be time stamped, for example, by the access point upon transmission, by the receiver upon receipt, *etc.*

Figure 5 is a state diagram showing an example state flow 500, according to various embodiments, for synchronizing the system clocks of the earphones 10a, 10b. The system flow 500 is described in the context of a single earphone 10, which may be a master 10a or slave 10b. In various embodiments, however, each earphone 10a, 10b may separately execute the state flow 500. At state 502, the earphone 10 may initiate, which may involve loading (*e.g.*, to the volatile memory 120) various software modules for clock synchronization. Upon completion of initiation, the earphone 10 may transition to state 504, where the earphone 10 may determine whether it is configured as a master or a slave. Configuration data indicating the master/slave status of the earphone 10 may be stored, for example, at non-volatile memory 122 and, in some embodiments, may be loaded (*e.g.*, to volatile memory 120 and/or one or more registers of the processor unit 114) during initiation. Until the earphone 10 determines whether it is a master or a slave, it may remain at state 504. If the earphone 10 determines that it is a slave, it may transition to the slave state 506, where the earphone 10 may receive and respond to edge events and drop system clock ticks as necessary, for example, as described by the process flow 400 above. In various embodiments, the earphone 10 may also respond to various other data requests in the slave state 506 including, for example, pairing inquiries.

Referring back to the state 504, if the earphone 10 determines that it is a master, it may transition to the state 508, where it may wait for an indication of its paired earphone (*e.g.*, associated slave). For example, an indication of the paired earphone may also be stored at nonvolatile memory 122. In various embodiments, the indication of the paired earphone may be loaded to the volatile memory 120 and/or the processor unit 114 during the initiation state 502. Also, in some embodiments, the master earphone 10a may originate messages (*e.g.*, broadcast and/or multicast) and await a response from its associated slave 10b. Communication between the

master earphone 10a and slave earphone 10b during configuration (such as in state 508) may occur via the communication link 15 and/or via an out-of-band link. In various embodiments, receiving the indication of the paired earphone also comprises sending and/or receiving a confirmation message to the paired earphone to verify that it is present and operating (*e.g.*, in the slave state 506). Until the indication of the paired earphone is received, the earphone 10 may remain in state 508. If a stop request is received (*e.g.*, if a user of the earphone 10 turns it off, or otherwise indicates a stop, if the source 12 indicates a stop, *etc.*), then the earphone 10 may also remain in state 508.

When the indication of the paired earphone is received, the earphone 10 may transition to time match state 510. At time match state 510, the earphone 10 may initiate and/or receive edge events as described herein, for example, by process flow 400. Edge events may be generated (*e.g.*, by the earphone 10) in a periodic manner, for example, every two (2) seconds, or some other suitable time period. Upon reaching a threshold level of synchronization, the earphone 10 may transition to the continued synchronization state 512. For example, the earphone 10 may transition to the continued synchronization state 512 upon the completion of a threshold number of edge event cycles and/or tick drops. In the continued synchronization state 512, the earphone 10 may continue to initiate and/or receive edge events. Edge events in the continued synchronization state 512, however, may be less frequent than in the time match state 510.

Various states in the state diagram 500 (*e.g.*, 506, 508, 510, 512) include transitions entitled "exit." These may occur, for example, at the completion of the playback of audio data, when indicated by a user of the earphone 10 or for any other suitable reason. Upon the occurrence of an exit transition, the earphone 10 may return to the initiate unit state 502. Also, an internal synchronization state 514 may be included in various embodiments where clock synchronization of the earphone 10 is not necessary. For example, the synchronization state 514 may be utilized in embodiments where the paired headphone has a direct, wired link to either the earphone 10 or both paired earphones have a direct, wired link to a common clock (*e.g.*, clock synchronization is not necessary).

It will be appreciated that there are various other methods and systems for synchronizing remote system clocks, and that any suitable method may be used. For example, the IEEE 1588 protocol provides methods for synchronizing clocks between network devices.

Independent of clock synchronization, the earphones 10a, 10b may synchronize playback of the audio data. In various embodiments, the earphones 10a, 10b may both maintain checksums of some or all of digital units (*e.g.*, frames, samples, bytes, other digital units, *etc.*) that are in a playback queue. The playback queue for each earphone 10a, 10b may include units that either are

to be played or have recently been played (*e.g.*, converted to sound by the transducer(s) 106). Units in the playback queue may be arranged chronologically in the order that they will, or being, or have been played. Although referred to herein as checksums, it will be appreciated that any suitable representation of the relevant audio data may be used including, for example, hashes, compressions, *etc.* The checksums may represent any suitable denomination of the audio data at any stage of the playback process, referred to herein as units. For example, in embodiments where the audio data is compressed according to a framed format, such as the MPEG 1 or 2, audio layer III format, each checksum may correspond to one frame or at least one sample sent to the decoder 305. Also, in some example embodiments, each checksum may correspond to a unit of decompressed audio 306 measured after the decoder 305, but prior to the DAC 125, for example, in PCM format.

The checksums may be used by the earphones 10a, 10b to compare the portion of the audio data being played at any given time and to make corrections for synchronization. Figure 6 is a flow chart showing an example process flow 600, according to various embodiments, for synchronizing audio data playback. The audio playback synchronization process may be managed by a master earphone 10a. The master earphone 10a may, but need not be, the same master earphone utilized for system clock synchronization described above.

At step 602, the master 10a may originate a checksum request to the slave 10b. The request may include a set of master checksums from the master 10a indicating a set of units from the master's playback queue (*e.g.*, units that are playing, have recently been played or are queued to be played by the master 10a). In some embodiments, the request includes other information such as, for example, a header, timestamps, *etc.* Checksums in the master checksum set may be arranged and/or described chronologically. For example, the position of each checksum in the master checksum set may correspond to the position of the corresponding unit in the master's playback queue. The number of master checksums in the request may be determined according to any suitable criteria (*e.g.*, the speed of the link 15). For example, in some embodiments, 48 checksums may be included, representing about 1.2 seconds of MPEG-2, audio-layer III (MP3) audio. The slave 10b may receive the checksum request at step 604.

At step 606, the slave 10b may compare the master checksums to its own set of slave checksums. The set of slave checksums may indicate a set of units from the slave's playback queue (*e.g.*, also arranged chronologically). The master and slave checksum sets may indicate units from equivalent positions in the playback queues of the respective earphones 10a, 10b. If there are matches between the master checksums and the stored checksums of the slave (*e.g.*, the slave checksums) it may indicate that the earphones 10a, 10b are either completely synchronized,

or out of synchronization by an amount less than the audio time of the sum of the master checksums. In the case that there are matches at decision step 608, the slave 10b may determine whether the master 10a and slave 10b are synchronized. For example, if the matched checksums occur at the same position in the respective checksum sets, it may indicate synchronization. On the other hand, if the matched checksums occur at offset positions in the respective checksum sets, it may indicate a lack of synchronization. The absolute value of the offset may indicate the number of units of difference between the playback positions of the master 10a and slave 10b. The direction of the offset may indicate which earphone 10a, 10b is behind. For example, if equivalent checksum values appear earlier in one earphone's checksum set than they do in the other earphone's checksum set, it may indicate that the first earphone is behind.

If the earphones 10a, 10b are synchronized, the slave 10b may send the master 10a an indication of synchronization. In some example embodiments, the slave 10b may also send the master 10a the set of slave checksums, which may, for example, allow the master to verify synchronization. Also, in other embodiments, instead of determining synchronization itself, the slave 10b may send its set of slave checksums back to the master 10a which may, then, determine whether the earphones 10a, 10b are synchronized.

If the slave 10b and master 10a are not synchronized at 610, then the earphones 10a, 10b may drop units to synchronize at 612. For example, the slave 10b may determine which earphone 10a, 10b is behind, and by how many units. This may be determined by the offset between the matched checksums from 608. For example, if the master and slave sets of checksums match, but the match is offset by X checksums, it may indicate that one earphone 10a, 10b is behind the other by X units. The direction of the offset may indicate which earphone 10a, 10b is behind. If the slave 10b is behind, it may drop the appropriate number of units. If the master 10a is behind, the slave 10b may send the master 10a an instruction to drop the appropriate number of units. In some embodiments, the instruction may include the slave checksum set, allowing the master 10a to verify the calculation of the slave 10b. Also, in some embodiments, the slave 10b may not determine which earphone 10a, 10b is behind and may instead send its slave checksums to the master 10a, which may determine which earphone 10a, 10b is behind and instruct it to drop units. Units may be dropped all at once, or may be spread out over time so as to minimize distortion of the playback. If there are no checksum matches at 608, it may indicate that the earphones 10a, 10b are out of synchronization by an amount of time greater than the playtime of the set of checksums. To remedy this, the earphones 10a, 10b may enter an extended synchronization mode at 614. In some example embodiments, dropping may occur only when the offset between the earphones 10a, 10b is greater than a threshold number of units.

Figures 7A and 7B are block diagrams 750, 751 showing comparisons between example master checksum sets and example slave checksum sets, according to various embodiments. In both of the block diagrams, the checksum sets comprise six checksums, indicated by M1, M2, M3, M4, M5, M6 for the master checksum sets and S1, S2, S3, S4, S5, S6 for the slave checksum sets. Any suitable number of checksums, however, may be included in the checksum sets. A direction of playback arrow 752 indicates an orientation of the checksums from first played (or to be played) to last. In some embodiments, each checksum may be associated with a time indicating when the corresponding unit is to be played.

In the example diagram 750 of Figure 7A, the there is an offset match between the values of the master checksum set 754 and the values of the slave checksum set 756. As illustrated, the amount of the offset is two units, with the slave 10b ahead, as the match begins with the S1 checksum corresponding to the M3 checksum. This indicates that the slave 10b is further ahead in the playback than the master 10a. In the example illustrated by the diagram 750, the master 10a may "catch-up" by dropping two units instead of playing them, for example, as described above with respect to 612. The dropped units may be any units in the playback queue of the master 10a that have not yet been played. In the example chart 751, there is an offset match between the values of the master checksum set 758 and the slave checksum set 760. As illustrated, the amount of the offset is three with the master 10a ahead, as the match begins with the M1 checksum matching the S4 checksum. This indicates that the master 10a is further ahead in the playback than the slave 10b. In the example illustrated by the diagram 751, the slave may "catch-up" by dropping three units, for example, as described above with respect to 612.

Figure 8 is a flow chart showing an example process flow, according to various embodiments, for implementing the extended synchronization mode 614. At the outset of the extended synchronization mode 614, the slave 10b may have received the master checksum set and provided its slave checksum set to the master 10a. Upon determining that there are no matches between the master and slave checksum sets (at 608), the earphones 10a, 10b may enter the extended synchronization mode. In some embodiments, the earphones 10a, 10b may not enter extended synchronization mode based on a single failure to match checksum sets but may instead enter extended synchronization mode only upon a predetermined number of failures to match checksum sets (*e.g.*, consecutive failures). In some embodiments, each earphone 10a, 10b may independently determine whether to enter the extended synchronization mode, while in other embodiments, one earphone (*e.g.*, master 10a or slave 10b) may determine to enter the extended synchronization mode and instruct the other accordingly. Because there was no match between the master and slave checksum sets, neither earphone 10a, 10b may know, at the outset of

synchronization mode 614, the value or the direction of the playback offset between the earphones 10a, 10b.

Once the earphones 10a, 10b are in extended synchronization mode 614, each earphone 10a, 10b may identify a synchronization marker for the other earphone 10a, 10b. The synchronization marker for each earphone 10a, 10b may be an indication of the earphone's position in the playback. For example, the synchronization marker for each earphone 10a, 10b may be a subset of checksums from a predetermined position in the earphone's checksum set corresponding to a unit or set of units in the playback. The predetermined position may indicate a unit or units being currently played, a unit or units just played, a unit or units about to be played, *etc.* The subset of checksums may comprise a single checksum, or multiple checksums.

At 804, the master 10a and slave 10b may traverse the playback (*e.g.*, the common audio playback signal), comparing the playback to the synchronization marker of the opposite earphone 10a, 10b. While traversing the playback, the earphones 10a, 10b may continue to play the playback out of synchronization, or may stop playing the playback (*e.g.*, stop converting it to sound at the transducer(s) 106) until synchronization is achieved. At 806, one of the earphones 10a, 10b may encounter the other earphone's synchronization marker in the playback. In various embodiments, the finding earphone is behind. For example, as the finding earphone finds the other earphone's synchronization marker it may just be reaching the point in the playback where the other earphone was when generating its checksum set. The finding earphone may know its current position in the playback and the time at which the opposite earphone was at the same position in the playback (*e.g.*, the time that the synchronization marker was set, or the time that the checksum set from the opposite earphone was sent). From this, the finding earphone may determine the number of units that it is behind. At 808, the finding earphone may send the opposite earphone a message indicating that the finding earphone has found the other's synchronization marker. In some embodiments, the message may also indicate the number of units to be dropped. When the opposite earphone receives the message, it may cease its own search for the finding earphone's synchronization marker. At 810, the finding earphone may drop the determined number of units, bringing the earphones 10a, 10b into synchronization on the playback. In some embodiments, as described herein below, the finding earphone may wait to receive an acknowledgement from the opposite earphone before beginning to drop units.

