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

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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

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

Application Number	
Filing Date	March 11, 2019
First Named Inventor	Nicholas A.J. Millington
Title	Playback Device Connection
Art Unit	
Examiner Name	
Attorney Docket Number	05-0601-CON0319A

SIGNATURE of Applicant or Patent Practitioner

Signature	/Brandon J. Kennedy/	Date (Optional)	March 11, 2019
Name	Brandon J. Kennedy	Registration Number	67,894
Title (if Applicant is a juristic entity)	Attorney of Record		
Applicant Name (if Applicant is a juristic entity)	SONOS, INC.		

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

☐ *Total of _____ forms are submitted.

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

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

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POWER OF ATTORNEY BY APPLICANT

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

Application Number	Filing Date

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

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 135176

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):

Sonos, Inc.

☐ 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	DocuSigned by: Mark Triplett	Date (Optional)	9/1/2015
Name	Mark Triplett 50B9ED8869E7465...		
Title	Director, Intellectual Property		

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

☐ Total of forms are submitted.

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

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

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Docket No.: 05-0601-CON0319A)

In re Application of:	)	
	)	Confirmation No.: TBD
Nicholas A.J. Millington et al.	)	
	)	Art Unit: TBD
Application No.: TBD	)	
	)	Examiner: TBD
Filed: March 11, 2019	)	
	)	
Title: Playback Device Connection	)	

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

GENERAL AUTHORIZATIONS UNDER 37 C.F.R. §§ 1.25(b) and 1.136(a)(3)

In this or any related application filed pursuant to 37 C.F.R. § 1.53, for the entire pendency thereof, and with respect to Deposit Account No. 506632, the Commissioner is hereby generally authorized:

(a) under 37 C.F.R. § 1.25(b), subject to the provisions of 37 C.F.R. § 1.311(b), to charge all fees set forth in 37 C.F.R. §§ 1.16 to 1.18; and

(b) under 37 C.F.R. § 1.136(a)(3) to treat any future reply requiring an extension of time as incorporating a request therefor, and specifically to charge any fee that may be due in connection with such a request.

Respectfully submitted,

Date: March 11, 2019

By: /Brandon J. Kennedy/
Brandon J. Kennedy
Registration No.: 67,894
(312) 754-9315

Lee Sullivan Shea & Smith LLP
656 W Randolph St., Floor 5W
Chicago, IL 60661
(312)754-9602

PTO/AIA/14 (02-18)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	05-0601-CON0319A
	Application Number	
Title of Invention	Playback Device Connection	

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
	Nicholas	A.J.	Millington	

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

City	Santa Barbara	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	614 Chapala St.		
Address 2			
City	Santa Barbara	State/Province	CA
Postal Code	93101	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Paul	V.	Hainsworth	

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

City	Foxboro	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	614 Chapala St.		
Address 2			
City	Santa Barbara	State/Province	CA
Postal Code	93101	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).

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	05-0601-CON0319A
	Application Number	
Title of Invention	Playback Device Connection	

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

Customer Number	135176		
Email Address	ls3_docketing@cardinal-ip.com	Add Email	Remove Email

Application Information:

Title of the Invention	Playback Device Connection		
Attorney Docket Number	05-0601-CON0319A	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	9	**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.

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	135176		

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	05-0601-CON0319A
	Application Number	
Title of Invention	Playback Device Connection	

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	15091113	2016-04-05	

Prior Application Status	Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15091113	Continuation of	14486667	2014-09-15	9866447	2018-01-09

Prior Application Status	Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14486667	Continuation of	13618829	2012-09-14	8868698	2014-10-21

Prior Application Status	Patented			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13618829	Continuation of	11147116	2005-06-06	8326951	2012-12-04

Prior Application Status	Expired			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)	
11147116	Claims benefit of provisional	60577284	2004-06-05	

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)

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	05-0601-CON0319A
	Application Number	
Title of Invention	Playback Device Connection	

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.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	05-0601-CON0319A
	Application Number	
Title of Invention	Playback Device Connection	

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

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

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

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

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

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

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

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	05-0601-CON0319A
	Application Number	
Title of Invention	Playback Device Connection	

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	SONOS, INC.		
Mailing Address Information For Applicant:			
Address 1	614 Chapala St.		
Address 2			
City	Santa Barbara	**State/Province**	CA
Country	US	Postal Code	93101
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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	05-0601-CON0319A
	Application Number	
Title of Invention	Playback Device Connection	

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	/Brandon J. Kennedy/			Date (YYYY-MM-DD)	2019-03-11
First Name	Brandon J.	Last Name	Kennedy/	Registration Number	67,894

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

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Privacy Act Statement

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

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

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

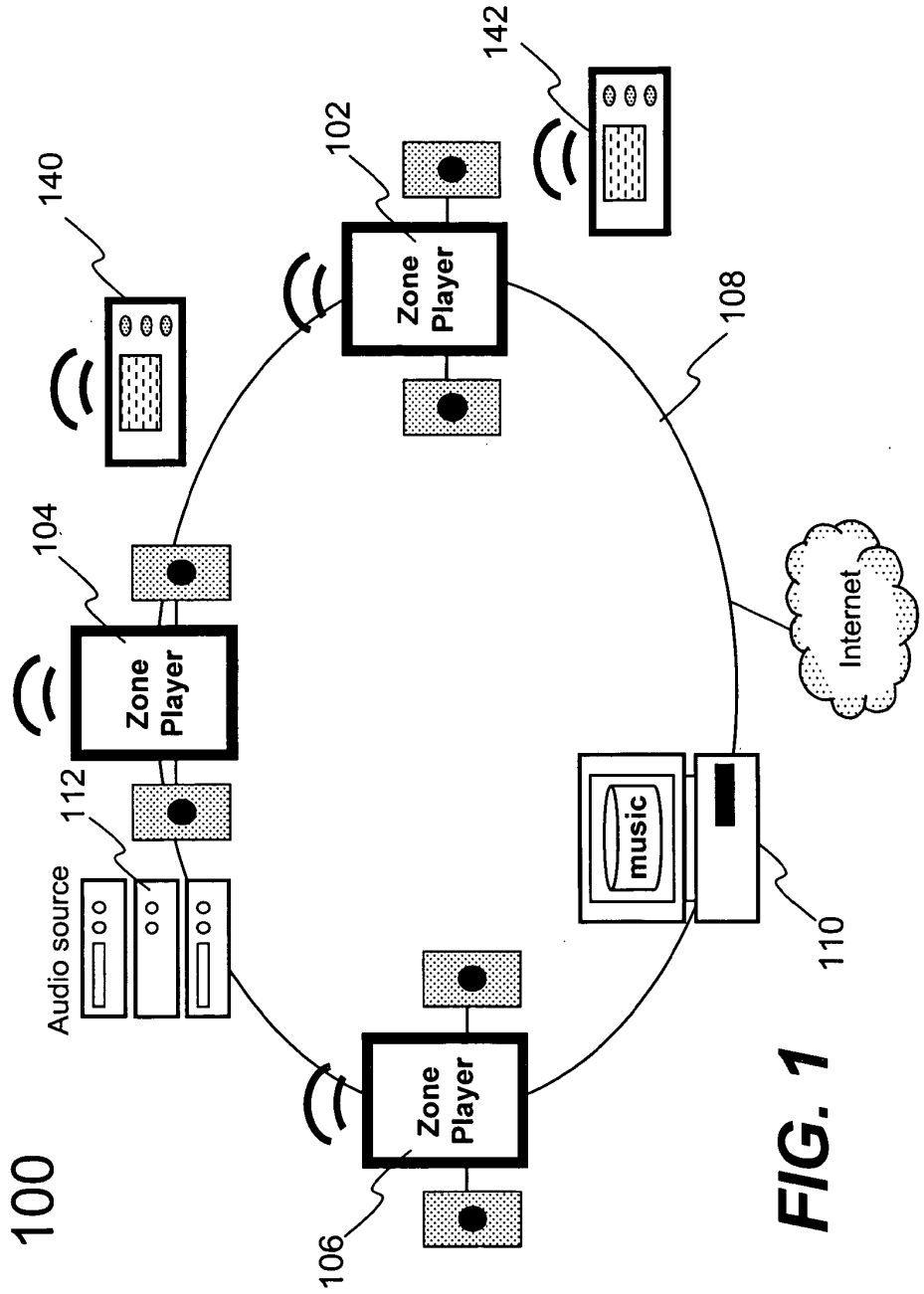

100
Zone Player
102
Zone Player
104
Zone Player
106
140
142
108
Internet
music
110
112
Audio source

FIG. 1

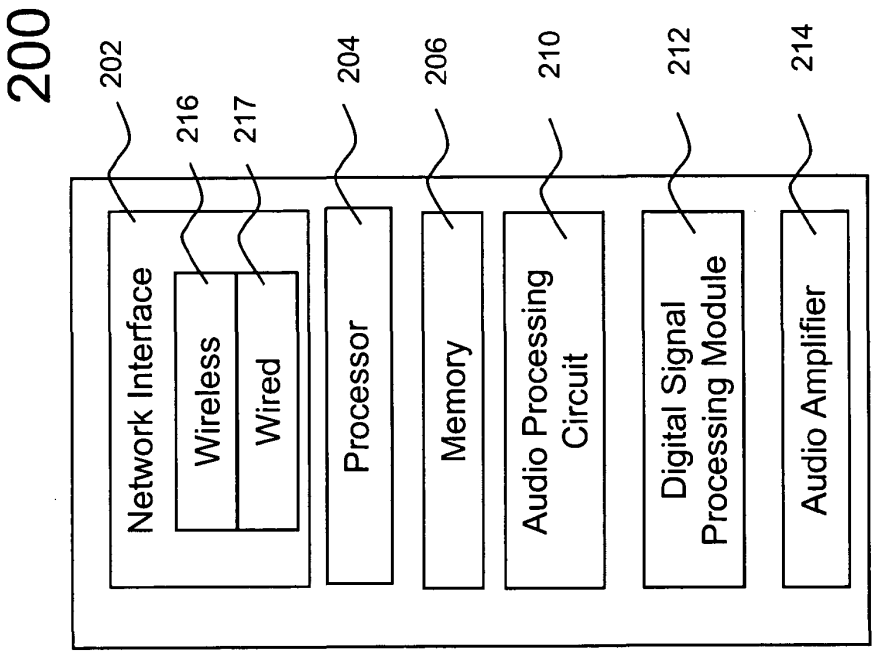

200
202
216
217
204
206
210
212
214
Network Interface
Wireless
Wired
Processor
Memory
Audio Processing Circuit
Digital Signal Processing Module
Audio Amplifier

FIG. 2A

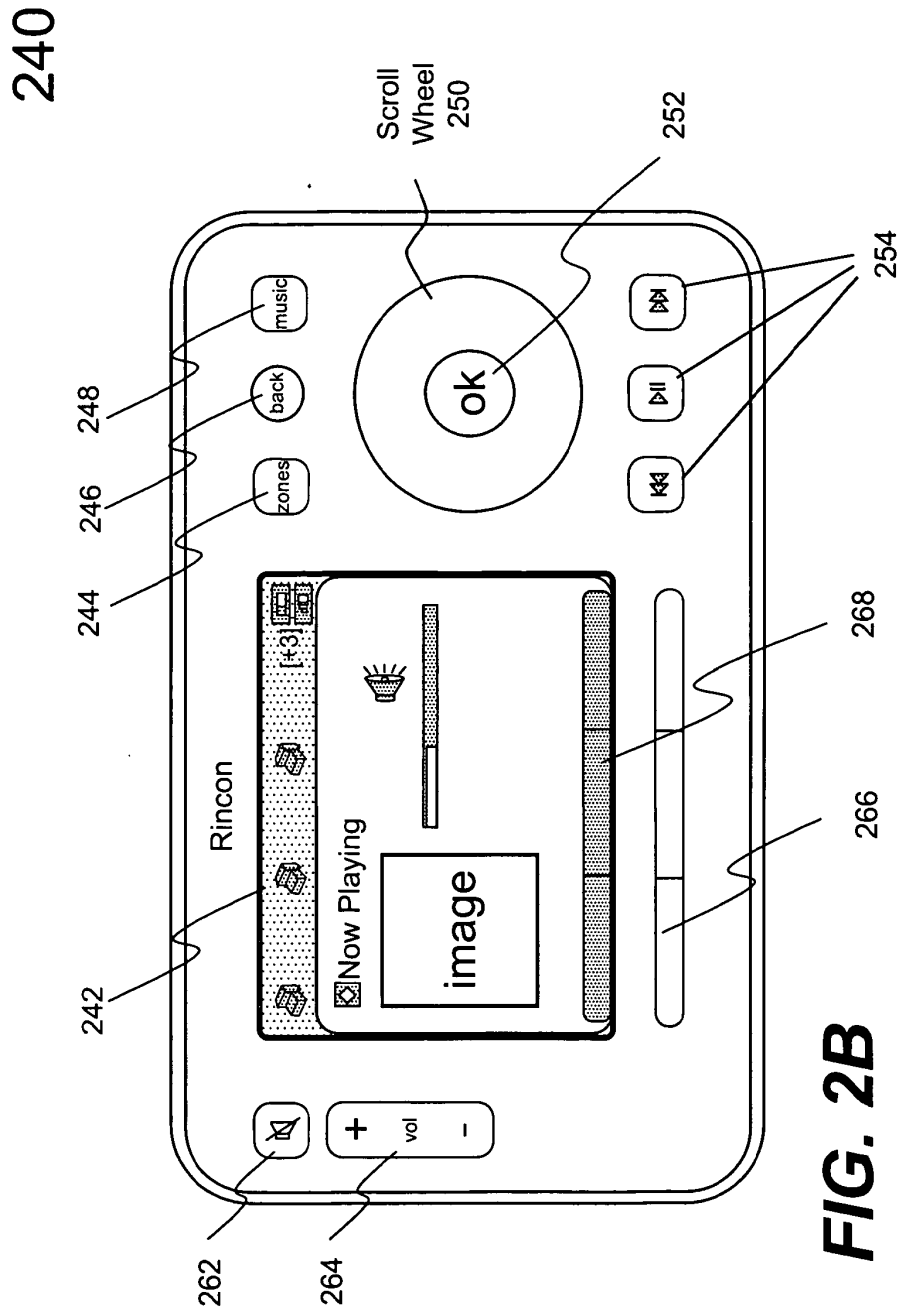

240
Scroll Wheel 250
252
254
248
246
244
242
268
266
262
264
music
back
zones
ok
Rincon
Now Playing
image
vol
+
-

FIG. 2B

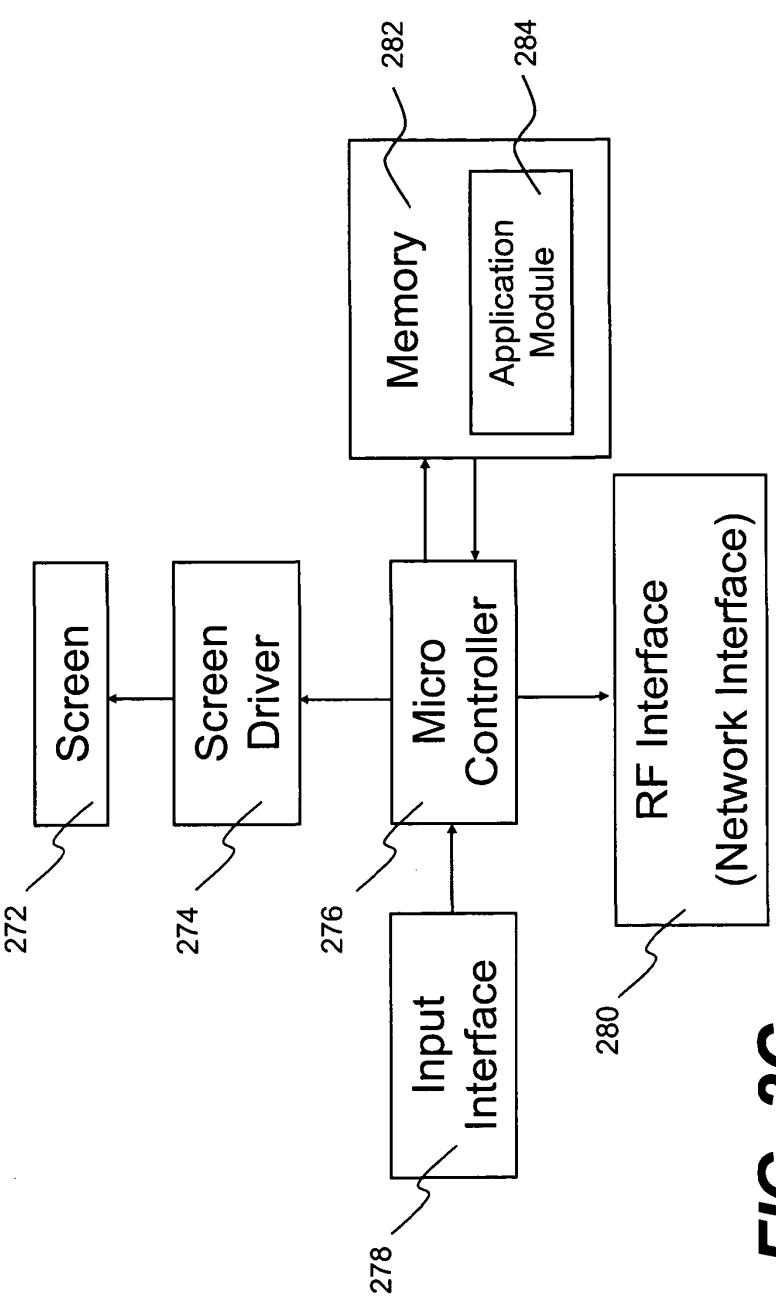

270
Screen
Screen Driver
Micro Controller
Memory
Application Module
RF Interface (Network Interface)
Input Interface
272
274
276
278
280
282
284

FIG. 2C

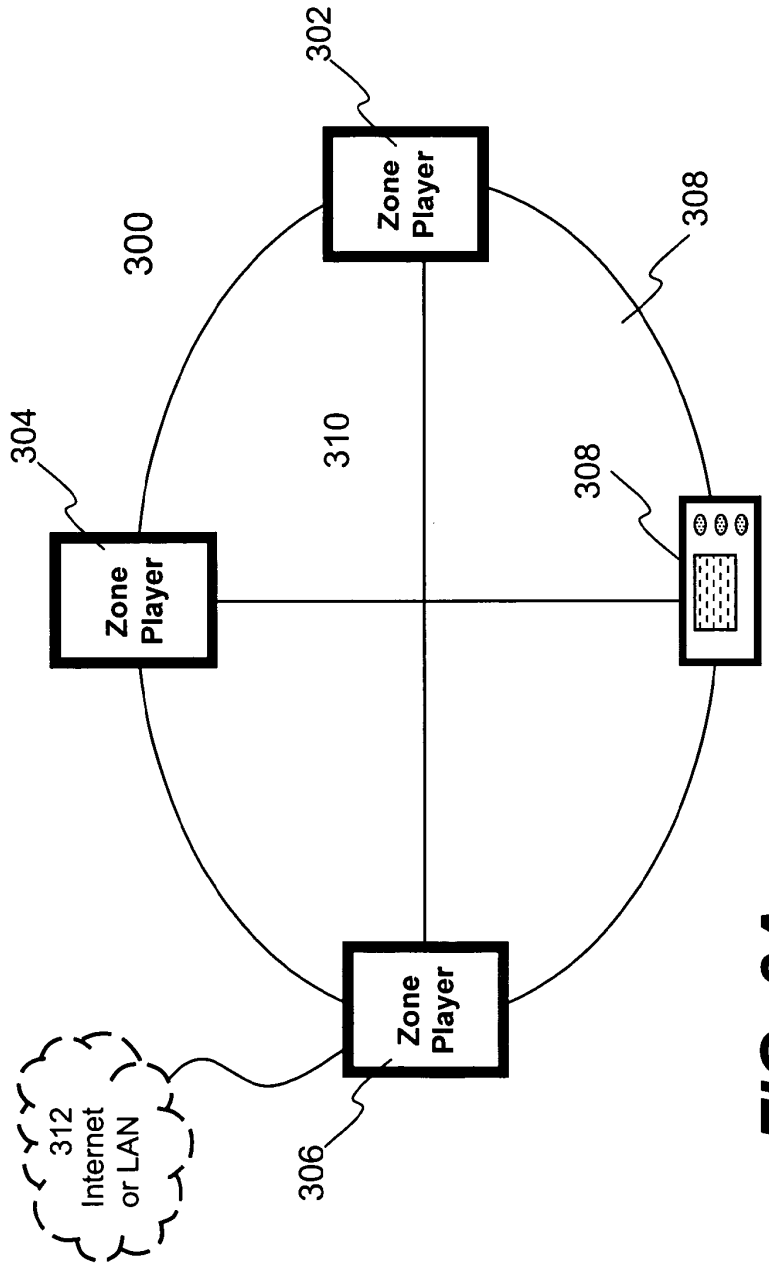

300
302
Zone Player
304
Zone Player
306
Zone Player
308
308
310
312
Internet or LAN

FIG. 3A

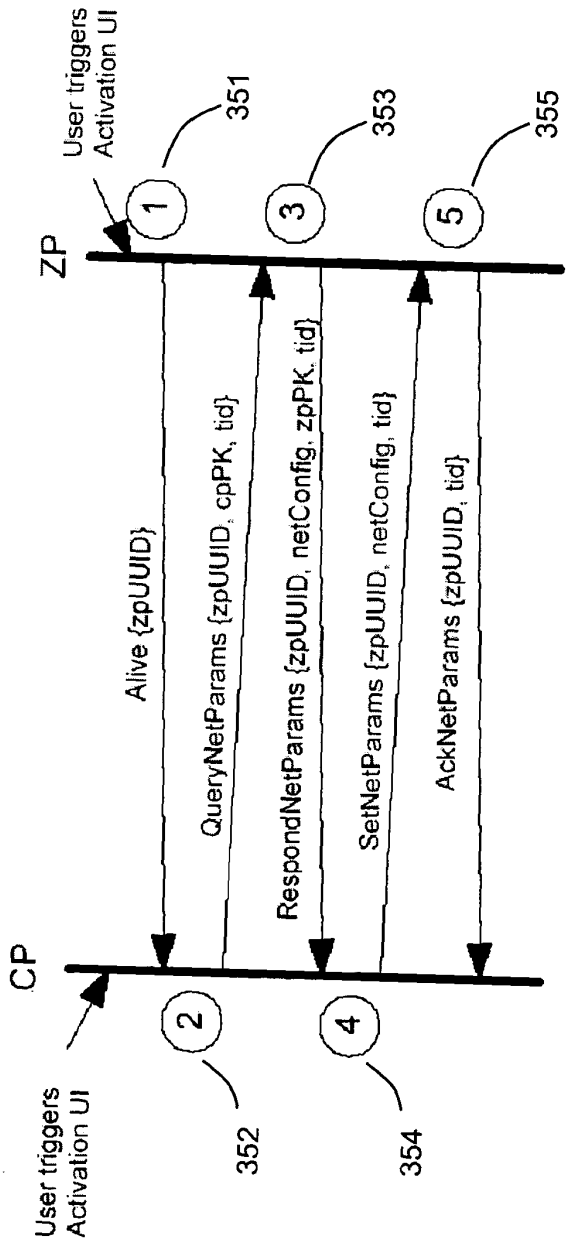

ZP
CP
User triggers Activation UI
User triggers Activation UI
1
2
3
4
5
351
352
353
354
355
Alive {zpUUID}
QueryNetParams {zpUUID, cpPK, tid}
RespondNetParams {zpUUID, netConfig, zpPK, tid}
SetNetParams {zpUUID, netConfig, tid}
AckNetParams {zpUUID, tid}

FIG. 3B

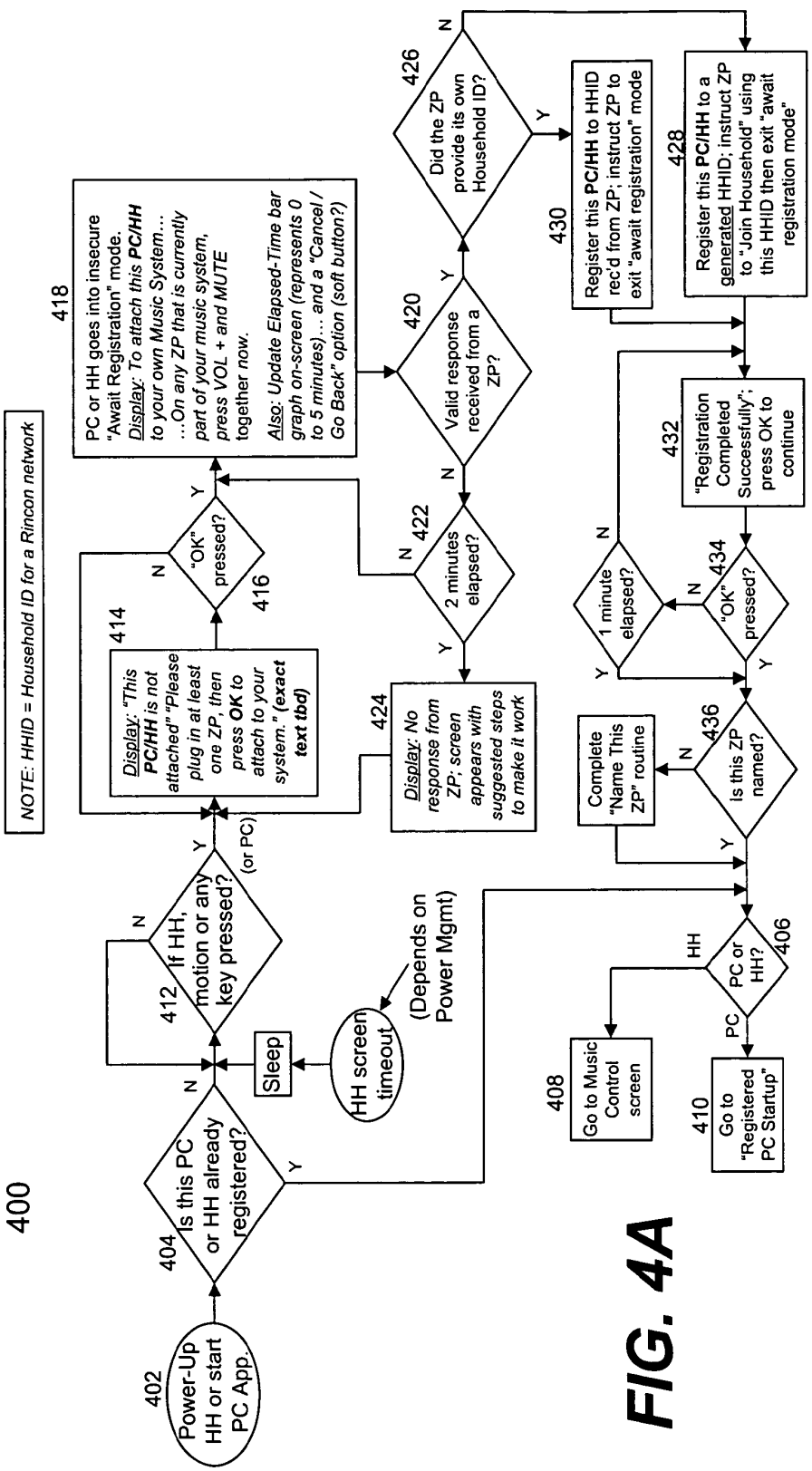

400
NOTE: HHID = Household ID for a Rincon network
402
Power-Up HH or start PC App.
404
Is this PC or HH already registered?
N
Y
Sleep
HH screen timeout
(Depends on Power Mgmt)
412
If HH, motion or any key pressed?
N
Y
(or PC)
414
Display: "This PC/HH is not attached" "Please plug in at least one ZP, then press OK to attach to your system." (exact text tbd)
416
"OK" pressed?
N
Y
418
PC or HH goes into insecure "Await Registration" mode.
Display: To attach this PC/HH to your own Music System... ...On any ZP that is currently part of your music system, press VOL + and MUTE together now.
Also: Update Elapsed-Time bar graph on-screen (represents 0 to 5 minutes)... and a "Cancel / Go Back" option (soft button?)
420
Valid response received from a ZP?
N
Y
422
2 minutes elapsed?
N
Y
424
Display: No response from ZP; screen appears with suggested steps to make it work
426
Did the ZP provide its own Household ID?
N
Y
428
Register this PC/HH to a generated HHID; instruct ZP to "Join Household" using this HHID then exit "await registration mode"
430
Register this PC/HH to HHID rec'd from ZP; instruct ZP to exit "await registration" mode
432
"Registration Completed Successfully"; press OK to continue
434
"OK" pressed?
N
Y
1 minute elapsed?
N
Y
436
Is this ZP named?
N
Y
Complete "Name This ZP" routine
406
PC or HH?
HH
PC
408
Go to Music Control screen
410
Go to "Registered PC Startup"

FIG. 4A

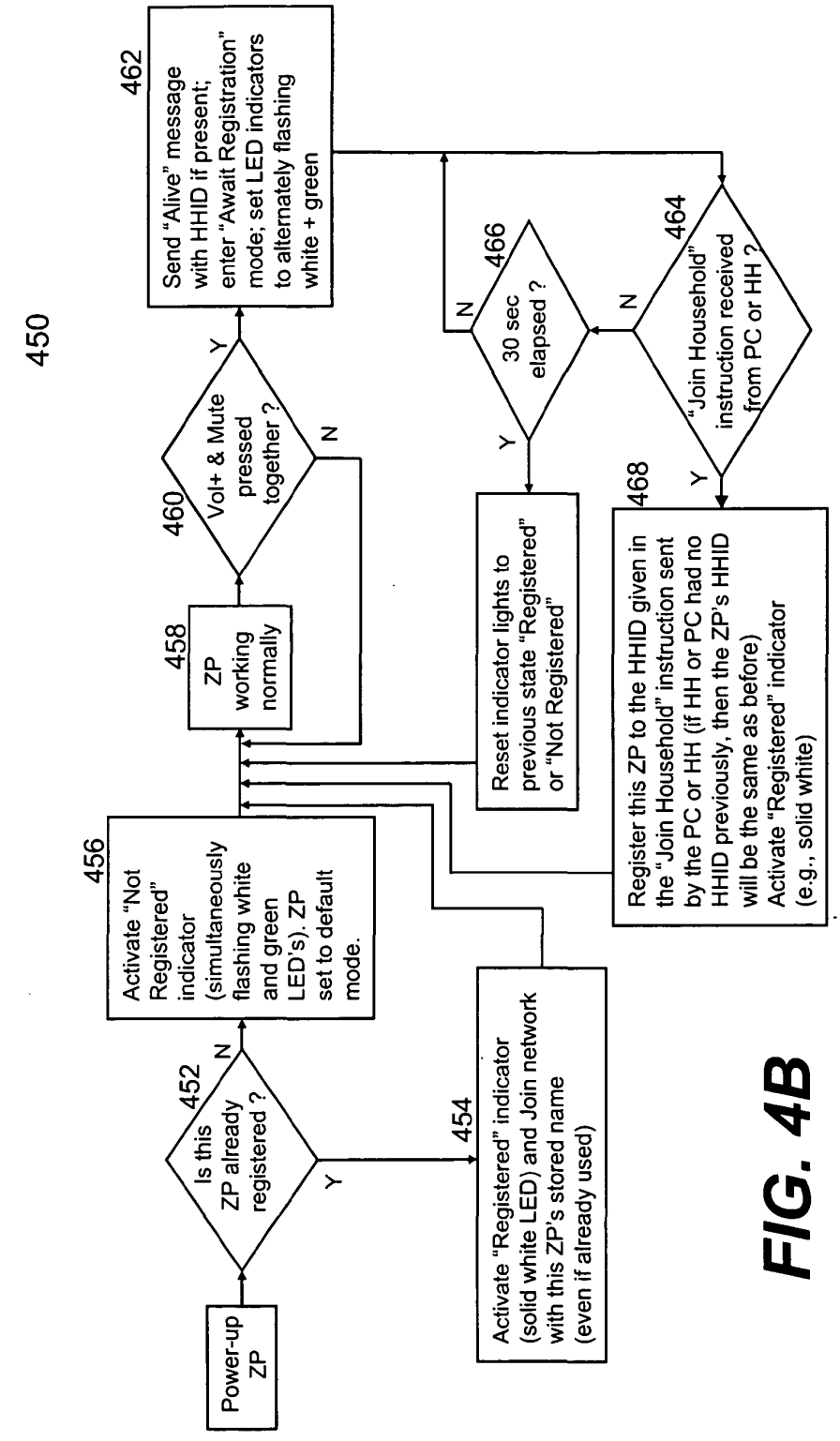
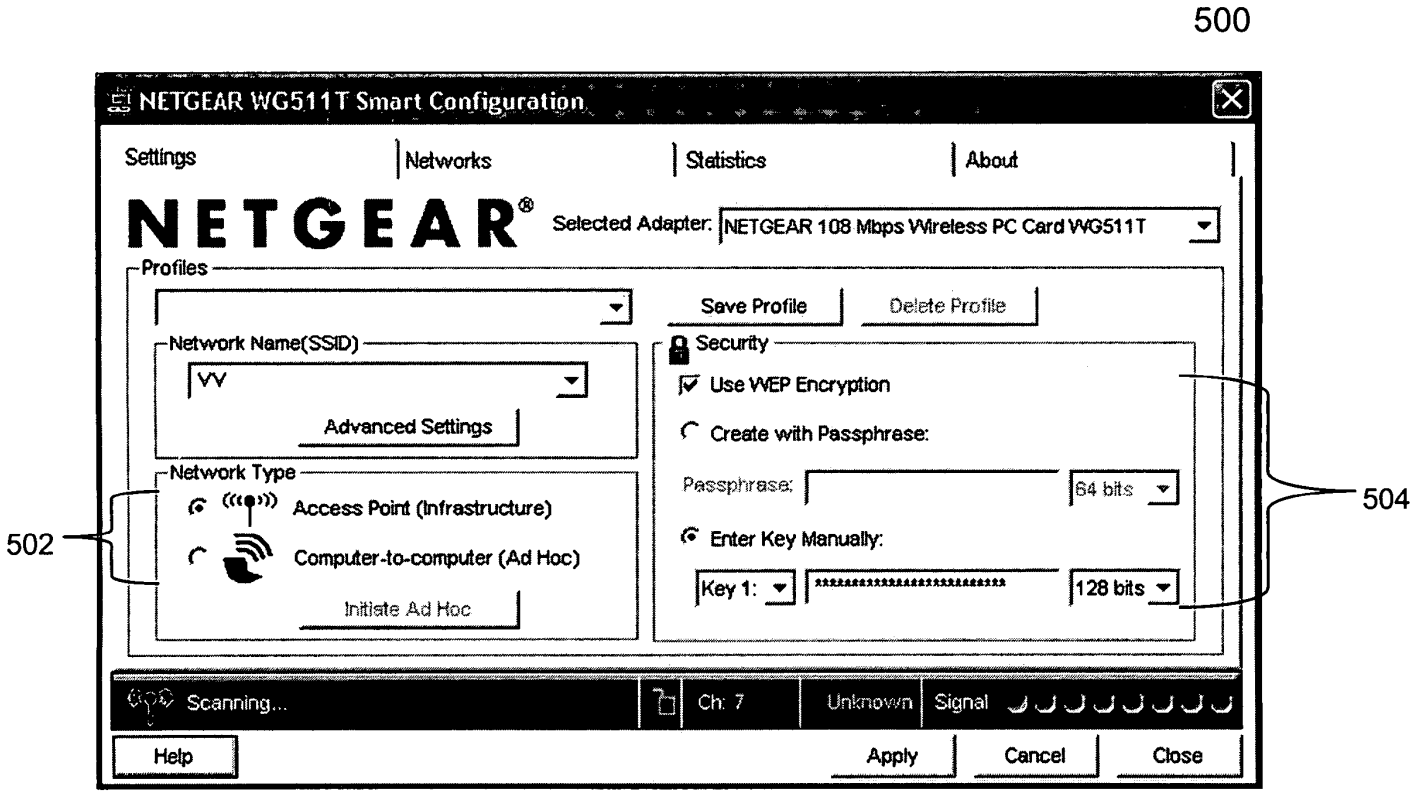

450
Power-up ZP
452
Is this ZP already registered ?
N
Y
454
Activate "Registered" indicator (solid white LED) and Join network with this ZP's stored name (even if already used)
456
Activate "Not Registered" indicator (simultaneously flashing white and green LED's). ZP set to default mode.
458
ZP working normally
460
Vol+ & Mute pressed together ?
Y
N
462
Send "Alive" message with HHID if present; enter "Await Registration" mode; set LED indicators to alternately flashing white + green
464
"Join Household" instruction received from PC or HH ?
N
Y
466
30 sec elapsed ?
N
Y
Reset indicator lights to previous state "Registered" or "Not Registered"
468
Register this ZP to the HHID given in the "Join Household" instruction sent by the PC or HH (if HH or PC had no HHID previously, then the ZP's HHID will be the same as before)
Activate "Registered" indicator (e.g., solid white)

FIG. 4B



(Prior Art)

FIG. 5

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:	Nicholas A.J. Millington	Nonprovisional Application Number (if known):	
Title of Invention:	Playback Device Connection		

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 /Brandon J. Kennedy/	Date March 11, 2019
Name (Print/Typed) Brandon J. Kennedy	Practitioner Registration Number 67,894

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

☐ *Total of _____ forms are submitted.

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

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

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.

ABSTRACT

An example playback device includes programming to perform functions including detecting a triggering event that causes the playback device to transmit a first message indicating that the playback device is available for setup. The functions also include receiving a response to the first message that facilitates establishing an initial communication path with a computing device operating on a secure wireless local area network (WLAN), where the initial communication path is outside of the secure WLAN. The functions also include receiving, from the computing device via the initial communication path, a second message containing network configuration parameters for the secure WLAN including an identifier of, and a security key for, the secure WLAN. The functions also include using the network configuration parameters to connect to the secure WLAN and transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN.

CLAIMS

We Claim:

1. A playback device comprising:

a network interface that is configured to provide an interconnection with at least one data network;

at least one processor;

a non-transitory computer-readable medium; and

program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup;

while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device operating on a secure wireless local area network (WLAN), wherein the initial communication path is outside of the secure WLAN;

receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;

using the network configuration parameters to connect to the secure WLAN; and

transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN.

2. The playback device of claim 1, wherein the triggering event comprises one of (a) powering on the playback device or (b) receiving user input via a physical interface of the playback device.

3. The playback device of claim 1, wherein the computing device comprises a controller device of a networked audio system.

4. The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

after receiving the second message, providing an indication that the playback device has successfully received the network configuration parameters for the secure WLAN.

5. The playback device of claim 4, wherein providing the indication comprises transmitting, to the computing device via the initial communication path, at least a third message indicating that the playback device has successfully received the network configuration parameters;

6. The playback device of claim 4, wherein providing the indication comprises providing an indication that the playback device has successfully connected to the secure WLAN using the network configuration parameters.

7. The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

after connecting to the secure WLAN, establishing a new networked audio system on the secure WLAN.

8. The playback device of claim 1, further comprising program instructions stored on the non-

transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

after connecting to the secure WLAN, joining an existing networked audio system operating on the secure WLAN.

9. The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

receiving, from the computing device, a command to assign a name to the playback device.

10. The playback device of claim 1, wherein communicating with the computing device via the secure WLAN comprises receiving a command related to playback of audio content.

11. The playback device of claim 10, wherein the command comprises a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN, and wherein the playback device further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN.

12. The playback device of claim 1, wherein the second message comprises a command for the playback device to adopt the network configuration parameters.

13. The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor,

cause the computing device to perform functions comprising:

after transitioning to communicating with computing device via the secure WLAN, receiving, from the computing device, a command to form a group with at least a first playback device of a networked audio system such that the playback device is configured to play back audio content in synchrony with at least the first playback device.

14. A non-transitory, computer-readable storage medium, wherein the non-transitory computer-readable storage medium is provisioned with program instructions that are executable to cause a playback device to perform functions comprising:

detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup;

while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device operating on a secure wireless local area network (WLAN), wherein the initial communication path is outside of the secure WLAN;

receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;

using the network configuration parameters to connect to the secure WLAN; and

transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN.

15. The non-transitory, computer-readable storage medium of claim 14, wherein the triggering event comprises one of (a) powering on the playback device or (b) receiving user input via a physical interface of the playback device.

16. The non-transitory, computer-readable storage medium of claim 14, wherein the non-transitory computer-readable medium is also provisioned with program instructions that are executable to cause the playback device to perform functions comprising:

after receiving the second message, providing an indication that the playback device has successfully received the network configuration parameters for the secure WLAN.

17. The non-transitory, computer-readable storage medium of claim 16, wherein providing the indication comprises transmitting, to the computing device via the initial communication path, at least a third message indicating that the playback device has successfully received the network configuration parameters;

18. The non-transitory, computer-readable storage medium of claim 16, wherein providing the indication comprises providing an indication that the playback device has successfully connected to the secure WLAN using the network configuration parameters.

19. The non-transitory, computer-readable storage medium of claim 14, wherein communicating with the computing device via the secure WLAN comprises receiving a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN, and wherein the non-transitory computer-readable medium is also provisioned with program instructions that are executable to cause the playback device to perform functions comprising:

in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN.

20. A method comprising:

detecting, by a playback device, a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the

playback device is available for setup;

while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device operating on a secure wireless local area network (WLAN), wherein the initial communication path is outside of the secure WLAN;

receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;

using the network configuration parameters to connect to the secure WLAN; and

transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN.

Application for a United States Patent United States Patent and Trademark Office

Title: Playback Device Connection

Inventor(s): Nicholas A.J. Millington
Paul V. Hainsworth

Assignee: Sonos, Inc.
614 Chapala St.
Santa Barbara, CA 93101

CROSS REFERENCE TO RELATED APPLICATIONS

[0000] This application is a continuation of U.S. App. 15/091,113, filed on Apr. 5, 2016; U.S. App. 14/486,667, filed on Sep. 15, 2014, and issued on Jan. 9, 2018, as U.S. Pat. 9,866,447; U.S. App. 14/486,667 is a continuation of U.S. App. 13/618,829, filed on Sep. 14, 2012, and issued Oct. 21, 2014, as U.S. Pat. 8,868,698; U.S. App. 13/618,829 is a continuation of U.S. App. 11/147,116 filed on Jun. 6, 2005, and issued Dec. 4, 2012, as U.S. Pat. 8,326,951; U.S. App. 11/147,116 claims priority to provisional application 60/577,284 filed Jun. 5, 2004, and which is now expired. The entire contents of the 15/091,113; 14/486,667; 13/618,829; 11/147,116; and 60/577,284 applications are incorporated herein by reference.

BACKGROUND

Field of the Invention

[0001] The invention is generally related to the area of multimedia technologies in consumer electronics industry. More particularly, the invention is related to techniques for connecting various devices to a network for secure communications with a minimum of human interaction and technical ability.

The Background of Related Art

[0002] Consumer electronics devices that operate using wireless or wired Ethernet standards are often subject to the same complicated set-up process as a wireless computer network. Typically, the person who sets up the wireless network must have at least some knowledge about IP (Internet Protocol) networking and Ethernet (e.g., 802.3, 802.11), such as addressing, security, broadcast, unicast, etc. Such a skill requirement is generally acceptable for computer-to-computer networks, which is typically done by an IT professional. However, it is impractical to require average consumers to have such knowledge to hook up consumer electronic devices, such as home entertainment products that use wireless/wired Ethernet connectivity.

[0003] FIG. 5 shows an exemplary setting **500** for connecting a computer to a wireless network. The setting **500** is typically displayed when a user is ready to connect the computer to a wireless network so that the user can enter relevant information in the setting **500.** Although the setting **500** requires very little information to make the computer connected to the network, the information is relatively technical to the average consumers. First, the user has to know what type of network the computer is going to be connected to. There are two choices **502,** Access Point (infrastructure) and Computer-to-computer (Ad Hoc). The distinction between these two types of network is a common knowledge to the IT professionals yet can be a difficult question to the average consumers. Further even if the user knows the difference, there are more questions or options related to the security settings in **504,** which evidently requires some good understanding about the network security over the wireless network.

[0004] For home entertainment products, there is a clear need to create simple methods of setting up and maintaining a secure wireless/wired in-home network with minimum human interventions.

SUMMARY OF THE INVENTION

[0005] This section is for the purpose of summarizing some aspects of the present invention and to briefly introduce some preferred embodiments. Simplifications or omissions in this section as well as in the abstract or the title of this description may be made to avoid obscuring the purpose of this section, the abstract and the title. Such simplifications or omissions are not intended to limit the scope of the present invention.

[0006] In general, the present invention pertains to techniques for automatically configuring necessary parameters of a device to be coupled to a network. According to one aspect of the present invention, an Ad-hoc (wireless or wired) network is established to facilitate communications among a group of devices. When a new device

is added to the network, a rudimentary communication path is initially established between one of the devices in the network ("first device") and the new device ("second device") such that necessary parameters (e.g., SSID, WEP security, channel frequency) can be exchanged for the second device to function properly in the network. To ensure the parameters are exchanged in a secure fashion, an additional public security procedure can be used between the two devices.

[0007] According to another aspect of the present invention, a first device that may be or may not be the device in the network broadcasts a message including probing datagrams in compliance with the standard IP broadcast. The rudimentary communication path may be established after the second device responds to the message from the first device. According to yet another aspect of the present invention, such an automatic configuration process is only started when a user is indeed ready to do so. In general, a mechanism is provided and accessible by the user to activate the process. As such, no incident or unwanted configuration process could be initiated without the approval of the user. In one embodiment, the second device is equipped with two buttons that must be pressed simultaneously to activate the automatic configuration process.

[0008] The necessary parameters in the second device are subsequently configured in several exchanges of messages with the first device. At least some of the messages are encrypted. As a result, the second device is automatically configured to operate correctly in the network with a minimum of human intervention and technical ability. In an exemplary application of the present invention for an audio system with a controller and multiple zone players, an Ad-hoc network is formed among the controller and the zone players, where the network may be wired or wireless or a mixture of both. In one case, either a handheld controller or a zone player (referred to as an access device) is coupled to an access point of a LAN. An Ad-hoc network can be thus formed based on the access device. The remaining (unconfigured) zone players may be coupled to the network whenever desired, all with minimum human intervention. As a

result, any one of the zone players may communicate with each other to share or distribute audio sources available on the Internet and reproduce sounds together or separately.

[0009] The present invention may be implemented in many forms including software, hardware or a combination of both as method, process, or system. According to one embodiment of the present invention, the present invention is a method for providing a first device and a second device for the network, activating the second device intentionally to automatically configure necessary parameters with the first device, establishing automatically a rudimentary communication path between the first device and the second device by scanning all available transmission channels allocated in accordance with a protocol; and exchanging messages between the first device and the second device over the rudimentary communication path till the second device is fully operating with the first device.

[0010] According to another embodiment of the present invention, the present invention is a system for establishing a network for a group of devices, the system comprises at least one of the devices provided to remotely control operations of one or more of the other devices, one of the devices (hereinafter "first device") configured to establish automatically respective rudimentary communication paths for probing communication, each of the rudimentary communication paths being with one of the other devices, wherein an automatic configuration process takes place only in one of the other devices after the user authorizes the one of the other devices to start the automatic configuration process, and wherein the automatic configuration process causes several messages to be exchanged between the first device and one of the other devices, some of the messages carry information pertaining to an appropriate

transmission channel, an identifier of the network and a security key for subsequent communication, the some of the messages are encrypted.

[0011] According to yet another embodiment of the present invention, the present invention is a system for establishing a network for a group of devices, the system comprises a plurality of zone players, each equipped with a mechanism that is once manually activated by a user, an automatic configuration process starts, wherein one of the zone players is coupled to a local area network as an access device; and at least a controller provided to remotely control operations of one or more of the zone players, wherein the access device establishes automatically respective rudimentary communication paths, each with the controller or one of the remaining zone players, the automatic configuration process takes places in the controller and each of the remaining zone players after the user manually activates the automatic configuration process respectively in the controller and each of the remaining z ne players, and wherein the automatic configuration process causes several messages to be exchanged between the access device and any one of the controller and the remaining zone players that have been activated for the automatic configuration process, some of the messages carry information pertaining to a transmission channel, an identifier of the network and a security key for subsequent communication, at least some of the messages are encrypted.

[0012] According to still another embodiment of the present invention, the present invention is a software product to be executable in a device for establishing a network for a group of devices, the software product comprises program code for activating a second device, when requested, to automatically configure necessary parameters with a first device, program code for establishing automatically a rudimentary communication path with the first device by scanning all available transmission channels allocated in accordance with a protocol, and program code for exchanging messages between the

first device and the second device over the rudimentary communication path till the second device is fully operating with the first device.

[0013] According to still another embodiment of the present invention, the present invention is a method for establishing a network for a group of devices, the method comprises providing a plurality of zone players, each equipped with a mechanism that once is manually activated by a user, an automatic configuration process starts, wherein at least a controller is provided to remotely control operations of one or more of the zone players; coupling one of the zone players to a local area network as an access device; establishing automatically respective rudimentary communication paths with the access device, each of paths being with the controller or one of the remaining zone players, wherein the automatic configuration process takes place in the controller and each of the remaining zone players after the user manually activates the automatic configuration process respectively in the controller and each of the remaining zone players, and exchanging several messages between the access device and any one of the controller and the remaining zone players that have been activated for the automatic configuration process, wherein some of the messages carry information pertaining to a transmission channel, an identifier of the network and a security key for subsequent communication, and at least some of the messages are encrypted.

[0014] One of the objects, features, and advantages of the present invention is to provide techniques that facilitate automatic configuration of devices to be coupled to a network with minimum human intervention.

[0015] Other objects, features, and advantages of the present invention will become apparent upon examining the following detailed description of an embodiment thereof, taken in conjunction with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

[0017] FIG. 1 shows an exemplary configuration in which the present invention may be practiced;

[0018] FIG. 2A shows an exemplary functional block diagram of a player in accordance with the present invention;

[0019] FIG. 2B shows an example of controllers that may be used to remotely control one of more players of FIG. 1;

[0020] FIG. 2C shows an exemplary internal functional block diagram of a controller in accordance with one embodiment of the present invention;

[0021] FIG. 3A shows three zone players and a controller that form an Ad-Hoc network as an example to facilitate the description of an automatic configuration process contemplated in the present invention;

[0022] FIG. 3B shows an embodiment that involves a process of five exchanges of data;

[0023] FIG. 4A shows a flowchart or process according to one embodiment of the present invention;

[0024] FIG. 4B shows another flowchart or process according to one embodiment of the present invention; and

[0025] FIG. 5 shows an exemplary setting for connecting a computer to a wireless network.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0026] The present invention pertains to techniques for automatically configuring necessary parameters of a device to be coupled to a network with minimum human intervention. According to one aspect of the present invention, a wired and/or wireless Ad-hoc network is established to facilitate communications among a group of devices. According to one aspect of the present invention, when a new device is added to the network, a rudimentary communication path is initially established between one of the devices ("first device") in the network and the new device ("second device") such that necessary parameters (e.g., SSID, WEP security, channel frequency) can be exchanged for the new device to function properly in the network. To ensure the parameters are exchanged in a secure fashion, an additional public security procedure can be used between the two devices.

[0027] The detailed description of the present invention is presented largely in terms of procedures, steps, logic blocks, processing, or other symbolic representations that directly or indirectly resemble the operations of devices or systems that can be used on networks. These descriptions and representations are typically use by those skilled in the art to most effectively convey the substance of their work to others skilled in the art.

[0028] Reference herein to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one embodiment of the invention. The appearances of the phrase "in one embodiment" in various places in the specification

are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Further, the order of blocks in process flowcharts or diagrams or the use of sequence numbers representing one or more embodiments of the invention do not inherently indicate any particular order nor imply any limitations in the invention.

[0029] Embodiments of the invention are discussed herein with reference to an audio system with multi-zone capability. However, those skilled in the art will readily appreciate that the detailed description given herein with respect to the audio system is for explanatory purposes as the invention extends beyond these limited embodiments.

[0030] Referring now to the drawings, in which like numerals refer to like parts throughout the several views. FIG. 1 shows an exemplary configuration **100** in which the present invention may be practiced. The configuration may represent, but not be limited to, a part of a residential home, a business building or a living complex with multiple zones. There are a number of multimedia players of which three examples **102, 104** and **106** are shown as audio devices. Each of the audio devices may be installed or provided in one particular area or zone and hence referred to as a zone player herein.

[0031] As used herein, unless explicitly stated otherwise, a track and an audio source are used interchangeably, an audio source or audio sources are in digital format and can be transported or streamed across a data network. To facilitate the understanding of the present invention, it is assumed that the configuration **100** represents a home. Thus, the zone player **102** and **104** may be located in two of the bedrooms respectively while the zone player **106** may be installed in a living room. All of the zone players **102, 104** and **106** are coupled directly or indirectly to a data network **108.** In addition, a computing device **110** is shown to be coupled on the network **108.** In

reality, any other devices such as a home gateway device, a storage device, or an MP3 player may be coupled to the network **108** as well.

[0032] The network **108** may be a wired network, a wireless network or a combination of both. In one example, all devices including the zone players **102, 104** and **106** are coupled to the network **108** by wireless means based on an industry standard such as IEEE 802.11. In yet another example, all devices including the zone players **102, 104** and **106** are part of a local area network that communicates with a wide area network (e.g., the Internet).

[0033] All devices on the network **108** may be configured to download and store audio sources or receive streaming audio sources. For example, the computing device **110** can download audio sources from the Internet and store the downloaded sources locally for sharing with other devices on the Internet or the network **108.** The zone player **106** can be configured to receive streaming audio source and share the source with other devices. Shown as a stereo system, the device **112** is configured to receive an analog source (e.g., from broadcasting) or retrieve a digital source (e.g., from a compact disk). The analog sources can be converted to digital sources. In accordance with the present invention, all audio sources, regardless of where they are located or how they are received, may be shared among the devices on the network **108.**

[0034] Any device on the network **108** may be configured to control operations of the zone players **102, 104** and **106.** In particular, one or more controlling devices **140** and **142** are used to control zone players **102, 104** and **106** as shown in FIG. 1. The controlling devices **140** and **142** are preferably portable and remotely control the zone players via wireless means (e.g., infrared, radio, wireless standard IEEE 802.11b or 802.11g). In one embodiment, besides controlling an individual zone player, the controlling device **140 or 142** is configured to manage audio sources and other

characteristics of all the zone players regardless where the controlling device **140** or **142** is located in a house or a confined living complex.

[0035] Referring now to FIG. 2A, there is shown an exemplary functional block diagram of a zone player **200** in accordance with the present invention. The zone player **200** includes a network interface **202,** a processor **204,** a memory **206,** an audio processing circuit **210,** a digital signal processing module **212,** and an audio amplifier **214.** The network interface **202** facilitates a data flow between a data network (i.e., the data network **108** of FIG. 1) and the zone player **200** and typically executes a special set of rules (i.e., a protocol) to send data back and forth. One of the common protocols is TCP/IP (Transmission Control Protocol/Internet Protocol) commonly used in the Internet. In general, a network interface manages the conversion of an audio source or file into smaller packets that are transmitted over the data network or reassembles received packets into the original source or file. In addition, the network interface **202** handles the address part of each packet so that it gets to the right destination or intercepts packets destined for the zone player **200.**

[0036] The network interface **202** may include either one or both of a wireless interface **216** and a wired interface **217.** The wireless interface **216,** also referred to as a RF interface, provides network interface functions by a wireless means for the zone player **200** to communicate with other devices in accordance with a communication protocol (such as the wireless standard IEEE 802.11a, 802.11b or 802.119). The wired interface **217** provides network interface functions by a wired means (e.g., an Ethernet cable). Depending on implementation, each of the zone players may be equipped with either one or both of the interfaces **216 or 217.** In one embodiment, a zone player, referred to as an access zone player, including both of the interfaces **216** and **217** is coupled to an access point of an LAN and communicates with other zone players wirelessly. Thus these other zone players may communicate with other devices on a

network or retrieve audio sources via the access zone player. The processor **204** is configured to control the operation of other parts in the zone player **200.** The memory **206** may be loaded with one or more software modules that can be executed by the processor **204** to achieve desired tasks.

[0037] The audio processing circuit **210** resembles most of the circuitry in an audio playback device and includes one or more digital-to-analog converters (DAC), an audio preprocessing part, an audio enhancement part or a digital signal processor and others. In operation, when an audio source (e.g., audio source) is retrieved via the network interface **202,** the audio source is processed in the audio processing circuit **210** to produce analog audio signals. The processed analog audio signals are then provided to the audio amplifier **214** for playback on speakers. In addition, the audio processing circuit **210** may include necessary circuitry to process analog signals as inputs to produce digital signals for sharing with other devices on a network.

[0038] Depending on an exact implementation, the digital signal processing module **212** may be implemented within the audio processing circuit **210** or as a combination of hardware and software. The audio amplifier **214** is typically an analog circuit that powers the provided analog audio signals to drive one or more speakers.

[0039] Referring now to FIG. 28, there is shown an example of a controller **240,** which may correspond to the controlling device **140 or 142** of FIG. 1. The controller **240** may be used to facilitate the control of multi-media applications, automation and others in a living complex. In particular, the controller **240** is configured to facilitate a selection of a plurality of audio sources available on the network, controlling operations of one or more zone players (e.g., the zone player **200)** through a RF interface corresponding to the wireless interface **216** of FIG. 2A. According to one embodiment, the wireless means is based on an industry standard (e.g., infrared, radio, wireless standard IEEE

802.11 a, 802.11b or 802.11g). When a particular audio source is being played in the zone player **200,** a picture, if there is one, associated with the audio source may be transmitted from the zone player **200** to the controller **240** for display. In one embodiment, the controller **240** is used to select an audio source for playback. In another embodiment, the controller **240** is used to manage (e.g., add, delete, move, save, or modify) a playlist.

[0040] The user interface for the controller **240** includes a screen **242** (e.g., a LCD screen) and a set of functional buttons as follows: a "zones" button **244,** a "back" button **246,** a "music" button **248,** a scroll wheel **250,** "ok" button **252,** a set of transport control buttons **254,** a mute button **262,** a volume up/down button **264,** a set of soft buttons **266** corresponding to the labels **268** displayed on the screen **242.**

[0041] The screen **242** displays various screen menus in response to a selection by a user. In one embodiment, the "zones" button **244** activates a zone management screen or "Zone Menu" to allow a user to group players in a number of desired zones so that the players are synchronized to play an identical playlist or tracks. The "back" button **246** may lead to different actions depending on the current screen. In one embodiment, the "back" button triggers the current screen display to go back to a previous one. In another embodiment, the 'back" button negates the user's erroneous selection. The "music" button **248** activates a music menu, which allows the selection of an audio source (e.g., a song track) to be added to a playlist (e.g., a music queue) for playback.

[0042] The scroll wheel **250** is used for selecting an item within a list, whenever a list is presented on the screen **242.** When the items in the list are too many to be accommodated in one screen display, a scroll indicator such as a scroll bar or a scroll arrow is displayed beside the list. When the scroll indicator is displayed, a user may

rotate the scroll wheel **250** to either choose a displayed item or display a hidden item in the list. The "ok" button **252** is use to confirm the user selection on the screen **242** or activate a playback of an item.

[0043] There are three transport buttons **254,** which are used to control the effect of the currently playing track. For example, the functions of the transport buttons may include play/pause and forward/rewind a track, move forward to the next track, or move backward to the previous track. According to one embodiment, pressing one of the volume control buttons such as the mute button **262** or the volume up/down button **264** activates a volume panel. In addition, there are three soft buttons **266** that can be activated in accordance with the labels **268** on the screen **242.** It can be understood that, in a multi-zone system, there may be multiple audio sources being played respectively in more than one zone players. The music transport functions described herein shall apply selectively to one of the sources when a corresponding zone player is selected.

[0044] FIG. 2C illustrates an internal functional block diagram of an exemplary controller **270,** which may correspond to the controller **240** of FIG. 2B. The screen **272** on the controller **270** may be a LCD screen. The screen **272** communicates with and is commanded by a screen driver **274** that is controlled by a microcontroller (e.g., a processor) **276.** The memory **282** may be loaded with one or more application modules **284** that can be executed by the microcontroller **276** with or without a user input via the user interface **278** to achieve desired tasks. In one embodiment, an application module is configured to facilitate automatic establishment of a wireless connection with a network or another device. In another embodiment, an application module is configured to facilitate automatically configuring itself after communicating with another configured device. It should be noted that similar application modules may also be included in the memory 206 of FIG. 2A. As a result, either a zone player or a controller may be

automatically configured to communicate over a network, provided such an automatic configuration is intended by a user.

[0045] The controller **270** includes a network interface **280** referred to as a RF interface **280** that facilitates wireless communication with a zone player via a corresponding wireless interface or RF interface thereof. The controller **270** may control one or more zone players, such as **102, 104** and **106** of FIG. 1. Nevertheless, there may be more than one controllers, each preferably in a zone (e.g., a room) and configured to control any one and all of the zone players.

[0046] It should be pointed out that the controller **240** in FIG. 2B is not the only controlling device that may practice the present invention. Other devices that provide the equivalent control functions (e.g., a computing device, a PDA, a hand-held device, and a laptop computer) may also be configured to practice the present invention. In the above description, unless otherwise specifically described, it is clear that keys or buttons are generally referred to as either the physical buttons or soft buttons, enabling a user to enter a command or data.

[0047] It is assumed that a user has obtained an audio system that includes a set of zone players and a controller. Although it is possible to connect each of the zone players and the controller to a network, the requirement for extra network cards, cables and a hub/switch/router makes the idea unattractive. The introduction of wireless networking has allowed for an implementation without these requirements. FIG. 3A shows that there are three zone players **302, 304** and **306** and a controller **308** that form a network branch that is also referred to as an Ad-Hoc network **310.** In one embodiment, the network **310** is pure wireless. In another embodiment, the network **310** is wired or a combination of wired and wireless. In general, an Ad-Hoc (or "spontaneous") network is a local area network or other small network in which there is

no one access point for all traffics. With an established Ad-Hoc network, the devices **302, 304, 306** and **308** can all communicate with each other in 'peer-to-peer' style of communication. Furthermore, any device may come/go from the network and the network will automatically reconfigure itself without needing the user to reconfigure the network.

[0048] By the Ad-Hoc network **310,** the devices **302, 304, 306** and **308** may share or exchange one or more audio sources and be grouped to play identical or different audio sources. For example, the devices **302** and **304** are grouped to play back one piece of music, and at the same time, the device **306** plays back another piece of music. In other words, the devices **302, 304, 306** and **308** as shown in FIG. 3A form a HOUSEHOLD that distribute audio and/or reproduce sound. As used herein, the term HOUSEHOLD (always in caps to disambiguate from the user's domicile) is used to represent a collection of networked devices that are cooperating to provide an application or service. An instance of a HOUSEHOLD is identified with a Household ID (or HHID).

[0049] In one embodiment, an HHID is a short string or an identifier that is computer-generated to ensure that it is unique. Accordingly, the network **310** may be characterized by a unique HHID and a unique set of configuration variables or parameters, such as Channels (i.e., respective frequency bands), SSID (a sequence of alphanumeric characters as a name of a wireless network), and WEP keys (wired equivalent privacy, or simply security keys). In one embodiment, SSID is simply set to be the same as HHID. One of the aspects of the present invention is to provide a bootstrap procedure that enables automatic and simple establishment of these configuration parameters in each device within a HOUSEHOLD to enable communications among the devices.

[0050] In general, each HOUSEHOLD includes two types of network nodes:

- Control Point (CP) - it controls the overall network setup process and sequencing, including an automatic generation of required network parameters (e.g., WEP keys). In one embodiment, it also provides the user with a HOUSEHOLD configuration user interface. The CP function is typically provided by a computer running a CP application module, or by a handheld controller (e.g., the controller **308)** also running CP application module.
- Zone Player (ZP) - the ZP is any other device on the network that is placed to participate in the automatic configuration process. It should be noted that ZP, as a notation used herein, includes the controller **308** or a computing device.

[0051] The configuration of a HOUSEHOLD involves multiple CP's and ZP's that rendezvous and establish a known configuration such that they can use standard networking protocol (e.g., IP over Wired or Wireless Ethernet) for communication. In one embodiment, there are two types of networks/protocols: Ethernet - 802.3 and Wireless - 802.11g. Interconnections between a CP and a ZP may use either one of the networks/protocols. A device in the system as a member of a HOUSEHOLD may• connect to both networks simultaneously. In an environment that has both networks in use, it is assumed that at least one device in a system is connected to both as a bridging device, thus providing bridging services between wired/wireless networks for others. The zone player **306** in FIG. 3A is shown to be connected to both networks, for example, the connectivity to the network **312** is based on Ethernet while the connectivity to other devices **302, 304** and **308** is based on Wireless.

[0052] *Establishing a rudimentary communication path.* In reference to FIG. 3A, a zone player is not yet a member of a HOUSEHOLD. It is assumed that the zone player is to be added to become a member of the HOUSEHOLD by a cable or wireless. When the zone player is initially turned on, it executes an embedded module that is configured

to establish a rudimentary communication path with another device (network-enabled). The rudimentary communication path facilitates the automatic configuration of the zone player via the another device. This communication path may operate over wireless and/or Ethernet protocols, as the zone player may be connected to one or both. In operation, the communication path does not cause negative effects on other devices in the vicinity and can reach all other members of the HOUSEHOLD (both CP's and ZP's) if there are any. It should also be noted that the communication path does not have to be direct between two devices and may be bridged by one or more other devices. Because the communication path is only used for initial device configuration, it does not require significant performance or sophisticated functionality. There are at least two elements to establish the communication path: channel selection and packet exchange.

[0053] *Channel Selection.* The selection of an appropriate (RF) transmission channel or simply channel is primarily an exercise in two constraints: finding a channel that is quiet from a protocol (e.g., 802.11) viewpoint, i.e., minimal conflicting wireless traffic, and finding a channel that is quiet from an RF viewpoint, i.e., minimal noise from other signals. Both of these tests may be applied because typically a home environment may have other RF (e.g., 2.4GHz) traffic or potentially other wireless access points. It is generally desirable to use a channel that is free from other RF interference. In any case, it is always desirable to avoid other wireless traffic.

[0054] Channel selection is typically accomplished with a scanning technique, namely the device listens on each channel for a period of time, looking for the presence of wireless beacons and other RF signals. In one embodiment, devices that are configured have a preferred channel for the HOUSEHOLD, devices that are not configured have a pre-defined (default) channel or channels that they rendezvous on. For example, 802.11b/g channel 1 could be pre-configured as the default channel.

Alternatively, multiple channels, with a well-known frequency hopping sequence, could be used by the devices (this would require an aperiodic frequency change interval).

[0055] Many hardware configurations only support reception/transmission on a single channel at a given time. Also there are configured and unconfigured devices that may use different channels for the bootstrap configuration and standard network operations (post-configuration communications). According to one embodiment, it is necessary to forcibly put the devices in a "configuration" mode, whereby they use the appropriate channels for communication.

[0056] *Packet Exchange.* To enable communication between devices that are not part of the same HOUSEHOLD, a packet exchange network infrastructure is developed. Probing messages are sent in such a way that they traverse both the Ethernet and wireless networks, reaching any connected devices. Devices that are already in a HOUSEHOLD constitute a network infrastructure that can be used to exchange unicast and multicast/broadcast network frames between the devices. A device that is not yet in the HOUSEHOLD has a much more limited networking capability and can only receive data from devices to which it is directly wired, and unencrypted messages broadcast to all wireless networks operating in a particular channel of the RF spectrum.

[0057] In general, an IP address of a new device is not known to any members of the HOUSEHOLD. If the device is purely wireless, it may not have an IP address at all, or it may have an automatically assigned IP address that is inaccessible to other devices with IP addresses respectively assigned by a DHCP server. To allow devices that are not members of the HOUSEHOLD to join the HOUSEHOLD, a transport may be constructed that can get data one "hop" beyond the HOUSEHOLD network infrastructure.

[0058] In one embodiment, packets of data are broadcasted among the members of the HOUSEHOLD. The packets of data comprise a mixture of "probe" datagrams and standard IP broadcast. For example, the 802.11 "probe" datagrams are used for the inherent ability to cross wireless network boundaries. In other words, the "probe" datagrams can be received by all listeners (i.e., other devices) on the channel, even those that are not configured with an SSID, because they are sent to the broadcast BSS (e.g., FF:FF:FF:FF:FF:FF) to which all devices may be configured to listen. A standard IP broadcast is used on the wired network segments and the HOUSEHOLD network infrastructure to enable a PC-based controller to participate while running with standard user privileges (which allow access only to IP-based network services). Used together as described below, the combination of the "probe" datagrams and IP broadcast provides for a broadcast datagram transport that allows even devices that have not had any networking parameters configured to communicate.