Figures 9-14 are bounce diagrams showing synchronization of the earphones 10a, 10b (*e.g.*, according to the process flows 600, 800 described above). Each of the bounce diagrams of Figures 9-14 may represent a different starting point and/or processing result. Figure 9 is a bounce diagram 900 showing synchronization of the earphones 10a, 10b in an example situation

where the slave 10b is behind the master 10a, but by a number of units small enough to avoid the extended synchronization mode. Accordingly, in the example situation of Figure 9, there may be an offset match between the master checksum set and the slave checksum set. In the bounce diagram 900, timeline 100a indicates actions of the master earphone 10a. Timeline 100b indicates actions of the slave earphone 10b. At 906, the master 10a may initiate the synchronization by sending a begin-synchronization message to the slave 10b. The begin-synchronization message may include a current set of master checksums. The slave 10b may receive the set of master checksums and compare it to the slave's own slave checksum set. In the example situation of Figure 9, the slave 10b determines that it is behind (*e.g.*, there is a match between the master and slave checksums, but the match is offset). In response, the slave 10b may send a drop-count message 908 to the master 10a and begin dropping units at 909. The drop-count message 908 may indicate to the master 10a that the slave 10b has determined it is behind and begun dropping units. The drop-count message 908 may also include an indication of the number of units to be dropped and, in some cases, the set of slave checksums. The number of units to be dropped may be, for example, the amount of the offset between matches. When the slave has completed dropping units at 909, it may send a done-dropping message 910 to the master 10a. The done-dropping message 910 may indicate that the slave 10b has completed its unit drop. The master 10a may send the slave 10b an acknowledge message at 912.

Figure 10 is a bounce diagram 1000 showing synchronization of the earphones 10a, 10b in an example situation where the master 10a is behind the slave 10b, but by a number of units small enough to avoid the extended synchronization mode. The master 10a may send a begin-synchronization message 1002 to the slave 10b including the master checksum set. Upon receipt of the begin-synchronization message 1002, the slave 10b may, in this example, determine that there is an offset match between master checksum set and the slave checksum set, and that the master 10a is behind. The slave 10b may send a drop-count message 1004 to the master 10a. The drop-count message 1004, in this example, may indicate that the master 10a is ahead and a number of units by which the master 10a is ahead (*e.g.*, the amount of the offset between matched units in the checksum sets). At 1006, the master 10a may drop units until it is synchronized. After completing the dropping, the master 10a may send the slave 10b a done-dropping message 1008. The slave 10b may acknowledge the done-dropping message 1008 with an acknowledge message 1010.

Figure 11 is a bounce diagram 1100 showing synchronization of the earphones 10a, 10b in an example situation where the slave 10b is behind by a number of units large enough to implicate the extended synchronization mode. In the example shown in Figure 11, the slave is

behind and drops units. Similar to the bounce diagrams 900 and 1000, the master 10a may initiate the synchronization with a begin-synchronization message 1102. The begin-synchronization message 1102 may include the master checksum set. The slave 10b may determine that there is no match between the master checksum set and its slave checksum set, leading to extended synchronization 614. Accordingly, the slave 10b may determine the master's synchronization marker and begin to traverse the playback in extended synchronization mode looking for the master's synchronization marker. The slave 10b may also send an acknowledge message 1104 with the slave's checksums to the master. The message 1104 may, in some cases, include an indication that the slave 10b has entered extended synchronization mode 614. The master 10a may also enter extended synchronization mode 614 at 1107, either based on its own comparison of the slave and master checksum sets or based on a command or other indication received from the slave 10b.

In the example illustrated by the diagram 1100, the slave 10b is behind. Accordingly, the slave 10b may find the master's synchronization marker at 1108. At this point, the slave 10b may be at the same or a similar position in the playback as the master 10a was when it sent the master checksum set. Accordingly, the slave 10b may calculate the number of units that it will have to drop to catch up with the master 10a. Upon finding the master's synchronization marker and calculating a number of units to drop, the slave 10b may send a drop-count message 1110 to the master. The message 1110 may indicate to the master 10a that the slave 10b has found the master's synchronization marker and, in some cases, may indicate the number of units that the slave 10b will drop. The master may respond with an acknowledge message 1112.

Upon receipt of the message 1112 (and, in some embodiments, before the receipt of the message 112), the slave 10b may drop the determined number of units at 1114. When the slave 10b has completed dropping, it may send a done-dropping message 1116 to the master 10a and exit extended synchronization. The master 10a may reply with an acknowledge message 1118. In some embodiments, the master may also restart the synchronization checking process at 1120. This may involve, for example, re-executing the process flow 600 immediately or after a delay. The duration of the delay may be predetermined.

Figure 12 is a bounce diagram 1200 showing synchronization of the earphones 10a, 10b in an example situation where the master 10a is behind by a number of units large enough to implicate the extended synchronization mode. In the example shown in Figure 12, the master 10a is behind in the playback. The master 10a may initiate synchronization with a begin-synchronization message 1202 including the master checksum set. At 1206, the slave 10b may determine that there are no matches between the master and slave checksum sets, and enter the

extended synchronization mode at 1206. The slave 10b may also send an acknowledgement message 1204 to the master 10a. As described above, the acknowledge message 1204 may include the slave's checksum set and/or an indication to enter the extended synchronization mode. The master 10a may enter the extended synchronization mode at 1207.

Because the master 10a is behind in the example shown in Figure 12, it may find the slave's synchronization marker at 1208. Based on the slave's synchronization marker, the time that the slave 10b sent its slave checksums, and the master's current time (measured by its system clock), the master 10a may determine a number of units that it will drop. The master 10a may send a drop-count message 1210 to the slave 10b. The drop-count message 1210 may indicate to the slave 10b that it may stop looking for the master's synchronization marker and, in some embodiments, may also indicate the number of units that the master 10a will drop. The slave 10b may send an acknowledge message at 1214. Upon (or sometimes before) receipt of the acknowledge message 1214, the master 10a may drop the determined number of units at 1216. Upon completion of the drop, the master 1218 may send a done-dropping message 1218 to the slave 10b and exit extended synchronization. The slave 10b may reply with an acknowledge message 1220. Upon receipt of the acknowledge message 1220, the master 10a may restart the synchronization check process, as described above, at 1222.

As illustrated by the bounce diagrams of Figures 9-12, there can be a delay between the sending of a message by one earphone 10a, 10b and receipt of the same message by the other earphone 10a, 10b. In some cases, the delay may allow both earphones 10a, 10b to believe that they are the first to find the other's synchronization marker. For example, Figure 13 is a bounce diagram 1300 showing synchronization of the earphones 10a, 10b in an example embodiment where the slave 10a is behind by a number of units large enough to implicate the extended synchronization mode, but where both earphones 10a, 10b find the other's synchronization marker. As described above, the master 10a may initiate the synchronization process by sending a begin-synchronization message 1302 to the slave 10b. The begin-synchronization message 1302 may include the master checksum set. In the example illustrated in Figure 13, the slave 10b may be behind the master 10a by an amount sufficient to require the extended synchronization mode 614. Accordingly, the slave 10b may not find any matches between the master checksum set and the slave checksum set. The slave 10b may enter the extended synchronization mode at 1306, and may send an acknowledge message 1304 (*e.g.*, with the slave checksum set). Upon receipt of the acknowledge message 1304, the master 10a may enter extended synchronization mode at 1307.

At 1308, the slave 10b may be the first to find the other earphone's (in this case, the master's) synchronization marker in the playback. The slave 10b may send a slave drop-count

message 1312 to the master 10a indicating that the slave 10b has found the master's synchronization marker (*e.g.*, and a number of units to be dropped by the slave 10b). Before the message 1312 reaches the master 10a, however, the master 10a may find the slave's synchronization marker at 1310 and send the slave 10b a master drop-count message 1314. When the slave 10b receives the master drop-count message 1314, it may determine which earphone 10a, 10b found the other's synchronization marker first. For example, the slave 10b may compare the number of units that it should drop with a number of units that the master 10a believes it should drop (*e.g.*, as included in the drop-count message 1314). The earphone 10a or 10b requiring the most unit drops may be the one that is actually behind (and the earphone that found the other's synchronization marker first). In some embodiments, each earphone may create a timestamp when finding a synchronization marker. When both headphones find a synchronization marker, the headphones 10a, 10b may compare the respective timestamps to determine which headphone found the other's synchronization marker first.

In the example of Figure 13, this the slave 10b has found the master 10a synchronization marker first. Accordingly the slave 10b may acknowledge the master drop-count message 1314 with an acknowledgement message 1316. The message 1316 may comprise a symbol or other indication to the master 10a that the slave will drop units. At 1320, the slave 10b may drop units. Upon completion of the unit drop, the slave 10b may send a done-dropping message 1324 to the master 10a. The master 10a may acknowledge 1326 and may restart the synchronization checking process, as described above, at 1328. In various embodiments, the master 10a, upon receipt of the slave drop-count message 1312, may independently determine which earphone 10a, 10b is ahead. In the example shown by Figure 13, the master 10a, upon determining that the slave is behind, may await the slave's acknowledgement 1316.

Figure 14 is a bounce diagram 1400 showing synchronization of the earphones 10a, 10b in an example embodiment where the master 10a is behind by a number of units large enough to implicate the extended synchronization mode, but where both earphones 10a, 10b find the other's synchronization marker. The synchronization may begin when the master 10a sends a begin-synchronization message 1402 to the slave 10b (*e.g.*, including the master checksum set). The slave 10b, upon finding no match between the master checksum set and its slave checksum set, may enter the extended synchronization mode at 1406, and may send an acknowledgement message 1404, optionally including the slave checksum set. Upon receipt of the acknowledgement message 1404, the master 10a may enter the extended synchronization mode at 1407. At 1408, the master 10a, which is behind in this example, may find the synchronization

marker of the slave 10b and send a master drop-count message 1412 to the slave 10b, optionally including the number of units that the master 10a intends to drop.

Before receiving the master drop-count message 1412, the slave 10b may find the synchronization marker of the master 10a at 1410, and send its own slave drop-count message 1414. Upon receipt of the slave drop-count message 1414, the master 10a may determine which earphone 10a, 10b is behind. Upon determining that the master 10a is behind, the master 10a may send an acknowledgement message 1418 with a symbol, or other indication to the slave 10b that it should not drop units. Upon receiving the master drop-count message 1412, the slave 10b may examine which earphone 10a, 10b, is actually behind. Upon determining that the master 10a is behind (per the instant example) the slave 10b may send an acknowledge message 1416. Upon receipt of the acknowledge message 1416, the master may begin dropping units at 1420. When the unit drop is complete, the master 10a may send a done-dropping message 1422 to the slave. The slave may reply with an acknowledge message 1424. Upon receiving the acknowledge message 1424, the master 10a may restart the synchronization check, as described above.

Figure 15 is a state diagram showing an example state flow 1500, according to various embodiments, for synchronizing a playback (*e.g.*, according to the process flows 600, 800 and incorporating concepts from the example bounce diagrams of Figures 9-14). Like the state flow 500 of Figure 5 described above, the state flow 1500 is described in the context of a single earphone, which may be a master 10a or slave 10b. In various embodiments, each earphone 10a, 10b may separately execute the state flow 1500. Also, in various example embodiments, the state flow 1500 may be executed concurrently with (or sequentially to) the state flow 500. At 1502, the earphone 10 may initiate. Initiation may involve loading (*e.g.*, to the volatile memory 120) various software modules and/or values for playback synchronization. For example, data indicating whether the earphone 10 is a slave or a master may be loaded. Upon completion of initiation, the earphone 10 may transition to searching state 1504. At searching state 1504, the earphone 10 may search for a playback stream (or other data format) to play. If the earphone 10 is a slave (or a wired earphone not requiring playback synchronization) it may transition to a playing state 1506 upon finding the stream. If the earphone 10 is a master, it may transition to a master synching state 1508 upon finding the stream. From the master synching state 1506, the earphone 10 may initiate a playback synchronization process, for example, as described above with respect to process flows 600, 800. Instructions may be sent to one or more slave earphones which, for example, may be in the playing state 1506. The synchronization process may proceed between the master earphone in the master synching state 1508 and one or more slave earphones 10b in the playing state 1506, for example, as described in process flow 600.

Upon synchronization, the earphone 10 (if it is a slave) may remain in the playing state 1506. If the earphone is a master, it may transition, upon synchronization, from the master synchronization state 1508 to a master synched state 1510. In the master synched state 1510, the master earphone may initiate synchronization (*e.g.*, according to the process flows 600, 800) at a predetermined interval (*e.g.*, every 2 seconds). The predetermined interval may be variable, for example, based on the degree to which the master and other earphones fall out of synchronization. For example, the more often the earphones are in, or close to being in synchronization with one another, the longer the interval may become.

The extended synchronization state 1512 and extended synchronization drop state 1514 may be used to implement extended synchronization, for example, as described herein above. A master earphone may enter the extended synchronization state 1512 from either the master synching state 1508 or the master synched state 1510, if there is no match between the master and slave checksum sets. A slave earphone may enter the extended synchronization state 1512 from the playing state 1506, for example, if there is no match between the master and slave checksum sets. The earphone (slave or master) may remain in the extended synchronization state 1512 until it finds the other earphone's synchronization marker or receives word that the other earphone has found its synchronization marker, at which point the earphones may transition to synchronization drop state 1514. The earphone may transition out of the extended synchronization drop state 1514 upon either completing its own dropping or receiving an indication that the other earphone has completed its dropping. A master may transition out of the extended synchronization drop state 1514 to master synching state 1508, as shown, or to master synched 1510. A slave may transition out of the extended synchronization drop state 1514 back to playing state 1506.

In various example embodiments, there may be common and/or similar transitions between states. For example, if the stream is lost, or if an instruction to switch streams is received, the earphone 10 may transition to the searching state 1504. Also, upon receipt of an exit command, the earphone 10 may transition to the initiate unit state 1502. Upon receipt of a stop command, the earphone 10 may transition to an idle state 1516. In the idle state 1516, the earphone 10 may cease playback. From the idle state, the earphone 10a may transition to the initiate unit state 1502 (*e.g.*, if an exit command is received) or to the searching state 1504 (*e.g.*, if a non-stop command is received). Commands for transitioning between states may be received from any suitable source. For example, a user may provide instructions either directly to the earphone 10, or to the source 12.

It will be appreciated that, in some cases, the earphone 10 in the state flow 1500 may experience underrun. Underrun may occur when the playback is received at a rate slower than the

playback rate. When the earphone 10 experiences underrun, it may transition to and/or remain at its current state. For example, an earphone 10 in any of states 1508, 1506, 1512 may remain in that state upon occurrence of an underrun. In some embodiments, a master earphone in the master synched state 1510 may transition to the master synching state 1508 upon occurrence of an underrun.

Communication between the earphones 10a, 10b (*e.g.*, link 15) may configured according to any suitable protocol including, for example, UDP. In some embodiments, communications between the earphones 10a, 10b, (*e.g.*, as described in the process flows 400, 600, 800 and bounce diagrams 900, 1000, 1100, 1200, 1300, 1400, may take the form of UDP packets. Besides UDP, any suitable low overhead protocol can be used. For example, in another embodiment, instead of transmitting UDP packets to the slave earphone 10b, the earphones 10 may exchange ping messages, such as Internet Control Message Protocol (ICMP) messages. The ICMP messages may be, for example, "Echo request" and "Echo reply" messages. For example, the sending earphone (master or slave, depending on the circumstance) may transmit an "Echo request" ICMP message and the receiving earphone may in return transmit an "Echo reply" ICMP message to the master earphone 10a.

The examples presented herein are intended to illustrate potential and specific implementations of the embodiments. It can be appreciated that the examples are intended primarily for purposes of illustration for those skilled in the art. No particular aspect or aspects of the examples is/are intended to limit the scope of the described embodiments. The figures and descriptions of the embodiments have been simplified to illustrate elements that are relevant for a clear understanding of the embodiments, while eliminating, for purposes of clarity, other elements.

In various embodiments disclosed herein, a single component may be replaced by multiple components and multiple components may be replaced by a single component to perform a given function or functions. Except where such substitution would not be operative, such substitution is within the intended scope of the embodiments.

While various embodiments have been described herein, it should be apparent that various modifications, alterations, and adaptations to those embodiments may occur to persons skilled in the art with attainment of at least some of the advantages. The disclosed embodiments are therefore intended to include all such modifications, alterations, and adaptations without departing from the scope of the embodiments as set forth herein.

CLAIMS

What is claimed is:

1. An apparatus comprising:

a first acoustic speaker device comprising a first acoustic transducer and a first transceiver, wherein the first transceiver receives and transmits wireless signals; and

a second acoustic speaker device comprising a second acoustic transducer and a second transceiver, wherein the second transceiver receives and transmits wireless signals, wherein the first and second speaker devices communicate wirelessly, wherein the first and second acoustic speaker devices play a common audio playback signal received from a source, and wherein:

the first acoustic speaker device transmits wirelessly a first message comprising a first checksum set, the first checksum set comprising a plurality of checksums indicating units of the common audio playback signal in a playback queue of the first acoustic speaker device;

the second acoustic speaker device receives the first message and compares the first checksum set to a second checksum set, wherein the second checksum set comprises a plurality of checksums indicating units of the common audio playback signal in a playback queue of the second acoustic speaker device; and

conditioned upon a match existing between at least one of the plurality of checksums of the first checksum set and at least one of the plurality of checksums of the second checksum set, at least one of the first and second acoustic speaker devices determines an offset of the match, wherein an absolute value of the offset indicates a number of units between positions of the first and second acoustic speaker devices in the common playback audio signal and a direction of the offset indicates which of the first and second acoustic speaker devices is behind.

2. The apparatus of claim 1, wherein, conditioned upon the absolute value of the offset being greater than a threshold number of units, one of the first and second acoustic speaker devices drops a number of units of the common playback audio signal equal to the absolute value of the offset

3. The apparatus of claim 1, wherein the first checksum set and the second checksum set correspond to equivalent portions of the respective playback queues of the first and second acoustic speaker devices.

4. The apparatus of claim 1, wherein, conditioned upon no match existing between at least one of the plurality of checksums of the first checksum set and at least one of the plurality of checksums of the second checksum set,

the first acoustic speaker device compares units of the common playback audio signal subsequently received by the first acoustic speaker device to a subset of the second checksum set; and

the second acoustic speaker device compares units of the common playback audio signal subsequently received by the second acoustic speaker device to a subset of the first checksum set.

5. The apparatus of claim 4, wherein the subset of the second checksum set comprises a plurality of checksums.

6. The apparatus of claim 4, wherein comparing units of the common playback audio signal subsequently received by the first acoustic speaker device to the subset of the second checksum set comprises finding a checksum for each of the units of the common playback audio signal subsequently received by the first acoustic speaker device.

7. The apparatus of claim 4, wherein, upon finding a match between at least one of the units of the common playback audio signal subsequently received by the first acoustic speaker device and the subset of the second checksum set, the first acoustic speaker device calculates a number of units that the first acoustic speaker device is behind the second acoustic speaker device by comparing a position of the subset of the second checksum set within the common audio playback signal to a position within the common playback audio signal of the at least one of the units of the common playback audio signal matching the first checksum.

8. The apparatus of claim 7, wherein the position within the common playback audio signal is indicated by a time.

9. The apparatus of claim 7, wherein upon finding the match between at least one of the units of the common playback audio signal subsequently received by the first acoustic speaker device and the subset of the second checksum set:

the first acoustic speaker device sends a message to the second acoustic speaker device indicating the match; and

upon receiving an acknowledgement to the message, the first acoustic speaker device drops a number of units equal to the number of units that the first acoustic speaker device is behind the second acoustic speaker device.

10. The apparatus of claim 7, wherein upon finding the match between at least one of the units of the common playback audio signal subsequently received by the first acoustic speaker device and the subset of the second checksum set, the first acoustic speaker device:

sends a message to the second acoustic speaker device indicating the match; and

receives from the second acoustic speaker device a message indicating that, prior to the match, the second acoustic speaker device found a match between one of the units of the common playback audio signal subsequently received by the second acoustic speaker device and the subset of the first checksum set.

11. The apparatus of claim 1, wherein, upon finding a match between at least one of the units of the common playback audio signal subsequently received by the second acoustic speaker device and the subset of the first checksum set, the second acoustic speaker device calculates a number of units that the second acoustic speaker device is behind the first acoustic speaker device by comparing a position of the subset of the first checksum set within the common audio playback signal to a position within the common playback audio signal of the one of the units of the common playback audio signal matching the subset of the first checksum set.

12. The apparatus of claim 1, wherein the common audio playback signal is compressed according to a first compression format, and wherein the units of the common audio playback signal corresponding to the plurality of checksums of the first and second checksum sets are defined according to the first compression format.

13. The apparatus of claim 1, wherein the units of the common audio playback signal corresponding to the plurality of checksums of the first and second checksum sets correspond to at

least one of frames of the common audio playback signal and samples of the common audio playback signal.

14. The apparatus of claim 1, wherein the units of the common audio playback signal correspond to frames of the common audio playback signal, and wherein each frame comprises a plurality of samples of the common audio playback signal.

15. A method executed by first and second acoustic speaker devices to synchronize playback of a common audio playback signal by the first and second acoustic speaker devices, the method comprising:

the first acoustic speaker device transmitting wirelessly a first message comprising a first checksum set, the first checksum set comprising a plurality of checksums indicating units of the common audio playback signal in a playback queue of the first acoustic speaker device, wherein the first acoustic speaker device comprises a first acoustic transducer and a first transceiver for receiving ant transmitting wireless signals;

the second acoustic speaker device receiving the first message and comparing the first checksum set to a second checksum set, wherein the second checksum set comprisses a plurality of checksums indicating units of the common audio playback signal in a playback queue of the second acoustic speaker device, and wherein the second acoustic speaker device comprises a second acoustic transducer and a second transceiver for receiving ant transmitting wireless signals; and

conditioned upon a match existing between at least one of the plurality of checksums of the first checksum set and at least one of the plurality of checksums of the second checksum set, at least one of the first and second acoustic speaker devices determining an offset of the match, wherein an absolute value of the offset indicates a number of units between positions of the first and second acoustic speaker devices in the common playback audio signal and a direction of the offset indicates which of the first and second acoustic speaker devices is behind.

16. The method of claim 15, further comprising, conditioned up on the absolute value of the offset being greater than a threshold, one of the first and second acoustic speaker devices dropping a number of units of the common playback audio signal equal to the absolute value of the offset

17. The method of claim 15, wherein the first checksum set and the second checksum set correspond to equivalent portions of the respective playback queues of the first and second acoustic speaker devices.

18. The method of claim 15, further comprising, conditioned upon no match existing between at least one of the plurality of checksums of the first checksum set and at least one of the plurality of checksums of the second checksum set,

the first acoustic speaker device comparing units of the common playback audio signal subsequently received by the first acoustic speaker device to a subset of the second checksum set;

the second acoustic speaker device comparing units of the common playback audio signal subsequently received by the second acoustic speaker device to a subset of the first checksum set.

19. The method of claim 18, wherein the subset of the second checksum set comprises a plurality of checksums.

20. The method of claim 15, further comprising, upon the first acoustic speaker device finding a match between at least one of the units of the common playback audio signal subsequently received by the first acoustic speaker device and the subset of the second checksum set, the first acoustic speaker device calculating a number of units that the first acoustic speaker device is behind the second acoustic speaker device by comparing a position of the subset of the second checksum set within the common playback audio signal to a position within the common playback audio signal of the at least one of the units of the common playback audio signal matching the first checksum.

21. The method of claim 20, further comprising, upon finding the match between one of the units of the common playback audio signal subsequently received by the first acoustic speaker device and the subset of the second checksum set:

the first acoustic speaker device sending a message to the second acoustic speaker device indicating the match; and

upon receiving an acknowledgement to the message, the first acoustic speaker device dropping a number of units equal to the number of units that the first acoustic speaker device is behind the second acoustic speaker device.

22. The method of claim 20, further comprising, upon finding the match between one of the units of the common playback audio signal subsequently received by the first acoustic speaker device and the subset of the first checksum set, the first acoustic speaker device:

sending a message to the second acoustic speaker device indicating the match; and

receiving from the second acoustic speaker device a message indicating that, prior to the match, the second acoustic speaker device found a match between one of the units of the common playback audio signal subsequently received by the second acoustic speaker device and the second checksum.

23. The method of claim 15, further comprising, upon finding a match between one of the units of the common playback audio signal subsequently received by the second acoustic speaker device and the subset of the first checksum set, the second acoustic speaker device calculating a number of units that the second acoustic speaker device is behind the first acoustic speaker device by comparing a position of the subset of the first checksum set within the common playback audio signal to a position within the common playback audio signal of the one of the units of the common playback audio signal matching the second checksum.

24. The method of claim 15, wherein the common audio playback signal is compressed according to a first compression format, and wherein the units of the common audio playback signal corresponding to the plurality of checksums of the first and second checksum sets are defined according to the first compression format.

25. The method of claim 15, wherein the units of the common audio playback signal corresponding to the plurality of checksums of the first and second checksum sets correspond to at least one of frames of the common audio playback signal and samples of the common audio playback signal.

26. The method of claim 25, wherein the units of the common audio playback signal correspond to frames of the common audio playback signal, and wherein each frame comprises a plurality of samples of the common audio playback signal.