[0059] In general, the probe datagrams comprise a number of elements to facilitate the configuration of other devices to join the HOUSEHOLD. In one embodiment, each of the elements carries up to 255 bytes of data. An element contains data payload for each message used by the bootstrap procedure to invite others to join the HOUSEHOLD. This element is repeated as many times as necessary to carry the complete message. In one embodiment, the IP broadcast datagrams contain the same data payload as the normal IP data payload.

[0060] Messages relating to the bootstrap procedure may be forwarded beyond the boundaries of an existing HOUSEHOLD network infrastructure (including properly configured wireless devices, and the wired network). Similarly, messages originating outside of the HOUSEHOLD network infrastructure may be forwarded into the infrastructure. This forwarding procedure may be accomplished in a mixed wireless/wired network environment without introducing a broadcast storm. A broadcast

storm is a state in which a message that has been broadcast across a network results in more responses than necessary, and each response results in even more responses in a snowball effect, subsequently resulting in a network meltdown. In one embodiment, the network is carefully configured to prevent such a broadcast storm or any illegal broadcast messages. To accomplish this, two flags are included in the message body, for example, "SENT_AS_PROBE" and "SENT_AS_IP_BROADCAST". When a device receives a "probe" message, assumed using "Sonos Netstart" SSID (or the broadcast BSS, as with all probe requests), it forwards the message as an IP broadcast message (after setting the "SENT_AS_IP_BROADCAST" flag) if the SENT_AS_IP_BROADCAST flag is not already set. Similarly, when it receives an IP broadcast with a UDP payload address to an appropriate port (e.g., port number 6969), it forwards the message as a "probe" datagram (after setting the "SENT_AS_PROBE" flag) if that flag is not already set. This allows messages related to the packet exchange both to enter and to exit the HOUSEHOLD network infrastructure without causing a broadcast storm.

[0061] Using this method of broadcast communication, packets can be sent between any member of the HOUSEHOLD and a device to join the HOUSEHOLD on both Ethernet and wireless networks. The device to join the HOUSEHOLD may be brand new and previously configured with a different network (e.g., a device with a stale configuration in a different household). In addition, if used sparingly, these broadcast messages do not interfere with the normal operation of the network or attached devices. As a result, a communication path on an agreed channel has been established between two devices.

[0062] *Device Discovery.* To minimize impact on existing networks and to improve configuration security, the system requires a user to manually activate the auto-configuration process. This is accomplished by a specific action on each device that is being added to the network. For example, if the user is installing a brand new

HOUSEHOLD, containing one CP and two ZP's, the activation process may be manually activated on each by, for example, powering off and on, pushing a reset button or pushing two or more specific buttons simultaneously. In one embodiment, the CP or ZP is simply powered up by the user, which activates the pre-installed module to start the bootstrap procedure.

[0063] For a ZP:

- If the device is unconfigured (e.g., factory default settings), it will immediately go into a "sleep" mode where it is awaiting an activation command.
- If the device has been previously configured, it will attempt to contact other members of its HOUSEHOLD network.

There are situations in which a ZP is orphaned, namely it is previously configured (e.g., perhaps, with another Ad-hoc network) and now is to be added to the HOUSEHOLD (e.g., the ZP is obtained from a previous owner). In the case of an orphan scenario, the ZP may patiently attempt to contact its original network. It can be perceived that this operation will be unsuccessful but otherwise harmless. Even in this configured state, the device can participate in the rudimentary broadcast communication processes described above.

[0064] For the CP:

- If the device is unconfigured (e.g., factory default settings), it will present the user with a description of how to start the configuration process.
- If the device is configured, it will attempt to contact other members of its HOUSEHOLD network.

The CP may also be an orphaned device, in which case it performs similarly to that of the ZP.

[0065] In both cases, correctly configured devices will establish network communications and make themselves available for normal operation. All devices, including those previously configured, will enter an "activation state" when the user indicates that this is desired. At this point, the configuration process can begin.

[0066] *Device Configuration.* The configuration is carried out by exchanging data between two devices that are not necessarily directly connected. This procedure is carried over a rudimentary communication path as described previously. The sequence of exchanging the data is initiated by the user or some other process, for example, activating a reset button, to trigger the "activation" or configuration mode on the involved devices. Each device executes this sequence, and then exits the activation mode. FIG. 3B shows an embodiment that involves a process of five exchanges of data.

[0067] Each of the data exchanges is referred to as a type of message: Alive, QueryNetParams, RespondNetParams, SetNetParams, and AckNetParams, each is explained as follows:

Alive - a message indicating that a named ZP is available for configuration. The message includes at least a *zpUU/O* which is a globally unique identifier that identifies the ZP sending the message.

QueryNetParams - a request from the CP to the ZP to respond with the ZP's current network configuration information. The request includes at least a *zpUUID, cpPK* (the RSA public key of the CP) and *tid* (a unique transaction identifier).

RespondNetParams - a response to the QueryNetParams. It includes the ZP's network configuration information (HHID, WEP key and RSA public key). For security reasons, the WEP key is encrypted using the CP's public key that is only readable by the CP. The response includes at least a *zpUUID, netConfig(the* ZP's current network configuration parameters), *zpPK, and tid.* It is should be noted that a new ZP, set to

factory defaults, shall have well-known parameter values, allowing the CP to determine that it is unconfigured.

SetNetParams - a command message from the CP to the ZP indicating that the ZP should reconfigure its network parameters. The WEP key is encrypted using the ZP's public key, and therefore only readable by the ZP. The command includes at least a *zpUU/O, netConfig* and *tid.* It should be noted that *netConfig* includes the new configuration parameters for the ZP, as determined by the CP. The ZP should save this value in its network configuration, in some cases, these parameters may match the ZP's existing configuration.

AckNetParams - a response to the SetNetParams messaging. The response indicates that the SetNetParams message was received and that the network configuration contained therein has been successfully applied. The response includes at least a *zpUUID* and a *tid.*

[0068] In operation, after a user activates the configuration process (on both ZP and CP) at 351 in FIG. 38. The CP enters a state where it is willing to accept an Alive message. The CP only remains in this state for a limited (finite) period of time. The ZP enters an activation state where it attempts rendezvous with a CP. The ZP only remains in this state for a limited (finite) period of time. The ZP will periodically transmit an Alive message until it either receives a QueryNetParams message, or exits the activation state.

[0069] At **352,** the CP receives an Alive message. If the CP is in the configuration mode, it will generate a new *tid,* and send a QueryNetParams message and send to the ZP. It should be noted that the CP may or may not have been configured at this point. In either case, it sends the QueryNetParams. At **353,** if it is already in the activation state, the ZP responds to a QueryNetParams with its current network configuration. If the ZP is unconfigured (e.g., factory default settings), it will

return an empty HHID and WEP key. If the ZP is previously configured, it will return its current configuration. The ZP also returns its public key such that the WEP key can be encrypted using the CP's public key.

[0070] At **354,** upon receiving the ZP's current configuration information, the CP decides on a course of action. Most, but not all, of these options result in a SetNetParams message being sent to the ZP. The matrix ofpossible situations:

	GP already configured	*GP not configured*
ZP *already configured*	The CP sends a SetNetParams message to the ZP containing the GP's current net config.	**The CP sets its own config to match the ZP config, and the config process is terminated.**
ZPnot *configured*	**The CP sends a** SetNetParams message **to the ZP containing the CP's current net config.**	**The CP generates new config parameters. The parameters are sent to the ZP in a** SetNetParams **message. The CP sets its own config to these values as well.**

[0071] At **355,** when the ZP receives a SetNetParams message, it reconfigures its own HHID and WEP key to match those contained in the network packet.

Accordingly, the GP determines that it generates new configuration parameters in accordance with the following:

- HHID - this is provided by the user via the CP user interface or automatically generated by the CP.

- SSID - this is automatically generated by the CP (e.g., set to the same value as the HHID).
- WEP Key- this is automatically generated (e.g., using a pseudo-random number generator, seeded with entropy collected by the GP).
- Channel - the GP probes the network looking for an acceptable channel (based on a variety of criteria, which may include traffic and interference from other sources).

[0072] Subsequent to the activation process, any devices that have been reconfigured will attempt to establish normal network communications using their new network configuration parameters. In all of the above steps, if the CP or ZP is not already in the activation state, receipt of any messages is ignored.

[0073] If there are multiple ZP's activated simultaneously, all of the devices could execute this same sequence, independently of each other (the CP is capable of multiple independent sessions). If multiple CP's are activated, each will respond to a ZP's Alive message and will execute the sequence - the first one to deliver the SetNetParams to the ZP will configure it. It should be noted that in this case, the second CP will never get an AckNetParams message (because the ZP has exited the activate state). This will cause a transaction timeout in the second CP, at which point it will typically inform the user of the error, or retry the entire sequence. Should it retry the entire sequence, it will not reprogram the ZP (as described above that the effect of an unconfigured CP talking to a configured ZP).

[0074] *Security.* To ensure that the communication among the members in a HOUSEHOLD by wireless means is secure, there are multiple issues in the auto-configuration that are resolved in the present invention.

1. Typically, the broadcasting messages in packet exchange are unencrypted. However, it is undesirable to transmit sensitive information such as WEP keys over wireless medium without encryption. As described below, public key cryptography is used to ensure that WEP keys are distributed in a secured manner.
2. Because the network configuration process is automated and the data is transmitted over the network, it is desirable to ensure that the process is not started without the approval of the user. Specifically, it must not be possible for a malicious wireless device to surreptitiously program one of the devices. Accordingly, the auto-configuration process is started manually by a user on all devices.
3. When one of the connected devices is removed from the HOUSEHOLD, it can no longer access to the network. This is accomplished with a mechanism on each device that resets it to factory default configuration (e.g., erases WEP keys and other private information).
4. It must be possible for the user to validate that they have correctly configured the right devices and that no other devices have been joined to the network. In one embodiment, this is accomplished with a validation/status user interface on the Control Point.

[0075] *Use of Public Key Cryptography.* The configuration process uses public key cryptography to exchange WEP keys and other information which must not be visible to any party sniffing the network. In one embodiment, this is accomplished in the following manner:

1. There is a designated (e.g., Sanos) certificate authority (CA), an entity that can issue signed public key certificates.

2. Each CP and ZP is factory configured with a unique certificate, public and private key, in a format that supports the RSA algorithm. The certificate is signed and issued by the designated CA, and includes a hash of the MAC address of a device.
3. CP and ZP exchange public keys and WEP keys are encrypted using the public key. In certain circumstances, the devices compare the MAC in received packets with that in the certificate to add an additional layer of security.

[0076] FIG. 4A shows a flowchart or process **400** according to one embodiment of the present invention. The process **400** may be implemented in hardware, software or a combination of both as a method, a system or a process. In one embodiment, the process **400** is implemented for a handheld controller or a computing device. To facilitate the understanding of the process **400,** the description herein is based on a handheld controller, such as the controller **308** of FIG. 3A, which shall not be considered as the limitations to the present invention.

[0077] Typically, a handheld controller (or HH) is equipped with a mechanism to allow a user to reset itself. In some implementation, the reset is simply done when the controller is powered up. At **402,** it is assumed that the controller is powered up. The process **400** goes to **404** to determine whether the controller is configured. By configuration, it means that the controller is ready for communication with other devices (e.g., zone players) that may or may not be on a network, preferably a wireless network. In the context of FIG. 3A, it means that the handheld device **308** is ready to communicate with each or all of the devices **302, 304,** and **306** (assuming that the devices **302, 304,** and **306** have not been configured yet).

[0078] It is assumed that the controller is configured, the process **400** goes to **406** where it determines whether the device is a controller or a computer. As described above, the device may be a controller, a personal computer or other type of device, although it has been assumed to be a controller. Nevertheless, in this embodiment, a step is provided to determine exactly what it is, because a controller and a computer may provide a different display or graphic environment. If the device is indeed a controller, the process **400** goes to **408,** wherein the controller shows a proper screen for a user to proceed with the control of the zone players or replay of certain audios via one or more zone players. If the device is a computer, the computer is typically loaded with a module that is now executed to display an environment (e.g., a graphic user interface or GUI) that allows a user to perform many tasks that may be done on the handheld controller in addition to other tasks that may be assisted by a pointing device (e.g., a mouse) or a keyboard.

[0079] In any case, it is assumed that the device is a controller. Referring back to **404,** it is now assumed that the device is not configured, the process **400** goes to **412** to determine if a user has activated the automatic configuration process. In one embodiment, the controller goes to "sleep" mode after a predefined time should there be no activation of the configuration process. When the user activates the configuration process, the process **400** goes **414** to determine whether the controller itself is coupled to an access point of a network, at least a member of the HOUSEHOLD (e.g., one zone player) is coupled thereto or an Ad-Hoc network. Typically, a GUI is provided for a handheld or a computer. Accordingly, a display with a relevant message is displayed. After it is certain that either the controller itself or a zone player is coupled to a network, a user may press "OK" in the displayed GUI.

[0080] At **418,** should the user desire to start the automatic configuration process now, the user activates the process manually. In one embodiment, there are two

buttons, labeled respectively as "VOL" and "Mute". When these two buttons are pressed at the same time, the automatic configuration process starts. The process **400** goes to **420** to determine whether a valid response is received from a zone player. If not, after a certain time **422,** the process **400** goes back to **418** to reactivate the process or **414** via **424** to remind the user to ensure that the required connection is placed.

[0081] In one embodiment, a handheld controller is configured to facilitate a new zone player to execute a household join process to join the HOUSEHOLD upon an appropriate channel. The channel may be agreed upon between the controller and the zone player as follows:

1) when a reset or two buttons are pushed on the ZonePlayer to 'activate' the household join process, it starts a scan through the available wireless channels, sending the "Alive" datagram for each channel in turn. Sometimes, it cycles through the channels several times;
2) as soon as the ZonePlayer receives a QueryNetParams request address to itself, it stops the channel cycling; and
3) The ZonePlayer remains locked on whatever channel it has stopped cycling until a successful sequence ending in the configuration of the ZonePlayer (at which point it uses the specified channel), or a timeout expires (at which point it returns to its original channel or resumes cycling through channels and sending alive messages if the overall timeout for the activation process has not expired).

[0082] Although the Zone Player performs the channel cycling, the controller may also be configured to perform the channel cycling as well. However, when the controller is, for example, a personal computer, the Zone Player is typically configured to cycle through the available channels.

[0083] In any case, when a valid response is received from the zone player, the process **400** determines whether the zone player provides its own network name (e.g., HHID) at **426.** If the zone player does not have an HHID, which means that the zone player is to be added into a wireless network named after an HHID provided by the device, the process **400** goes to **428** to instruct the zone player to join the wireless network. If the zone player does have an HHID, which means that the device itself is to be added into the wireless network named after the HHID provided by the zone player, the process **400** goes to **430** to exit.

[0084] The automatic configuration process, as described above, is executed. After it is completed, a message or an indication of completion is displayed. After the user acknowledges at **434,** the user is offered to name the zone player, for example, "Dinning" which means that the zone player is in the dinning room. Subsequently, the process **400** goes to **406.**

[0085] For completeness, FIG. 4B shows a flowchart or process **450** that may be also implemented in hardware, software or a combination of both as a method, a system or a process. In one embodiment, the process **450** is implemented for a zone player. To facilitate the understanding of the process **450,** the description herein is based on a zone player, such as the player **302** of FIG. 3A, which shall not be considered as the limitations to the present invention.

[0086] When a zone player is powered up, the process **450** determines whether the zone player is already registered or configured at **452.** There are situations in which the zone player just obtained by a user is already configured, for example, the zone player is a used one (i.e., previously configured). If it is indeed configured, the process **450** goes to **454** where an indication of "registered" is shown. If the zone player is never

configured, the process **450** goes to **456** to indicate such. It is assumed that the zone player works normally at **458** (e.g., through an internal checkup).

[0087] At **460,** a user activates the automatic configuration process by, for example, pressing two buttons, labeled respectively as "VOL" and "Mute", at the same time. The automatic configuration process starts by sending out an Alive message at 462 as described above. At **464,** the zone player awaits a response. If no response is received within or beyond a predefined time, the process **450** goes to **466 or 458** to continue waiting for a response or restart the process. It is assumed that there is a response, and the automatic configuration process continues as shown in FIG. 3B without failure, the process goes to **468** where the zone player is now part of the wireless network named after an HHID received either from a configured device or provided by itself.

[0088] There are numerous functions, benefits and advantages in the present invention. One of them is that the present invention provides techniques for automatically configuring parameters of a device to be coupled to an Ad-hoc network, where the Ad-hoc network forming by a group of devices can be wireless, wired or a combination of both. By way of the present invention, a system including a set of zone players and one or more controllers operates correctly and does not interfere with any existing network. Other functions, benefits and advantages can be appreciated from the detailed description provided above.

[0089] The present invention has been described in sufficient details with a certain degree of particularity. It is understood to those skilled in the art that the present disclosure of embodiments has been made by way of examples only and that numerous changes in the arrangement and combination of parts may be resorted without departing from the spirit and scope of the invention as claimed. Accordingly,

the scope of the present invention is defined by the appended claims rather than the foregoing description of embodiments.

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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):

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Office Action Summary	Application No. 16/298,515	Applicant(s) Millington et al.	
	Examiner GLENFORD J MADAMBA	Art Unit 2451	AIA (FITF) Status No

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

Period for Reply

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

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

Status

1)☑ Responsive to communication(s) filed on 11 March 2019.

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

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

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

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

Disposition of Claims*

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

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

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 is/are rejected.

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

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

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The non-statutory 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. See *In re Goodman*, 11F.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) may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-20 of the instant application {hereinafter Millington '515} are rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable

over claims 1-20 of co-pending application to Millington et al, U.S. Patent Application 16/298,542 {hereinafter Millington '542}. Although the conflicting claims are not identical, they are not patentably distinct from each other.

The subject matter claimed in the instant application is technically disclosed in the co-pending application since the instant application and the co-pending application are claiming common and/or overlapping subject matter. Claims 1, 14, 20 of the instant application and independent claims 1, 13 and 20 of the co-pending application both recite, in part, a playback device performing functions comprising "detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup; while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device operating on a secure wireless local area network (WLAN), wherein the initial communication path is outside of the secure WLAN; receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN; using the network configuration parameters to connect to the secure WLAN; and transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN".

Claims 1-20 of the instant application are drawn to the same invention as that recited by co-pending application to Millington '542; however, claims 1, 13 and 20 of the

co-pending application {Millington '542} recites the added feature(s) of "**while operating on a secure wireless local area network (WLAN), (a) receiving user input indicating that a user wishes to set up a playback device to operate on the secure WLAN and (b) receiving a first message indicating that a given playback device is available for setup**". Claims 1-20 of the co-pending application accordingly anticipates all of the limitations and features recited by claims 1-20 of the instant application {Millington '515}.

In removing these limitations {in the co-pending application}, the scope of the claim(s) is merely broadened by eliminating elements and their functions. It has been held that omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re Karlson, 136 USPQ 184 (CCPA). Also note Ex parte Rainu, 168 USPQ 365 (Bd. App. 1969) (omission of a reference element whose function is not needed would be obvious to one skilled in the art).

Claim Rejections - 35 USC § 102

1. 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.

1. Claims **1, 2, 4, 5, 6, 12, 14, 15, 16, 17, 18, 20** are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by **Ladas** et al (hereinafter Ladas), U.S. Patent Publication 2004/0168081 A1.

As per claim(s) **1, 14, 20,** Ladas discloses particular features of the invention, such as a **playback device comprising:**

a network interface that is configured to provide an interconnection with at least one data network (Ladas: e.g., *Network Interface*_53) [0028] [Fig. 1];

at least one processor (Ladas: e.g., *Processing Unit*_21) [0026] [Fig. 1];

a non-transitory computer-readable medium (Ladas: e.g., 'computer-readable media', such as ROM 24, RAM 25, etc.) [0025] [Fig. 1]; **and**

program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions (Ladas: e.g., *Program Data_38*) [0025] [Fig. 1] **comprising:**

detecting a triggering event that causes the playback device to enter a setup mode (Ladas: e.g., expressly teaches / illustrates in one aspect a **User 'pressing a BIND button'_124 on wireless network interface device_120 of the computing device** to be joined to the 'secure wireless network' ...") [0038] (step 202) [Fig. 5] **in which the playback device transmits at least a first message indicating that the playback device is available for setup** (e.g., "**a '*bind signal*' 206 is transmitted to the access point"** in response to the bind control being activated on

the computing device that the user wants to join to the secure wireless network) [0039] [Figs. 2 & 5];

while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device operating on a secure wireless local area network (WLAN) (Ladas: e.g., expressly teaches in one aspect that "Accordingly, **the access point transmits a '*bind signal*' 212 back to the computing device** that is to join the secure wireless network…") [0039] [Fig. 5]**, wherein the initial communication path is outside of the secure WLAN** (Ladas: e.g., expressly teaches / illustrates in one aspect that "Either a user of the computing device, or a person authorized to control access to the secure network can initiate a bind step to enable the computing device to join the network, and a '**temporary alternate network**' is then created between an access point of the network and the computing device network interface card (NIC)…") [Abstract] (e.g., additionally / expressly teaches that in response to the user pressing the BIND button, "a 'new '***temporary alternate network***' **used only while joining the computing device to the secure wireless network is created** in a step 404; this **'alternate network' is used only by the access device and the computing device when joining the computing device to the 'normal secure network'**…") [0041] [Figs. 5 & 6] (e.g., **'*Join Temp Network*' 410**) [0043] [Fig. 4];

receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN (Ladas: e.g.,

expressly teaches in one aspect that "next, a step 214 carries out a 'key exchange' to initiate a secure transmission from the access point to the computing device. The 'key exchange' produces an encryption key enabling the access point to transmit an **'encrypted message'** that conveys the '***SSID'*** and '***WEP key'*** to the computing device in a step 216…") [0039] (e.g., '***Key Exchange'_214*** / '***WEP Key'_216*** messages) [Fig. 5];

using the network configuration parameters to connect to the secure WLAN (Ladas: e.g., expressly discloses that in step 218, the computing device decrypts the received SSID and WEP key messages and '**acknowledges'** receipt of these parameters) [0039] (e.g., '***ACK'_218***) [Fig. 5] (e.g., expressly discloses / illustrates wherein **the computing device receives the transmitted {secure} 'network credentials' {s420}, '*Decodes Correct Network Credentials* {SSID / WEP Key} *& Attempts to Join the* {Secure} *Network'* {s422}**) [Fig. 7] [0044]; **and**

and transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN (Ladas: e.g., expressly discloses that "In step 430, the computing device is joined to the secure wireless network. Accordingly, the access point responds to the acknowledgement from step 428, and in step 432 'restarts the secure wireless network' with the correct network credentials (e.g., SSID and WEP key, or the WPA key) that were previously provided to the computing device. **Thereafter, the computing device begins normal operation in a step 434, being now able to communicate with each of the other computing devices that are on the 'secure wireless network**'…") [0044] (e.g., ***'Join Completed Network'_218 / 'Restart***

Network with Correct Network Credentials'_432 → 'Begin Normal Operations'_434) [Fig. 7].

Claim(s) **14, 20** recite(s) substantially the same limitations as claim 1, is/are distinguishable only by its/their statutory category (computer-readable media, method), and accordingly rejected on the same basis.

As per claim(s) **2, 15,** Ladas discloses the device **wherein the triggering event comprises one of (a) powering on the playback device or (b) receiving user input via a physical interface of the playback device** (Ladas: e.g., expressly teaches / illustrates in one aspect **a User 'pressing a BIND button' 124 on wireless network interface device 120 of the computing device** to be joined to the 'secure wireless network' ...") [0038] (step 202) [Fig. 5].

Claim(s) **15** recite(s) substantially the same limitations as claim 2, is/are distinguishable only by its/their statutory category (computer-readable media, method), and accordingly rejected on the same basis.

As per claim(s) **4, 16,** Ladas discloses the device **further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:**

after receiving the second message, providing an indication that the playback device has successfully received the network configuration parameters for the secure WLAN (Ladas: e.g., expressly discloses that in step 218, the computing

device decrypts the received SSID and WEP key messages and '**acknowledges'** receipt of these parameters) [0039] (e.g., '***ACK'_218***) [Fig. 5].

Claim(s) **16** recite(s) substantially the same limitations as claim 4, is/are distinguishable only by its/their statutory category (computer-readable media, method), and accordingly rejected on the same basis.

As per claim(s) **5, 17,** Ladas discloses the device **wherein providing the indication comprises transmitting, to the computing device via the initial communication path, at least a third message indicating that the playback device has successfully received the network configuration parameters** (Ladas: e.g., expressly discloses that in step 218, the computing device decrypts the received SSID and WEP key messages and '**acknowledges'** receipt of these parameters) [0039] (e.g., '***ACK'_218***) [Fig. 5].

Claim(s) **17** recite(s) substantially the same limitations as claim 5, is/are distinguishable only by its/their statutory category (computer-readable media, method), and accordingly rejected on the same basis.

As per claim(s) **6, 18,** Ladas discloses the device **wherein providing the indication comprises providing an indication that the playback device has successfully connected to the secure WLAN using the network configuration parameters** (Ladas: e.g., expressly discloses that "**the computing device transmits an 'acknowledgement' to the access point in step 426, and in response, the access point transmits an acknowledgement back to the computing device in step 428**.

In step 430, the computing device is 'joined' to the secure network. Accordingly, the access point responds to the acknowledgement from step 428, and in step 432 'restarts the secure wireless network' with the correct network credentials (e.g., SSID and WEP key, or the WPA key) that were previously provided to the computing device. **Thereafter, the computing device begins 'normal operation' in a step 434, being now able to communicate with each of the other computing devices that are on the 'secure wireless network'** ...") [0044] (e.g., '**ACK'_426 → ACK 428 →*'Join Completed Network'_218 / 'Restart Network with Correct Network Credentials'_432 → 'Begin Normal Operations'_434***) [Fig. 7].

Claim(s) **18** recite(s) substantially the same limitations as claim 6, is/are distinguishable only by its/their statutory category (computer-readable media, method), and accordingly rejected on the same basis.

As per claim(s) **12,** Ladas discloses the device **wherein the second message comprises a command for the playback device to adopt the network configuration parameters** (Ladas: e.g., expressly discloses / illustrates in one aspect wherein the *Access Point* performs a ***'Key Exchange' {s214}*** with the computing device attempting to join the secure network and further transmits an '**encrypted message**' including a **WEP Key / SSID** {secure network credentials} **{s216}** for the computing device to 'decode / apply' in joining the secure network) [0039] [Fig. 5] (e.g., expressly discloses / illustrates wherein the computing device receives the transmitted {secure} 'network credentials' {s420}, '***Decodes Correct Network Credentials* {SSID / WEP Key} *& Attempts to Join the*** {Secure} ***Network'* {s422}**) [Fig. 7] [0044].

Claim Rejections - 35 USC § 103

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

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

2. Claims **3, 7, 8, 10, 11, 13, 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ladas** in view of **Isley** et al (hereinafter Isley), US Patent Publication 2002/0124097 A1

As per claim(s) **3,** while Ladas discloses features of the invention as above, he does not explicitly disclose the additional recited feature{s} of the computing device **wherein the computing device comprises a *controller device* of a networked audio system**. Nonetheless, the said feature(s) is/are expressly disclosed by Isley in a related endeavor.

Isley discloses as his invention a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., local network, such as a '**home audio system**'} based on defined zones with the site [Isley: Abstract] [0011] [Fig. 1]. In particular, Isley discloses disclose the additional recited feature{s} of the computing device **wherein the computing device comprises a *controller device* of a networked audio system** (Isley: e.g., '***Controller'_125***) [Fig. 1] (e.g., expressly teaches in one aspect that "**user**

device 130 in combination with the Controller 125, provides a user interface configured to receive a user designation of aggregations of the audio equipment 145, 150.. **The Controller operates to designate the associated identifiers to be received by respective ones of the plurality of network attached audio devices 105**...") [0039] (e.g., additionally / expressly teaches that "a ***Zone manager 315* 'defines' a plurality of zones for the site**. The 'zones' may include **'one'** {or a plurality} **of the individual addressable audio devices** included in the illustrated block of *network audio devices 305*...") [0047] [Fig. 3] (e.g., 'The Zone manager defines a relationship between a reference audio device and for the addressable radio devices in the zones...") [Abstract] Fig. 4] [0055].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify and/or combine Ladas's invention with the above said additional feature, as disclosed by Isley, for the motivation of providing a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., a '**home audio system**'} based on defined zones with the site [Isley: Abstract] [0011].

As per claim(s) **7,** while Ladas discloses features of the invention as above, he does not explicitly disclose the additional recited feature{s} of the computing device performing functions further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising: **after connecting to the secure WLAN, establishing a new networked audio system on the secure WLAN**.

Nonetheless, the said feature(s) is/are expressly disclosed by Isley in a related endeavor.

Isley discloses as his invention a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., local network, such as a '**home audio system'**} based on defined zones with the site [Isley: Abstract] [0011] [Fig. 1]. In particular, Isley discloses disclose the additional recited feature{s} of the computing device performing functions further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising: **after connecting to the secure WLAN, establishing a new networked audio system on the secure WLAN** (Isley: e.g., ***Networked Audio Device_105 / 205*** of a **'Home Audio System'**, which may be a '**MP3 player'**, for example) [0004] [0008] [Fig. 2] (e.g., expressly teaches i one aspect that "a *Zone manager 315* 'defines' a plurality of zones for the site. The 'zones' may include '**one'** {or a plurality} **of the individual addressable audio devices** included in the illustrated block of *network audio devices 305*...") [0047] [Fig. 3] (e.g., '**Channel 1' *Network Audio Device*_405**) [Fig. 4] [0055].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify and/or combine Ladas's invention with the above said additional feature, as disclosed by Isley, for the motivation of providing a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., a '**home audio system'**} based on defined zones with the site [Isley: Abstract] [0011].

As per claim(s) **8,** Ladas in view of Isley discloses substantial features of the invention as above. In particular, Isley discloses the additional recited feature(s) of the computing device performing function further comprising **after connecting to the secure WLAN, joining an existing networked audio system operating on the secure WLAN** (Isley: e.g., expressly teaches that in dynamically defining aggregate {audio} 'zones', **the system can 'add'** {or remove} ***Audio devices_105* to** {or from} **groups of virtual zones**...") [0040] [Fig. 1] (e.g., additionally / expressly discloses in one aspect that "Channels can be added or removed from the virtual zone in some embodiments of the present invention by dynamically configuring '**additional *audio devices***' to belong to the same network group...") [0057] [Fig. 4] (e.g., '**Channels 2-4' *Network Audio Devices*_405**) [Fig. 4].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify and/or combine Ladas's invention with the above said additional feature, as disclosed by Isley, for the motivation of providing a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., a '**home audio system'**} based on defined zones with the site [Isley: Abstract] [0011].

As per claim(s) **10,** Ladas in view of Isley discloses substantial features of the invention as above. In particular, Isley discloses the additional recited feature(s) of the computing device **wherein communicating with the computing device via the secure WLAN comprises receiving a command related to playback of audio content** (Isley: e.g., expressly teaches that "the network interface 100 or audio interface 320 may, thus, dynamically designate respective ones of the addressable audio devices for inclusion in

an aggregation of groups of audio equipment (block 525). Furthermore, one of the **'identifiers' associated with a digital audio stream** to be received by the respective addressable audio devices in the group **may be provided** (block 525). **The 'selection' of a digital audio stream to which each audio device in a group will "tune" may be provided to the OSGi 350 as part of** a **received 'user designation'** {command} at block 520. . .") [0060] [Fig. 5].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify and/or combine Ladas's invention with the above said additional feature, as disclosed by Isley, for the motivation of providing a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., a '**home audio system'**} based on defined zones with the site [Isley: Abstract] [0011].

As per claim(s) **11, 19,** Ladas in view of Isley discloses substantial features of the invention as above. In particular, Isley discloses the additional recited feature(s) of the computing device **wherein the command comprises a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN** (Isley: e.g., '***Audio Source(s)'_110, 330***) [Figs. 1 & 3] (e.g., additionally / expressly teaches that "the network interface 100 or audio interface 320 may dynamically designate respective ones of the addressable audio devices for inclusion in an aggregation of 'groups' of audio equipment (block 525). Furthermore, one of the ***'identifiers'*** **associated with a digital audio stream** to be received by the respective addressable audio devices in the group **may be provided** (block 525). **The 'selection' of a digital audio stream to which each audio device in**

a group will "tune" may be provided to the OSGi 350 as part of a received 'user designation' {command} at block 520 ...") [0060] [Figs. 1, 3 & 4-5], and **wherein the playback device further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising: in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN** (Isley: e.g., expressly illustrates in one aspect '*Room 1 Audio Equipment*' outputting audio content from 'Channel 1' audio source, '*Room 2 Audio Equipment*' outputting audio content from 'Channel 2', '*Room 3 Audio Equipment*' outputting audio content from 'Channel 3', etc.) [Fig. 4] (e.g., "Each of the Network Addressable Audio Devices_405 'defines a channel' which operates to drive associated Audio Equipment 450, such as 'speakers' located in respective 'rooms' of a residence...") [0055] (e.g., '***Designate Audio Devices_525 → Receive Audio Stream over Local Network_530 → Output Audio_535***) [Fig. 5].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify and/or combine Ladas's invention with the above said additional feature, as disclosed by Isley, for the motivation of providing a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., a '**home audio system**'} based on defined zones with the site [Isley: Abstract] [0011].

Claim(s) **19** recite(s) substantially the same limitations as claim 11, is/are distinguishable only by its/their statutory category (computer-readable media, method), and accordingly rejected on the same basis.

As per claim(s) **13,** Ladas in view of Isley discloses substantial features of the invention as above. In particular, Isley discloses the additional recited feature(s) of the computing device further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising **after transitioning to communicating with computing device via the secure WLAN, receiving, from the computing device, a command to form a group with at least a first playback device of a networked audio system such that the playback device is configured to play back audio content in synchrony with at least the first playback device** (Isley: e.g., expressly teaches in one aspect that "the ***User Interface device 130***, in combination with the ***Controller 125***, provides a '*user interface*' configured to receive a **user designation of 'aggregations'** {groupings} **of the audio equipment 145**, 150 located at the site so as to provide '**dynamic zone aggregation**'. ***Controller 125*** operates to *designate* the 'associated identifiers' to be received by respective ones of the plurality of network attached audio devices 105. **In other words,** the ***Controller 125*** **essentially 'tells' the *network audio devices 105* the "channel" to which they should tune. The *controller 125* makes this 'designation'** *based on* the '**user designation'** from the ***user device 130*** to provide 'dynamic zone aggregation'. Thus, '**individual ones' of the network attached audio devices may be '*grouped*' together and '*instructed*' to listen to the '*same* channel' to provide '*common* audio signals' to multiple rooms in a house, while 'other groupings' of the *network attached audio devices 105* may be 'assigned a different channel' to**

provide a 'different audio signal source' in another set of rooms within the residence...") [0039] [Fig. 1].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify and/or combine Ladas's invention with the above said additional feature, as disclosed by Isley, for the motivation of providing a system and method for dynamic distribution of 'audio signals' at a 'site' {i.e., a '**home audio system**'} based on defined zones with the site [Isley: Abstract] [0011].