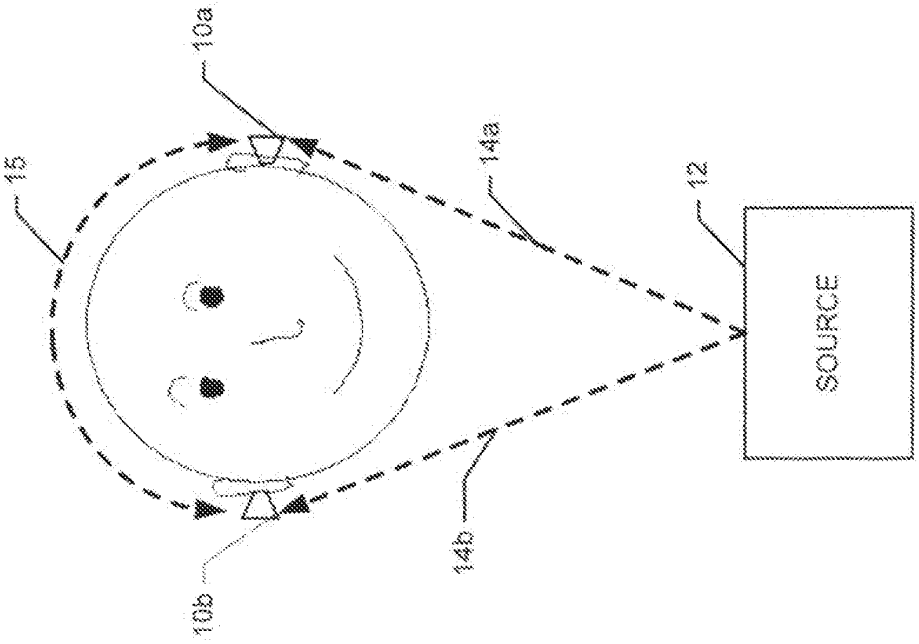


Fig. 1

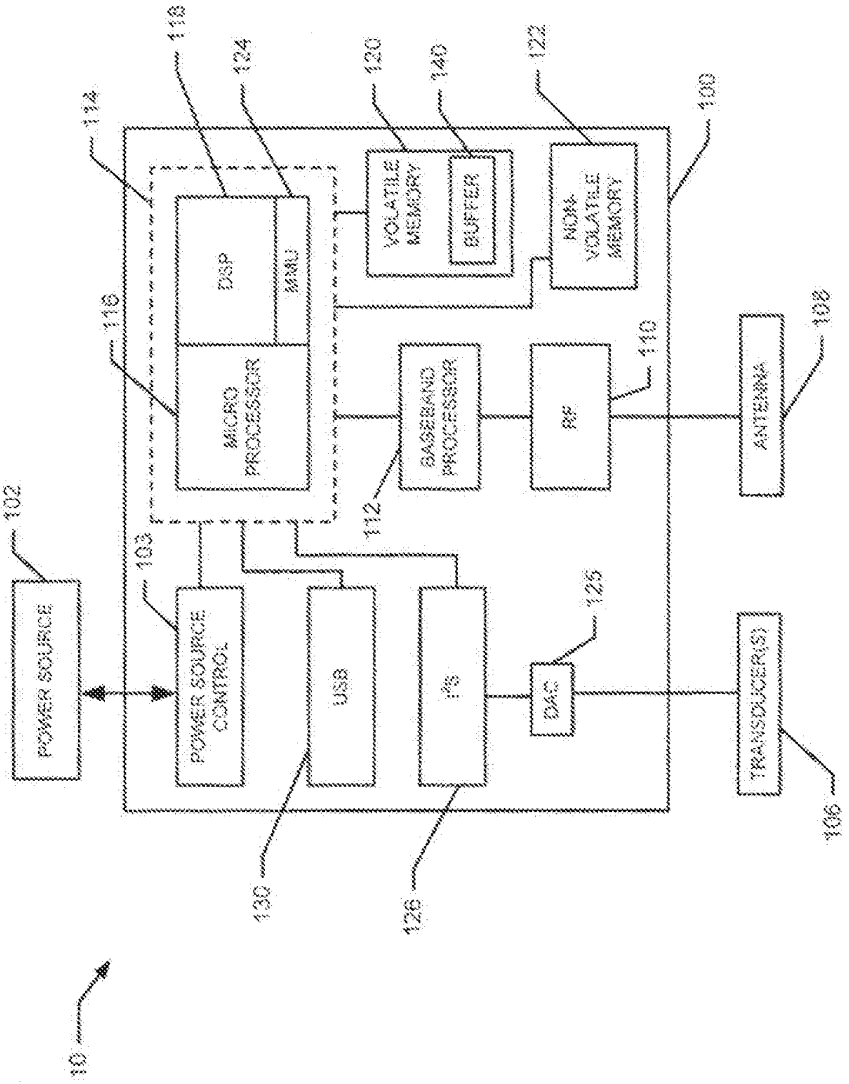

10
POWER SOURCE
102
POWER SOURCE CONTROL
103
MICRO PROCESSOR
116
DSP
MMU
114
118
124
VOLATILE MEMORY
BUFFER
120
140
NON-VOLATILE MEMORY
122
100
BASEBAND PROCESSOR
112
RF
110
ANTENNA
108
USB
130
I²S
126
DAC
128
TRANSDUCER(S)
106

Fig. 2

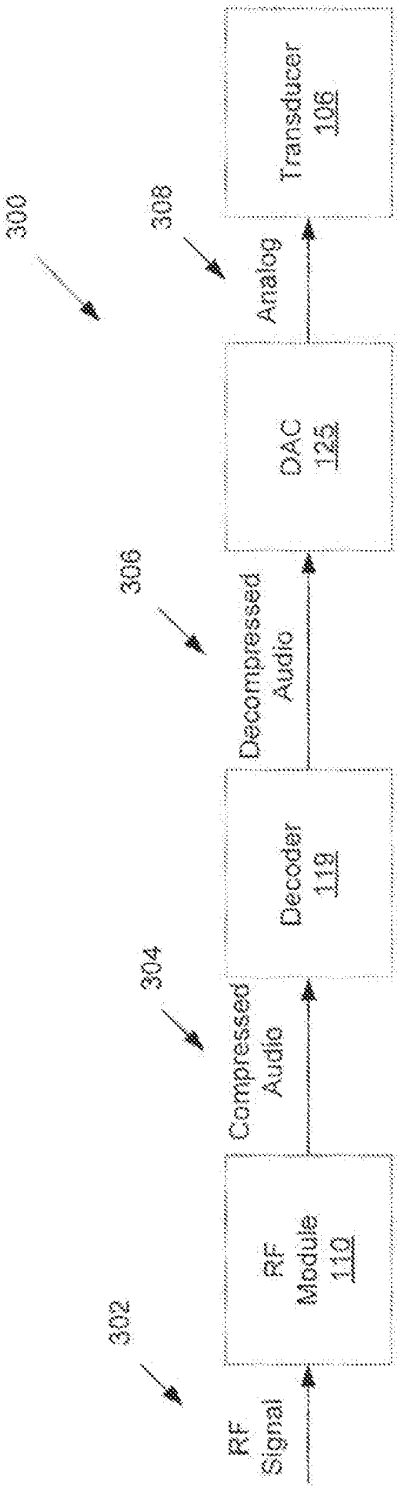

300
302
RF Signal
RF Module 110
304
Compressed Audio
Decoder 110
306
Decompressed Audio
DAC 125
308
Analog
Transducer 106

Fig. 3

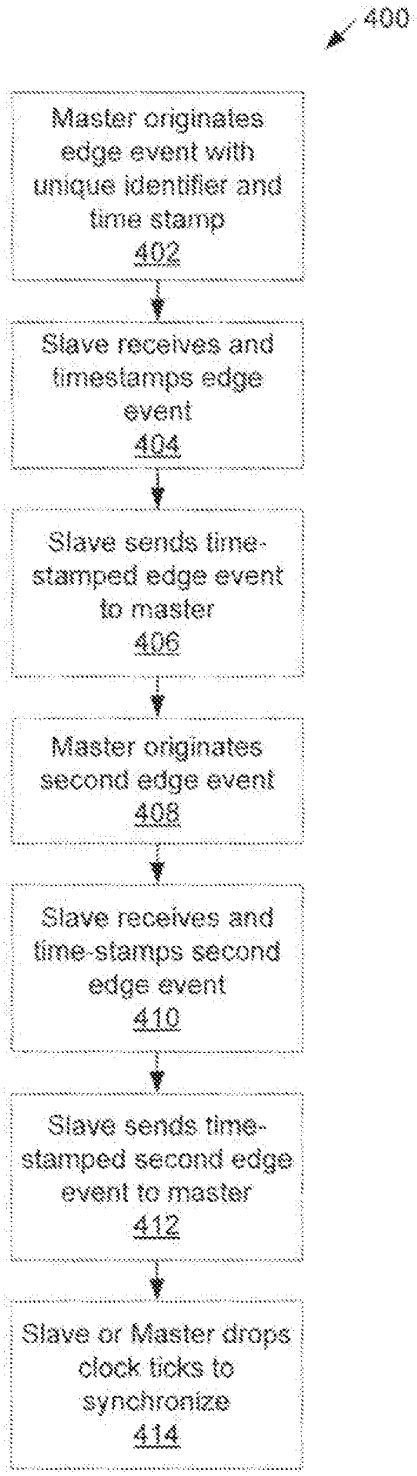

400
Master originates edge event with unique identifier and time stamp
402
Slave receives and timestamps edge event
404
Slave sends time-stamped edge event to master
406
Master originates second edge event
408
Slave receives and time-stamps second edge event
410
Slave sends time-stamped second edge event to master
412
Slave or Master drops clock ticks to synchronize
414

Fig. 4

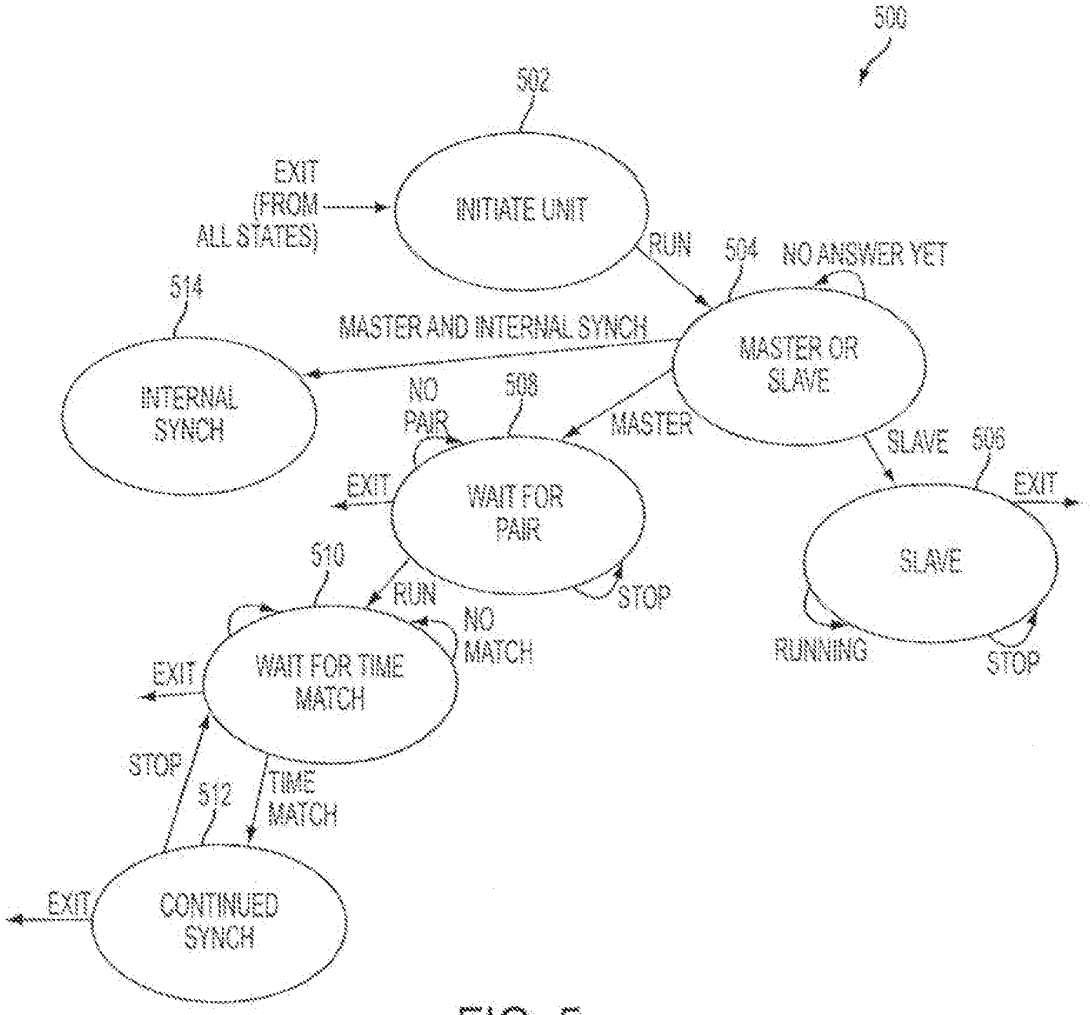

500
502
INITIATE UNIT
EXIT (FROM ALL STATES)
RUN
504
NO ANSWER YET
MASTER OR SLAVE
MASTER AND INTERNAL SYNCH
514
INTERNAL SYNCH
NO PAIR
508
MASTER
SLAVE
506
EXIT
WAIT FOR PAIR
EXIT
SLAVE
510
RUN
STOP
NO MATCH
WAIT FOR TIME MATCH
EXIT
RUNNING
STOP
STOP
512
TIME MATCH
CONTINUED SYNCH
EXIT

FIG. 5

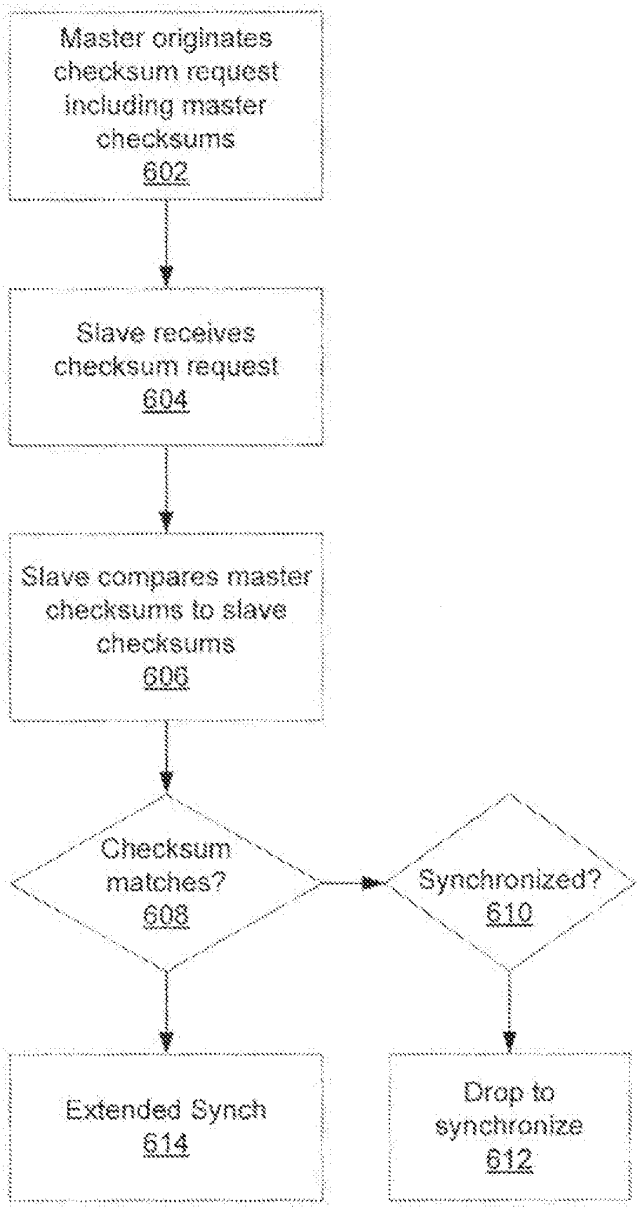

Master originates checksum request including master checksums 602
Slave receives checksum request 604
Slave compares master checksums to slave checksums 606
Checksum matches? 608
Synchronized? 610
Extended Synch 614
Drop to synchronize 612

Fig. 6

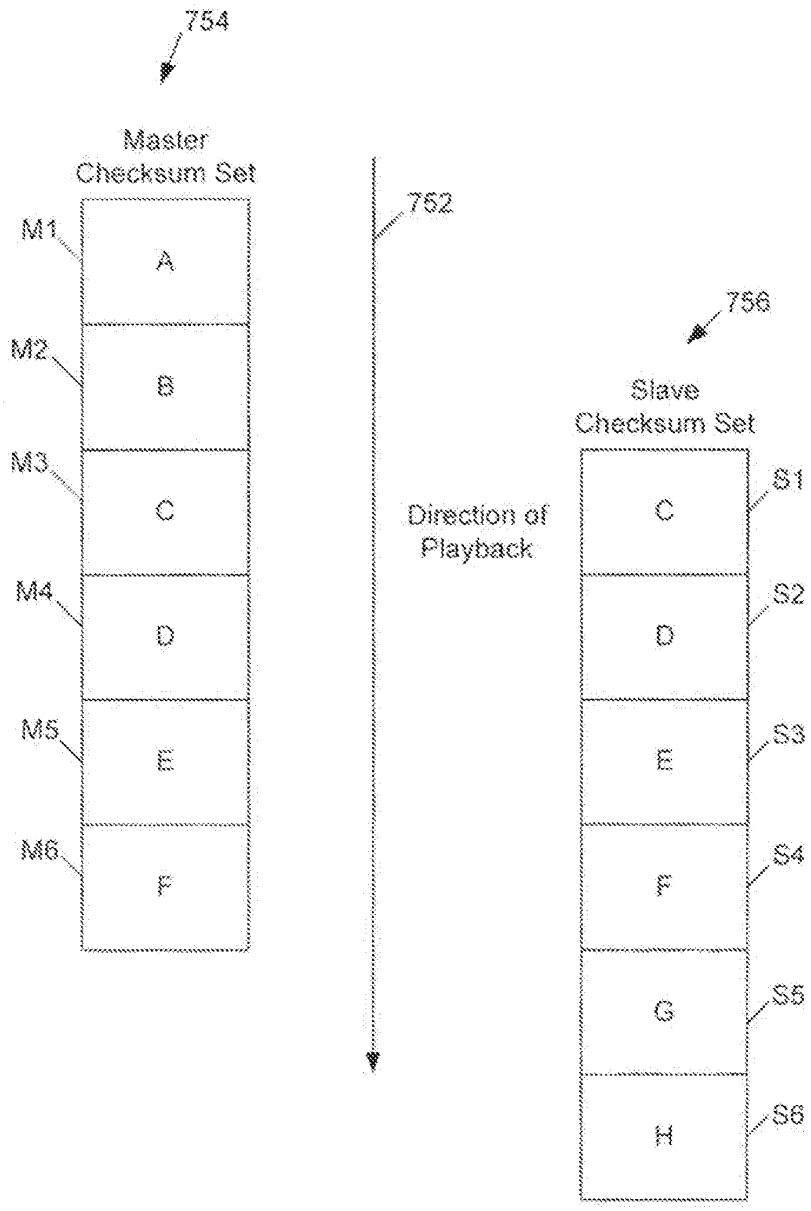

754
Master
Checksum Set
M1
A
M2
B
M3
C
M4
D
M5
E
M6
F
752
Direction of
Playback
756
Slave
Checksum Set
C
S1
D
S2
E
S3
F
S4
G
S5
H
S6

Fig. 7A

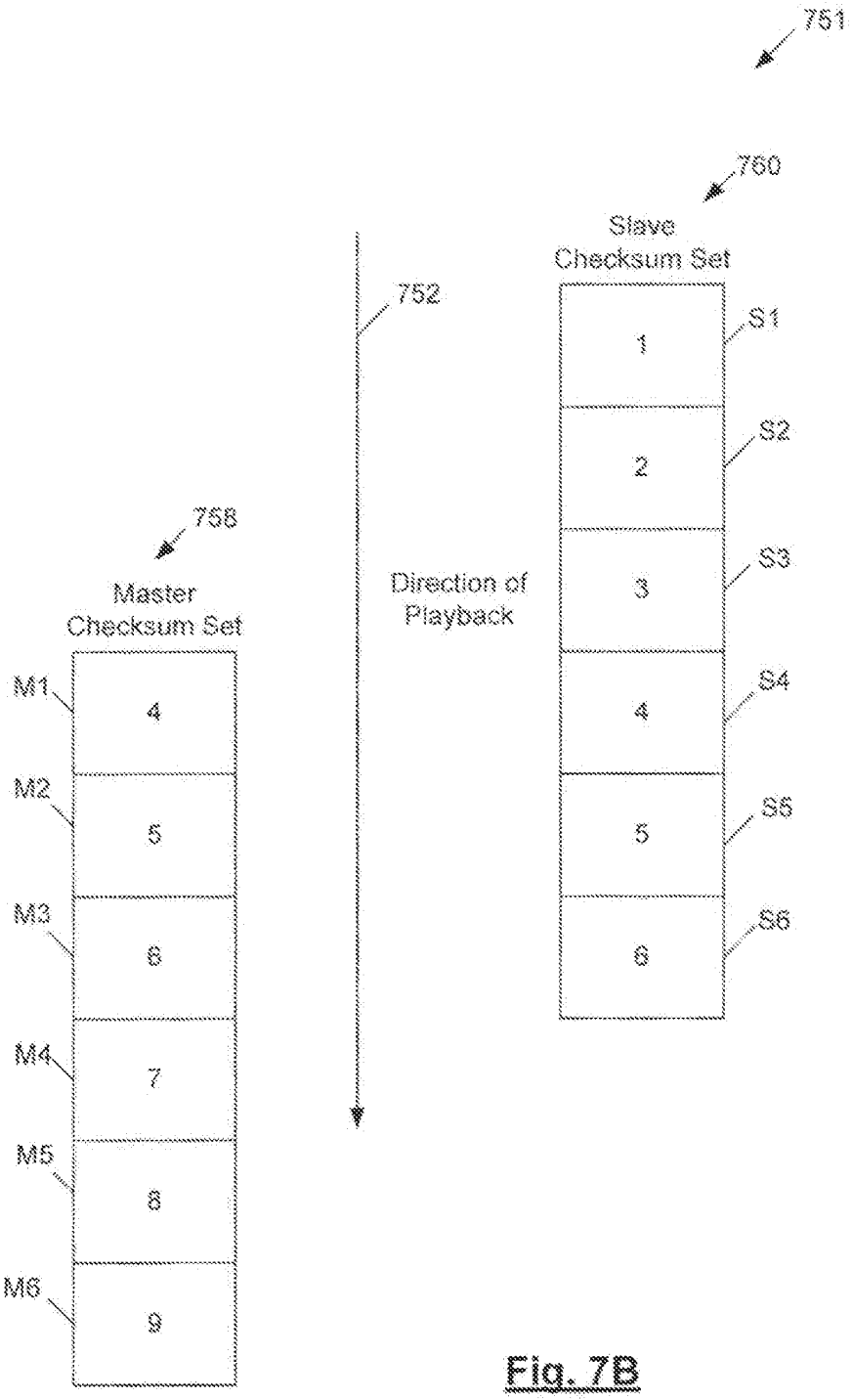

751
760
Slave
Checksum Set
752
S1
S2
S3
S4
S5
S6
1
2
3
4
5
6
Direction of
Playback
758
Master
Checksum Set
M1
M2
M3
M4
M5
M6
4
5
6
7
8
9

Fig. 7B

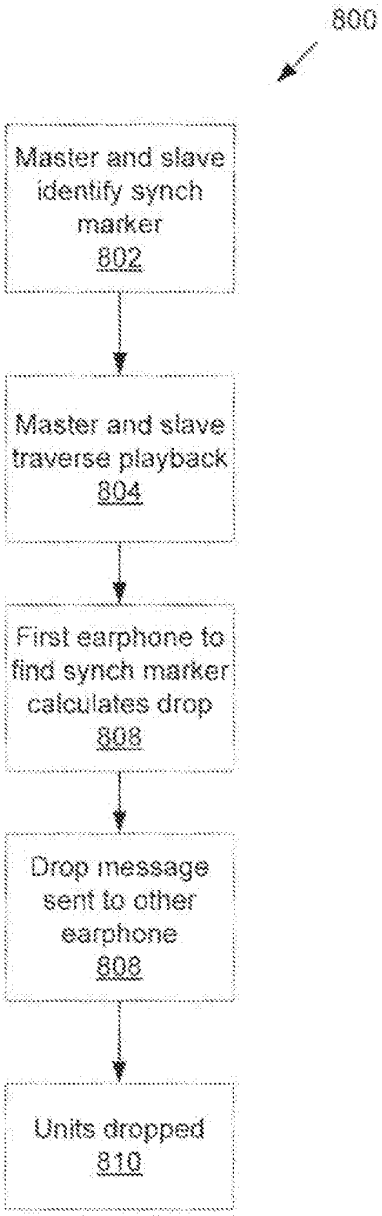

800
Master and slave identify synch marker 802
Master and slave traverse playback 804
First earphone to find synch marker calculates drop 808
Drop message sent to other earphone 808
Units dropped 810

Fig. 8

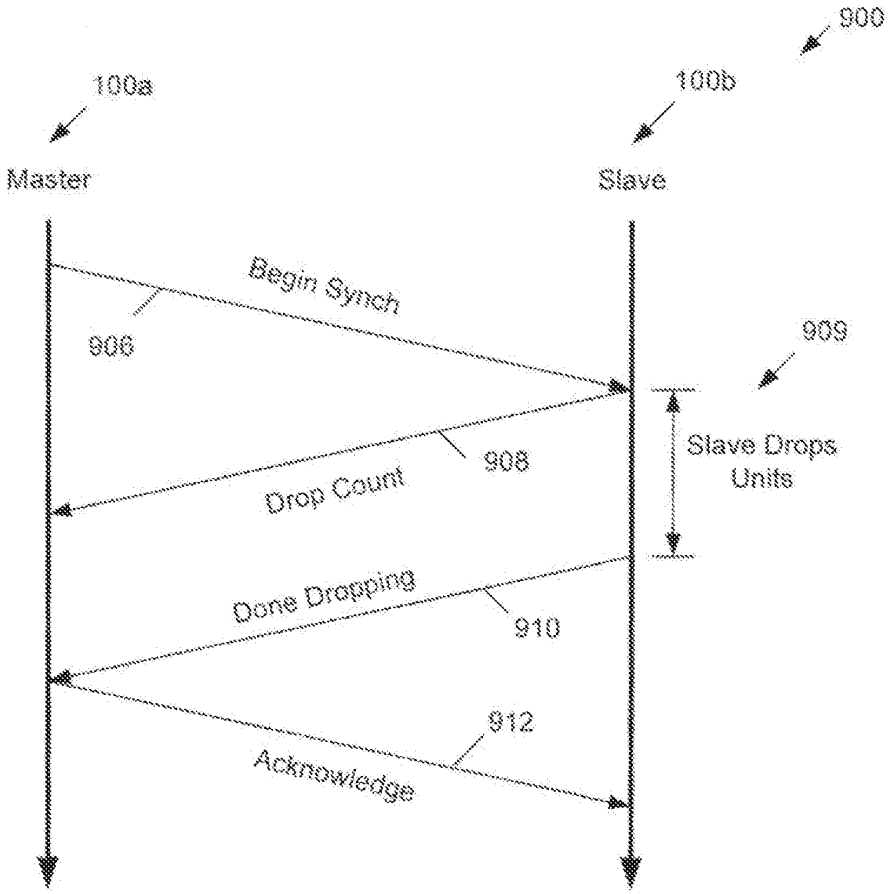

900
100a
100b
Master
Slave
Begin Synch
906
909
Slave Drops
Units
908
Drop Count
Done Dropping
910
912
Acknowledge