3. Claim **9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Ladas** in view of **Vasisht** et al (hereinafter Vasisht), US Patent Publication 2004/0133689 A1

As per claim(s) **9,** while Ladas discloses features of the invention as above, he does not explicitly disclose the additional recited feature{s} of the computing device further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising **receiving, from the computing device, a command to *assign a name* to the playback device**. Nonetheless, the said feature(s) is/are expressly disclosed by Vasisht in a related endeavor.

Vasisht discloses as his invention a system and method for automatically configuring a communications network for a user, including the instantiation of a communications network and automatically generating a plurality of unique network configurations settings for one or more network devices of the communications network [Vasisht: Abstract] [0024-0025] [Figs. 2 & 4]. In particular, Vasisht discloses the

additional recited feature{s} of the computing device further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising **receiving, from the computing device, a command to *assign a name* to the playback device** (Vasisht: e.g., expressly teaches in one aspect **'Entering a *Unique Node Name* for the Node device'_s424**) [0092].

It would thus be obvious to one of ordinary skill in the art at the time of the invention to modify and/or combine Ladas's invention with the above said additional feature, as disclosed by Vasisht, for the motivation of providing a system and method for automatically installing and configuring a communications network for a user, such as a 'home network', Small Office and Home Office {SOHO} networks, and the like [Vasisht: Abstract] [0003] [0024].

Claim(s) **17** recite(s) substantially the same limitations as claim 8, is/are distinguishable only by its/their statutory category (computer-readable media, method), and accordingly rejected on the same basis.

Conclusion

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GLENFORD J MADAMBA whose telephone number is (571)272-7989. The examiner can normally be reached on Monday through Friday 9am-5pm.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Parry can be reached on 571-272-8328. 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.

/GLENFORD J MADAMBA/

Primary Examiner, Art Unit 2451

Notice of References Cited	Application/Control No. 16/298,515	Applicant(s)/Patent Under Reexamination Millington et al.	
	Examiner GLENFORD J MADAMBA	Art Unit 2451	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-20040168081-A1	08-2004	Ladas, Corey M.	H04L63/0428	726/8
*	B	US-20020124097-A1	09-2002	Isely, Larson J.	H04H60/95	709/231
*	C	US-20040133689-A1	07-2004	Vasisht, Samrat	H04L29/12216	709/228
	D					
	E					
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

CPC - Searched*		
Symbol	Date	Examiner
709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc. or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.	05/01/2019	GJM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
709	222	05/01/2019	GJM

* 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
DBs searched: USPAT, USPGPUB, USOCR, DERWENT, EPO, JPO, IBM-TDB	05/01/2019	GJM

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

✓	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	05/27/2019								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
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	9	✓								
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	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								

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

PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2447
Examiner Name	HWANG, Joon H.
Attorney Docket Number	05-0601-CON0319A

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG, Joon H.
	Attorney Docket Number	05-0601-CON0319A

	1	Final Office Action mailed 05 June 2014, issued in connection with U.S. Patent Application No. 13/907666, filed on 31 May 2013, 12 pages.	
	2	Final Office Action mailed 13 July 2009, issued in connection with U.S. Patent Application No. 10/816217, filed on 01 April 2004, 16 pages.	
	3	Final Office Action mailed 13 September 2012, issued in connection with U.S. Patent Application No. 13/297000, filed on 15 November 2011, 17 pages.	
	4	Final Office Action mailed 18 November 2015, issued in connection with U.S. Patent Application No. 13/533105, filed on 26 June 2012, 56 pages.	
	5	Final Office Action mailed 21 October 2011, issued in connection with U.S. Patent Application No. 10/816217, filed on 01 April 2004, 19 pages.	
	6	Final Office Action mailed 27 March 2014, issued in connection with U.S. Patent Application No. 13/533105, filed on 26 June 2012, 29 pages.	
	7	Final Office Action mailed 28 January 2011, issued in connection with U.S. Patent Application No. 10/816217, filed on 01 April 2004, 21 pages.	
	8	Final Office Action mailed 30 June 2008, issued in connection with U.S. Patent Application No. 10/816217, filed on 01 April 2004, 30 pages.	
	9	Final Office Action mailed on 02 June 2017, issued in connection with U.S. Patent Application No. 13/848932, filed on 22 March 2013, 32 pages.	
	10	Final Office Action mailed on 03 August 2015, issued in connection with U.S. Patent Application No. 13/848921, filed on 22 March 2013, 13 pages.	

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	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG, Joon H.
	Attorney Docket Number	05-0601-CON0319A

EXAMINER SIGNATURE			
Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	05/27/2019

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	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG, Joon H.
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E.Coyne/	Date (YYYY-MM-DD)	2019-04-02
Name/Print	Michael E. Coyne	Registration Number	58443

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

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

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(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2447
Examiner Name	HWANG; Joon H
Attorney Docket Number	05-0601-CON0319A

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	1	20140079242		2014-03-20	NGUYEN; Nam et al.	
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	3	20140123005		2014-05-01	FORSTALL; Scott J [Us] et al.	
	4	20140140530		2014-05-22	GOMES-CASSERES GLENN [US] et al.	
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	1	FOUT, Tom, "Universal Plug and Play (UPnP) Client Support," Microsoft, August 2001, 18 pages.	
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	Examiner Name	HWANG; Joon H
	Attorney Docket Number	05-0601-CON0319A

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
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	1	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions Exhibit 9: Defendants' Invalidity Contentions for U.S. Patent No. 9,202,509 filed April 15, 2016, 163 pages.	
	2	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Preliminary Identification of Prior Art References, provided July 29, 2016, 5 pages.	
	3	Sonos, Inc. v. D&M Holdings Inc. et al., Defendants' Brief in Support of their Motion for Leave to Amend their Answer to Add the Defense of Inequitable Conduct, provided October 12, 2016, 24 pages.	
	4	Sonos, Inc. v. D&M Holdings Inc. et al., Defendants' Opposition to Sonos's Motion to Strike Defendants' New Amended Answer Submitted with their Reply, provided October 3, 2016, 15 pages.	
	5	Sonos, Inc. v. D&M Holdings Inc. et al., Exhibit A: Defendants' Second Amended Answer to Plaintiffs' Third Amended Complaint, provided October 12, 2016, 43 pages.	
	6	Sonos, Inc. v. D&M Holdings Inc. et al., Exhibit B: Defendants' Second Amended Answer to Plaintiffs' Third Amended Complaint, provided October 12, 2016, 43 pages.	
	7	Sonos, Inc. v. D&M Holdings Inc. et al., Opening Brief in Support of Defendants' Motion for Leave to Amend Their Answer to Add the Defense of Inequitable Conduct, provided August 1, 2016, 11 pages.	
	8	Sonos, Inc. v. D&M Holdings Inc. et al., Order, provided October 7, 2016, 2 pages.	
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That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
Name/Print	Michael E. Coyne	Registration Number	58443

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	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG; Joon H
	Attorney Docket Number	05-0601-CON0319A

	23	2486183	GB		2012-06-13	CAMBRIDGE SILICON RADIO LIMITED.		
	24	07-210129	JP		1995-08-11	INTERNAT'L BUSINESS MACH CORP (IBM)		
	25	2000149391	JP	A	2000-05-30	VICTOR COMPANY OF JAPAN.		
	26	2001034951	JP		2001-02-09	SANYO ELECTRIC CO.		
	27	2002111817	JP		2002-04-12	NEC CORP.		
	28	2002123267	JP	A	2002-04-26	SONY CORP.		
	29	2002358241	JP	A	2002-12-13	VICTOR COMPANY OF JAPAN.		
	30	2003037585	JP		2003-02-07	SONY CORP.		
	31	2003101958	JP		2003-04-04	TOSHIBA CORP.		
	32	2003169089	JP	A	2003-06-13	ANCL INC., et al.		
	33	2003506765	JP	A	2003-02-18	CHUNG; Randall M.		

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	34	2005108427	JP		2005-04-21	RICOH KK.		
	35	2005136457	JP		2005-05-26	SANYO ELECTRIC CO. LTD.		
	36	2007241652	JP	A	2007-09-20	CORE COLORS INC.		
	37	2009075540	JP	A	2009-04-09	TOUCHTUNES MUSIC CORP.		
	38	2009135750	JP		2009-06-18	KYOCERA CORP.		
	39	2009506603	JP	A	2009-02-12	SONY ERICSSON MOBILE COMMUNICATIONS AB.		
	40	2009535708	JP		2009-10-01	MICROSOFT CORPORATION.		
	41	2009538006	JP	A	2009-10-29	SONY ERICSSON MOBILE COMMUNICATIONS AB.		
	42	2011130496	JP		2011-06-30	TOSHIBA CORP.		
	43	63269633	JP		1988-11-07	UNKNOWN.		
	44	439027	TW		2001-06-07	MITAC TECHNOLOGY CORP.		

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	45	0019693	WO	A1	2000-04-06	WIRELESS SYSTEM TECHNOLOGIES I [CA], et al.		
	46	0110125	WO	A1	2001-02-08	CHUNG, RANDALL M.		
	47	02073851	WO		2002-09-19	PULSE-LINK, INC.		
	48	03093950	WO	A2	2003-11-13	GOLDBERG DAVID [US], et al.		
	49	199525313	WO		1995-09-21	INTERNATIONAL BUSINESS MACHINE CORPORATION.		
	50	1999023560	WO		1999-05-14	COLLABORATION PROPERTIES, INC.		

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Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	05/27/2019

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	Attorney Docket Number	05-0601-CON0319A

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

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	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
Name/Print	Michael E. Coyne	Registration Number	58443

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

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

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.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1985	709/220.ccls.	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:13
S2	2193	ad$1hoc adj network$1	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:13
S3	438682	(wired, wireless)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S4	1521	S2 and S3	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S5	1082	S2 same S3	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S6	8	S5 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S7	29	S5 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:17
S8	6	S7 and zone	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:18
S9	262	zone adj players	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:18
S10	4904	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:18
S11	728858	(wired, wireless)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2009/01/09 12:19

			IBM_TDB			
S12	4102	S10 and S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:19
S13	2968	S10 same S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:19
S14	8	S13 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:19
S15	8	S14 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:19
S16	29	S13 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S17	0	S9 and S16	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S18	26	S9 and network	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S20	8	(US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$).did.	USPAT; DERWENT	OR	ON	2009/01/13 13:01
S21	4909	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:26
S22	593	S21 and broadcast$3 near3 (period$6, interval$1, time)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:27
S23	122	S21 and broadcast$3 adj (period$6, interval$1, time)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2009/01/13 13:27

			IBM_TDB			
S24	0	S21 and broadcast$3 adj (period$6, interval$1, time) with expir$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:27
S25	2	S21 and broadcast$3 adj (period$6, interval$1, time) with (end$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:28
S26	7	S23 and (wep, ssid)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:30
S27	0	zone adj player$1 same configur$5 with mode	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:04
S28	18	zone adj player$1 same configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:04
S29	29	prob$3 near3 message and SSID and WEP	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:10
S30	4	S29 and flag same broadcast	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:10
S31	0	broadcast adj storm same flag same probe	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:12
S32	2	broadcast adj storm and flag same probe	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2009/01/13 17:13

			EPO; JPO; DERWENT; IBM_TDB			
S33	0	configuration adj mode and zone adj player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S34	2308	configuration adj mode and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S35	528	configuration adj mode same controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S36	0	S35 and "zone player"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:15
S37	0	S35 and "synchrony group"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:16
S38	266	S35 and group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:16
S39	14	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/01/14 11:26
S40	2	zone adj player and (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2009/01/14 11:28

			IBM_TDB			
S41	1909	zone and (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S42	153	zone same (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S43	51	zone with (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S44	447	zone adj players	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S45	5809	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S46	1	S44 and S45	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S47	101	S44 and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:35
S48	79	S47 and (synchrony, group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:36
S49	1404	zone near3 player$1	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2009/11/06 15:46

			EPO; JPO; DERWENT; IBM_TDB			
S50	2	S45 and S49	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:46
S51	12	S45 same zone with (player$1, device$1, terminal$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:47
S52	2085	controller and ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:52
S53	1707	S52 and (configur$5, synchroni$7)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:53
S54	57	S53 and (synchroniz$7) near5 operation$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:54
S55	14	S54 and (broadcast$3) with (packet, data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:55
S56	2	"20080267218"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 16:19
S57	22	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$).did. or (US-7469139-$ or US-	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:16

		7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$).did.				
S58	2	"6349352".pn.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:17
S59	23	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:19
S60	15	S59 and synchron$7	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:20
S61	2	"20090259762"	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:40
S62	51442	(zone, media) near3 player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S63	20532	S62 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S64	514	S63 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S65	218	S64 and playback	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:09
S66	24	S65 and join$3 near3 network	US-PGPUB; USPAT; USOCR;	OR	ON	2011/03/03 18:09

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S67	1599	zone near3 player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S68	473	S67 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S69	6	S68 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S70	496	zone adj player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S71	1	S70 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S72	145	S70 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S73	0	S72 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:17
S74	71	S72 and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:17
S75	151	(audio, media) adj player$1 with	US-PGPUB;	OR	ON	2011/03/03

		zone$2	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			18:22
S76	93	S75 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:22
S77	0	S76 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:22
S78	0	S75 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:23
S79	0	S76 and IP near2 broadcast	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:24
S80	0	S76 and datagrams near2 prob$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:24
S81	22189	secure near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:21
S82	10665	(unsecure, ad$1hoc) near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S83	978	S81 and S82	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S84	0	S83 and zone near2 player$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S85	509	zone adj players	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:22

S86	0	S85 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S87	8495	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S88	1	S85 and S87	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S89	9	S85 and (secure, private) near2 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:25
S90	473	zone adj player$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:27
S91	94	S90 and (secure, ad$1hoc)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S92	37	S91 and network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S93	8	S92 and join$3	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S94	29	S92 not S93	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:30
S95	0	S90 and "wep key"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S96	0	S90 and "wired equivalent privacy"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S97	2098	media near2 player with (zones, area)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S98	3	S97 and "wired equivalent privacy"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:32
S99	45961	Home near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S100	374	S99 and ("wired equivalent privacy",	US-PGPUB;	OR	ON	2011/10/11

		HHID)	USPAT; DERWENT			12:33
S101	374	S99 and ("wired equivalent privacy")	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S102	0	S101 and HHID	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S103	0	S99 and HHID	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S104	67	S101 and join$3 near5 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S105	61	S101 and join$3 near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S106	27	S81 and S105	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:35
S107	39	S105 and (secure, private) near2 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:35
S108	14	S82 and S107	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:35
S109	4	S108 and (media, playback, zone) near2 (device, terminal, apparatus)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:42
S110	31	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:48
S111	358248	(media, playback, zone) near2 (device, terminal, apparatus, player)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:20
S112	10969	S111 and home near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:20

S113	1507	S112 and zone$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:21
S114	34	S113 and WEP	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:21
S115	2	"20100245582"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:31
S116	743	wep and home near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:34
S117	98	S116 and zone$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:34
S118	10	S117 and join$4 near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:35
S119	0	S85 and WEp	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:37
S120	665	home near2 network and WEP	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S121	357	S120 and (audio, music)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S122	76	S121 and (connect44, join$4) near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S123	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:40

		or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.				
S124	30	S123 and wired and wireless	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:40
S125	9	S123 and "network interface" same wired same wireless	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:43
S126	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/22 21:43
S127	16	S126 and configuration near3 (setting$1, information)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/22 21:44
S128	393	wep and request with configuration	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/23 00:47

S129	78	S128 and join$3 with network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/23 00:47
S130	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	OFF	2012/06/12 14:09
S131	21	S130 and button	US-PGPUB; USPAT; DERWENT	OR	OFF	2012/06/12 14:11
S132	5224	709/231.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:22
S133	4802	370/254.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:22
S134	0	S132 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S135	17	S133 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S136	2189	"L5" and (wired, wireless)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S147	77	(US-20060142034-$ or US-	US-PGPUB;	OR	OFF	2019/05/03

		20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	USPAT; DERWENT			17:04
S148	77	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:49
S150	19	S148 and wlan	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:50
S151	7	S148 and wlan with secure	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:50
S152	45	S148 and configuration	US-PGPUB; USPAT;	OR	OFF	2019/05/15 18:34

			DERWENT			
S153	1737	zone near2 players	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S154	875	S153 and audio	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S155	19	S154 and wlan	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S156	531	networked with audio near3 system	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:22
S157	71	S156 and synchronized near3 playback	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:22
S158	39	S157 and (@ad<"20150604" or @rlad<"20050604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:23
S159	4	S157 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:24
S160	793	(media, zone) near2 players and synchronized with playback	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S161	72	S156 and S160	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S162	1	S161 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S163	4974	(media, zone, audio) near2 players with (group$1, zone$1)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:27
S164	250	S163 and wlan	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 19:28
S165	27	S164 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:28
S166	310	S154 and grouping	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 19:31
S167	35	S166 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO;	OR	ON	2019/05/15 19:31

			DERWENT			
S168	257	(media, audio) adj player near2 (zone$1, group$1, grouping$1)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:36
S169	505	(media, audio) adj player with player near2 (zone$1, group$1, grouping$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/15 19:36
S170	52	S169 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:37
S171	874	networked same audio near3 system	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:39
S172	265	S171 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S173	419	S156 and (@ad<"20150604" or @rlad<"20050604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S174	105	S173 and group$4 with player$1	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S175	1	"20040168081"	US-PGPUB	OR	ON	2019/05/20 16:00
S176	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/20 17:37

		US-7792311-$).did.				
S177	3	S176 and audio near2 (network, system) and playback near3 (device, terminal, ue)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/05/20 17:38
S178	2	"20020124097"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/05/20 17:39
S179	475824	709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc. or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S180	629	S179 and ssid and wep near2 (key, password)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S181	236	S180 and wlan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S182	51	S181 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:21
S183	51	S182 and access near2 point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:21

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S137	6339	709/220.ccls.	US-PGPUB; USPAT	OR	OFF	2012/07/15 11:24

S138	3105	S137 and (wired, wireless)	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S139	58	S138 and ssid and wep	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S140	4	S139 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S143	1080521	@ad >="20040606" and @ad<="20060606"	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S144	1141	S137 and S143	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S145	17	S144 and ssid and wep	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S146	1	S145 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29

5/ 27/ 2019 2:16:28 PM
C:\ Users\ gmadamba\ Documents\ EAST\ Workspaces\ 16298515_2019-05-02_CON of 15091113.wsp

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
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Application Number	16298515
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First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2447
Examiner Name	HWANG, Joon H.
Attorney Docket Number	05-0601-CON0319A

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG, Joon H.
	Attorney Docket Number	05-0601-CON0319A

	1	"884+ Automatic Matrix Mixer Control System," Ivie Technologies, Inc., 2000, pp. 1-4.	
	2	Advanced Driver Tab User Interface WaveLan GUI Guide, AVAGO0009, Agere Systems, February 2004, 4 pages.	
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	Attorney Docket Number	05-0601-CON0319A

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☒ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
Name/Print	Michael E. Coyne	Registration Number	58443

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	1	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Amended Invalidity Contentions, filed September 14, 2016, 100 pages.	
	2	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions, filed April 15, 2016, 97 pages.	
	3	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Preliminary Identification of Indefinite Terms, provided July 29, 2016, 8 pages.	
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	9	Sonos, Inc. v. D&M Holdings Inc. et al., Exhibit A: Defendants' First Amended Answer to Plaintiffs' Third Amended Complaint, provided August 1, 2016, 26 pages.	
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	12	Sonos, Inc. v. D&M Holdings Inc. et al., First Amended Complaint for Patent Infringement, filed December 17, 2014, 26 pages.	
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	30	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Amended Invalidity Contentions Exhibit 10: Defendants' Invalidity Contentions for U.S. Patent No. 9,219,959 filed September 27, 2016, 236 pages.	
	31	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Amended Invalidity Contentions Exhibit 11: Defendants' Invalidity Contentions for U.S. Design Patent No. D559,197 filed September 27, 2016, 52 pages.	
	32	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Amended Invalidity Contentions Exhibit 2: Defendants' Invalidity Contentions for U.S. Patent No. 8,588,949 filed September 27, 2016, 224 pages.	
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	34	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Amended Invalidity Contentions Exhibit 4: Defendants' Invalidity Contentions for U.S. Patent No. 8,938,312 filed September 27, 2016, 229 pages.	
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	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG, Joon H.
	Attorney Docket Number	05-0601-CON0319A

	45	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions Exhibit 3: Defendants' Invalidity Contentions for U.S. Patent No. 8,843,224 filed April 15, 2016, 118 pages.	
	46	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions Exhibit 4: Defendants' Invalidity Contentions for U.S. Patent No. 8,938,312 filed April 15, 2016, 217 pages.	
	47	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions Exhibit 5: Defendants' Invalidity Contentions for U.S. Patent No. 8,938,637 filed April 15, 2016, 177 pages.	
	48	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions Exhibit 6: Defendants' Invalidity Contentions for U.S. Patent No. 9,042,556 filed April 15, 2016, 86 pages.	
	49	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions Exhibit 7: Defendants' Invalidity Contentions for U.S. Patent No. 9,130,771 filed April 15, 2016, 203 pages.	
	50	Sonos, Inc. v. D&M Holdings Inc. et al., Defendant's Initial Invalidity Contentions Exhibit 8: Defendants' Invalidity Contentions for U.S. Patent No. 9,195,258 filed April 15, 2016, 400 pages.	

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Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	05/27/2019

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CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
Name/Print	Michael E. Coyne	Registration Number	58443

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

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Doc description: Information Disclosure Statement (IDS) Filed

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Attorney Docket Number	05-0601-CON0319A

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	1	Non-Final Office Action mailed on 01 June 2016, issued in connection with U.S. Patent Application No. 14/184522, filed on 19 February 2014, 21 pages.	
	2	Non-Final Office Action mailed on 01 September 2010, issued in connection with U.S. Patent Application No. 11/147116, filed 06 June 2005, 36 pages.	
	3	Non-Final Office Action mailed on 02 November 2016, issued in connection with U.S. Patent Application No. 14/486667, filed on 15 September 2014, 37 pages.	
	4	Non-Final Office Action mailed on 03 February 2009, issued in connection with U.S. Patent Application No. 11/147116, filed on 06 June 2005, 32 pages.	
	5	Non-Final Office Action mailed on 03 January 2017, issued in connection with U.S. Patent Application No. 14/808875, filed on 24 July 2015, 10 pages.	
	6	Non-Final Office Action mailed on 03 June 2015, issued in connection with U.S. Patent Application No. 14/564544, filed on 09 December 2014, 7 pages.	
	7	Non-Final Office Action mailed on 03 November 2016, issued in connection with U.S. Patent Application No. 14/184528, filed on 19 February 2014, 17 pages.	
	8	Non-Final Office Action mailed on 03 October 2014, issued in connection with U.S. Patent Application No. 13/863083, filed on 15 April 2013, 22 pages.	
	9	Non-Final Office Action mailed on 04 June 2015, issued in connection with U.S. Patent Application No. 13/871795, filed on 26 April 2013, 16 pages.	
	10	Non-Final Office Action mailed on 04 March 2015, issued in connection with U.S. Patent Application No. 13/435776, filed on 30 March 2012, 16 pages.	
	11	Non-Final Office Action mailed on 04 October 2016, issued in connection with U.S. Patent Application No. 15/089758, filed on 04 April 2016, 9 pages.	

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	12	Non-Final Office Action mailed on 05 October 2016, issued in connection with U.S. Patent Application No. 13/864250, filed on 17 April 2013, 10 pages.	
	13	Non-Final Office Action mailed on 05 October 2016, issued in connection with U.S. Patent Application No. 13/864252, filed on 17 April 2013, 11 pages.	
	14	Non-Final Office Action mailed on 06 October 2016, issued in connection with U.S. Patent Application No. 15/088678, filed on 01 April 2016, 9 pages.	
	15	Non-Final Office Action mailed on 07 July 2015, issued in connection with U.S. Patent Application No. 14/486667, filed on 15 September 2014, 22 pages.	
	16	Non-Final Office Action mailed on 07 November 2011, issued in connection with U.S. Patent Application No. 11/147116, filed 06 June 2005, 48 pages.	
	17	Non-Final Office Action mailed on 07 October 2016, issued in connection with U.S. Patent Application No. 15/156392, filed on 17 May 2016, 8 pages.	
	18	Non-Final Office Action mailed on 08 March 2016, issued in connection with U.S. Patent Application No. 13/848921, filed on 22 March 2013, 13 pages.	
	19	Non-Final Office Action mailed on 09 August 2016, issued in connection with U.S. Patent Application No. 13/871795, filed on 26 April 2013, 31 pages.	
	20	Non-Final Office Action mailed on 10 April 2017, issued in connection with U.S. Patent Application No. 13/871785, filed on 26 April 2013, 10 pages.	
	21	Non-Final Office Action mailed on 10 March 2011, issued in connection with U.S. Patent Application No. 12/035112, filed on 21 February 2008, 12 pages.	
	22	Non-Final Office Action mailed on 10 May 2016, issued in connection with U.S. Patent Application No. 14/504812, filed 02 October 2014, 22 pages.	

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	23	Non-Final Office Action mailed on 10 November 2016, issued in connection with U.S. Patent Application No. 15/243355, filed on 22 August 2016, 11 pages.	
	24	Non-Final Office Action mailed on 11 July 2017, issued in connection with U.S. Patent Application No. 13/848921, filed on 22 March 2013, 10 pages.	
	25	Non-Final Office Action mailed on 12 January 2017, issued in connection with U.S. Patent Application No. 13/895076, filed on 15 May 2013, 10 pages.	
	26	Non-Final Office Action mailed on 12 June 2015, issued in connection with U.S. Patent Application No. 13/848932, filed on 22 March 2013, 16 pages.	
	27	Non-Final Office Action mailed on 12 March 2015, issued in connection with U.S. Patent Application No. 13/705174, filed on 05 December 2012, 13 pages.	
	28	Non-Final Office Action mailed on 13 January 2016, issued in connection with U.S. Patent Application No. 14/184528, filed on 19 February 2014, 14 pages.	
	29	Non-Final Office Action mailed on 13 March 2015, issued in connection with U.S. Patent Application No. 13/705177, filed 05 December 2012, 15 pages.	
	30	Non-Final Office Action mailed on 15 August 2017, issued in connection with U.S. Patent Application No. 14/184522, filed on 19 February 2014, 11 pages.	
	31	Non-Final Office Action mailed on 15 July 2016, issued in connection with U.S. Patent Application No. 14/803953, filed on 20 July 2015, 20 pages.	
	32	Non-Final Office Action mailed on 16 November 2016, issued in connection with U.S. Patent Application No. 15/228639, filed on 04 August 2016, 15 pages.	
	33	Non-Final Office Action mailed on 17 August 2017, issued in connection with U.S. Patent Application No. 14/184528, filed on 19 February 2014, 12 pages.	

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	34	Non-Final Office Action mailed on 17 November 2014, issued in connection with U.S. Patent Application No. 13/864247, filed on 17 April 2013, 11 pages.	
	35	Non-Final Office Action mailed on 18 February 2009, issued in connection with U.S. Patent Application No. 10/861653, filed on 05 June 2004, 18 pages.	
	36	Non-Final Office Action mailed on 18 January 2013, issued in connection with U.S. Patent Application No. 13/618829, filed on 14 September 2012, 58 pages.	
	37	Non-Final Office Action mailed on 18 November 2014, issued in connection with U.S. Patent Application No. 13/435739, filed on 30 March 2012, 10 pages.	
	38	Non-Final Office Action mailed on 19 June 2015, issued in connection with U.S. Patent Application No. 13/533105 filed on 26 June 2012, 38 pages.	
	39	Non-Final Office Action mailed on 19 November 2014, issued in connection with U.S. Patent Application No. 13/848921, filed on 22 March 2013, 9 pages.	
	40	Non-Final Office Action mailed on 20 April 2017, issued in connection with U.S. Patent Application No. 90/013882, filed on 27 December 2016, 197 pages.	
	41	Non-Final Office Action mailed on 20 August 2009, issued in connection with U.S. Patent Application No. 11/906702, filed on 02 October 2007, 27 pages.	
	42	Non-Final Office Action mailed on 21 September 2016, issued in connection with U.S. Patent Application No. 15/080591, filed on 25 March 2016, 9 pages.	
	43	Non-Final Office Action mailed on 21 September 2016, issued in connection with U.S. Patent Application No. 15/080716, filed on 25 March 2016, 8 pages.	
	44	Non-Final Office Action mailed on 21 September 2016, issued in connection with U.S. Patent Application No. 15/088283, filed on 01 April 2016, 9 pages.	

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	46	Non-Final Office Action mailed on 22 September 2016, issued in connection with U.S. Patent Application No. 15/088906, filed on 01 April 2016, 9 pages.	
	47	Non-Final Office Action mailed on 22 September 2016, issued in connection with U.S. Patent Application No. 15/155149, filed on 16 May 2016, 7 pages.	
	48	Non-Final Office Action mailed on 23 July 2018, issued in connection with U.S. Patent Application No. 15/091113, filed on 5 April 2016, 19 pages.	
	49	Non-Final Office Action mailed on 23 June 2015, issued in connection with U.S. Patent Application No. 13/705176, filed on 05 December 2012, 30 pages.	
	50	Non-Final Office Action mailed on 23 October 2014, issued in connection with U.S. Patent Application No. 13/848904, filed on 22 March 2013, 11 pages.	

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Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
Name/Print	Michael E. Coyne	Registration Number	58,443

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG, Joon H.
	Attorney Docket Number	05-0601-CON0319A

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	6	WI-DK Release 2 WaveLan Embedded Drivers for VxWorks and Linux, AVAGO0056, Agere Systems, July 2003, 2 pages.	
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	13	Yamaha DME Designer 3.5 setup manual guide; copyright 2004, 16 pages.	
	14	Yamaha DME Designer 3.5 User Manual; Copyright 2004, 507 pages.	
	15	Yamaha DME Designer software manual: Copyright 2004, 482 pages.	
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Name/Print	Michael E.Coyne	Registration Number	58443

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	43	Non-Final Office Action mailed 25 June 2010, issued in connection with U.S. Patent Application No. 10/816217, filed 01 April 2004, 17 pages.
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	45	Non-Final Office Action mailed 27 May 2014, issued in connection with U.S. Patent Application No. 14/186850, filed 21 February 2014, 13 pages.	
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	47	Non-Final Office Action mailed 29 November 2010, issued in connection with U.S. Patent Application No. 11/801468, filed on 09 May 2007, 17 pages.	
	48	Non-Final Office Action mailed 30 July 2013 issued in connection with U.S. Patent Application No. 13/724048, filed on 21 December 2012, 7 pages.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2447
Examiner Name	HWANG, JOON H
Attorney Docket Number	05-0601-CON0319A

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	1	Notice of Allowance mailed on 13 July 2015, issued in connection with U.S. Patent Application No. 14/184526, filed on 19 February 2014, 22 pages.	
	2	Notice of Allowance mailed on 13 July 2017, issued in connection with U.S. Patent Application No. 13/895076, filed on 15 May 2013, 10 pages.	
	3	Notice of Allowance mailed on 13 November 2013, issued in connection with U.S. Patent Application No. 13/724048, filed 21 December 2012, 7 pages.	
	4	Notice of Allowance mailed on 13 October 2015, issued in connection with U.S. Patent Application No. 13/864251, filed on 17 April 2013, 7 pages.	
	5	Notice of Allowance mailed on 14 August 2012, issued in connection withU.S. Patent Application No. 11/147116, filed on 06 June 2005, 33 pages.	
	6	Notice of Allowance mailed on 14 December 2016, issued in connection with U.S. Patent Application No. 15/088906, filed on 01 April 2016, 9 pages.	
	7	Notice of Allowance mailed on 14 June 2012, issued in connection with U.S. Patent Application No. 12/035112, filed on 21 February 2008, 9 pages.	
	8	Notice of Allowance mailed on 15 July 2015, issued in connection with U.S. Patent Application No. 13/705174, filed on 05 December 2012, 18 pages.	
	9	Notice of Allowance mailed on 15 March 2017, issued in connection with U.S. Patent Application No. 15/080716, filed on 25 March 2016, 7 pages.	
	10	Notice of Allowance mailed on 16 June 2009, issued in connection with U.S. Patent Application No. 10/861653, filed on 05 June 2004, 11 pages.	
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	31	Parasound Zpre2 Zone Preamplifier with PTZI Remote Control, 2005, 16 pages.	
	32	Notice of Allowance mailed on 28 November 2017, issued in connection with U.S. Patent Application No. 15/091014, filed on 05 April 2016, 8 pages.	
	33	Notice of Allowance mailed on 29 April 2015, issued in connection with U.S. Patent Application No. 13/863083, filed on 15 April 2013, 19 pages.	

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	36	Notice of Allowance mailed on 29 March 2017, issued in connection with U.S. Patent Application No. 14/803953, filed on 20 July 2015, 8 pages.	
	37	Notice of Allowance mailed on 3 April 2017, issued in connection with U.S. Patent Application No. 15/088678, filed on 1 April 2016, 8 pages.	
	38	Notice of Allowance mailed on 30 August 2016, issued in connection with U.S. Patent Application No. 14/290493, filed on 29 May 2014, 7 pages.	
	39	Notice of Allowance mailed on 30 July 2015, issued in connection with U.S. Patent Application No. 13/705178, filed on05 December 2012, 18 pages.	
	40	Notice of Allowance mailed on 30 March 2017, issued in connection with U.S. Patent Application No. 15/088532, filed on 01 April 2016, 7 pages.	
	41	Notice of Allowance mailed on 5 August 2015, issued in connection with U.S. Patent Application No. 13/435776, filed on 30 March 2012, 26 pages.	
	42	Notice of Allowance mailed on 6 April 2017, issued in connection with U.S. Patent Application No. 15/088283, filed on 1 April 2016, 7 pages.	
	43	Notice of Allowance mailed on 6 July 2015, issued in connection with U.S. Patent Application No. 13/297000, filed on 15 November 2011, 24 pages.	
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	45	Notice of Intent to Issue Re-Examination Certificate mailed on 03 August 2017, issued in connection with U.S. Patent Application No. 90/013882, filed on 27 December 2016, 20 pages.	
	46	NUTZEL et al., "Sharing Systems for Future HiFi Systems," IEEE, 2004, 9 pages.	
	47	Office Action in Ex Parte Reexamination mailed on 20 October 2017, issued in connection with U.S. Patent Reexamination Application No. 90/013959, filed on 16 June 2017, 50 pages.	
	48	"Sonos Multi-Room Music System User Guide," Version 090401, Sonos, Inc. 1 April 2009, 256 pages.	
	49	Palm, Inc., "Handbook for the Palm VII Handheld," May 2000, 311 pages.	