Fig. 9

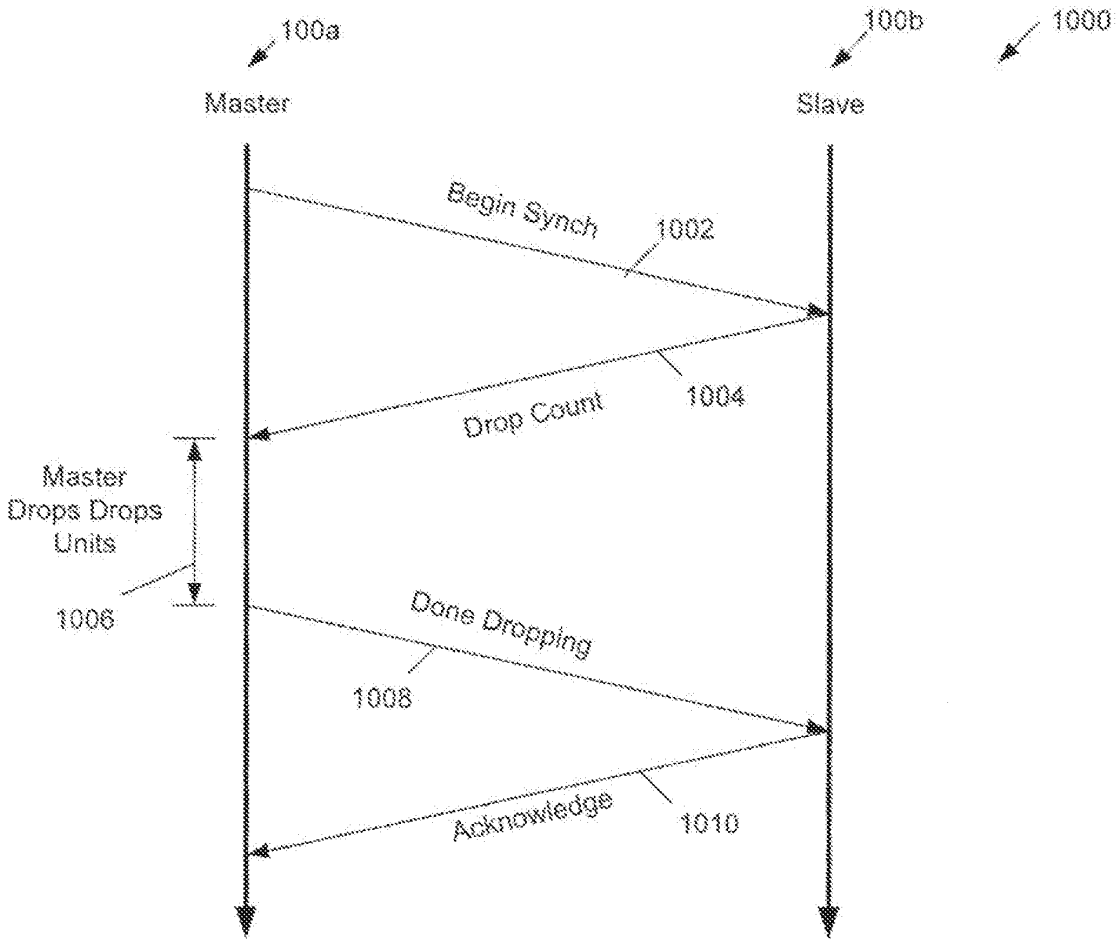

100a
100b
1000
Master
Slave
Begin Synch
1002
Drop Count
1004
Master
Drops Drops
Units
1006
Done Dropping
1008
Acknowledge
1010

Fig. 10

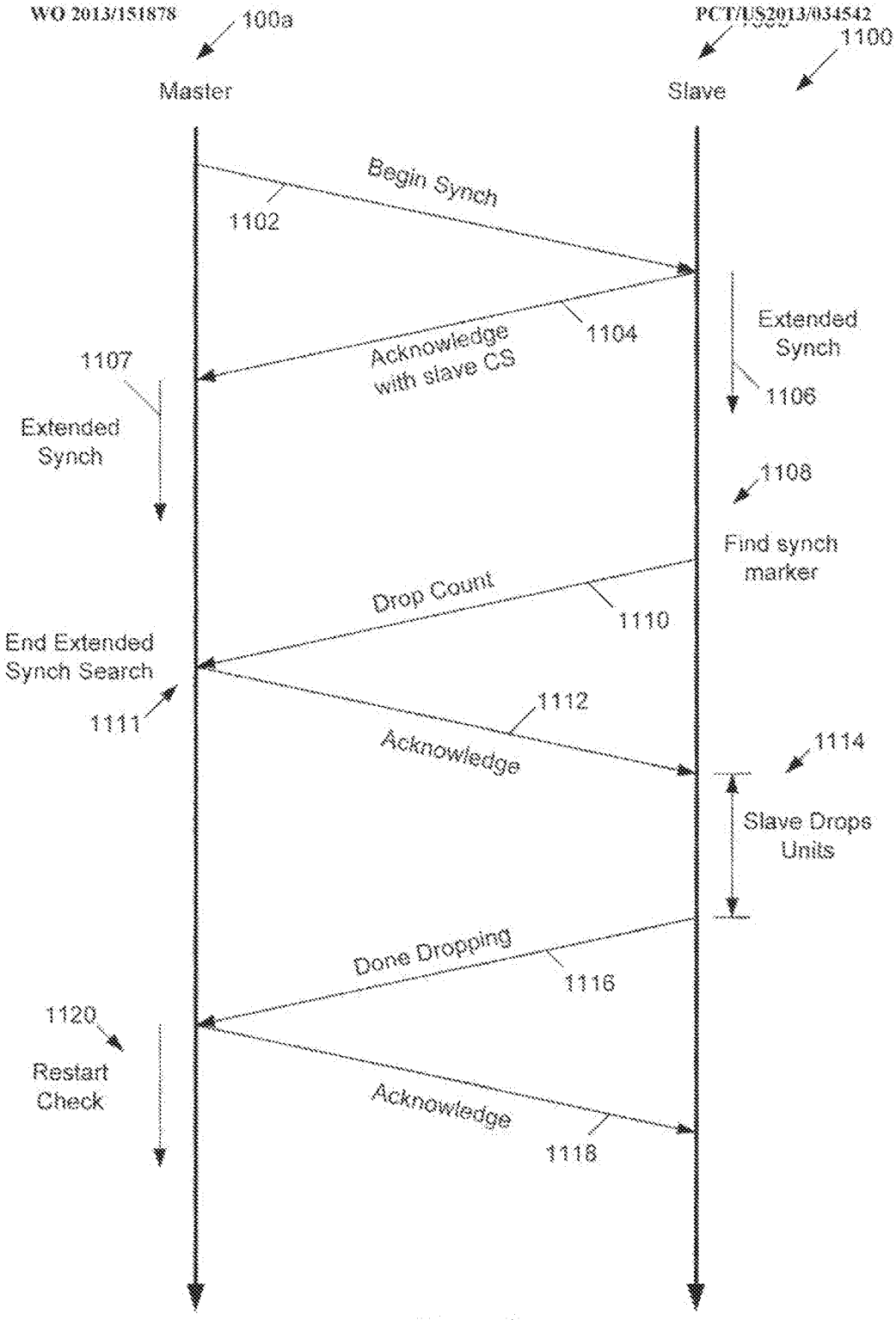

100a
Master
1100
Slave
Begin Synch
1102
Acknowledge with slave CS
1104
Extended Synch
1106
1107
Extended Synch
1108
Find synch marker
Drop Count
1110
End Extended Synch Search
1111
1112
Acknowledge
1114
Slave Drops Units
Done Dropping
1116
1120
Restart Check
Acknowledge
1118

Fig. 11

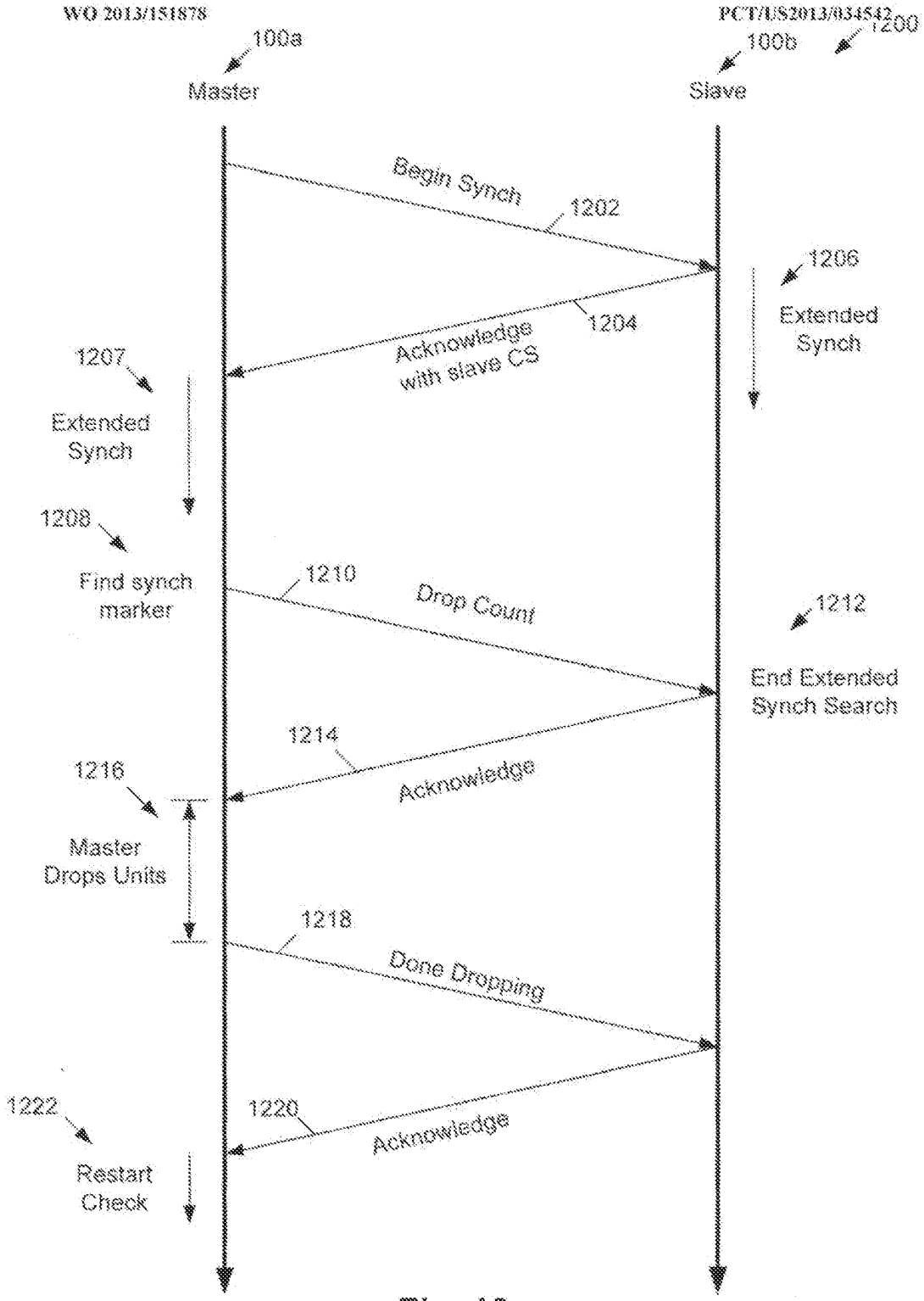

1200
100a
Master
100b
Slave
Begin Synch
1202
1206
Extended Synch
1204
Acknowledge with slave CS
1207
Extended Synch
1208
Find synch marker
1210
Drop Count
1212
End Extended Synch Search
1214
Acknowledge
1216
Master Drops Units
1218
Done Dropping
1222
Restart Check
1220
Acknowledge

Fig. 12

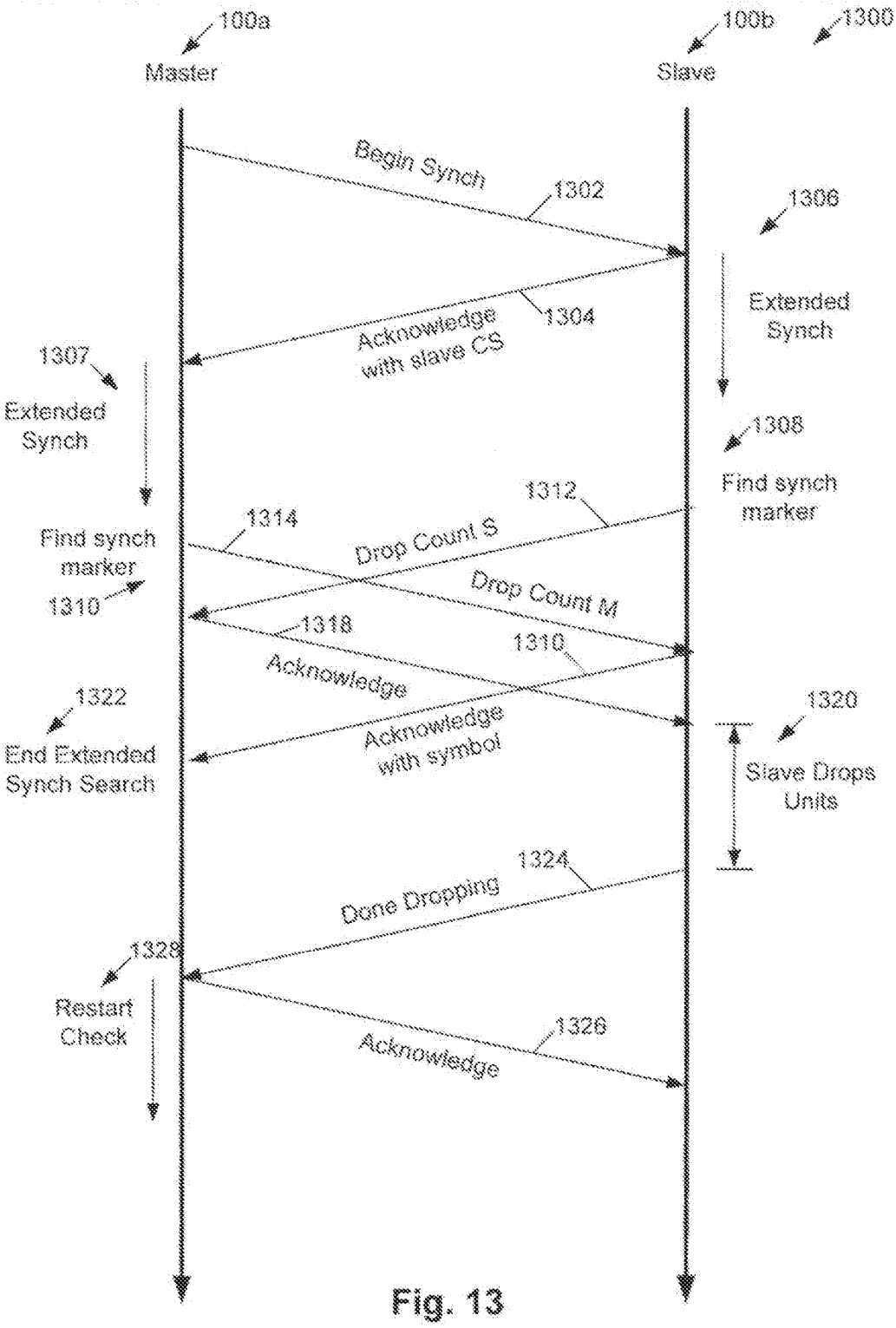

100a
Master
100b
1300
Slave
Begin Synch
1302
1306
Extended Synch
Acknowledge with slave CS
1304
1307
Extended Synch
1308
Find synch marker
1312
1314
Find synch marker
1310
Drop Count S
Drop Count M
1318
Acknowledge
1310
1322
End Extended Synch Search
Acknowledge with symbol
1320
Slave Drops Units
1324
Done Dropping
1328
Restart Check
1326
Acknowledge

Fig. 13

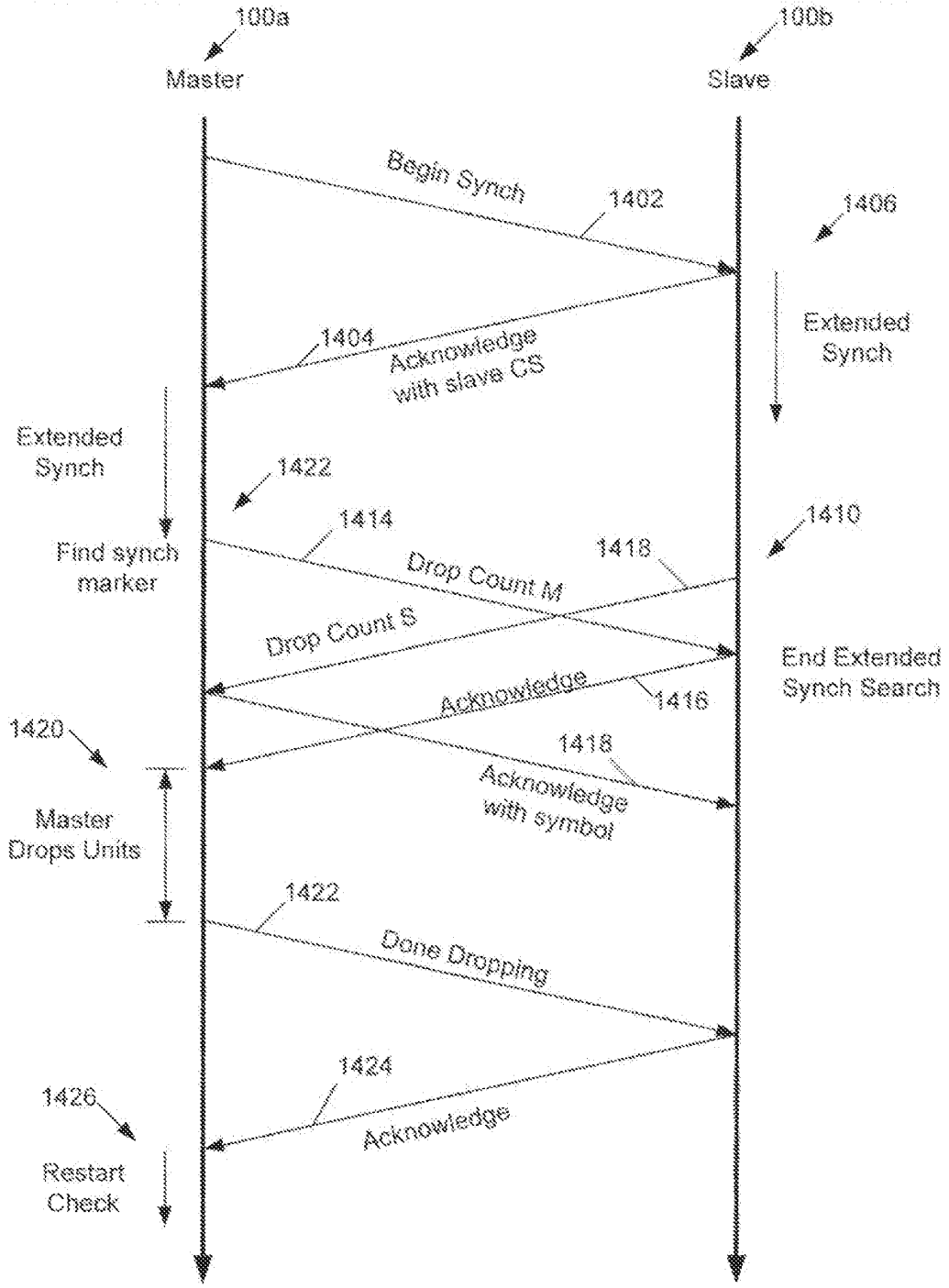

100a
Master
100b
Slave
Begin Synch
1402
1406
Extended Synch
1404
Acknowledge with slave CS
Extended Synch
1422
1414
1410
Find synch marker
1418
Drop Count M
Drop Count S
End Extended Synch Search
Acknowledge
1416
1420
1418
Acknowledge with symbol
Master Drops Units
1422
Done Dropping
1424
1426
Acknowledge
Restart Check

Fig. 14

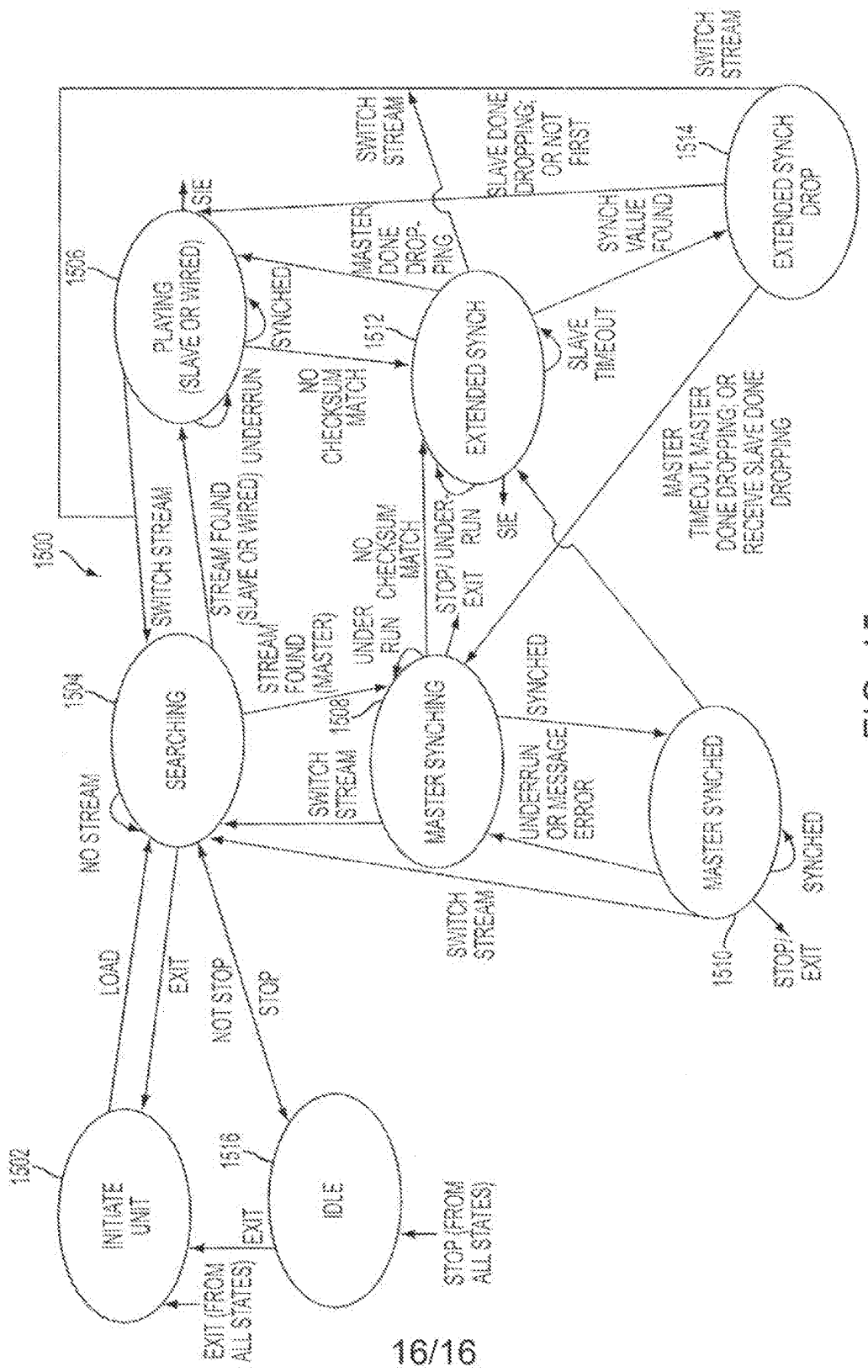

1600
INITIATE UNIT
1602
IDLE
1616
SEARCHING
1604
PLAYING (SLAVE OR WIRED)
1606
MASTER SYNCHING
1608
MASTER SYNCHED
1610
EXTENDED SYNCH
1612
EXTENDED SYNCH DROP
1614
LOAD
EXIT
NOT STOP
STOP
EXIT (FROM ALL STATES)
STOP (FROM ALL STATES)
NO STREAM
SWITCH STREAM
STREAM FOUND (SLAVE OR WIRED)
UNDERRUN
NO CHECKSUM MATCH
SWITCH STREAM
STREAM FOUND (MASTER)
UNDER RUN
NO CHECKSUM MATCH
STOP/ UNDER RUN EXIT
SIE
SYNCHED
UNDERRUN OR MESSAGE ERROR
SWITCH STREAM
STOP/ EXIT
SYNCHED
SWITCH STREAM
SLAVE DONE DROPPING, OR NOT FIRST
SYNCH VALUE FOUND
SLAVE TIMEOUT
MASTER TIMEOUT, MASTER DONE DROPPING OR RECEIVE SLAVE DONE DROPPING
MASTER DONE DROP-PING
SIE
SWITCH STREAM
SYNCHED

FIG. 15

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/034542

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04R5/033
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)
H04R

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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/238375 A1 (PILATI LAURENT [FR] ET AL) 24 September 2009 (2009-09-24)	1,3-8, 10,11, 13-15, 17-20, 22,23, 25,26
Y	paragraphs [0042] - [0083]; figures 5,6,8,9,11	2,9,12, 16,21,24
Y	WO 2006/053704 A1 (NAT UNIV IRELAND [IE]; CUCOS ALEX [IE]; CORCORAN PETER [IE]) 26 May 2006 (2006-05-26) page 7, lines 5-9 page 8, line 10 - line 19 page 10, line 3 - line 29	2,9,12, 16,21,24

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 August 2013	30/08/2013

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	Borowski, Michael

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/034542

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2008/113053 A1 (QUALCOMM INC [US]; RUTSCHMAN PHILLIP [US]) 18 September 2008 (2008-09-18) the whole document	1,15
A	US 2008/240074 A1 (LE-FAUCHEUR LAURENT [FR] ET AL) 2 October 2008 (2008-10-02) the whole document	1,2,15, 16

2

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2013/034542

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009238375 A1	24-09-2009	US 2009238375 A1	24-09-2009
		US 2011320214 A1	29-12-2011
WO 2006053704 A1	26-05-2006	AT 402587 T	15-08-2008
		EP 1815713 A1	08-08-2007
		JP 5149012 B2	20-02-2013
		JP 2008522468 A	26-06-2008
		US 2007297459 A1	27-12-2007
		WO 2006053704 A1	26-05-2006
WO 2008113053 A1	18-09-2008	EP 2119200 A1	18-11-2009
		JP 2010523018 A	08-07-2010
		KR 20100015531 A	12-02-2010
		TW 200901744 A	01-01-2009
		US 2008226094 A1	18-09-2008
		US 2012155670 A1	21-06-2012
		WO 2008113053 A1	18-09-2008
US 2008240074 A1	02-10-2008	US 2008240074 A1	02-10-2008
		WO 2008121943 A1	09-10-2008

Form PCT/ISA/210 (patent family annex) (April 2005)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Koss Corporation	§ **Examiner:**	TBD
		§	
Inventors:	Michael J. Koss *et al.*	§ **Art Unit:**	TBD
		§	
Serial No.:	TBD	§ **Atty. Docket No.**:	120223CON6
		§	
Filing Date:	TBD	§ **Confirmation No.:**	TBD

Title: CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK

PRELIMINARY AMENDMENT

K&L Gates, LLP
Pittsburgh, PA 15222
August 7, 2018

VIA EFS (WEB)

Commissioner for Patents
Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Prior to examination, prior to calculation of the application filing fees, and prior to a determination on Applicant's Track One prioritized examination request, please amend the above-referenced application ("the Subject Application") as follows, wherein:

Amendments to the Specification begin on page 2;

Amendments to the Claims begin on page 4; and

Remarks begin on page 8.