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	16	Non-Final Office Action mailed on 30 September 2016, issued in connection with U.S. Patent Application No. 13/864249, filed on 17 April 2013, 12 pages.	
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	18	North American MPEG-2 Information, "The MPEG-2 Transport Stream," Retrieved from the Internet: URL: http://www.coolstf.com/mpeg/#ts, 2006, pp. 1-5.	
	19	Notice of Allowance mailed 31 January 2013, issued in connection with U.S. Patent Application No. 13/298090, filed on 16 November 2011, 19 pages.	
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	37	Notice of Allowance mailed on 06 September 2013, issued in connection with U.S. Patent Application No. 13/619237, filed on 14 September 2012, 10 pages.	
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	45	Notice of Allowance mailed on 10 November 2011, issued in connection with U.S. Patent Application No. 11/906702, filed on 02 October 2007, 17 pages.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG, JOON H
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-04-01
Name/Print	Michael E. Coyne	Registration Number	58,443

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

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Examiner Name	HWANG; Joon H
Attorney Docket Number	05-0601-CON0319A

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	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2447
	Examiner Name	HWANG; Joon H
	Attorney Docket Number	05-0601-CON0319A

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Name/Print	Michael E. Coyne	Registration Number	58443

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16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A

CONFIRMATION NO. 7686

135176
LS3 Sonos
Lee Sullivan Shea & Smith LLP
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Case No. 05-0601-CON0319A

In re Application of: Sonos, Inc. Serial No.: 16/298,515 Filing Date: March 11, 2019 Title: Playback Device Connection	Confirmation No.: 7686 Examiner: Glenford J. Madamba Group Art Unit: 2451

RESPONSE TO NON-FINAL OFFICE ACTION
MAILED MAY 30, 2019

In response to the Non-Final Office Action mailed May 30, 2019, Applicant submits the following amendments and remarks.

Claim Amendments begin at page 2.

Remarks begin at page 10.

Applicant believes that all fees required for the present response have been filed during the electronic filing process. Applicant authorizes the office to charge any underpayment or credit any overpayment to Deposit Account No. 506632, and to treat any filing in this matter that requires an extension of time as incorporating a request for the extension.

CLAIM AMENDMENTS

1. (Currently Amended) A playback device comprising:

a network interface that is configured to provide an interconnection with at least one data network;

at least one processor;

a non-transitory computer-readable medium; and

program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup;

while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device that is installed with an application for controlling the playback device, wherein the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point, wherein the initial communication path with the computing device does not traverse the access point ~~is outside of the secure WLAN~~;

receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;

using the network configuration parameters to connect to the secure WLAN that is defined by the access point; and

transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN that is defined by the access point.

2. (Original) The playback device of claim 1, wherein the triggering event comprises one of (a) powering on the playback device or (b) receiving user input via a physical interface of the playback device.

3. (Original) The playback device of claim 1, wherein the computing device comprises a controller device of a networked audio system.

4. (Original) The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

after receiving the second message, providing an indication that the playback device has successfully received the network configuration parameters for the secure WLAN.

5. (Currently Amended) The playback device of claim 4, wherein providing the indication comprises transmitting, to the computing device via the initial communication path, at least a third message indicating that the playback device has successfully received the network configuration parameters[[;]].

6. (Original) The playback device of claim 4, wherein providing the indication comprises providing an indication that the playback device has successfully connected to the secure WLAN using the network configuration parameters.

7. (Original) The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

after connecting to the secure WLAN, establishing a new networked audio system on the secure WLAN.

8. (Original) The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

after connecting to the secure WLAN, joining an existing networked audio system operating on the secure WLAN.

9. (Original) The playback device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

receiving, from the computing device, a command to assign a name to the playback device.

10. (Original) The playback device of claim 1, wherein communicating with the computing device via the secure WLAN comprises receiving a command related to playback of audio content.

11. (Original) The playback device of claim 10, wherein the command comprises a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN, and wherein the playback device further comprises program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the playback device to perform functions comprising:

in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN.

12. (Original) The playback device of claim 1, wherein the second message comprises a command for the playback device to adopt the network configuration parameters.

13. (Original) The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising:

after transitioning to communicating with computing device via the secure WLAN, receiving, from the computing device, a command to form a group with at least a first playback device of a networked audio system such that the playback device is configured to play back audio content in synchrony with at least the first playback device.

14. (Currently Amended) A non-transitory, computer-readable storage medium, wherein the non-transitory computer-readable storage medium is provisioned with program instructions that are executable to cause a playback device to perform functions comprising:

detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup;

while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device that is installed with an application for controlling the playback device, wherein the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point, wherein the initial communication path with the computing device does not traverse the access point ~~is outside of the secure WLAN~~;

receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;

using the network configuration parameters to connect to the secure WLAN that is defined by the access point; and

transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN that is defined by the access point.

15. (Original) The non-transitory, computer-readable storage medium of claim 14, wherein the triggering event comprises one of (a) powering on the playback device or (b) receiving user input via a physical interface of the playback device.

16. (Original) The non-transitory, computer-readable storage medium of claim 14, wherein the non-transitory computer-readable medium is also provisioned with program instructions that are executable to cause the playback device to perform functions comprising:

after receiving the second message, providing an indication that the playback device has successfully received the network configuration parameters for the secure WLAN.

17. (Currently Amended) The non-transitory, computer-readable storage medium of claim 16, wherein providing the indication comprises transmitting, to the computing device via the initial communication path, at least a third message indicating that the playback device has successfully received the network configuration parameters[[;]].

18. (Original) The non-transitory, computer-readable storage medium of claim 16, wherein providing the indication comprises providing an indication that the playback device has successfully connected to the secure WLAN using the network configuration parameters.

19. (Original) The non-transitory, computer-readable storage medium of claim 14, wherein communicating with the computing device via the secure WLAN comprises receiving a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN, and wherein the non-transitory computer-

readable medium is also provisioned with program instructions that are executable to cause the playback device to perform functions comprising:

in response to receiving the command, retrieving the audio content from the audio source via the communication path that includes the secure WLAN.

20. (Currently Amended) A method comprising:

detecting a triggering event that causes the playback device to enter a setup mode in which the playback device transmits at least a first message indicating that the playback device is available for setup;

while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device that is installed with an application for controlling the playback device, wherein the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point, wherein the initial communication path with the computing device does not traverse the access point ~~is outside of the secure WLAN~~;

receiving, from the computing device via the initial communication path, at least a second message containing network configuration parameters for the secure WLAN, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN;

using the network configuration parameters to connect to the secure WLAN that is defined by the access point; and

transitioning from communicating with the computing device via the initial communication path to communicating with the computing device via the secure WLAN that is defined by the access point.

REMARKS

1. Summary of the Office Action

In the Non-Final Office action dated May 30, 2019, ("the Action") the Examiner rejected claims 1-20 on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-20 of co-pending application 16/298,542. The Examiner also rejected claims 1, 2, 4-6, 12, 14-18, and 20 under 35 USC 102(e) as being anticipated by US Patent Pub. 2004/0168081 ("Ladas"). The Examiner also rejected claims 3, 7, 8, 10, 11, 13, and 19 under 35 U.S.C. 103 as allegedly unpatentable over Ladas in view of U.S. Pub. 2002/0124097 ("Isley"). The Examiner also rejected claim 9 under 35 U.S.C. 103 as allegedly unpatentable over Ladas in view of U.S. Pub. 2004/0133689 ("Vasisht").

2. Summary of Examiner Interview

A telephonic examiner interview took place on July 18, 2019. Participants included Examiner Glenford Madamba and Applicant's representative Brandon Kennedy. During the interview, the participants discussed the rejections of the claims as well as suggested amendments to the claims. The Examiner indicated that the currently proposed amendments appeared to overcome the cited reference, but that further search would be required. No agreement regarding allowance was reached. Applicant thanks the Examiner for his time in conducting the interview.

3. Status of the Claims

Without conceding the merits of the claim rejections, Applicant has amended claims 1, 5, 14, 17, and 20. Claims 1-20 are pending. Support for the claim amendments can be found generally throughout Applicant's specification, including at least paragraphs [0008], [0032],

[0034], [0036], [0039], [0051], [0052], [0056], [0079]. No new matter has been added by way of these amendments.

4. Response to the Double Patenting Rejections

Applicant respectfully requests that the double patenting rejections be held in abeyance until the claims of the present application have been allowed.

5. Response to Rejections of Claims 1, 14, and 20 under 35 U.S.C. § 102

As noted above, the Examiner rejected independent claims 1, 14 and 20 under § 102 as anticipated by Ladas. However, Applicant submits that Ladas does not teach at least "while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device that is installed with an application for controlling the playback device, wherein the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point but the initial communication path with the computing device does not traverse the access point" in combination with the other elements of amended claims 1, 14 and 20.

In the Action, the Examiner equated the access point 102 in Ladas to the "computing device" of Applicant's claims. (Action at p. 6). For example, the Examiner points to paragraph [0041] in Ladas for the discussion of a "temporary alternate network" (Action at p. 6), which the Examiner has construed as the "initial communication path" of Applicant's claims. Ladas states that "[a] new temporary alternate network used only while joining the computing device to the secure wireless network is created in a step 404; this alternate network is used only by the access device and the computing device when joining the computing device to the normal secure network." Ladas at [0041].

Ladas also states that "[t]he computing device then uses the SSID and WEP key that it received from the access point to make a connection to the wireless network in a step 222. The access point . . . accepts the connection in a step 224 so that the computing device is now joined to the secure wireless network." *Id.* at [0039]. Thus, the connection to the secure wireless network in Ladas is another connection to the access point 102, which can be seen visually in Figure 5 (i.e., "CONNECT" at steps 222 and 224). The same is shown in Figure 6, at steps 322 and 324.

This arrangement in Ladas cannot anticipate Applicant's claims, as amended. In particular, Applicant's claims include "the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point but the initial communication path with the computing device does not traverse the access point." Accordingly, the access point 102 of Ladas cannot be construed as both the "access point" and the "computing device" in Applicant's claims.

Because Ladas does not teach every element of independent claims 1, 14, and 20, Ladas does not anticipate claims 1, 14, and 20. Consequently, Applicant requests withdrawal of the 102 rejections of claims 1, 14, and 20 over the cited references, and submits that claims 1, 14, and 20 should be allowed. Further, Applicant submits that dependent claims 2-13 and 15-19 should be allowed as well for at least the reason that they each depend from an allowable independent claim.

6. Conclusion

For at least the foregoing reasons, Applicant submits that the claims are in condition for allowance. Applicant thus respectfully requests favorable reconsideration and allowance of the claims. Applicant does not acquiesce in any assertion by the Examiner that is not expressly

addressed by these remarks. Should the Examiner wish to discuss this case, the Examiner is encouraged to call the undersigned at (312) 754-9315.

Respectfully submitted,

LEE SULLIVAN SHEA & SMITH LLP

Date: July 22, 2019

By: /Brandon J. Kennedy/
Brandon J. Kennedy
Reg. No. 67,894

Electronic Acknowledgement Receipt	
EFS ID:	36648459
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	Playback Device Connection
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	22-JUL-2019
Filing Date:	11-MAR-2019
Time Stamp:	12:51:51
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		05-0601-CON0319A_Response_to_Non Final_OA.pdf	126124 88cb52f8c5e3690ef46c7b262730daf6941864e4	yes	13

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	13
Warnings:			
Information:			
	Total Files Size (in bytes):	126124	

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Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed	PTO/SB/25 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION**
Application Number	16298515
Filing Date	11-Mar-2019
First Named Inventor	Nicholas Millington
Attorney Docket Number	05-0601-CON0319A
Title of Invention	Playback Device Connection

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

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Owner	Percent Interest
Sonos, Ind.	100%

The owner(s) of percent interest listed above 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 any patent granted on pending reference Application Number(s)

16298542 filed on 03/11/2019

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◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status: ○ Small Entity ○ Micro Entity ◉ Regular Undiscounted I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number 67894 ○ A sole inventor ○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ○ A joint inventor; all of whom are signing this request	
Signature	/Brandon J. Kennedy/
Name	Brandon J. Kennedy

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	16298515
Filing Date:	11-Mar-2019
Title of Invention:	Playback Device Connection
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Filer:	Brandon Jacob Kennedy
Attorney Docket Number:	05-0601-CON0319A

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 16298515

Filing Date: 11-Mar-2019

Applicant/Patent under Reexamination: Millington

Electronic Terminal Disclaimer filed on August 5, 2019

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt	
EFS ID:	36786726
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	Playback Device Connection
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	05-AUG-2019
Filing Date:	11-MAR-2019
Time Stamp:	17:17:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$160
RAM confirmation Number	E201985H17463848
Deposit Account	506632
Authorized User	Brandon Kennedy
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	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	33922 116f3d7e64a0712c306caeb10d1e4a9d5b7c2b81	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30437 c8a547cbdbf0144785e940d28ec6838e8bad76af	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	64359		

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

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	1	Non-Final Office Action mailed on 30 May 2019, issued in connection with U.S. Patent Application No. 16/298542, filed on 11 March 2019, 22 pages.	

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-08-05
Name/Print	Michael E. Coyne	Registration Number	58443

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

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

Electronic Acknowledgement Receipt	
EFS ID:	36784211
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	Playback Device Connection
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Michael E. Coyne
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	05-AUG-2019
Filing Date:	11-MAR-2019
Time Stamp:	17:22:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	16298542_NFOA_05-0601-CON0319B_5-30-19_22pages.pdf	1404202 fa0b4ed8fe13d01b53638d5adab5690b918bb5bb	no	22

Warnings:

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	05-0601-CON0319A_0_IDS_20190805153039.pdf	1053213 5226499bcb017689dee439065b5253a80b330227	no	4
Warnings:					
Information:					
			Total Files Size (in bytes):	2457415	

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2451
Examiner Name	Glenford J. Madamba
Attorney Docket Number	05-0601-CON0319A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6686838		2004-02-03	REZVANI; Babak et al.	

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

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	None						

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

NON-PATENT LITERATURE DOCUMENTS Remove

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

	1	None	

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-08-15
Name/Print	Brandon J. Kennedy	Registration Number	67894

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

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

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

Electronic Patent Application Fee Transmittal	
Application Number:	16298515
Filing Date:	11-Mar-2019
Title of Invention:	Playback Device Connection
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Filer:	Brandon Jacob Kennedy/Jaden Knosher
Attorney Docket Number:	05-0601-CON0319A
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	36890062
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	Playback Device Connection
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	15-AUG-2019
Filing Date:	11-MAR-2019
Time Stamp:	17:35:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$240
RAM confirmation Number	E20198EH35491254
Deposit Account	506632
Authorized User	Brandon Kennedy
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	Information Disclosure Statement (IDS) Form (SB08)	05-0601-CON0319A_0_IDS_20190815171054.pdf	1053165 87912ad8ef9207526c8ab5a462d35e10d00e0f8a	no	4
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30437 15ef7d43a004de088845a3b731a871b868f9d4ce	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1083602		

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

135176 7590 09/24/2019

LS3 Sonos
Lee Sullivan Shea & Smith LLP
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

EXAMINER
MADAMBA, GLENFORD J

ART UNIT	PAPER NUMBER
2451	

DATE MAILED: 09/24/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

TITLE OF INVENTION: PLAYBACK DEVICE CONNECTION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	12/24/2019

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)

135176 7590 09/24/2019

LS3 Sonos
Lee Sullivan Shea & Smith LLP
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

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.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

TITLE OF INVENTION: PLAYBACK DEVICE CONNECTION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	12/24/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
MADAMBA, GLENFORD J	2451	709-222000

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
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16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

135176 7590 09/24/2019

LS3 Sonos
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656 W. Randolph St.
Floor 5W
Chicago, IL 60661

EXAMINER	
MADAMBA, GLENFORD J	
ART UNIT	PAPER NUMBER
2451	

DATE MAILED: 09/24/2019

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.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/298,515	Applicant(s) Millington et al.	
	Examiner GLENFORD J MADAMBA	Art Unit 2451	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 22 July 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 1-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

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

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

   * Certified copies not received: _____ .

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

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

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

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

Attachment(s)

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

/GLENFORD J MADAMBA/
Primary Examiner, Art Unit 2451

Allowable Subject Matter

1. The numbering of original claims 1-20 is maintained. No claims have been canceled and no new claims have been added.

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

The Office has deemed Applicant's latest filed claim amendments and corresponding remarks (filed 7/22/2019) *persuasive* to overcome the current rejection of the claims over the applied prior art reference(s), and the claims are thus considered in condition for patentability **(MPEP § 1302.14).**

In particular, the Office notes that no reasonable rejection of the claim over prior art or prior art combination discloses the currently recited features / elements of the independent claims *as a whole*. Additionally, the Office further notes that Applicant's latest filed claim amendments further defining the independent claims, and specifying in part a playback device further performing the function of "while in the setup mode, receiving a response to the first message that facilitates establishing an initial communication path with a computing device that is installed with an application for controlling the playback device, wherein the computing device is operating on a secure wireless local area network (WLAN) that is defined by an access point wherein the initial communication path with the computing device does not traverse the access point:…", as well as the accompanying arguments / remarks [Remarks: par 3, pg. 11 – par 3, pg. 12] -- is also considered to be persuasive, as none of the currently applied prior art reference(s)

[*Ladas* et al], or additional candidate prior art reference, expressly / sufficiently discloses the above combination of features / elements, as currently recited by the amended independent claims. Accordingly, independent claim 1, and similarly the other independent claims (claims 14 and 20), are considered allowable over prior art.

The Office also notes and remarks that the instant application claims are considered allowable for generally the same rationale given to the allowance of related application 14/486,667 (now Patent 9,866,447) dated 6/2/2017.

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."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenford Madamba whose telephone number is 571-272- 7989. The examiner can normally be reached on Monday-Friday 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Parry can be reached on 571-272-8328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, .contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). 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.

/GLENFORD J MADAMBA/
Primary Examiner, Art Unit 2451

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

CPC - Searched*		
Symbol	Date	Examiner
709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc. or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.	05/01/2019	GJM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
709	222	05/01/2019	GJM

* 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
DBs searched: USPAT, USPGPUB, USOCR, DERWENT, EPO, JPO, IBM-TDB	05/01/2019	GJM
Claim amendments / remarks received in response to non-final action issued, and amended independent claim 1 appears to be in condition for allowance. Updated search conducted, and no additional / pertinent candidate prior art found to fully / reasonably disclose the independent claims. Case is allowed.	09/16/2019	GJM

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
709/H04L41	222/28	09/16/2019	GJM

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

✓	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	05/27/2019	09/16/2019							
1	1	✓	=							
2	2	✓	=							
3	3	✓	=							
4	4	✓	=							
5	5	✓	=							
6	6	✓	=							
7	7	✓	=							
8	8	✓	=							
9	9	✓	=							
10	10	✓	=							
11	11	✓	=							
12	12	✓	=							
13	13	✓	=							
14	14	✓	=							
15	15	✓	=							
16	16	✓	=							
17	17	✓	=							
18	18	✓	=							
19	19	✓	=							
20	20	✓	=							

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

CPC						
Symbol					Type	Version
H04L	/	41	/	22	F	2013-01-01
H04L	/	65	/	60	I	2013-01-01
G06F	/	3	/	04842	I	2013-01-01
G06F	/	3	/	0482	I	2013-01-01
H04L	/	63	/	20	I	2013-01-01
H04L	/	67	/	02	I	2013-01-01
H04L	/	67	/	10	I	2013-01-01
H04L	/	12	/	2809	I	2013-01-01
H04L	/	41	/	0809	I	2013-01-01
H04W	/	12	/	08	I	2013-01-01
H04W	/	12	/	003	I	2019-01-01
H04W	/	12	/	04	I	2013-01-01
H04L	/	63	/	10	I	2013-01-01
H04L	/	41	/	0803	I	2013-01-01
H04L	/	12	/	2807	I	2013-01-01
H04L	/	12	/	28	I	2013-01-01
G06F	/	3	/	0481	I	2013-01-01
G06F	/	3	/	04847	I	2013-01-01
H04L	/	67	/	141	I	2013-01-01
H04L	/	12	/	2803	I	2013-01-01
H04L	/	41	/	28	A	2013-01-01
H04L	/	63	/	0823	A	2013-01-01
H04W	/	84	/	12	A	2013-01-01
H04L	/	2012	/	2841	A	2013-01-01
H04L	/	2012	/	2849	A	2013-01-01
H04L	/	63	/	065	A	2013-01-01

CPC Combination Sets						
Symbol					Type	Set	Ranking	Version
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/GLENFORD J MADAMBA/ Primary Examiner, Art Unit 2451	16 September 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.: 20190916

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	**Art Unit**
	GLENFORD J MADAMBA	2451

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H04L	/	12	/	24	

NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
709	222

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

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/GLENFORD J MADAMBA/ Primary Examiner, Art Unit 2451 (Primary Examiner)	16 September 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office — Part of Paper No.: 20190916

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

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/GLENFORD J MADAMBA/ Primary Examiner, Art Unit 2451	16 September 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.: 20190916

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2451
Examiner Name	Glenford J. Madamba
Attorney Docket Number	05-0601-CON0319A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6686838		2004-02-03	REZVANI; Babak et al.	

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

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	None						

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

NON-PATENT LITERATURE DOCUMENTS Remove

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

EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

	1	None

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

EXAMINER SIGNATURE

Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	09/16/2019

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

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

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	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-08-15
Name/Print	Brandon J. Kennedy	Registration Number	67894

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

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

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

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

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

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2451
Examiner Name	MADAMBA, Glenford J.
Attorney Docket Number	05-0601-CON0319A

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	1	Non-Final Office Action mailed on 30 May 2019, issued in connection with U.S. Patent Application No. 16/298542, filed on 11 March 2019, 22 pages.	

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EXAMINER SIGNATURE

Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	09/16/2019

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

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Coyne/	Date (YYYY-MM-DD)	2019-08-05
Name/Print	Michael E. Coyne	Registration Number	58443

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	450103	709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc. or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 13:59
L2	75	L1 and ssid and wep and (join$3, access$3) near3 secure near network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 14:03
L3	38	L2 and wlan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 14:05
L4	242	((("MILLINGTON") near3 ("Nicholas")) OR (("HAINSWORTH") near3 ("Paul"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2019/09/16 14:06
L5	3	L4 and ssid and wep and (join$3, access$3) near3 secure near network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 14:06
S1	1985	709/220.ccls.	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:13
S2	2193	ad$1hoc adj network$1	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:13
S3	438682	(wired, wireless)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S4	1521	S2 and S3	USPAT; USOCR;	OR	ON	2009/01/09 12:14

			EPO; JPO; DERWENT			
S5	1082	S2 same S3	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S6	8	S5 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S7	29	S5 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:17
S8	6	S7 and zone	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:18
S9	262	zone adj players	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:18
S10	4904	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:18
S11	728858	(wired, wireless)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:19
S12	4102	S10 and S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:19
S13	2968	S10 same S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:19
S14	8	S13 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:19
S15	8	S14 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:19
S16	29	S13 and WEP	USPAT; USOCR;	OR	ON	2009/01/09 12:20

			EPO; JPO; DERWENT			
S17	0	S9 and S16	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S18	26	S9 and network	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S20	8	(US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$).did.	USPAT; DERWENT	OR	ON	2009/01/13 13:01
S21	4909	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:26
S22	593	S21 and broadcast$3 near3 (period$6, interval$1, time)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:27
S23	122	S21 and broadcast$3 adj (period$6, interval$1, time)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:27
S24	0	S21 and broadcast$3 adj (period$6, interval$1, time) with expir$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:27
S25	2	S21 and broadcast$3 adj (period$6, interval$1, time) with (end$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:28
S26	7	S23 and (wep, ssid)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:30
S27	0	zone adj player$1 same configur$5 with mode	US-PGPUB; USPAT; USOCR;	OR	ON	2009/01/13 17:04

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S28	18	zone adj player$1 same configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:04
S29	29	prob$3 near3 message and SSID and WEP	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:10
S30	4	S29 and flag same broadcast	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:10
S31	0	broadcast adj storm same flag same probe	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:12
S32	2	broadcast adj storm and flag same probe	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:13
S33	0	configuration adj mode and zone adj player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S34	2308	configuration adj mode and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S35	528	configuration adj mode same controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S36	0	S35 and "zone player"	US-PGPUB;	OR	ON	2009/01/13

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			17:15
S37	0	S35 and "synchrony group"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:16
S38	266	S35 and group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:16
S39	14	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/01/14 11:26
S40	2	zone adj player and (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:28
S41	1909	zone and (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S42	153	zone same (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S43	51	zone with (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S44	447	zone adj players	US-PGPUB; USPAT; USOCR;	OR	ON	2009/11/06 15:34

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S45	5809	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S46	1	S44 and S45	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S47	101	S44 and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:35
S48	79	S47 and (synchrony, group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:36
S49	1404	zone near3 player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:46
S50	2	S45 and S49	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:46
S51	12	S45 same zone with (player$1, device$1, terminal$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:47
S52	2085	controller and ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:52
S53	1707	S52 and (configur$5, synchroni$7)	US-PGPUB;	OR	ON	2009/11/06

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			15:53
S54	57	S53 and (synchroniz$7) near5 operation$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:54
S55	14	S54 and (broadcast$3) with (packet, data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:55
S56	2	"20080267218"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 16:19
S57	22	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:16
S58	2	"6349352".pn.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:17
S59	23	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:19
S60	15	S59 and synchron$7	US-PGPUB; USPAT;	OR	ON	2009/11/25 15:20

			DERWENT			
S61	2	"20090259762"	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:40
S62	51442	(zone, media) near3 player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S63	20532	S62 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S64	514	S63 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S65	218	S64 and playback	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:09
S66	24	S65 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:09
S67	1599	zone near3 player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S68	473	S67 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S69	6	S68 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15

S70	496	zone adj player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S71	1	S70 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S72	145	S70 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S73	0	S72 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:17
S74	71	S72 and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:17
S75	151	(audio, media) adj player$1 with zone$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:22
S76	93	S75 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:22
S77	0	S76 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:22
S78	0	S75 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2011/03/03 18:23

			DERWENT; IBM_TDB			
S79	0	S76 and IP near2 broadcast	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:24
S80	0	S76 and datagrams near2 prob$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:24
S81	22189	secure near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:21
S82	10665	(unsecure, ad$1hoc) near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S83	978	S81 and S82	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S84	0	S83 and zone near2 player$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S85	509	zone adj players	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:22
S86	0	S85 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S87	8495	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S88	1	S85 and S87	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S89	9	S85 and (secure, private) near2 network	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2011/10/11 12:25

			EPO; JPO; DERWENT; IBM_TDB			
S90	473	zone adj player$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:27
S91	94	S90 and (secure, ad$1hoc)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S92	37	S91 and network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S93	8	S92 and join$3	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S94	29	S92 not S93	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:30
S95	0	S90 and "wep key"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S96	0	S90 and "wired equivalent privacy"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S97	2098	media near2 player with (zones, area)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S98	3	S97 and "wired equivalent privacy"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:32
S99	45961	Home near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S100	374	S99 and ("wired equivalent privacy", HHID)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S101	374	S99 and ("wired equivalent privacy")	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S102	0	S101 and HHID	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S103	0	S99 and HHID	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S104	67	S101 and join$3 near5 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S105	61	S101 and join$3 near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S106	27	S81 and S105	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:35
S107	39	S105 and (secure, private) near2 network	US-PGPUB; USPAT; USOCR;	OR	ON	2011/10/11 12:35

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S108	14	S82 and S107	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:35
S109	4	S108 and (media, playback, zone) near2 (device, terminal, apparatus)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:42
S110	31	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:48
S111	358248	(media, playback, zone) near2 (device, terminal, apparatus, player)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:20
S112	10969	S111 and home near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:20
S113	1507	S112 and zone$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:21
S114	34	S113 and WEP	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:21
S115	2	"20100245582"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:31
S116	743	wep and home near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:34
S117	98	S116 and zone$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:34
S118	10	S117 and join$4 near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:35
S119	0	S85 and WEp	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2011/10/11 13:37

			IBM_TDB			
S120	665	home near2 network and WEP	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S121	357	S120 and (audio, music)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S122	76	S121 and (connect44, join$4) near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S123	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:40
S124	30	S123 and wired and wireless	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:40
S125	9	S123 and "network interface" same wired same wireless	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:43
S126	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/22 21:43

		or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.				
S127	16	S126 and configuration near3 (setting$1, information)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/22 21:44
S128	393	wep and request with configuration	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/23 00:47
S129	78	S128 and join$3 with network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/23 00:47
S130	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-	US-PGPUB; USPAT; DERWENT	OR	OFF	2012/06/12 14:09

		7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.				
S131	21	S130 and button	US-PGPUB; USPAT; DERWENT	OR	OFF	2012/06/12 14:11
S132	5224	709/231.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:22
S133	4802	370/254.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:22
S134	0	S132 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S135	17	S133 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S136	2189	"L5" and (wired, wireless)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S147	77	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/03 17:04

S148	77	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:49
S150	19	S148 and wlan	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:50
S151	7	S148 and wlan with secure	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:50
S152	45	S148 and configuration	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 18:34
S153	1737	zone near2 players	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S154	875	S153 and audio	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S155	19	S154 and wlan	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S156	531	networked with audio near3 system	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:22
S157	71	S156 and synchronized near3 playback	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:22
S158	39	S157 and (@ad<"20150604" or @rlad<"20050604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:23

S159	4	S157 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:24
S160	793	(media, zone) near2 players and synchronized with playback	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S161	72	S156 and S160	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S162	1	S161 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S163	4974	(media, zone, audio) near2 players with (group$1, zone$1)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:27
S164	250	S163 and wlan	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 19:28
S165	27	S164 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:28
S166	310	S154 and grouping	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 19:31
S167	35	S166 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:31
S168	257	(media, audio) adj player near2 (zone$1, group$1, grouping$1)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:36
S169	505	(media, audio) adj player with player near2 (zone$1, group$1, grouping$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/15 19:36
S170	52	S169 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:37
S171	874	networked same audio near3 system	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:39
S172	265	S171 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S173	419	S156 and (@ad<"20150604" or @rlad<"20050604")	USPAT; USOCR;	OR	ON	2019/05/15 19:40

			EPO; JPO; DERWENT			
S174	105	S173 and group$4 with player$1	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S175	1	"20040168081"	US-PGPUB	OR	ON	2019/05/20 16:00
S176	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/20 17:37
S177	3	S176 and audio near2 (network, system) and playback near3 (device, terminal, ue)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/05/20 17:38
S178	2	"20020124097"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/05/20 17:39
S179	475824	709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc. or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S180	629	S179 and ssid and wep near2 (key, password)	US-PGPUB; USPAT;	OR	ON	2019/05/26 18:20

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S181	236	S180 and wlan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S182	51	S181 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:21
S183	51	S182 and access near2 point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:21

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	1691	H04L41/28$2.cpc.	US-PGPUB; USPAT	OR	OFF	2019/09/16 14:07
L7	38	L6 and ssid and wep	US-PGPUB; USPAT	OR	ON	2019/09/16 14:08
L8	13	L7 and wlan	US-PGPUB; USPAT	OR	OFF	2019/09/16 14:08
L9	13	L8 and (join$3, access$3) near3 network	US-PGPUB; USPAT	OR	ON	2019/09/16 14:09
S137	6339	709/220.ccls.	US-PGPUB; USPAT	OR	OFF	2012/07/15 11:24
S138	3105	S137 and (wired, wireless)	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S139	58	S138 and ssid and wep	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S140	4	S139 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S143	1080521	@ad >="20040606" and @ad<="20060606"	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S144	1141	S137 and S143	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S145	17	S144 and ssid and wep	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S146	1	S145 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29

9/16/2019 2:10:27 PM
C:\Users\gmadamba\Documents\EAST\Workspaces\16298515_2019-05-02_CON of

15091113.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 05-0601-CON0319A)

In re Application of:		)	
		)	Confirmation No.: 7686
Sonos, Inc.		)	
		)	Group Art Unit: 2451
Serial No.:	16/298,515	)	
		)	Examiner: Madamba, Glenford J.
Filed:	March 11, 2019	)	
		)	
Title:	PLAYBACK DEVICE CONNECTION	)	

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

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Applicant thanks Examiner Madamba for the thorough examination and for recognizing the allowability of the subject matter of the claims.

Applicant respectfully submits that the Reasons for Allowance may not take into account the entirety of the Applicant's claimed invention as reflected in the claims, the specification, and the prosecution history of the application. Applicant believes that the claims, specification, and prosecution history in their entirety provide an adequate basis for allowability of the claims.

The Applicant also notes that there are additional reasons that one or more of the claims are allowable that have not been specifically included in the Reasons for Allowance. The Applicant respectfully submits that, notwithstanding the Reasons for Allowance, it is believed that each of the allowed claims is patentable in its own right, for other reasons raised during prosecution and/or explained in the Specification of the present application.

For example, while the Reasons for Allowance focus on certain aspects of the independent claims, there are many aspects of the independent claims that distinguish the allowed claims from the cited art of record. All of these distinctions, made apparent in the prosecution history of the present application, should be considered when evaluating the allowability of the claims.

To the extent that specific parts of the Examiner's Statement of Reasons for Allowance or other statements in the Notice of Allowance may pertain to features appearing in some but not all claims, Applicant respectfully submits that the Examiner has thoroughly examined the claims, recognized the features appearing or not appearing in each of the claims, and properly found each of the claims to be allowable. To the extent that the Examiner has paraphrased claim features, Applicant respectfully submits that the claims have been construed in view of their language in light of the specification and not limited by any of the Examiner's statements or by the recitation therein of any specific claim features.