Amendments to the Specification

Please replace paragraph [0001] with the following amended paragraph:

[0001] The present application claims priority under 35 U.S.C. § 120 as a continuation application to United States nonprovisional patent application Serial No. 15/927,262, filed March 21, 2018, which is a continuation of United States nonprovisional patent application Serial No. 15/463,559, filed March 20, 2017, now U.S. Patent 9,992,061, issued June 5, 2018, which is a continuation of United States nonprovisional patent application Serial No. 15/080,940, filed March 25, 2016, now U.S. Patent 9,629,190, issued April 18, 2017, which is a continuation of United States nonprovisional patent application Serial No. 14/850,508, filed September 10, 2015, now U.S. Patent 9,326,304, issued April 26, 2016, which is a continuation of U.S. nonprovisional patent application Serial No. 14/702,316, filed May 1, 2015, now U.S. Patent 9,185,168, issued November 10, 2015, which is a continuation of U.S. nonprovisional patent application Serial No. 13/832,719, filed March 15, 2013, now U.S. Patent 9,060,288, issued June 16, 2015, both of which are incorporated herein by reference in their entirety.

Please replace paragraph [0013] with the following amended paragraph:

[0013] The CAP 16 is connectable, through, for example, a wired connection, to a source of digital audio that stores and plays digital audio files, such as MP3, FLAC, etc. files. The source may be, as shown in Figure 1, a personal DAP 20 or a computer 22, for example, although in other embodiments other media source devices may be used. The personal DAP 20 may be a personal MP3 player, iPod, iPhone, etc., or any other personal electronic device capable of storing and playing digital audio files. The computer 22 may be any suitable computer device, such as a personal computer, laptop computer, tablet computer, smart phone, etc., and preferably has a browser to facilitate initializing the CAP 16 and earphones 14, as described further below. The CAP 16 may connect to the DAP 20 via a USB connector (not shown) that connects to a USB port (e.g., conventional, mini, and micro) of the CAP 16 and to an audio jack on the DAP 20, such as a 3.5mm TRS or TRRS audio jack. The CAP 16 may connect to the computer 22 via a USB connection (not shown). Also, the CAP 16 may be an integral part of the DAP 20 or the computer 22. As shown in Figure 1, the earphones 14 may also connect to a wireless access point 24 via a wireless infrastructure communication link 26, that is again preferably a Wi-Fi link, although other wireless protocols could be used. The wireless infrastructure communication

link 26 may be part of an infrastructure wireless network because it utilizes a wireless access point 24 and connects to an Internet service provider (e.g., a Wi-Fi hotspot).

Amendments to the Claims

Please amend the claims as follows. The following listing of the claims replaces all prior listing(s) of the claims in the Subject Application.

1. (Canceled)

2. (New) A system comprising:

a wireless access point;

an electronic device;

a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and

one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by the wireless access point,

wherein:

the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and

the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.

3. (New) The system of claim 2, further comprising a remote network server, wherein the after connecting to the wireless access point, the electronic device is for receiving control data from the remote network server.

4. (New) The system of claim 2, wherein the electronic device comprises a lighting system.

5. (New) The system of claim 2, wherein the electronic device comprises a camera.

6. (New) The system of claim 2, wherein the electronic device comprises a medial device.

7. (New) The system of claim 2, wherein the electronic device comprises a gaming system.

8. (New) The system of claim 2, wherein the electronic device comprises acoustic speaker device.

9. (New) The system of claim 8, wherein the acoustic speaker device comprises a set of earphones.

10. (New) The system of claim 8, wherein:
the system further comprises a remote network server; and
the acoustic speaker device is further for:
after connecting to the wireless access point, streaming audio content from the remote network server via the infrastructure wireless network; and
playing the audio content streamed from the remote network server, such that the acoustic speaker device is enabled to play audio streamed via the infrastructure wireless network.

11. (New) The system of claim 2, wherein:
the system further comprises a remote network server; and
the electronic device comprises a video player that is further for:
after connecting to the wireless access point, streaming video content from the remote network server via the infrastructure wireless network; and
playing the video content streamed from the remote network server, such that the video player is enabled to play video streamed via the infrastructure wireless network.

12. (New) The system of claim 2, wherein the mobile computer device comprises a smartphone, and wherein the smartphone comprises a radio module for communicating wirelessly via the ad hoc wireless network with the electronic device.

13. (New) The system of claim 2, wherein:
the infrastructure wireless network comprises an infrastructure Wi-Fi network; and
the credential data for the infrastructure Wi-Fi network comprises an identifier for the infrastructure Wi-Fi network.

14. (New) The system of claim 13, wherein the credential data for the infrastructure Wi-Fi network additionally comprises a password for the infrastructure Wi-Fi network.

15. (New) The system of claim 14, wherein the credential data for the infrastructure Wi-Fi network additionally comprises encryption type data for the infrastructure Wi-Fi network.

16. (New) The system of claim 13, wherein the ad hoc wireless network comprises a Bluetooth wireless network.

17. (New) The system of claim 2, wherein the one or more host servers host a website through which, via the mobile computer device, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user.

18. (New) A system comprising:
an electronic device;
a mobile computer device that is in communication with the electronic device via an ad hoc wireless communication link; and
one or more host servers that are in communication with the mobile computer device via the Internet, wherein the one or more host servers receive and store credential data for an infrastructure wireless network provided by a wireless access point,
wherein:
the mobile computer device is for transmitting to the electronic device, wirelessly via the ad hoc wireless communication link between the electronic device and the mobile

computer device, the credential data for the infrastructure wireless network stored by the one or more host servers; and

the electronic device is for, upon receiving the credential data for the infrastructure wireless network from the mobile computing device, connecting to the wireless access point via the infrastructure wireless network using the credential data received from the mobile computer device.

19. (New) The system of claim 18, wherein the one or more host servers host a website through which, via the mobile computer device, a user of the electronic device specifies the credential data for the infrastructure wireless network, such that the one or more host servers receive and store the credential data, and such that the credential data are stored by the one or more host servers for an account associated with the user.

20. (New) The system of claim 19, wherein:

the infrastructure wireless network comprises an infrastructure Wi-Fi network;

the credential data for the infrastructure Wi-Fi network comprises:

an identifier for the infrastructure Wi-Fi network; and

a password for the infrastructure Wi-Fi network; and

the electronic device comprises an electronic device selected from the group consisting of:

an acoustic speaker;

a video player;

a lighting system;

a camera;

a medical device; and

a gaming system.

21. (New) The system of claim 18, further comprising a remote network server, wherein the after connecting to the wireless access point, the electronic device is for receiving control data from the remote network server.

REMARKS

In this amendment, Applicant has amended the specification at:

- ¶ [0001] to update the priority claim; and
- ¶ [0013] to state that the CAP "may be an integral part of the DAP 20 or the computer 22."

Support for the amendment at ¶ [0013] is disclosed in U.S. Patent 8,190,203 ("the '203 Patent"), which the Subject Application incorporates by reference. *See* Subject Application at ¶ [0015]. The '203 Patent discloses that the CAP, which is referred to as a "wireless network adapter" in the '203 Patent, "may be an integral part" of the digital audio player or computer. *See* '203 Patent at col. 4:6-20. In the '203 Patent, the "data source 20" may be "a digital audio player" (just like the digital audio player 20 of the Subject Application) or a laptop or PC (just like the computer 22 of the Subject Application). *See* '203 Patent at col. 3:66 - col. 4:2. Thus, the Subject Application as originally filed discloses that the CAP could be an "integral part" of the digital audio player 20 or the computer 22. Thus, no new matter is added by this amendment to the specification.

Applicant has also amended the claims to (i) cancel original claim 1 and (ii) add new claims 2-21. Support for the new claims may be found throughout the application as originally filed; no new matter is added. For example, ¶¶ [0023]-[0024] of the Subject Application disclose various types of electronic devices to which the network credentials are transmitted.

Applicant filed a Request for Track One prioritized examination with the filing of the Subject Application and Applicant submits that Subject Application, upon entry of the present amendments, qualifies for Track One prioritized examination. The Subject Application as amended: is an original nonprovisional utility application filed under 35 U.S.C. § 111(a); does not contain more than four independent claims (it has two independent claims—claims 2 and 18); does not contain more than thirty total claims (it has twenty claims); and does not contain any multiple dependent claims.

If the undersigned can be of assistance to the Examiner in addressing any additional issues to advance the application to a condition of allowance, please contact the undersigned at the number set forth below.

Respectfully submitted,

Date: August 7, 2018

/Mark G. Knedeisen/
Mark G. Knedeisen
Reg. No. 42,747

K&L GATES LLP
K&L Gates Center
210 Sixth Ave.
Pittsburgh, Pennsylvania 15222

Ph. (412) 355-6342
Fax (412) 355-6501
email: mark.knedeisen@klgates.com

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Filer:	Mark G. Knedeisen/Autumn Vanatta
Attorney Docket Number:	120223CON6

Filed as Small Entity

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2855**

Electronic Acknowledgement Receipt	
EFS ID:	33395880
Application Number:	16057360
International Application Number:	
Confirmation Number:	9075
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK
First Named Inventor/Applicant Name:	Michael J. Koss
Customer Number:	26285
Filer:	Mark G. Knedeisen/Autumn Vanatta
Filer Authorized By:	Mark G. Knedeisen
Attorney Docket Number:	120223CON6
Receipt Date:	07-AUG-2018
Filing Date:	
Time Stamp:	16:44:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$2855
RAM confirmation Number	080818INTEFSW00003939021818
Deposit Account	021818
Authorized User	Autumn Vanatta
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	TrackOne Request	08-07-2018_Track_1_Request.pdf	121847 3c4e700219e0ccb8b7956c5492dea8123d6d2dac	no	1
Warnings:					
Information:					
2	Transmittal of New Application	08-07-2018_New_Application_Transmittal.pdf	317054 e808d6a6969abdb7af52427b04e467fcda20342f	no	2
Warnings:					
Information:					
3	Oath or Declaration filed	08-07-2018_Declarations.pdf	390673 967d9f121893c666b06f5810f19cd4beb4cd12c7	no	3
Warnings:					
Information:					
4	Application Data Sheet	08-07-2018_ADS.pdf	1823066 0099dfc8cc41edb54ebf669ee0e0f14ac9073889	no	9
Warnings:					
Information:					
5	Nonpublication request from applicant	08-07-2016_Nonpublication_Request.pdf	122948 f17581d4cabfac9b97fd3f2fa428ce1702926ac3	no	1
Warnings:					
Information:					
6		08-07-2018_Application.pdf	129034 c930f9173be00d4d431b36987f2c518334cee97a	yes	13
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	

	Specification		1	11	
	Claims		12	12	
	Abstract		13	13	
Warnings:					
Information:					
7	Drawings-only black and white line drawings	08-07-2018_Drawings.pdf	786847 74ac14c1e921be5f345a2ea0ce121b2ce06461f9	no	4
Warnings:					
Information:					
8		08-07-2018_IDS.pdf	217766 777b0ea3783d4adc57975f749902ca9fae8c5066	yes	4
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	4	
Warnings:					
Information:					
9	Foreign Reference	WO2013151878.pdf	4309744 73f0776bcd952ef2ff6620146315 6c58de87bd35	no	52
Warnings:					
Information:					
10	Non Patent Literature	Brodnick-Review-Koss-Striva-could-be-the-next-big-thing.pdf	2853614 83ed5466ae0665650dcd4322526b51043a89a160	no	17
Warnings:					
Information:					
11	Non Patent Literature	Robson-Koss-Striva-MyKoss-Wi-Fi-Streaming.pdf	789521 b31efa9f0029fcad62f886b6207d64cc0822654e	no	7
Warnings:					

Information:					
12	Non Patent Literature	Robson-Interview-Michael-J-Koss.pdf	816930 0b10855e574fa66db3ffab754cdd69fd96549903	no	7
Warnings:					
Information:					
13		08-07-2018_Preliminary_Amendment.pdf	164410 e95c2aa123652a9db7946efee6b035a53703c7ff	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Specification	2	3
	Claims	4	7
	Applicant Arguments/Remarks Made in an Amendment	8	9

Warnings:					
Information:					
14	Fee Worksheet (SB06)	fee-info.pdf	40256 d9a34589b66d0e61b10708d2d236f989239ce299	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	12883710		

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.

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

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

First Named Inventor:	Michael J. Koss	Nonprovisional Application Number (if known):	
Title of Invention:	CONFIGURING WIRELESS DEVICES FOR A WIRELESS INFRASTRUCTURE NETWORK		

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

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

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

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

---OR---

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

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

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

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

Signature /Mark G. Knedeisen/	Date August 7, 2018
Name (Print/Typed) Mark G. Knedeisen	Practitioner Registration Number 42,747

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

☑ *Total of 1 forms are submitted.

DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 16057360 Document Date: 08/07/2018

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.

Form Revision Date: August 26, 2013