Respectfully submitted,

Date: September 24, 2019 By: /Brandon J. Kennedy/
Brandon J. Kennedy
Registration No. 67,894

Doc Code: IFEE PTOL/85B-EFS

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
16298515	11-Mar-2019	Nicholas Millington	05-0601-CON0319A	7686

TITLE OF INVENTION :

PLAYBACK DEVICE CONNECTION

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Regular Undiscounted	Utility under 35 USC 111(a)	2451	222000	GLENFORD MADAMBA

Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
$1000	$0	$1000	24-Dec-2019	$0

1.Change of Correspondence Address and/or Indication Of Fee Address (37 CFR 1.33 & 1.363)

Current Correspondence Address:	Current Indicated Fee Address :
135176 LS3 Sonos Lee Sullivan Shea & Smith LLP 656 W. Randolph St. Floor 5W Chicago IL 60661 UNITED STATES 312-754-9602 ls3_docketing@cardinal-ip.com	
☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☒ Fee Address indication requested, system generated SB/47-EFS form attached

2.Entity Status

Change in Entity Status

○ Applicant certifying micro entity status; system generated Micro Entity certification form attached. See 37 CFR 1.29.
Note: Absent a valid certification of micro entity status, issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment. If this box is checked, you will be prompted to choose a micro entity status on the gross income basis (37 CFR 1.29(a)) or the institution of higher education basis (37 CFR 1.29(d)), and make the applicable certification online.

○ Applicant asserting small entity status. See 37 CFR 1.27.
Note: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

◉ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

WEB IFEE 1.0

Doc Code: IFEE PTOL/85B-EFS

Document Description: Issue Fee Payment (PTO-85B)

3.The Following Fee(s) Are Submitted:

☒ Issue Fee	☐ I authorize USPTO to apply my previously paid issue fee to the current fees due
☐ Publication Fee	☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____
☐ Advance Order - # of copies _____	☒ If **in addition to** the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency, or credit any overpayment, to Deposit Account Number 506632 . The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

1.

2.

3.

5.Assignee Name(s) and Residence Data To Be Printed

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

Name	City	State	Country	Category
Sonos, Inc.	Santa Barbara	CALIFORNIA	united states	corporation

6.Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/Brandon J. Kennedy/	**Date**	09-24-2019
Name	Brandon Jacob Kennedy	**Registration Number**	67894

WEB IFEE 1.0

Doc Code: MFEE.C.AD PTO/SB/47-EFS

Document Description: Maintenance Fee Address Change

FEE ADDRESS INDICATION FORM			
Application Number	16298515	Art Unit	2451
Filing Date	11-Mar-2019	Examiner Name	GLENFORD MADAMBA
First Name Inventor	Nicholas Millington	Attorney Doc. Number	05-0601-CON0319A

INSTRUCTIONS: In order for the fee address identified on this form to be effective, the issue fee must have been paid for the application listed on this form. Only an address represented by a customer number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. For more information on customer numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

Please recognize as the Fee Address under the provisions of 37 CFR 1.363 the address associated with:

Customer Number:	135176 LS3 Sonos Lee Sullivan Shea & Smith LLP 656 W. Randolph St. Floor 5W Chicago IL 60661 UNITED STATES 312-754-9602 ls3_docketing@cardinal-ip.com

Signature :

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application.

Signature	/Brandon J. Kennedy/	**Date**	09-24-2019
Name	Brandon Jacob Kennedy	**Registration Number**	67894

Electronic Patent Application Fee Transmittal

Application Number:	16298515
Filing Date:	11-Mar-2019
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Filer:	Brandon Jacob Kennedy
Attorney Docket Number:	05-0601-CON0319A

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	1000

Electronic Acknowledgement Receipt	
EFS ID:	37258308
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	24-SEP-2019
Filing Date:	11-MAR-2019
Time Stamp:	16:25:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1000
RAM confirmation Number	E20199NG25491628
Deposit Account	506632
Authorized User	Brandon Kennedy
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 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	Amendment after Notice of Allowance (Rule 312)	05-0601-CON0319A_Comments_on_Statement.pdf	67403 a1ca8f4ed72ce755cdb69d989de10ea791b5e221	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	Web85b.pdf	46159 7ecb30c0baafb4d5d15bf9d54161733dc43b3552	no	2
Warnings:					
Information:					
3	Maintenance Fee Address Change	web85feeaddress.pdf	33082 1d47fdc2d5e739a4d9dba195559e38332dc1624e	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	31793 86ef8ffa41253191805393493a0eb175fadc2d6a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	178437		

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	None						

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

NON-PATENT LITERATURE DOCUMENTS Remove

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	1	Non-Final Office Action mailed on 04 September 2019, issued in connection with U.S. Patent Application No. 15/091113, filed on 5 April 2016, 23 pages.	
	2	Notice of Allowance mailed on 26 August 2019, issued in connection with U.S. Patent Application No. 16/298,542, filed on 11 March 2019, 8 pages.	

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-09-24
Name/Print	Brandon J. Kennedy	Registration Number	67,894

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

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

Electronic Patent Application Fee Transmittal	
Application Number:	16298515
Filing Date:	11-Mar-2019
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Filer:	Brandon Jacob Kennedy/Jaden Knosher
Attorney Docket Number:	05-0601-CON0319A
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	37259098
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	24-SEP-2019
Filing Date:	11-MAR-2019
Time Stamp:	16:23:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$240
RAM confirmation Number	E20199NG24211581
Deposit Account	506632
Authorized User	Brandon Kennedy
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	Non Patent Literature	15091113_NFOA_05-0601-CON0316B_9-4-19_23pages.pdf	1057382 6160e9a7c851af707f6d9288d40e668e65525b86	no	23
Warnings:					
Information:					
2	Non Patent Literature	16298542_NOA_05-0601-CON0319B_8-26-19_8pages.pdf	446085 e90ae797da42f638c3259781157136a5e0562fa3	no	8
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	05-0601-CON0319A_0_IDS_20190924153110.pdf	1053298 f6a0ce270f862606d6562df04121b6f3e4355087	no	4
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30446 2ad5b895c1c83b93fb9d304d86dc98292ce16958	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2587211		

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

135176 7590 10/16/2019

LS3 Sonos
Lee Sullivan Shea & Smith LLP
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

EXAMINER	
MADAMBA, GLENFORD J	

ART UNIT	PAPER NUMBER
2451	

NOTIFICATION DATE	DELIVERY MODE
10/16/2019	ELECTRONIC

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

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

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

ls3_docketing@cardinal-ip.com
york@ls3ip.com

PTOL-90A (Rev. 04/07)

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
16/298,515	03/11/2019	Millington et al.	05-0601-CON0319A

	EXAMINER	
LS3 Sonos Lee Sullivan Shea & Smith LLP 656 W. Randolph St. Floor 5W Chicago, IL 60661	GLENFORD J MADAMBA	
	ART UNIT	PAPER
	2451	20191010

DATE MAILED: _____

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

Commissioner for Patents

This communication is being sent out to indicate that the document(s) listed in the ids filed/dated 9/24/2019 has/have been considered by the Office on 10/10/2019.

/GLENFORD J MADAMBA/
Primary Examiner, Art Unit 2451

PTO-90C (Rev.04-03)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2451
Examiner Name	MADAMBA, Glenford J.
Attorney Docket Number	05-0601-CON0319A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	None						

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

NON-PATENT LITERATURE DOCUMENTS Remove

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

EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	1	Non-Final Office Action mailed on 04 September 2019, issued in connection with U.S. Patent Application No. 15/091113, filed on 5 April 2016, 23 pages.	
	2	Notice of Allowance mailed on 26 August 2019, issued in connection with U.S. Patent Application No. 16/298,542, filed on 11 March 2019, 8 pages.	

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

EXAMINER SIGNATURE

Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	10/10/2019

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-09-24
Name/Print	Brandon J. Kennedy	Registration Number	67,894

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

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 16/298,515	Filing Date 03/11/2019	☐ 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $460 =	
☐ 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	10/28/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

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

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

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

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

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

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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

Application Number	16298515	Filing Date	2019-03-11	Docket Number (if applicable)	05-0601-CON0319A	Art Unit	2451
First Named Inventor	Nicholas A.J. Millington			Examiner Name	MADAMBA, Glenford J.		

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

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the orde in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☐ Amendment/Reply

☒ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 506632

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

EFS - Web 2.1.16

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-10-28
Name	Brandon J. Kennedy	Registration Number	67894

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is t 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 estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Tim will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions fo 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.

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

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

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.

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

Electronic Patent Application Fee Transmittal

Application Number:	16298515
Filing Date:	11-Mar-2019
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Filer:	Brandon Jacob Kennedy
Attorney Docket Number:	05-0601-CON0319A

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4000	4000
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
RCE- 1ST REQUEST	1801	1	1300	1300
		Total in USD ($)		**5440**

Electronic Acknowledgement Receipt	
EFS ID:	37582852
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	28-OCT-2019
Filing Date:	11-MAR-2019
Time Stamp:	17:42:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$5440
RAM confirmation Number	E20190RH43165714
Deposit Account	506632
Authorized User	Brandon Kennedy
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	TrackOne Request	05-0601-CON0319A_Track1Request.pdf	145762 fbf4ec94b0006e02b1850d78f92830e171518928	no	2
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	05-0601-CON0319A_0_IDS_20191028165927.pdf	1054475 0e1062c71e2a0cf1187431920a9f5d879603410a	no	6
Warnings:					
Information:					
3	Foreign Reference	CA2371747A1.pdf	4669992 973ab3f0c2df9ad72f39890eb610edcc3ac9ff0f	no	154
Warnings:					
Information:					
4	Foreign Reference	WO0237217A2.pdf	1394152 285ac69864401a4b03d47e2d0b9180521a30715e	no	25
Warnings:					
Information:					
5	Foreign Reference	WO9709756A2.pdf	2241998 a68831fab8827bd3e7c3a29f3b8047f8780f8b76	no	22
Warnings:					
Information:					
6	Non Patent Literature	Chertov_IPR_Declaration_re_US7391791.pdf	1315231 a09035be3c9f1b7d4535c44b8916ae2d925b74ed	no	92
Warnings:					
Information:					

7	Non Patent Literature	Chertov_IPR_Declaration_re_US8942252.pdf	1061538 24a45c46818f0337fbb840e3d250ba2918fda553	no	81
Warnings:					
Information:					
8	Non Patent Literature	Bluesound_Answer_Exhibit_C_10-14-19_16pages.pdf	295512 79d8692548c632db0a5acd2ae8791191895938a3	no	16
Warnings:					
Information:					
9	Non Patent Literature	Bluesound_Answer_Exhibit_D_10-14-19_36pages.pdf	1070335 5a7d0c1e97c71bb9904a88df82603ab7a315f629	no	36
Warnings:					
Information:					
10	Non Patent Literature	Bluesound_Answer_Exhibit_E_10-14-19_21pages.pdf	581432 10f01327e22a98696e228012522b887f50b2e02c	no	21
Warnings:					
Information:					
11	Non Patent Literature	Bluesound_Answer_10-14-19_66pages.pdf	1356492 56f34b470e08ebed160308d3f675acc9acb1ab6c	no	66
Warnings:					
Information:					
12	Non Patent Literature	Bluesound_Answer_Exhibit_A_10-14-19_3pages.pdf	700504 bea13eb9a07e0e20c0b0a7f80108261c286686a9	no	3
Warnings:					
Information:					
13	Request for Continued Examination (RCE)	05-0601-CON0319A_RCE.pdf	1349949 008e1c86be01cf4ea8b65a7850fe77415e851ff1	no	3
Warnings:					
Information:					

14	Fee Worksheet (SB06)	fee-info.pdf	33883 1782de8c8cfb644d7f03067a4e0c47f094484d5a	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	17271255	

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:	Nicholas A.J. Millington	Nonprovisional Application Number (if known):	16/298,515
Title of Invention:	Playback Device Connection		

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.

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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 /Brandon J. Kennedy/	Date 2019-10-28
Name (Print/Typed) Brandon J. Kennedy	Practitioner Registration Number 67,894

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.**

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
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Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2451
Examiner Name	MADAMBA, Glenford J.
Attorney Docket Number	05-0601-CON0319A

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5642171		1997-06-24	BAUMGARTNER; Donn M. et al.	
	2	6006275		1999-12-21	PICAZO et al.	
	3	6119239		2000-09-12	FUJII; Kazuo	
	4	6122749		2000-09-19	GULICK; Dale A.	
	5	6703940		2004-03-09	ALLEN; William A. et al.	
	6	6801507		2004-10-05	HUMPLEMAN; Richard et al.	
	7	7058719		2006-06-06	MOTOYAMA; Tetsuro	
	8	7269338		2007-09-11	JANEVSKI; Angel	

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	Attorney Docket Number	05-0601-CON0319A

	9	7313384		2007-12-25	MEENAN; Patrick et al.	
	10	7321784		2008-01-22	SERCEKI; Zeljko John et al.	
	11	8064904		2011-11-22	JAIN; Nikhil et al.	
	12	8601394		2013-12-03	SHEEHAN; Conor et al.	
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	1	20020161865		2002-10-31	NGUYEN; Brian G.	
	2	20050198221		2005-09-08	MANCHESTER; Scott et al.	
	3	20060161635		2006-07-20	LAMKIN; Allan B. et al.	
	4	20070220150		2007-09-20	GARG; Gopal K.	

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	5	20080109852		2008-05-08	KRETZ; Martin H. et al.	

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	1	2371747	CA	A1	2001-05-25	SAMSUNG ELECTRONICS CO LTD [KR]		
	2	0237217	WO	A2	2002-05-10	SONY ELECTRONICS INC [US]		
	3	9709756	WO	A2	1997-03-13	BUCALO BRIAN D [US], et al.		

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	1	Sonos, Inc. v. Implicit, LLC: Declaration of Roman Chertov in Support of the Inter Partes Review of U.S. Patent No. 7,391,791 dated March 9, 2018, 92 pages.	
	2	Sonos, Inc. v. Implicit, LLC: Declaration of Roman Chertov in Support of the Inter Partes Review of U.S. Patent No. 8,942,252 dated March 9, 2018, 81 pages.	
	3	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit A, filed October 14, 2019, 3 pages.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	4	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit C, filed October 14, 2019, 16 pages.	
	5	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit D, filed October 14, 2019, 36 pages.	
	6	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit E, filed October 14, 2019, 21 pages.	
	7	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint, filed October 14, 2019, 66 pages.	

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	Filing Date	2019-03-11
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	Art Unit	2451
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	Attorney Docket Number	05-0601-CON0319A

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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Name/Print	Brandon J. Kennedy	Registration Number	67894

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(11) CA 2 371 747 (13) A1

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WANG, DONGYAN (US).

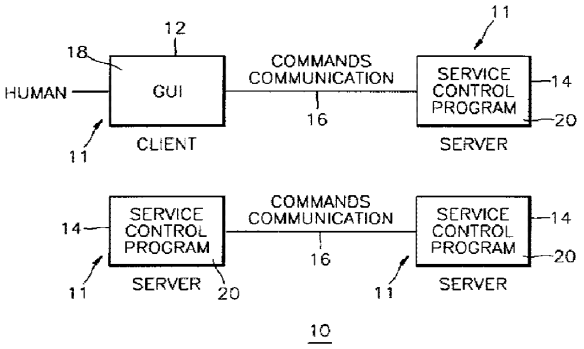
(74) RIDOUT & MAYBEE LLP

(54) COMMUNICATION ENTRE DISPOSITIFS ET COMMANDE DE DISPOSITIFS DANS UN RESEAU DOMESTIQUE RELIE A UN RESEAU EXTERNE AVEC SOUTIEN REGIONAL

(54) DEVICE COMMUNICATION AND CONTROL IN A HOME NETWORK CONNECTED TO AN EXTERNAL NETWORK WITH REGIONAL SUPPORT

(57)

A method and system for providing user interfaces in a first network including first devices interconnected via a communication medium and at least one interface device connecting said first network to at least a second network having interconnected second devices providing services, the user interfaces for controlling the devices that are currently connected to the first network and devices that are currently connected to the second network. In each of one or more first devices in the first network a process includes: (a) obtaining information from one or more of said first devices currently connected to the first network, said information including device information; and (b) generating a user interface description including: (1) at least one reference associated with the device information of each of said one or more first devices, (2) at least a redirection identification code (RIC) corresponding to that first device, and (3) at least one reference associated with the services provided by the second network. The second network includes at least a first portal and at least a destination service provider for providing services, and the method further comprises the steps of: at least a first device requesting service from the second network by sending a request including an RIC to the first portal using a reference in the user interface description, the first portal determining a destination service provider based on the received RIC, and the first portal redirecting the request to the destination service provider. The destination service provider in the second network can be internal or external to the first portal.



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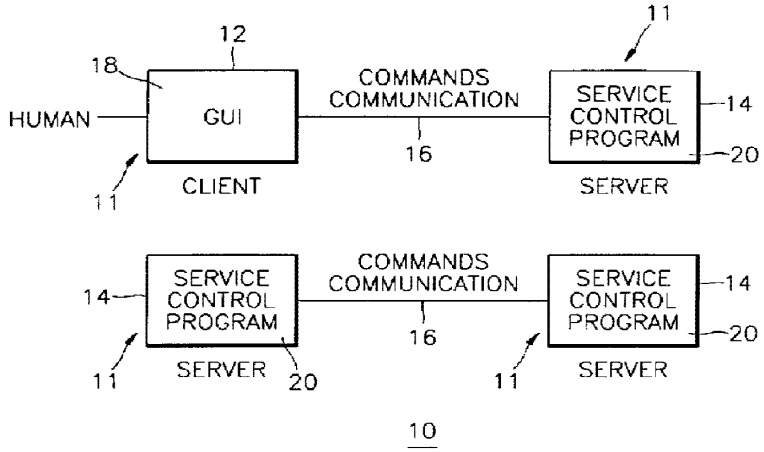
(71) Demandeur/Applicant:
SAMSUNG ELECTRONICS CO., LTD., KR

(72) Inventeurs/Inventors:
HUMPLEMAN, RICHARD, US;
WANG, DONGYAN, US

(74) Agent: RIDOUT & MAYBEE LLP

(54) Titre : COMMUNICATION ENTRE DISPOSITIFS ET COMMANDE DE DISPOSITIFS DANS UN RESEAU DOMESTIQUE RELIE A UN RESEAU EXTERNE AVEC SOUTIEN REGIONAL

(54) Title: DEVICE COMMUNICATION AND CONTROL IN A HOME NETWORK CONNECTED TO AN EXTERNAL NETWORK WITH REGIONAL SUPPORT



(57) Abrégé/Abstract:
A method and system for providing user interfaces in a first network including first devices interconnected via a communication medium and at least one interface device connecting said first network to at least a second network having interconnected second devices providing services, the user interfaces for controlling the devices that are currently connected to the first network and devices that are currently connected to the second network. In each of one or more first devices in the first network a process includes: (a) obtaining information from one or more of said first devices currently connected to the first network, said information including device information; and (b) generating a user interface description including: (1) at least one reference associated with the device information of each of said one or more first devices, (2) at least a redirection identification code (RIC) corresponding to that first device, and (3) at least one reference associated with the services provided by the second network. The second network includes at least a first portal and at least a destination service provider for providing services, and the method further comprises the steps of: at least a first device requesting service from the second network by sending a request including an RIC to the first portal using a reference in the user interface description, the first portal determining a destination service provider based on the received RIC, and the first portal redirecting the request to the destination service provider. The destination service provider in the second network can be internal or external to the first portal.

Abstract of the Invention

A method and system for providing user interfaces in a first network including first devices interconnected via a communication medium and at least one interface device connecting said first network to at least a second network having interconnected second devices providing services, the user interfaces for controlling the devices that are currently connected to the first network and devices that are currently connected to the second network. In each of one or more first devices in the first network a process includes: (a) obtaining information from one or more of said first devices currently connected to the first network, said information including device information; and (b) generating a user interface description including: (1) at least one reference associated with the device information of each of said one or more first devices, (2) at least a redirection identification code (RIC) corresponding to that first device, and (3) at least one reference associated with the services provided by the second network. The second network includes at least a first portal and at least a destination service provider for providing services, and the method further comprises the steps of: at least a first device requesting service from the second network by sending a request including an RIC to the first portal using a reference in the user interface description, the first portal determining a destination service provider based on the received RIC, and the first portal redirecting the request to the destination service provider. The destination service provider in the second network can be internal or external to the first portal. (Representative Drawing: Fig. 1)

DEVICE COMMUNICATION AND CONTROL IN A HOME NETWORK CONNECTED TO AN EXTERNAL NETWORK WITH REGIONAL SUPPORT

Technical Field

The present invention relates to the field of networks, and more particularly, to home networks having multi-media devices connected thereto.

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<Cross-References to Related Applications>

Applicants claim the benefit of U.S. Provisional Application No. 60/166,602 entitled "Regional Service Support for Home Network Top-Level Home Page and External Device Manufacturer's Portal Services," filed on November 19, 1999 which application is incorporated herein by reference.

Background Art

A network generally includes a communication link and various devices with communication capability connected to the communication link. The devices include computers, peripheral devices, routers, storage devices, and appliances with processors and communication interfaces. An example of a network is a home network for a household in which various devices are interconnected. A usual household can contain several devices including personal computers and home devices that are typically found in the home. As such the term "device" typically includes logical devices or other units having functionality and an ability to exchange data, and can include not only all home devices but also general purpose computers. Home devices include such

electronic devices as security systems, theater equipment, TVS, VCRs, stereo equipment, and direct broadcast satellite services or (DBSS), also known as digital satellite services (DSS), sprinkler systems, lighting systems, micro waves, dish washer, ovens/stoves, washers/dryers, and a processing system in an automobile.

In general, home devices are used to perform tasks that enhance a homeowner's life style and standard of living. For example, a dishwasher performs the task of washing dirty dishes and relieves the homeowner of having to wash the dishes by hand. A VCR can record a TV program to allow a homeowner to watch a particular program at a later time. Security systems protect the homeowner's valuables and can reduce the homeowner's fear of unwanted entry.

Home devices, such as home theater equipment, are often controlled using a single common control unit, namely a remote control device. This single common control unit allows a homeowner to control and command several different home devices using a single interface. Thus, may manufacturers have developed control units for controlling and commanding their home devices from a single interface.

One drawback associated with using the remote control unit to command and control home devices is that it provides static and command logic for controlling and commanding each home device. Therefore, a particular remote control unit can only control and command those home devices for which it includes the necessary control and command logic. For example, if a remote control unit comprises logic for controlling a television (TV), a video cassette recorder (VCR), and a digital video device (DVD), but not a compact disk (CD) unit, the remote control unit can not be used to command and control the CD unit. In addition, as new home devices are developed, the remote control unit will not be able to control and command the new home devices that require control and command logic that was not known at the time the remote

control unit was developed.

Further, typically a remote control unit can only be used to command and control those home devices that are within the signal range of the remote control unit. Therefore, a user cannot use the remote control unit from a single location in the house to control and command home devices that are interconnected, but located in separate areas of the home. For example, a VCR that is located upstairs in a bedroom may be connected to a TV that is downstairs in the family room. If a user wishes to play a tape contained in the VCR located upstairs in the bedroom, on the TV located downstairs in the family room, the user cannot control and command both the TV and the VCR from a single location.

Another drawback associated with using remote control units is that known remote control units cannot control a plurality of diverse devices, and more particularly, cannot control a plurality of devices having different capabilities to communicate with each other in order to accomplish tasks or provide a service. Further, conventional network systems do not provide a mechanism for software applications in different network devices to automatically communicate with one another in order to accomplish tasks without direct user command.

To alleviate the above problems, some network models provide a central/singular user interface (UI) in one device including static device information for networked devices for user control of network devices. However, in such networks a change to device information (e.g., ICON) in a device requires a change to, and rebuilding of, the top level page. Further, if the device displaying the central user interface becomes unavailable, user control of the network is curtailed. Another problem with the central/singular page is that every UI device must display the same page, and a scope is not provided for each manufacturer to generate its own UI look and feel nor alter the technology used in the UI device. The content of an icon/information representing a device cannot be changed, and a UI device cannot display a

more prominent look to a device icon such as the icon for the UI device itself. Nor can a UI builder tool obtain e-business icons from an external Web Portal. Such a model cannot be standardized for industry use because a central/single UI device controls the UI.

Further, existing networks only allow communication and control of devices connected to a network (e.g., 1394) using said central user interface, without the ability to provide user interface and control of devices and services connected to another different network (e.g., Internet).

There is, therefore, a need for a method and a system which provides dynamic control and command devices in a home network. There is also a need for such a method and system to provide the ability for accessing devices connected to a first network and accessing devices and services connected to a second different network, and to independently generate different user interface representations of the devices connected to the first and of devices and services connected to the second network for user control and communication. There is also a need for such a method and system to provide regional service and support for devices located in different geographical regions.

Disclosure of the Invention

The present invention satisfies these needs. In one embodiment, the present invention provides a method and system for providing user interfaces in a first network including first devices interconnected via a communication medium and at least one interface device connecting said first network to at least a second network having interconnected second devices providing services, the user interfaces for controlling the devices that are currently connected to the first network and devices that are currently connected to the second network. In one version, the method comprises the steps of, in each of one or more first devices in the first network: (a) obtaining information from one or more of said first devices currently connected to the first network,

said information including device information; and (b) generating a user interface description including: (1)at least one reference associated with the device information of each of said one or more first devices, (2) at least a redirection identification code (RIC) corresponding to that first device, and (3) at least one reference associated with the services provided by the second network.

The second network includes at least a first portal and at least a destination service provider for providing services, and the method further comprises the steps of: at least a first device requesting service from the second network by sending a request including an RIC to the first portal using a reference in the user interface description, the first portal determining a destination service provider based on the received RIC, and the first portal redirecting the request to the destination service provider. The destination service provider in the second network can be internal or external to the first portal.

A reference associated with services provided by the second network comprises at least one hyper-link to said first portal, wherein the first portal includes service information comprising at least redirection information based on RICs to services provided by other service providers in the second network. The first portal further includes a list of RICs and corresponding destination service provider portal addresses, such that the steps of determining a destination service provider further includes the steps of looking up in said list a destination service provider portal address corresponding to a received RIC, and redirecting the request to said destination service provider portal address. Each destination service provider address can comprise a URL. The RIC an be obtained from a user or automatically . For at least one user device, the corresponding RIC comprises an identifier representing the geographical region of the first device.

A user interface is displayed based on each user interface description

on a device connected to the first network capable of displaying a user interface, for user control of said first devices and communication with said second devices. Displaying each user interface is based on using each reference in the corresponding user interface description to access the associated information in each first device, and associated service information in each second device; generating the user interface including information corresponding to each device using the accessed information in each device; and displaying the user interface on said device capable of displaying a user interface.

Brief Description of the Drawings

These and other features, aspects and advantages of the present invention will become better understood with regard to the following description, appended claims and accompanying drawings where:

FIG. 1 shows an example block diagram of the architecture of an embodiment of a network according to the present invention;

FIG. 2 shows an example block diagram of the architecture another embodiment of a network according to the present invention;

FIG. 3 illustrates an example of a layered interface model that can be used for communicating between home devices in accordance with the present invention;

FIG. 4a shows an example architecture diagram of a DVCR server device replaying video to a DTV client device capable of displaying a user interface, in a network according to the present invention;

FIG. 4b shows another example architecture diagram of a server device communicating with a client device capable of displaying a user interface, in a network according to the present invention;

FIGS. 5-6 illustrate example top-level GUIs representing the functions of networked devices to a user;

FIG. 7 shows an example block diagram architecture of a home network constructed in accordance with another embodiment of the present invention;

FIG. 8 shows an example process according to the present invention

for communication between a 1394 network and a non-1394 network for IP address configuration;

FIGS. 9a-c show example functional block diagrams of connections to data and control bits of an embodiment of a discovery system architecture in a network according to another aspect of the present invention;

FIG. 10 shows an example flow diagram for discovery and configuration agents in the home network in connection with the functional block diagrams in FIGS. 9a-c;

FIG. 11 shows an example flow diagram for user interface description generator agent in the home network in connection with the functional block diagrams in FIGS. 9a-c;

FIG. 12 shows a pictorial outline of a top level network user interface description including links to external services, showing actual icon and name HTML file references and addresses, according to another aspect of the present invention;

FIG. 13 shows example top-level GUI representing the functions of devices in a home network and services provided by an external network, based on the user interface description of FIG. 12;

FIG. 14 shows another example process according to another aspect of the present invention for communication between a 1394 network and a non-1394 network for IP address configuration;

FIG. 15 shows an example flow diagram for user interface description generator agent in the home network for generating a top level network user interface description including links to external services, according to another aspect of the present invention;

FIG. 16 shows a pictorial outline of a top level network user interface description including links to external services and regional identification codes (RIC) using Zip codes, showing actual icon and name HTML file references and addresses, according to another aspect of the present invention;

FIG. 17 shows an example method of user configuration wherein a user can input general RIC information such as Zip code or area code for regional support;

FIG. 18 shows an example method of automatic configuration for obtaining IP addresses as RICs via service providers' system;

FIG. 19 shows an example flowchart of steps of an embodiment of redirection according to the present invention in conjunction with FIG. 17;

FIG. 20 shows an example flowchart of steps of another embodiment of redirection according to the present invention in conjunction with FIG. 18; and

FIG. 21 shows an example block diagram of architecture of a network system including several home networks, and several external networks, interconnected via a communication network such as the Internet, wherein redirection based on RIC is implemented according to an aspect of the present invention.

Appendices 1-4, illustrative examples for: (1) Top-Level Page description 250 (Appendix 1); (2) Background.htm (Appendix 2); (3) Icon.htm (Appendix 4); and (4) Name.htm (Appendix4);

Appendices 5-12, illustrative examples for the following htm files for generating the top level home network user interface description and GUI in FIGS. 12-13 including external links, wherein:

Appendix 5 - illustrates Top-Level Page Example TLNUID (index.htm)

Appendix 6 - example background.htm;

Appendix 7 - illustrates example icon.htm;

Appendix 8 - illustrates example name.htm;

Appendix 9 - illustrates example logoicon1.htm;

Appendix 10 - illustrates example logoname1.htm;

Appendix 11 - illustrates example logoicon2.htm;

Appendix 12 - illustrates example logoname2.htm;

Appendix 13 illustrates a Perl Example Program for Trace Route for regional service;

Appendix 14 illustrates example of a redirection program;

Appendices 15, 6, 7, 8, 16, 17, 18, and 19, illustrative examples for htm files for generating the top level home network user interface description and

GUI in FIGS. 13 and 16 including external links with regional support, wherein:

Appendix 15 - illustrates Top-Level Page Example TLNUID (index.htm)

Appendix 16 - illustrates example logoicon1.htm;

Appendix 17 - illustrates example logoname1.htm;

Appendix 18 - illustrates example logoicon2.htm; and

Appendix 19 - illustrates example logoname2.htm.

To facilitate understanding, identical reference numerals have been used, where possible, to designate identical elements that are common throughout the figures.

Best mode for carrying out the Invention

<Network Overview>

Referring to FIG. 1, in an embodiment of the present invention, a network 10 comprises multiple devices 11 including at least one client device 12 and at least one server device 14 interconnected via a communication link 16. The communication link 16 can include a 1394 serial bus providing a physical layer (medium) for sending and receiving data between the various connected home devices. The 1394 serial bus supports both time-multiplexed audio/video (A/V) streams and standard IP (Internet Protocol) communications (e.g., IETF RFC 2734). In certain embodiments, a home network uses an IP network layer as the communication layer for the home network. However, other communication protocols could be used to provide communication for the home network. For example, the invention may be implemented using Function Control Protocol (FCP) as defined by IEC 61883, or any other appropriate protocol. Thus, a network may generally include two or more devices interconnected by a physical layer exchange or transfer of data in accordance with a predefined communication protocol.

Each client device 12 may communicate with one or more server devices 14 in the network 10. Further, each server device 14 may

communicate with one or more other server devices 14, and one or more client devices 12, in the network 10. Each client device 12 can include a user communication interface including input devices such as a mouse and keyboard for receiving user input, and a display for providing a control user interface for a user to interact with the networked devices. The user interface can include a graphical user interface (GUI) 18 for providing information to the user. Each server device 14 includes hardware as a resource in the network for providing services to the user, and can further include a server or service control program 20 for controlling the server hardware.

Each server device 14 provides a service for the user, except control user interface, and each client device 12 provides a service including control user interface for user interaction with the network 10. As such, only client devices 12 interact directly with users, and server devices 14 interact only with client devices 12 and other server devices 14. Example services can include MPEG sourcing/sinking and display services.

In an exemplary embodiment of the present invention, a browser based network (e.g., a home network) uses Internet technology to control and command devices including client devices and server devices that are connected to a network. Each device includes device information such as interface data (e.g. HTML, XML, JAVA, JAVASCRIPT,GIF, JPEG, graphics files, or any other format useful for the intended purpose) that provides an interface for commanding and controlling of the device over the network. In certain embodiments, each device includes device information such as one or more Hypertext markup Language (HTML) pages that provide for the commanding and controlling of that device. Using the browser technology, the network employs Internet standards to render the HTML pages in order to provide users with a plurality of graphical user interface (GUIs) for commanding and controlling each device. In one example, the network is configured as an intranet.

In one embodiment, a client device comprises a device providing control interface service to a human operator, including a graphical display hardware for down communication and a mouse or other point-and-click device for up (or return) communication. A server device comprises a module supplying a service, which can be any service other than a control interface provided by a client device. As such, the server/client device relationship is a control relationship, wherein the server device provides a service but a client device can use the data, as a DTV displays video data, but need not manipulate or alter the data. It is thus consistent with this definition to observe that, frequently, a server may be a source of information and a client (a browser, for example) may be a consumer of information.

Examples of specific functions which can be implemented by server devices include: return of information (data); performance of a function (e.g., mechanical function) and return of status; return of a data steam and status; reception of a data stream and return of status; or saving of a state for subsequent action. Examples of server devices include MPEG source, sink and display servers. While a server device typically includes a custom, built-in, control program to implement control of its own hardware, a client functions to interface with the server device. However, server device as used herein does not imply that a web server and a protocol stack must be used.

FIG. 2 shows a block diagram of an embodiment of a network 100 according to an aspect of the present invention. A 1394 serial bus 114, described above, electronically connects multiple devices 11 including server devices 14 (e.g., DVD 108, DVCR 110), client devices 12 (e.g., DTV 102, 103), Bridge 116, DVCR120, PC 105, cable/modem access 107, and DBS access 109, on the network 100. FIG. 3 illustrates an example of a layered interface model that can be used for communicating between the devices 11 in accordance with the present invention. In this example, a device (server) 150 communicates with a client device 166 using one or more of the network communication layers 152-164. In one example, an application in the device

150 communicates with an application in the device 166 via the network layer 160. The details of lower layers 162 and 164 are not seen by the applications, whereby use of e.g. either 1394 or Ethernet does not make a difference to said applications in the devices 150, 166. Further not all the upper layers of the 7-layer model are used all the time (e.g., in the Web model (TCP/IP model) session layer 156 and presentation layer 154 are not used). As such, in one version, by employing the Internet Protocol standard for the network layer 160, the devices can communicate with each other without having to know specific details about the other communication layers (i.e. application 152, presentation 154, session 156, transport 158, data link 162 and physical 164). Thus, by employing the Internet Protocol standard for the network layer 160, the network can use a combination of different communication layers in communicating between different devices.

A single physical package can include several devices which are logically networked via a network layer for example as shown in FIG. 3 not necessarily via a physical network (e.g., such devices can include a VCR and a TV in a single housing). Where a logical device accesses a GUI to enable a user to control a device, the device and the logical device can be included in the same physical package. In such an embodiment, the physical device fetches a GUI from itself. However, in other embodiments the network interconnects separate physical devices, wherein for example, a first device fetches a GUI from a second device, to permit user interaction with the GUI to control the second device.

In a presently preferred embodiment, a 1394 serial bus is used as the physical layer 164 for the data communications on the network 100. Because of its enhanced bandwidth capabilities (e.g., enhanced and guaranteed bandwidth and isochronous stream capability), the 1394 serial bus can provide a single medium for all data communications on the network 100 (i.e. audio/video streams and command/control).

Further, the 1394 serial bus provides automatic configuration reset such that when a device is plugged in/removed all the 1394 interfaces reset, the 1394 bus reconfigures and every device knows the presence of every other device (including a newly added one or without the one just removed). Also, the 1394 interface supports a data space for configuration information that is addressable from any device allowing other devices to write/read information and make modifications e.g. to permit the operation of the network layer protocol. However, it is possible to achieve these results with different software and standards. As such, the network 100 is not restricted to using a 1394 serial bus, and, in alternative embodiments of the present invention, other bus types, such a Ethernet, ATM, wireless, etc., can be used as the physical layer if they meet the particular throughput requirements of an individual network (e.g., a home network) . Further, a modified version of e.g. wireless-Ethernet can include the essential features of 1394.

As depicted in FIG. 2, the network 100 includes several devices connected to the 1394 serial bus 114. In this example, the devices include a DBSS 104 for receiving transmission signal from a satellite 122 for subsequent display. Associated with the DBSS is a network interface unit ("NIU") which, among other things, provides an interface between the DBSS satellite transmission and the 1394 serial bus 114.

A digital video device (DVD) 108 is also connected to the exemplary network 100. The DVD 108 can be used to display digitally encoded videos on a television. Also connected to the exemplary network 100 is a digital video cassette recorder (DVCR) 110, i.e., a digital TV 102. In this example, the DTV 102 provides a human interface for the network 100 by employing browser technology to allow users to control and command for devices over the home network 100. A second DTV 103 provides another human interface for the network 100 by employing browser technology to allow users to control and command for devices over the home network 100. The DTVs 102 and 103 can provide human interfaces for the network 100 as each DTV comprises a

screen for displaying HTML pages. However other devices having display capability can be used to provide human interfaces. Thus, in certain embodiments of the invention, a device such as the personal computer 105 (PC) is used to provide a human interface for a respective home network, as a PC 105 typically embodies a screen display unit.

The 1394 serial bus 114 is depicted as using the HTTP/IP interface protocol, and preferably HTTP/TCP/IP, wherein IP provides packet format (a one-way write only model), TCP provides an error free version of IP (e.g., ensures packets arrive and in correct order), and HTTP provides 2-wa connection (packet to server will expect a response -a 'read' model). Certain devices can require other protocol interface types (e.g., UPD/IP, FTP/IP,TELNET/IP, SNMP/IP, DNS/IP, SMTP/IP). In certain embodiments of the invention, a proxy 116 can be used to interface two networks using dissimilar interface protocols on their respective mediums which, when connected, comprise the network 100. The proxy 116 (e.g. Web proxy) can include Home Automation type protocols such as the HTML/HTTP/TCP/IP proxy for X10, Lonworks, CEBus (on their respective physical technologies), or non-IP protocols on 1394 (e.g., AVC/FCP/1394).

In certain embodiments, the two network mediums are of the same type. For example, as depicted in FIG. 2, the 1394 serial bus 114 using the HTTP/IP interface protocol is connected by a proxy 116 to the Home Automation neutral 118 (e.g., X10). By using the proxy 116 as HTML/HTTP/CTP/IP/1394 proxy for VCR-Commands/AVC/FCP/1394, to interface between HTML/HTTP/TCP/IP and X10 protocols, DVCR 120 is also accessible on the network 100. In certain other embodiments, a network can comprise two network mediums of dissimilar types, e.g., a 1394 Serial bus and Ethernet. Therefore, in certain embodiments of the invention, a proxy is used to interface two dissimilar medium types to from a single network. A discovery process, described further below, can be used for the discovery of devices that are powered on and connected to the network 100. Also, the same 1394 bus can be used

without need for a bridge box.

As depicted in FIG. 2, devices 11 including DTV 102, DTV 103, PC 105, DVCR 110, DVD 108, DSS-NIU 104 and DVCR 120 represent devices that are currently connected to the network 100 comprising a 1394 network. A client-server relationship exists among the attached devices, with the DTV 102 , DTV 103 and PC 105 typically behaving as clients and devices DVCR 110, DVD 108, DSS-NIU 104 and DVCR 120 behaving as servers.

A typical1394 network comprises interconnected devices such as a collection of appliances including server devices offering one or more services to be controlled (e.g., DVCR 100 as an MPEG video recording and replay service), and client device offering a user interface (UI) service (e.g., DTV 102) for controlling the server devices. Some appliances (e.g., DTV 103) can have both services (e.g., MPEG decode and display capability) to be controlled, and a UI controller capability. According to an aspect of the present invention, methods and systems including protocols, document description, image compression and scripting language standards from technologies utilized in the World Wide Web standard (Web model) are used to implement t a 1394WEB user-to-device control model in the network 100. The Web model is a client/server model. The controlled server device (service) comprises a Web server and the controller client device (i.e., a device capable of displaying a UI) comprises a Web client including a GUI presentation engine, described further below, such as a Web browser (e.g., Explorer J, NetscapeJ, etc.).

<User Device Control>

FIG. 4a shows a server device such as the DVCR 110 replaying MPEG video to a client device such as the DTV 102 in a network 100 according to the present invention, wherein the DTV 102 can display a user interface. The DVCR 110 includes Web server hardware and software and the DTV 102 includes Web browser software. A user can utilize the DTV 102 to request that the DTV 102 display a user interface based on the device information 202

contained in the DVCR 110 or based on the device information 204 contained in the DTV 102. For example, the user can utilize a browser 200 in the DTV 102 to display an HTML control page GUI 202 contained in the DVCR 110 or an HTML control page GUI 204 contained in the DTV 102. Each page 202, 204 includes graphical user interface description information in HTML, wherein the browser 200 reads that information to generate a graphical user interface. Each page 202, 204 represents the Control Interface of the Applications 206, 212, respectively. Each page 202, 204 can include a hierarchy of pages to represent a corresponding application control interface.

Each GUI 202 and/or 204 includes active control icons and/or buttons for the user to select and control devices currently connected to the network 100. If, for example, the user selects a PLAY button in the GUI 202 of the DVCR 110 displayed by the browser 200 on the DTV 102, a hyperlink message is returned to the DVCR 110 Web server and directed to an application software 206 (e.g., MPEG Record/Replay Service Application Software) in the DVCR 110 for operating a DVCR hardware 208. In one example, an MPEG video stream source 208 in the DVCR 110 transmits an MPEG video stream to an MPEG vide decode and display system 210 in the DTV 102 for display under the control of application control software 212 in the DTV 102. The application software 206 in the DVCR 110 also sends information back to the application software 212 in the DTV 102, including e.g. an acknolwdgement if the operation is successful, or an altered or different control GUI 202 to the DTV 102 indicating status to the user. There can be further communication between the application softwares 206 and 212 e.g. for setting up a 1394 isochronous video stream connection for video stream service.

FIG. 4b shows another example architecture diagram of a server device communicating with a client device capable of displaying a user interface, in a network 100. The server device such as DVCR 110 replays MPEG video to the client device such as the DTV 102 in the network 100, wherein the DTV 102 can display a user interface.

<Communication Protocol>

In an embodiment of the invention, the communication protocol between devices in the network 100 is based on the Hypertext Transfer Protocol (HTTP 1.1), an application-level protocol for distributed, collaborative, hypermedia information systems. HTTP is a generic, stateless, object-oriented protocol that can be use for many tasks. A feature of HTTP is the typing and negotiation of data representation, allowing devices to be built independently of the data being transferred over the network 100 to which the devices are connected.

<GUI Description Language>

The description document language for defining various GUIs 202, 204 can be e.g. HTML, version 4.0, the publishing language of the World Wide Web. HTML supports text, multimedia, and hyperlink features, scripting languages and style sheets. HTML 4.0 is an SGML application conforming to International Standard ISO 8879 -- Standard Generalized Markup Language.

<Image Compression Formats>

To display images, three still image graphics compression formats specified by the HTML specification are utilized in the 1394WEB network 100 for ICON, LOGO and other graphics. The still image graphics compression formats are: Graphics Interchange Format (GIF89s) , Progressive Joint Photograhic Experts Group (JPEG) and Portable Network Graphics (PNG). Table 1 shows the differences in capabilities between the three different still image graphics compression formats.

<Table 1>

	PNG	Progressive JPEG	GIF89a
Color Depth	48 bit	24 bit	8 bit
Colors Supported		16.7 million	256
Formats Supported	Raster, Vector	Raster	Raster
Compression Scheme	LZ77 derivative	JPEG	LZW
Transparency	Per Pixel for Grayscale & RGB, Per Color for Indexed, 256 levels	No	Single Color, 2 levels (Binary)
Progressive Display	Yes	Yes	Yes
Scalable	No	No	No
Animation		No	Yes
Lossless Compression	100%		
Truecolor	48 bits		
Grayscale	16 bits		
Indexed-color	Yes		
Gamma Correction (light intensity)	Yes		
Chromaticity Correction	Both		
Searchable Meta-Data	Yes		
Extensibility	Yes, chunk encoded		

<Scripting Language>

Further, the Web scripting language, ECMA-Script-262, is utilized to provide a means for visually enhancing the GUI Web pages 202 as part of a Web-based client-server architecture. The scripting language is a programming language for manipulating, customizing, and automating the facilities/services of the devices. The user interface 200 provides basic user

interaction functions, and the scripting language is utilized to expose that functionality to program control. The existing system provides the host environment of objects and facilities completing the capabilities of the scripting language. The web browser 200 provides the ECMA-Script host environment for client-side computation including, for example, objects that represent windows, menus, pop-ups, dialog boxes, text areas, anchors, frames, history, cookies, and input/output.

The web browser 200 provides the host environment for the EXMA-Script-262, and the host environment supports attaching scripting code to events such as change of focus, page and image loading, unloading, error and abort, selection, form submission, and mouse actions. Scripting code is included within the HTML pages 202 and 204 and the displayed page is the browser 200 includes a combination of user interface elements, and fixed and computed text and images. The scripting code responds to user interaction without need for a main program.

<Client Device Specification>

In one example, the specification for a 1394WEB client browser 200 includes HTTP1.1 specification, wherein section >8.1.2.1 Negotiation' of the HTTP1.1 specification regarding connection persistence is modified such that an HTTP1.1 client device such as e.g. the DTV102 expects a connection to server device such as e.g. the DVCR 110 via the 1394 to remain open, because the persistent connection in 1394WEB user control allows full status reporting from the server device (DVCR 110) while the GUI 202 and/or 204 remains visible in the browser 200 of the client device (DTV 102). The HTTP connection remains open (HTTP spec RFC 2068) wherein a client that supports persistent connections may "pipeline" its requests (i.e., send multiple requests without waiting for each response). A server must send its responses to those requests in the same order that the requests were received. This allows the web browser 200 to pipeline requests to the DVCR 110 which the DVCR 110 can then satisfy later with e.g. status responses such as Now

Playing, Now Recording, Rewind Finished, Tape Broken, Etc. Other example implementations include e.g. the control page from the DVCR 110 can contain a request to loop on the DVCR 100 request of GUI description 202.

The GUI presentation engine 200 is utilized in the client device such as the DTV 102 to interpret GUI descriptions 202, 204 written in the HTML4.0 document description language and the associated specifications (below), and to create the graphical form for display to the user. The GUI presentation engine 200 includes the following e.g. attributes: (1) window (GUI) minimum default size of e.g., H0x640 pixels (480x640 where 480 vertical, 640 horizontal). This default size is to insure the intended appearance in the GUIs 202, 204 is transferred to the user in the browser 200. The transferred GUIs 202, 204 are displayed in a window 480x640 pixels or magnified larger with the same aspect ratio unless otherwise directed by the user; (2) still image compression formats: e.g., GIF89a, JPEG, and PNG; (3) style sheet formats and fonts: e.g., CSS1 and CSS2; (4) fonts such as the following e.g. built-in fonts are required for the client device to free simple server appliances from having to support such fonts. Minimum one font from each generic Latin family can be selected: e.g., Times New Roman, from 'serif' family; Helvetica, from 'sans-serif' family; Zapf-Chancery, from 'cursive' family; Western from 'fantasy' family; and Courier from 'monospace' family. Other fonts can also be utilized; and (5) scripting language e.g., ECMA-262. Examples of the GUI presentation engine 200 include Web browsers such as Explorer J and NetscapeJ configured/customized as desired.

<Server Device Specification>

One or more of the server devices (e.g. a 1394WEB network, controlled appliance Web server such as the DVCR 110), include the following six enumerated components:

(1) HTTP1.1 web server protocol, with section >8.1.2.1 Negotiation' of the HTTP1.1 specification regarding connection modified such that an

HTTP1.1 server device (e.g. DVCR 110) assumes that a HTTP1.1 client device (e.g., DTV 102) intends to maintain a persistent connection with the server device. The persistent connection in the 1394WEB network 100 allows full status reporting from e.g. the server device DVCR 110 to the client device DTV 102 while the GUI 202 of the DVCR 110 remains visible in the browser 200 of the DTV 102. Further, a method using HTTP conditional GET to obtain the latest status of server devices can be used. Whenever the user returns to the home network directory or causes it to be refreshed, the browser 200 redisplays the page in its entirety. This is necessary because the HTML that underlies the home network directory may have been regenerated if a device has been added to or removed from the network 100. It is also possible for device icons to be updated to reflect changes in their device's operating state. As such, browsers implemented by EIA-775.1 devices utilize HTTP "conditional get" requests to determine whether or not fresh copies of web pages or graphics should be retrieved from the server.

(2) Device home page GUI descriptions 202, 204 written e.g. in HTML4.0, include file e.g. icon.htm, name.htm, logo.htm, index.htm, gif files, etc.. The file index.htm is referenced by HTML links included in device icon.htm and name.htm HTML files, wherein index.htm can be optionally named e.g. "INDEX.HTML" or "INDEX.HTM". File named INDEX.HTM is not required to be a standard name because the ICON.HTM and NAME:HTM are made with hyperlinks to the 'INDEX.HTM', therefore the name is arbitrary. ICON.HTM and LOGO.HTM reference the actual graphics files in the same device e.g. LOGO.GIF and ICON.GIF. The descriptions 202, 204 are accessible by the devices (e.g., HTTP devices) in the network 100. To guarantee a desired appearance, the control GUI design can be for a default GUI size of e.g. 480x640 pixels. For example, a transferred GUI 202 can be displayed in a window of 480x640 pixels in the browser 200 or magnified larger with the same aspect ratio unless otherwise directed by the user.

(3) At least two device ICON files are provided to represent the device

in a top-level network page 220 (FIGS. 5-6) in the browser 200 showing information about the devices connected to the network. An ICON can comprise a graphic file type (e.g. GIF, JPG or PNG) and named ICON.HTM. In one example, ICON.HTM(DVCR) references the INDEX.HTM file in the HTML page 202 and ICON.HTM(DTV) references the INDEX.HTM file in the HTML page 204. The top-level link for the control pages (e.g., INDEX.HTM) of the device can be ICON.HTM. The browser 200 places the icons and links therein) of a plurality of devices in the network 100 in the top-level HN directory page 220 for service discovery by the user. Then user clicks the ICON displayed in the page 220 and the device page (e.g. INDEX.HTM in page 202) is fetched. The default displayed HN directory is the top-level discovery page.

A number of additional and different graphic icons can also be utilized, for example, to represent device status, user configured preference or manufacturers formats which may be substituted for the icon graphic. In a discovery process described further below, ICONs from the devices connected to the network 100 are collected together and displayed in the top level network devices page 220 for selection by a user. An example device ICON specification comprises: File name ICON.HTM accessible by the HTTP server (files names are in a directory, file space, accessible by the web server so that they can be retrieved and forwarded over the network to the browser); Graphic file type such as GIF, JPG or PNG; and Icon graphic with a maximum size of 70(V)x130(H) pixels.

(4) At least two device LOGO files are provided to represent the device in the top-level network devices page. LOGO can comprise a graphic file type (e.g., GIF, JPG or PNG) and named LOGO. HTM. In one example, LOGO.HTM(DVCR) references the INDEX.HTM in the HTML page 202 and LOGO.HTM(DTV) references the INDEX.HTM in the HTML page 204. In one version, the top-level link for the control pages (e.g., INDEX.HTM) of the device can be LOGO.HTM. All device logos are placed in the top-level HN directory page 220 for service discovery by the user. Then user clicks the LOGO displayed in the page 220 and the device page (e.g. 202) is fetched. A

number of additional and different graphics for manufacturer services can be substituted for the logo graphic format . According to the discovery process, LOGOs from devices connected to the network 100 are collected together and displayed in the top level network devices page 220 for selection by a user. An example device LOGO specification comprises: File name LOGO.HTM accessible by the HTTP server; Graphic file type such as GIF, JPG or PNG; and logo graphic maximum size of about 70(V)x130(H) pixels.

(5) At least one device NAME is provided to represent the device in the top-level network devices page. NAME comprises TEXT in an HTML file NAME.HTM. This text can also reference control pages (e.g., 202). This is a top-level link in the discovery page to the control interface of the device. The text provides a way to distinguish identical devices whereby for e.g. two identical DTV's can be distinguished by adding NAME text 'Bedroom TV' and 'Family Room TV'. The text can comprise a few words to clearly represent the device type e.g. DVCR or DTV. According to the discovery process, NAMEs from devices connected to the network are accessed along with corresponding ICONs/LOGOs and displayed in the top level network devices page 220 under the ICON/LOGO. An example NAME specification comprises: File name NAME.HTM accessible by the HTTP server; Text unspecified, such as, with Font size 10, two lines of text can be displayed under the corresponding ICON/LOGO. Therefore, for example the space size for the NAME.HTM text can be 20 vertical by 130 horizontal to match the ICON/LOGO (70 vertical x 130 horizontal). As shown by example in FIGS. 5-6, the format of the top-level UI 220 can comprise a matrix of icons representing the functions of the networked devices to the user. The name representing the device (from name.htm) is placed under the icon (from icon.htm) from the same device. Logo (from logo.htm) may be placed e.g. in any vacant icon position. As the Top-level description 250 (described further below in conjunction with FIGS. 9a-c) is generated independently by UI capable devices, the exact design need not be prearranged. The icon, logo and name maximum sizes can be prearranges to facilitate design of the GUI matrix.

(6) A device information summary home page description document written in HTML4.0 can be provided, named e.g. "info.html" or "info.htm", and made accessible by the HTTP server for the discovery process. A link can be provided to INFO.HTM information via control pages e.g. 202, 204. The device information summary homepage provides the user a device summary instead of the detailed control interface as shown in the device homepage. Table 2 shows device attributes text that are included and others that can be included. This table can be extended to included other attributes.

<Table 2>

Name	Value
Device Name	Device name (user configurable)
Device Location	Device location in home (user configurable)
Device Icon	Current Device ICON name
Device Type	Device type or category (VCR, DSS, TV, etc.)
Device Model	Device model
Manufacturer Name	Name of device manufacturer
Manufacturer Logo	Manufacturer Logo image name
Manufacturer URL	Device manufacturer's URL
Stream Source Name Default	Service: Default source device name for this Device's destination service
Stream Destination Name Default	Service: Default destination device name for this Device's source service
Stream Source Attributes	Type of service device can deliver (attributes and capability)
Stream Destination Attributes	Type of service device can receive (attributes and capability)

Table 2 includes device summary information such as Manufacturer Name, Manufacturer Logo image name, and can further include a Manufacturer URL for help if there is an available Internet connection to the manufacturers Web site. Table 2 can further include a user configurable Device Name and Device Location in the home. There can be several variations of the Device Icon representing different states of the device. The Device Icon attribute field includes the name of the current icon. Therefore, the device summary information page can provide immediate device state information to the user by displaying the icon representative of current state.

Each device can include one or more services, e.g. video Stream Source or video Stream Destination. Each source capability has a complementing Default Destination capability and each destination capability has a complementing Default Source capability. This Stream Default Name entry can be used e.g. to automatically default the nearest DTV to be the destination when a DVCR is being controlled as source to eliminate having to select the DTV each time. A background cross-referencing of the Stream Default Name to 1394 address is provided. The video stream services are provided by the 1394 interface itself (not by Web model). As such there is a linkage of the default source or sink to the 1394 address mechanism. The user can access a device and select a name for default, which is then saved on the device. The device's software agent must find the 1394 address and parameters for the 1394 s/w to enable the default stream when required.

Using the Source and Destination service attributes, new server/services can be implemented while maintaining compatibility with existing host or device (nodes) and services. For example, if a new server device providing a new service is developed that is compatible with an existing server device, both the new and existing serviers can be added to the attribute list of the new node while maintaining compatibility with existing nodes using the existing server in the network 100. The user can select a compatible device

for purchase. These provide a user with "ABOUT" information to check capabilities of existing equipment e.g. prior to purchasing new equipment where compatibility is desired.

<Network Operation>

A discovery process for every device supporting the 1394WEB standard (e.g. devices capable of displaying a user interface) gathers device information from devices connected to the network 100 to generate the top-level user control page description for the home network, wherein each device is represented by a graphical icon reference and a textual name reference detailed above. The top-level description can include a default page for a presentation engine such as the browser 200, wherein the browser 200 collects the graphic images and names from the devices as it renders the network top-level graphical user interface 220 (GUI) displayed in the browser 200 as shown by example in FIGS. 5-6. The dynamically created top-level HN directory page 220 is made the default page for the browser (first page displayed when the browser is launched).

With reference to FIG. 4b, example operation steps include: (1) the browser 200 in device 102 is launched, (2) the browser 200 fetches and presents HN-Directory HTM (Top-Level UI) from the page 204, (3) the browser 200 fetches the HTM files icon.htm and names.htm from pages 202, 204 and presents in the Top-Level UI, (4) the browser 200 fetches any graphics files (e.g., GIF) from pages 202, 204, and presents in Top-Level UI, (5) the browser 200 is then able to present the full HN_Directory page 220 (page 220 is made with hyperlinks to 'INDEX.HTM' files for different devices connected to the network 100), and (6) when a user clicks e.g. DVCR icon in GUI 220 to control the DVCR 110, a corresponding hyperlink in the top-level page 220 to 'INDEX.HTM' of the DVCR 110 is used to retrieve the 'INDEX.HTM' (top control page of DVCR) from page 202 in the DVCR 110, and present the DVCR control page to the user (e.g., if the frame that was clicked (e.g. the icon.htm frame) is not large enough, a graphic is presented in another copy of

the browser with full frame size). The user can then command and control the DVCR 110 using the control interface provided by 'INDEX.HTM' of the DVCR device 110 presented by the browser 200 in the DTV 102

The name 'INDEX.HTM' is arbitrary because the ICON.HTM and NAME.HTM are made with hyperlinks to the 'INDEX.HTM'. However, ICON.HTM and LOGO.HTM reference the actual graphics files (e.g. LOGO.GIF and ICON.GIF) in the same devices. In one embodiment, LOGO.HTM can be optional if a logo for a device is optional. The HN_Directory HTML file can have a standard name so that it can be accessed from another device.

FIGS. 5-6 show that the host device, such as a client device (e.g., DTV 102, HDTV1) or server device (e.g., DVCR 110) that generates and presents the top-level GUI page 220 can assume priority and use a larger size icon for the host device's icon, name, logo, etc. In one version, only devices with servers (services on offer) are displayed in the GUI 220 (a "Client device" comprises device with Client capability, where if it is only client then it is not displayed in the top-level GUI as there is no service to offer). The discovery process reads information from the 1394 address space data storage (configuration ROM structure), as defined in clause 8 of ISO/IEC 13213. Although called 'ROM' it is assumed that the address space is write-able to allow user configuration and modification of user relevant stored values. The contents of the configuration ROM and the discovery process are described further below.

Device naming, addressing and discovery processes for home or local network control of consumer devices using Internet, Web and 1394 technology, can be different from the requirements and practice in the general Internet space. As such according to an aspect of the present invention for in home or local network control of consumer devices, special processes including device discovery, addressing and naming requirements are utilized. For

example, the home network must fully function without the presence of external communications and services, without a network administrator, and configuration must be fully automatic. User control can be in many cases entirely keyboard-less. Further, the IEEE1394 protocol is utilized to provide a sophisticated interface including features that can be provide simple, efficient and superior discovery and configuration functions.

<1394 Home Network>

FIG. 7 shows a block diagram of a network 300 constructed in accordance with another embodiment of the present invention. To facilitate understanding, identical reference numerals have been used, where possible, to designate identical elements that are common throughout all the figures herein. As depicted in FIG. 7, a 1394 serial bus 114, described above, electronically connects multiple devices including server devices 14 (e.g., DVD 108, DVCR 110) and client devices 12 (e.g., DTV 102) on the network 100, described above in reference to FIG. 2, wherein the devices communicate using the example layered interface model of FIG. 3 as described above.

The network 300 is not restricted to using a 1394 serial bus, and, in alternative embodiments of the present invention, other bus types, such a Ethernet, ATM wireless, etc., can be used as the physical layer if they meet the particular throughput requirements of an individual network (e.g., a home network) . As depicted in FIG. 7, the network 300 includes several devices connected to the 1394 serial bus 114. In this example, the devices include a DBSS 104 for receiving transmission signal from a satellite 122 for subsequent display. Associated with the DBSS is a network interface unit ("NIU") which, among other things, provides an interface between the DBSS satellite transmission and the 1394 serial bus 114. A digital video device (DVD) 108 is also connected to the exemplary network 300. The DVD 108 can be used to source digitally encoded videos for display on e.g. a digital television. Also connected to the exemplary network 100 is a digital video cassette recorder (DVCR) 110, a digital TV (DTV)102. In this example, the DTV 102 provides

a human interface for the network 300 by employing browser technology to allow users to control and command for devices over the home network 300. A second DTV 103 provides another human interface for the network 100 by employing browser technology to allow users to control and command for devices over the home network 100. The DTVs 102 and 103 can provide human interfaces for the network 300 as each DTV comprises a screen for displaying HTML pages. However other devices having display capability can be used to provide human interfaces. Thus, in certain embodiments of the invention, a device such as a personal computer 105 (PC) is used to provide a human interface for a respective home network, as a PC 105 typically embodies a screen display unit.

The 1394 serial bus 114 is depicted as using the HTTP/IP interface protocol, and preferably HHTP/TCP/IP, wherein IP provides packet format (a one-way write only model), TCP provides an error free version of IP (e.g., ensures packets arrive and in correct order), and HTTP provides 2-wa connection (packet to server will expect a response -a 'read' model). Certain devices can require other protocol interface types (e.g., TCP/IP, UPD/IP, FTP/IP,TELNET/IP, SNMP/IP, DNS/IP, SMTP/IP). In certain embodiments of the invention, a proxy 116 can be used to interface two networks using dissimilar interface protocols on their respective mediums which, when connected, comprise the network 300.

For example, as depicted in FIG. 7, the 1394 serial bus 114 using the HTTP/IP interface protocol is connected by a proxy 116 to the Home Automation network 118 (e.g., X10). By using the proxy 116 as HTML/HTTP/CTP/IP/1394 proxy for VCR-Commands/AVC/FCP/1394, to interface between HTML/HTTP/TCP/IP and X10 protocols, DVCR 120 is also accessible on the network 300.

In this embodiment, the network 300 can be connected to an external network 119 of dissimilar type (e.g., Ethernet) to the 1394 Serial bus, via a bus

121. A proxy 117 is used to interface the two dissimilar medium types. For communication between the addressing scheme of the external network 119, and the addressing scheme of the network 300, the bridge 117 comprises a Network Address Translation (NAT) boundary. This technique can be utilized for company LAN's and is a 'divide and conquer' approach to the complex problem of satisfying various network's differing IP address requirements and prevents 'running out of IPV4' addresses. The external network can include e.g. CABLE-TV network 115 via Ethernet to the telephone e.g. ADSL), providing broadband connection to the Internet and WWW. The Ethernet 119 provides the bridge function to the external network. The bridge 117 or Ethernet 119 may provide the NAT address conversion function. If the Ethernet is to provide local private (to home only) addressing (e.g. as defined by then IETF standard RFC 1918) then the NAT function is in the Ethernet 119. Existing cable modems are set up with a global address and also Internet global address for the PC on the Ethernet (in this case the NAT is in the bridge 117).

<IP Name/Address Configuration>

The aforementioned device naming, addressing and discovery processes for the network 300 are now described. For device naming, point and click Web operation (e.g., using GUI/Web) does not require name services (DNS, Domain Name Service). The Web GUI provides an abstraction layer, and the addresses are hidden as hyper-text links invoked by user 'clicks' to active GUI areas (e.g., buttons). Any change to the devices in the local network 300 causes the top-level discovery GUI page 200 (FIGS. 5-6) to be recreated by the browser 200 (FIGS. 4a-b) representing the status of the devices in the network 300 at that time and by default presented to the user for immediate use.

For device to device control a different look-up service is utilized for more than names (e.g., service look-up and application look-up). As such, DNS may not provide the necessary features for device to device control.

However, a device (e.g., a 1394 connected PC) can access a DNS service as usual. DNS is not required for discovery or operation of devices/services within the home, but DNS (name to address) look-up service is required for external accesses e.g. from a PC. When a name e.g. "www.yahoo.com" is typed in to a Browser then look up take place for the IP address of the Yahoo computer, i.e. 216.32.74.52, because the Internet (even home internet) operates with addresses.

For a 775WEB UI device which includes an agent for generating the HN top-level directory GUI description and also includes access to the special company web server e.g. homewideweb.com (IP address), can also have the DNS address knowledge. The DNS server computer IP address can be any IP address under the control of the manufacturer. Effectively the DNS address is built-in to the device (or can be updated if the agent is made to be update-able and is later updated).

For device addressing, in one embodiment of the invention, utilizing fixed IP addresses from a large address space can afford the simplest and most reliable network configuration, and the readily accessible ROM data space in the1394 interface allows utilization of fixed IP addresses therein. In another embodiment of the invention, non-fixed IP (dynamic) addresses can be utilized, wherein an abstraction layer (e.g., name or look-up mechanism) is employed to retain pre-organized communications

For IP address configuration, the following protocols can be utilized: (1) Dynamic Host Configuration Protocol (DHCP) with DHCP servers and DHCP clients, (2) DHCP clients resort to auto-configuration (DHCP server not present), and (3) preferably, FWHCP (Fire-Wire Host Configuration Protocol) server agent(s) and FWHCP clients, described further below. The auto-configuration in (2) above is that proposed as an IETF Draft "draft-ietf-dhc-ipv4-autoconfig-04.txt".

DHCP requires support of the BOOTP/UDP protocol, and replicates what is done within the 1394 specification and provides features such as lease time and dynamic addressing. Typical DHCP requires management by an administrator and must be configured and adapted to the network requirements of mass manufactured consumer electronics (CE) appliances where, for example, multiple identical CE appliances with DHCP server built-ins must be considered.

The 1394 technology provides 'Plug-in' or 'Power-up' reset and following 'Self-ID' sequences, well suited for network configuration. Further, the 1394 specification provides a built-in 'ROM' address space well suited for storage of, and access to, configuration data (e.g., IP addresses). As such, in a preferred embodiment of the invention, an IP address configuration agent (FWHCP) and discovery page for user control of 1394 devices are utilized. FWHCP provides IP address configuration for 1394WEB and 1394 devices. The purpose and result of FWHCP is similar to DHCP (i.e., a server to identify and assign the local IP addresses), but in operation FWHCP uses data in 1394-address space and 1394 commands. FWHCP provides IP address configuration of 1394WEB devices on the 1394 network avoiding collisions with devices on adjacent attached networks other than 1394. Devices are manufactured with a built-in IP address from the 10.x.x.x range. In the unlikely event of a collision, FWHCP sets a new IP address and saves it in the device.

DHCP/Auto-configuration can be utilized for devices on networks other than 1394. DHCP protocol provides client "requested IP address". Preferably, the requested IP address space is selected from the upper part of the 24 bit RFC1918 range (10.128.1.1 to 10.254.254.254). By choosing part of the allowed private address range for 1394 IP addresses and another part for other configuration methods (e.g., DHCP and DHCP/Auto-Configuration) then compatible and non-interfering addresses are generated for a heterogeneous network and allow FWHCP and DHCP to coexist.

While choice of non-overlapping IP addresses for 1394 and adjacent networks is desirable, the heterogeneous network using FWHCP will configure successfully even if they do overlap. Also, DHCP clients check their assigned IP address with a test ARP message before using it. As such, different address configuration methods can coexist successfully.

<Network Scenarios and Address Management>

Referring to FIG. 8, an example process according to the present invention for communication between a 1394 network (e.g., network 300) and a non-1394 network (e.g., Ethernet 119) for IP address configuration is described. In this case the 1394 network 300 utilizes FWHCP configuration and the non-1394 network 119 utilizes DHCP configuration or other method. Generally, 1394 devices (such as DTV and DVCR in FIG. 7) do not support DHCP. The 1394 DEVICE-3, for 1394 network to non-1394 network communication, includes an IP address in the 1394 ROM space and provides support for FWHCP for a 1394 device. The DEVICE-3 further includes means for supporting the configuration mechanisms on the non-1394 network, and maintains an extension data leaf in the 1394 ROM space for IP addresses of devices on the non-1394 network. As such, configuration processes (e.g., FWHCP for top-level UI description generation) on the 1394 network 300 can include use of IP addresses on the non-1394 network by selecting IP addresses from the extension data leaf. The non-1394 network configuration operates to provide the IP addresses for the 1394 extension data leaf.

According to the discovery process (agent), 1394 specification 'plug-in' reset and self-ID is utilized for configuration and can be used for IP address configuration. Preferably, fixed IP addressing is utilized for home networks, however dynamic IP addressing can also be utilized. DNS is not required within 1394WEB control because a top-level GUI description is created with hypertext-links that use IP addresses rather than names. Preferably, the IP configuration agent (FWHCP) for the 1394 network is utilized for IP configuration using 1394 ROM data and 1394 commands, however DHCP can

also be utilized. FWHCP utilizes lower half of RFC1918 10.LH.X.X addresses and other home networks (not 1394) use upper half 10.UH.X.X. Preferably, the FWHCP server agent is built-in to any device that can be a client (control initiator). Where there are several client devices connected to the 1394 network, only the client device with the highest Global Unique Identification (GUID) operates. GUID comprises a number built-in to the interface. If there are multiple FWHCP agents available on the 1394WEB network then there is an initial self-election process to determine the one that will operate and all others remain quiet. The highest GUID will operate. In other versions, highest bit-reversed-GUID can be used.

A device interfacing to a non-1394 network supports a ROM extension leaf of IP addresses on the non-1394 network. This allows inclusion of the IP addresses on the non-1394 network in the 1394 top-level GUIs (e.g., FIGS. 4a-b, GUIs 202, 204). Control data bits in the 1394 ROM space are used to control the operation of three configuration agents: (1) 1394 Self_ID count, (2) IP configuration FWHCP, and (3) UI description generation described further below.

Initially 1394 Self-ID count discovers the existence of devices. After a bus reset (caused by power up/down or device attachment/detachment) 1394 software in the device observes the automatic configuration process (1394 self-ID cycles) for the purpose of counting the number devices. This is a normal part of 1394 software for any 1394 device. Then, IP Configuration FWHCP (the one self -elected FWHCP) probes the discovered devices and checks their built-in IP address. Discovered duplicate (colliding) IP addresses are disabled and a new address is assigned to the device. Then, UI description generation agent (UI or other devices), reads all 1394WEB device IP addresses and generates a top-level device directory Graphic User Interface file in HTML of top-level icon pages from each device later rendered by a Web browser for User discovery of devices for control.

According to the present invention each device in the 1394 network 400 can generate its own top-level network UI description 250 (FIG. 9c). The UI description 250 is used by a presentation engine such as the browser 200 in a client device to generate and display a top level directory page such as page 220 in FIGS. 5-6. After the 1394 Self-ID agent has enumerated all devices connected to the 1394 network 300, the top-level UI description 250 is generated separately by all UI devices (and non-UI devices as desired). A device (e.g., DTV) can select a more prominent (e.g., larger) icon to represent that device, and make the entire GUI 220 with a different look. This technique provides substantially more reliable operation than a centrally generated GUI for operation of all device, because each device can generate its own UI description 250 and display a GUI (e.g., top level page 220) based thereon without dependence on another device. In each UI description 250, device icon and logo image files of the devices currently connected to the network 300 are referenced by icon and logo HTML 'pages' and name text wrapped in an HTML page (ICON.'Graphic' referenced ICON.HTM is in pages 202 and 204 which also include the control pages for the device; Fig. 5 below also shows the ICON.HTM, LOGO.HTM and NAME.HTM in a top-level directory page). HTML frames are used to create the top-level directory UI description 250 for network devices in each network device as desired.

As such, advantageously, a useful layer of abstraction is provided to allow use of alternative file names and types for e.g. identification graphics in the network devices without need for change in the top-level description 250 generated in each device. The name text is also placed in an HTML description 202, 204 (NAME.HTM is in pages 202, 204), allowing a user to configure the name text at a device e.g. DTV to change to e.g., DTV-BED2 through one of the device GUI pages 220. As such, the page 220 is displayed as the Browser is launched after a reset. The user sees and clicks DVCR ICON graphic, whereby DVCR top level control GUI 202 is fetched (with 'Play' button etc.). User clicks one of the buttons e.g. "Configure Device NAME" which is another GUI (of hierarchy of control pages for DVCR) with a large

selection of different names.

User clicks one name out of the lists of names provided e.g. "Master Bedroom DVCR".

Software on the device changes the file names so that the file named NAME.HTM contains the text "Master Bedroom DVCR" (the old default NAME.HTM file that contained DVCR is changed to some other name).

Appearance of the GUI 220 is more stable in the event of 'bad citizen' devices having too much or oversized text or oversized logos. In this case the frames isolate the problem and prevent the bad items from adversely affecting the appearance of the entire top-level GUI 220.

<Device Discovery Architecture>

Referring to FIGS. 9a-c, 10, 11 example functional blocks and connections to data and control bits and flowchart of an embodiment of a system architecture 400 for the aforementioned discovery process are shown. The system 400 comprises five primary elements: (1)1394 non-volatile memory space (IEEE1212R ROM) 402 for configuration data and control data bit storage; (2)1394 Device Discovery Agent (1394DDA) 404; (3) IP Address Configuration Agent (FWHCP) 406; (4) UI Description Generation Agent 408; and (5) GUI Generation and run-time environment 410 (e.g., Web Browser 200 in FIG. 2). Further, FIG. 10 shows an example flow diagram for the DDA and FWHCP agents in system 400 operating in connection with the functional blocks in FIGS. 9a-c. And, FIG. 10 shows an example flow diagram for the UIDGA agent in system 400 operating in connection with the functional blocks in FIGS. 9a-c.

Referring to FIGS. 9a and 10 all devices include the 1394 device discovery agent (1394DDA) 404 to enumerate the devices on the 1394 bus, after a reset, and to write the value into the local 1394 ROM space 402 for communicating the value to other functional agents (steps 500, 502). For synchronizing (inhibiting) commencement of other configuration agents, the

1394DDA agent 404 also sets the 'configuration operating' control bits . The discovery agent/mechanism can use means, other than the ROM space, to communicate information between the configuration agents that are local to one device and where the information does not need to be seen by other devices.

<1394 ROM Data in all Devices>

All devices in the network 300 include the following information relevant to the discovery and IP address agents 404 and 406, respectively, for the1394WEB in the 1394 configuration ROM 402: (1) Built-in 64 bit GUID (Global Unique ID, in 1394 specification); (2) Built-in IP address from the RFC 1918 private address space in the range '10.1.1.1' to '10.127.254.254'. Manufacturers can select a value from the GUID such that chance of collision is minimized. The upper portion of the private address space (i.e., 10.128.1.1 to 10.254.254.254) is reserved for devices on bridged networks; (3) Assigned IP address in the range '10.1.1.1' to '10.127.254.254' (assigned by operating FWHCP agent 406); (4) IP address extension leaf for IP devices on bridged networks; (5) Assigned Count of 1394 devices (assigned by 1394DDA agent 404); (6) Control/status bits to indicate Configuration-in-Progress Synchronization control for 1394 Device Discovery Agent 404, and to indicate IP-Address configuration (The control bits indicate the configuration is in progress and therefore the values, in ROM data other than the control bits, for 1394DDA and IP address are not checked or not written and therefore should not be used). The bits further indicate which IP address is valid (assigned or built-in), and whether an FWHCP server agent 406 is present in the device; (7) HTTP web server to allow files in the device's file space to be accessed remotely; and (8) device information 202, 204 including actual 'icon', 'name' and 'logo' HTML files and other referenced graphic files accessible through the Web Server. The above summarized information is detailed in the 1394 ROM space description below.

<IEEE 1212 Configuration ROM>

The content of the general 1394ROM structure 402 is specified in IEEE1212r, IEEE1212 and IEC61883. The ROM structure 402 is a hierarchy of information blocks, wherein the blocks higher in the hierarchy point to the blocks beneath them. The location of the initial blocks is fixed while other entries are vendor dependent, but can be specified by entries within the higher blocks.

Table 3 shows the Bus_Info_Block and Root_Directory of the configuration ROM 402. The first byte of each entry is known as a key and identifies the type of entry. The following can be implemented in the configuration ROM of all devices making use of the EIA-775 specifications, including display devices such as DTVs and source devices such as DVCRs, STBs, etc. There may be several other structures required based on other protocols to which each device conforms. Table 3 includes information for a device which also complies with the IEC61883 protocol. The Root_directory contains pointers to a Model_Directory and three Unit_Directory entries (IEC61883, EIA-775 and 1394WEB), to indicate that the device supports EIA-775 as well as 1394WEB protocols. The Root directory entries are useful to other 1394 devices to discover the protocols and software (also called services) supported by this 1394 device.

<Table 3>

Offset (Base address FFFF F000 0000)

Bus_info_block

Offset

$04\ 00_{16}$	04	crc_length	rom_crc_value		
$04\ 04_{16}$	"1394"				
$04\ 08_{16}$	flags	Reserved	cyc_clk_acc	Max_rec	feserved
$04\ 0C_{16}$	node_vendor_id			Chip_id_hi	
$04\ 10_{16}$	chip_id_lo				

Wherein, 04 $0C_{16}$ and 04 10_{16} are also known as the 64 bit GUID or Global Unique ID.

Root_directory

Offset

04 14_{16}	root_length	CRC
	03_{16}	Model_vendor_id
	81_{16}	Vendor_name_textual_descriptor offset
	$0C_{16}$	Node_capabilities
	$8D_{16}$	Node_unique_id offset
	$D1_{16}$	Unit_Directory offset (IEC 61883)
	$D1_{16}$	**Unit_Directory offset (EIA-775)**
	$D1_{16}$	**Unit_Directory offset (1394WEB)**
	Optional	
xx xx_{16}	$C3_{16}$	Model_Directory offset

The IEC_61883 unit directory is shown in Table 4. This directory is referenced by the Unit_Directory offset, in the Root Directory (e.g., Root_directory table). In the Unit_SW_Version field, the least significant bit specifies AV/C (0) as specified in IEC 61883.

<Table 4>

Unit_Directory (IEC_61883)

Directory length	CRC
12_{16}	**Unit_Spec_ID** (1394TA = 00 A0 $2D_{16}$)
13_{16}	**Unit_SW_Version** (first pass key = 01_{16})
....	<<possibly other fields>>
....	....

The EIA-775 Unit Directory is shown in Table 5. The following EIA-775

specific information appears in the EIA-775 Unit Directory.

<Table 5>

directory length	CRC
12_{16}	**Unit_specification_ID** (EIA-775 = 005068_{16})
13_{16}	**Unit_software_version** (010100_{16})
....	<<possibly other fields>>
....	

The Unit_specification_ID specifies the identity of the organization responsible for the architectural interface of the device and the specification. In this example case, the directory and identity value=005068_{16} refers to the EIA as the responsible body and the EIA-775 control architecture specification.

The Unit_software_version designates EIA-775 revision level supported by the device. The format is shown in Table 6.

<Table 6>

First octet	01_{16}
Second octet	Major Version Number (currently 01_{16})
Third octet	Minor Version Number (currently 00_{16})

The 1394WEB Unit Directory is shown in Table 7. The following 1394WEB specific information appears in the 1394WEB Unit Directory.

<Table 7>

directory length	CRC
12_{16}	**Unit_specification_ID** (1394WEB = $00XXXX_{16}$)
13_{16}	**Unit_software_version** (010100_{16})
38_{16}	**Discovery_control_bits**
39_{16}	**Assigned_Count_of_1394_devices**
$3A_{16}$	**IP_Address_Built_in**
$3B_{16}$	**IP_Address_Assigned**
	IP_Address_Extension Leaf
$--_{16}$	<<possibly other fields>>

The Unit_specification_ID specifies the identity of the organization responsible for the architectural interface of the unit and the specification. In this example case the directory and identity value=$00XXXX_{16}$ refers to the responsible body and the 1394WEB control architecture specification.

The Unit_software_version designates the 1394WEB revision level supported by the device. The format is shown in Table 8.

<Table 8>

First octet	01_{16}
Second octet	Major Version Number (currently 01_{16})
Third octet	Minor Version Number (currently 00_{16})

<Discovery_control_bits (38_{16})>

Key value (38_{16}) permitted by the IEEE1212R specification section 8.8 for the private use by the owner of the directory and architecture is used for the Discovery_control_bits immediate value.

<Table 9>

				FWHCP Server Agent	Configuration operating. Do not use (if True)		Which IP address?
X				Yes=1	1394 Dev. Count	IP-Address	Assignd_ 1Built-in_0
31	6	5	4	3	2	1	0 (LSB)

These are control bits in 1394 ROM space 402 accessible by local and remote device. The control bits are used by the IP address configuration agent 406 and the User Interface description generation agent 408 as described further below.

In one embodiment of the invention, said control bits provide the following information:

Bit 0 - Which IP address - Indicates which IP address is used or is in-use i.e, the Bulit-In address (=FALSE) or Assigned Address (=TRUE). This is set by the operating IP configuration agent FWHCP 406.

Bits 1, 2 - Configuration Operating Do not use - When set indicate that the 1394 device discovery and also, seperately, the IP configuration agents 404 and 406, respectively, are operating and therefore the values referred to are invalid as they can change or are not yet written. These bits are set by the local (device) 1394DDA agent 404. The1394DDA agent 404 clears the 1394 Dev. Count bit and the operating FWHCP agent 406 clears the IP-address bit.

Bit 3 - Presence of FWHCP Server Agent 406 B Is set if the device has an operable FWHCP agent 406. This bit and GUID are used by the FWHCP agents 406 to determine which FWHCP agent 406 will operate.

Assigned_Count_of_1394_devices (39_{16}) - Assigned immediate value of the count of 1394 devices in the network 300. The count is made as the 1394 interface goes though its self-ID cycles. The 1394 device discovery

agent 404 generates the value, which is saved in ROM space 403 for subsequent use by the IP and UI configuration agents 406 and 408, respectively.

IP_Address_Built_In ($3A_{16}$) B Assigned Immediate Value. This address is assigned at manufacture time and built-in to the device. If this Built-in address cannot be used, an alternative address can be saved in the Assigned address space and the control bit set to indicate such.

IP_Address_Assigned ($3B_{16}$) - Assigned Immediate Value. If identical IP addresses are detected, the IP address configuration agent FWHCP 406 assigns this address to prevent collision. Further, the control bit is set to indicate such.

IP_Address_Extension Leaf_for_attached_network (BC_{16}) - This directory entry is for the address offset to the data leaf for the IP address extension table, see Table 10. The data leaf contains IP addresses for devices on connected non-1394 networks (but also could be bridged 1394 networks). The table is included in communications devices of types (e.g., bridge) that connect through to foreign (non-1394) networks. The table can be expanded to include as many IP addresses as required. The address of the communications device itself should not be included in the table.

<Table 10>

Leaf Length -1 (n) $_{16}$	CRC-16 $_{16}$
IP Address 1 (e.g., 32 bit)	
....	
IP Address n (e.g., 32 bit)	

In regards to Control word for Discovery Control Bits, use of a ROM entry for the actual Discovery Control Bits word as defined herein works but is an example implementation. As ROM is not designed to be written efficiently (i.e., ROM areas have to be erased and writing them is slow relative to other hardware e.g. register).

Registers are provided in the 1394 hardware for data that must be written to frequently. In another version, a 1394 Register can be used for the 'Discovery_control_bits' control word. Registers are in a space also addressable by other devices, whereby another device can look up in the ROM the address of the Register and then write to that Register.

Referring Figure 9b, one or more devices include an IP address configuration agent (FWHCP) 406 (e.g., all UI devices and Gateway devices and any other device that can be a Control initiator). The FWHCP configuration agent 406 accesses all devices' IP address values in data in the1394 ROM 402 across the 1394 network 300. For synchronization commencement and completion of commencement of other applications (e.g., the UI description generation), the FWHCP agent 406 also accesses the 'configuration operating' control bits.

Referring to Figure 9c, devices capable of displaying user interfaces, and also some other devices (e.g., Gateway devices), can include the UI description generation agent (UIDGA) 408 for generating the top-level UI description 250 in e.g. HTML. Because as detailed above only one IP configuration agent 406 operates per network 300, not all devices need to include the IP configuration agent 406, though all devices can include an IP configuration agent 406. If a device has the operating IP Configuration Agent 406 and is a User Interface Device then the IP configuration agent should operate before the UI Description Generation agent. The UI description generation agent (UIDGA) 408 utilizes information including control bits defined in the1394 ROM space 402 and other information (e.g., for determining which FWHCP operates is the Global Unique ID (GUID) of Bus_Info_Block of Table 3) for determining which IP configuration agent 406 (if multiple in the network) operates, synchronizing commencement and for access to the in-use IP addresses. Any device may have and operate a UIDGA for making the HN_Directory page (top-level discovery page). After the IP addresses are configured UIDGA reads the addresses to make the HN_Directory page. In

each client device, when UI description generation is complete, the GUI generation and run-time environment 410 (e.g., Web Browser 200 in FIG. 2) uses the UI description HTML file 250 to access all devices' HTTP file space for icons, names and logos (Icon.HTM, Name.HTM and Logo.HTM are contained in pages 204, and 204) to generate the full top-level GUI 220 for display in that client device. Web Browser uses HTML file 250 to render the actual GUI graphics, in the process accessing files from the devices e.g. Icon.HTM, Name.HTM and Logo.HTM and in turn accessing any additional files these files reference e.g. ICON.GIF and LOGO.GIF.

<1394 Device Discovery Agent (1394DDA)>

Referring to FIGS. 9a-c, 10 as discussed, each 1394WEB device in the network 300 can include the device discovery agent 404. The device discovery agent 404 enumerates the 1394 devices in 1394 address space connected to the 1394 bus, wherein the raw discovery is performed in 1394 hardware. The Self_ID and Physical Node Number Assignment and the steps leading to it is the basic discovery process performed by the interface hardware/firmware. All devices monitor the Self_ID cycles and make a note of the existence of 1394 devices. This is a part of 1394 software for any 1394 device: (1) Reset -Bus reset propagates to all interfaces, on device power-up, device attachment and device detachment, (2) Tree Identification -Transforms a simple net topology into a tree, to establish a ROOT which is master for certain functions: Bus Cycle Master, Highest priority in arbitration for bus time, (3) Self Identification -Assigns Physical Node number (address) and also exchange speed capabilities with neighbors. Highest numbered node with both Contender Bit and Link-on Bit is Isochronous Resource Manager.

The discovery agent 404 writes the final count value of the devices to the 1394 ROM space to communicate it to other agents. The device discovery agent 404 is the first software agent to execute after a 1394 reset cycle, and control bits (Discovery Control Bits 2 and 1, Configuration Operating: 1394DDA, and IP_Address) are used to delay other agents,

including the configuration agents 406 and 408, from execution until the discovery agent 404 has finished execution.

In one embodiment, the1394DDA agent 404 in each device performs the steps 500, 502 including: (1) setting synchronization control bits (i.e.,'1394DDA in progress' and 'IP configuration in progress' bits) in the device's own 1394 ROM space 402 to indicate that the 1394DDA in progress and IP configuration is in progress (IP configuration will not be in progress if 1394 DDA is executing) and that the values of 1394 device count and IP address are not valid, whereby said control bits inhibit other agents (e.g., 408) from operating prematurely; as such the 1394 DDA executes, then an elected FWHCP executes, and then (usually for UI device) UIDGA executes; (2) counting the number of 1394 self-identity sequences after a 1394 Reset to discover the number of devices and effectively their local node addresses for use by the other agents 406, 408; (3) writing the device count value to the device's own 1394 ROM space 402; and (4) clearing (e.g., to false) the synchronization control bit for '1394DDA in progress' in the device's own 1394 ROM 402, wherein the 'IP configuration in progress' bit remains set and is cleared later by the operating FWHCP agent 406.

Alternative Architecture for Configuration with IP Address list in network communication (bridge) device is possible. For example, the IP address list of IP addresses of devices on a bridged (e.g., non-1394 network) can alternatively be examined at the IP configuration stage by the FWHCP agent 406 rather than only at the UIDGA stage by the UIDGA agent 408. This allows the FWHCP agent 406 to detect and correct address collisions and therefore allow operation without having two separately defined address ranges, one for the 1394 network 300 and one for the non-1394 network 119. Correction of address collision can be accomplished by modifying the address of a colliding 1394 device as the bridged network IP address list cannot be modified by the aforementioned agents 406, 408 for the 1394 network 300. Configuration is more reliable if the FWHCP agent 406 can check the addresses in the bridged

network 119 for collision prior to allowing the addresses used on the 1394 network 300.

<IP Address Configuration Agent (FWHCP Agent)>

Referring to FIGS 9a-c, 10 the IP Address Configuration software agent (FWHCP) 406, operates to provide 'Fixed' IP address management and to detect and correct IP address clashes in the mass manufactured 1394 devices. All 1394WEB UI devices include, and other devices can include, an FWHCP agent 406. Only one FWHCP agent 406 operates in the network however. The 1394DDA 404 agent is the first software agent to execute after a 1394 reset cycle, and as aforementioned the1394DDA 404 agent sets the '1394DDA in progress' and 'IP configuration in progress' bits to delay the FWHCP agent 406 until the 1394DDA agent 404 has executed to completion.

In one embodiment, the IP Address configuration agent 406 in a device performs steps including polling the 1394DDA configuration operation control bit (i.e., the '1394DDA in progress' bit) to determine if the 1394DDA configuration software agent 404 has executed to completion. If so, then the FWHCP agent 406 uses the count of devices determined by the 1394 DDA agent 404, and reads GUID's and Control Words from every device (step 504) to determine which device in the network 300 is selected to execute its FWHCP agent 406 (step 506). The selected device is one with an FWHCP agent 406 that finds it has the highest GUID (step 508). All other FWHCP agents 406 in other devices remain dormant (step 510). The operating FWHCP agent 406 reads the 'in-use' (active) IP address (determined by Discovery_control_bits BIT 0) from each local node (e.g. units present on the interface, host) and listed (step 512). In one version, the software agent makes a list for saving the IP addresses to an 'Array' as they are read (steps 514-518). The list will be in memory (RAM or DRAM) under the control of the compiler and OS. In-use status is determined by a bit setting in the device, which indicates whether the built-in or assigned address is in-use. In Table 7 the IP_address_assigned and IP_address_built_in are in the 1394Web Unit

Directory.

The operating FWHCP agent 406 examines said list for collision among IP addresses listed therein (other collision detection and resolution methods can also be used) (steps 520-522). If a collision is detected, the FWHCP agent alters the colliding addresses by e.g. substituting the least significant 6 bits of IP address for their 6 bit node address (step 524). Only the minimum number of alterations are performed to relieve the collision. If one of the colliding addresses is already an assigned address, then that address is altered in preference to the colliding built-in address by e.g. incrementing the 6 bit substitute value and re-checking until the collision is resolved. The FWHCP agent 406 writes the altered value back to the device and the control bit (Discovery_Control_Bits: Bit 0) is set to indicate that the assigned IP address is in-use, and the built-in default is no longer in-use (step 526). The process is repeated for each IP address (step 528). After the collision resolution process, the operating FWHCP agent 406 accesses each device in turn and sets the 'IP configuration in-progress' bits in each device to e.g. 'false' to indicate that the indicated IP address is valid.

<UI Description Generation Agent>

In conventional WWW operation, users access the same top level page. Referring to FIGS. 4b, 7 and 9-11, according to an aspect of the present invention however, all UI devices (e.g., devices capable of displaying user interfaces) include an UI description generation agent (UIDGA) 408 to independently generate a top-level UI page 220 for control of the devices on the local network (e.g., network 100, network 300, etc.) by users. In one example, a client device (e.g., PC) dynamically generates a locally saved default page 220 for user control of devices connected to the network 100. This allows each UI device (e.g., DTV 102) to generate a different view 220 of the home network e.g. with a larger more prominent icon for that UI's devices displayed. As such, the user is readily made aware of which UI device is 'right here' (in front of the user) or in the case of access external to

the home, no device is 'right here'. A device without a UI can generate a UI for another device but is unaware of type of device (e.g., Cable Modem generates UI of HN devices for user external to the home). In this case the actual UI device is unknown. Therefore no particular device is prominent in the GUI. Further, manufacturers of devices connected to the network 100 can provide their own GUI design 202, 204 in each device as desired. In addition later, improved Browser and Web technology designs need not be hampered by existing technology.

Non-UI devices, particularly those devices performing a gateway function, can also include a UI Description Generation agent 408 to generate top-level GUI descriptions 250, without including GUI Generation and Run-Time processes 410 (e.g., Web Browser 200) to generate and display GUIs 220. With appropriate address use (e.g., using the RFC1918 private addresses on the local HN), this allows external WWW access to the 1394WEB network devices.. External addresses are assigned 'real' IP addresses suitable for Internet use. Generally there is a unit (e.g., gateway type unit) with the UIDGA 408 which represents the home to the outside Internet. The gateway's UIDGA generates a different UI description for the outside use (remote access case different from inside local device use), using the home's IP address with extended links to identify which home device local private IP address.

UI devices execute the following software processes to generate and display views 220 of the network 100/300: (1) 1394 Device Discovery Agent 404 described above, (2) UI Description Generation Agent (UIDGA) 408, and (3) GUI Generation and Run-Time (e.g., Web Browser 200) process 410. Referring to FIG. 11, in one embodiment, a UIDGA agent 408 in a device performs steps including polling the IP address configuration bits in the device's own 1394 ROM 402 to ensure completion of the FWHCP agent 406, prior to accessing any further IP information (step 600). Upon completion of FWHCP agent 406, using the count of devices generated by the 1394DDA

agent 404, the UIDGA agent 408 then accesses the control word in each device currently connected to the network, to determine the settings for the 'configuration operating' false, and 'in-use' IP addresses bits (the UIDGA agent 408 makes the top-level HTML page, HN_Directory page, 220 shown by e.g., in FIGS. 5-6). Thereafter, the UIDGA agent 408 reads the actual in-use IP address value, and builds a complete list of the IP addresses of the devices currently connected to the network 300. The IP address list includes information (e.g., Icon, Logo, Name, etc.) from every device, and is written in HTML by using the IP address of each device . Before it can include the addresses, the UIDGA 408 finds the address of each device by accessing each device and checking to see which address is in use by reading Table 9, Discovery_control_bit, control bit (Bit 0). Then UIDGA 408 reads Table 7 Address either Built_in or Assigned. For devices that communicate to bridged networks, as determined by the presence of the extension IP address list entry in that device's 1394 ROM 402, the UIDGA agent 408 reads the extension IP-addresses from the list (IP_Address_Extension_Leaf) to allow those devices to be included in the GUI 220. The entry BC (IP_Address_Extension_Leaf) contains a reference link address that points to the actual data leaf. Devices on the attached bridged network are only included in the IP_Address_Extension_Leaf list if they also support the 1394WEB type of service i.e. they have Web Server and Icon.HTM etc and Control pages ('index.htm).

The UIDGA agent 408 reads the IP address list (step 602) and generates the top-level network UI description 250 (FIG. 9c) in e.g. HTML (e.g., Appendix 1) using the IP address list (UIDGA outputs the HN_Directory, top-level network UI page, HTML file) (step 604). The UIDGA agent 408 uses the IP Addresses in the hypertext links to each device for the icon.htm, name.htm and logo.htm files. UIDGA writes an HTML file including the references to each discovered device's HTML page i.e. ICON.HTM, NAME.HTM, LOGO.HTM (e.g., Appendix 2, 3, 4). The UIDGA agent 408 then uses HTML files to reference items including the icon and logo graphics files

and name data, rather than including the raw icon.gif or logo.gif and raw name text in the top level UI description 250 (step 606). This allows said items to be changed by the corresponding device to reflect current status, customized by the manufacturer or configured by the user at the device, without causing any change in the top-level HTML UI description 250 in the controlling UI device. Though one graphic per device is shown in the example GUI pages 220 (FIGS. 5-6), customization allows inclusion of more than one graphic file referenced by ICON.HTM or LOGO.HTM and more text in the NAME.HTM. In one embodiment, HTML frames are utilized to implement the UI description 250 as showing in examples further below. Use of frames stabilizes the appearance of the GUI 220 in the event of 'bad citizen' devices. For example a device presenting too many words or overly large text in its 'name' frame will only affect that device's GUI look (by having some of the words truncated and not displayed) and not adversely affect the appearance of the whole Top-level GUI 220 in the UI device. The UIDGA 408 then invokes the GUI generation process 410 (e.g., browser) in a client device to generate and display a user interface (step 608).

<GUI Generation and Run-Time Processes>

The GUI generation process 410 (e.g., Web Browser 200) utilizes the UI description 250 in e.g. HTML to generate GUI pages 220 on UI devices. In one example, to provide keyboard-less operation for consumer electronics devices (e.g., DTV) the Browser 200 at start-up defaults to reading and rendering a locally generated 'top-level-devices.html' description 250 to generate the network top-level control GUI 220. Locally as used here means in the same device (a UI device having a UIDGA that generates the device's own HN Directory (top-level) GUI of the network devices). HN Directory, Top level Network UI and Discovery page are the same. For personal computers (PC) with keyboard this need not be the default. For CE devices, launch of the Browser 200 is delayed until after completion of the UIDGA default page 250 generation by the UIDGA agent 408. In the event that UIDGA agent 408 cannot complete its tasks, then the Browser 200 displays an alternative UI

page 220 showing a network configuration error occurred (e.g., "Unable to generate the HN_Directory Page because of xxxxxx. Try disconnecting device xxxxxxx. Network configuration error number xxxxxx occurred. Contact service Tel service xxx-xxx-xxxx or Web service http://www.service.com.")

To generate the GUI 220, the Browser 200 fetches the 'icon.htm', 'name.htm' and 'logo.htm' files from device information 202, 204 in each referenced device (i.e., in the UI description, where for example ICON.HTM is in the HN_Directory Page HTML file) as defined by the HTML UI description 250. The contents of these pages 202, 204 (e.g. the icon graphic) need not be static and can be altered dynamically to reflect device status change, or after user customization. In order to display the most current top-level page 220, the Browser 200 does not cache the 'icon.htm', 'name.htm' and 'logo.htm' files. In another version, a check is always made first to determine if the device has made any changes to the HTML files 202, 204 it holds. HTTP "Conditional get" is used for checking the status of controlled device. Depending on the status code returned, the Browser 200 will either read from its cache or fetch a fresh or updated copy the HTML file 202, 204 from the devices. The HWW GUI display is not affected unless there is any change of the status of the controlled device.

The browser 200 does not attempt to display the top-level HN directory until it has been completely generated. If the HTML 250 is not generated within some reasonable amount of time, the browser displays an alternate page. If a network configuration error is the source of the problem, the alternate page might provide some technical support or user diagnostic assistance.

Whenever the user returns to the top-level HN directory or causes it to be refreshed, the browser 200 redisplays the page 220 in its entirety. This is necessary because the HTML 250 that underlies the top-level HN directory may have been regenerated if a device has been added to or removed from the network 100. It is also possible for device icons to be updated to reflect

changes in their device's operating state. As such, browsers implemented by EIA-775.1 devices use HTTP "conditional get" requests to determine whether or not fresh copies of web pages or graphics are retrieved from the server.

In this aspect, the present invention provides a User Interface description where user discovery of devices is thus made entirely with references (i.e. in the abstract), where the references are 'containers' for the discovery information (e.g., text and/or graphics) of each device and resident on each device. Each 'container' includes actual textual information and/or references to one or more graphics formatted information files where each file may include one or more images and/or text. Use of the reference 'containers' allows each device to choose its preferred UI content or graphics format or alter its UI content to be displayed (by changing the text or graphic information referred to) without need to have the UI description page altered in any way. Therefore, communication of changes with the generating agent software of the Discovery UI description is not required. In one version, devices reference their e.g. ICON and LOGO graphics files indirectly using HTML files enabled by creating the network Top-level description using HTML frames. Similarly the device name that is displayed under the icon is represented by NAME HTML file. HTML files are used to reference e.g. the icon and logo graphics files and name data rather than include the raw icon.gif or logo.gif and raw name text. This allows the item to be changed to reflect current status, customized by the manufacturer or user configured at the device without causing any change in the top-level HTML description. This level of abstraction allows the Top-level UI description to be always the same regardless of the graphics ICON and LOGO file names and types and NAME text to be displayed. Also the device may use different, multiple or dynamically change the graphics files and text displayed in the Top-level GUI without the change needing to be communicated to the UIDGA. The change is automatically included whenever the GUI is redisplayed. Use of frames also stabilizes the GUI display in the event of bad citizen devices using non-displayable graphics or text as the error is confined to the particular frame and doesn't affect the whole GUI.

The change is automatically included whenever the GUI is redisplayed.

In one example, network devices top-level UI description is generated independently by any network device and certainly by devices capable of displaying UI (UI device). Generating a user interface in each device rather than generating a centrally UI, allows a device to show its own device icon/text preferentially in the GUI. In addition each GUI is manufacturer customizable, user configurable and also more reliable because it does not depend on another device e.g. a single central server. This is demonstrated with the 1394 scheme above. Multiple UI generation is enabled because all device IP addresses are accessible via the 1394 interface. UI devices (with Browser) include UIDGA agent to generate their own top-level GUI description after a 1394 reset cycle when a device attached or power-up.

All UI devices independently generate a top-level UI page for control for the local network. This is different from the conventional WWW operation wherein users access the same top level page. According to one version the present invention, the client device (e.g., PC) dynamically generates a locally saved default page file for any purpose, allowing each UI device (e.g., DTV) to generate a different view of the home network e.g. with a larger more prominent icon for its own display. Further manufacturers have scope to make their own GUI design better then another. In addition later, improved Browser and Web technology designs need not be hampered by earlier technology.

Referring to Appendices 1-4, illustrative examples for the following are provided: (1) Top-Level Page description 250 (Appendix 1); (2) Background.htm (Appendix 2); (3) Icon.htm (Appendix 4); and (4) Name.htm (Appendix4).

<Linked External Web Server/service>

According to another aspect of the present invention, network

configuration and user interface (UI) description generation for the home network top-level page Graphical User Interface (GUI) are performed to provide external services (e.g. web services) from an external network (e.g., Portal) as well as from home network devices 11. In one embodiment, the external network includes interconnected devices providing services (e.g., servers comprising one or more computing systems executing software for providing services). As such, in one example, manufacturer's Portal (external Web Server) services from an external network 702 (FIG. 7) are included in home network top-level user interface description 250.

In one implementation, internet gateway address of a gateway 700 is defined in an address space visible to all 1394 devices in the home network 300. Thereafter, for at least one device 11 (e.g., client device 12 such as DTV 102) in the home network 300, if a gateway 700 is detected by e.g. the discovery agent 404, then the UI description generator agent (UIDGA) 408 of that device 11 can include external IP addresses in the home network top-level UI description (TLNUID) 250 (as well as Home Network device addresses described above) of that device 11. Alternatively, each device 11 can discover the gateway device 700 by communicating and obtaining information, for example, from another device (such as DTV 103, or cable modem) to get the gateway IP address, or the device 11 can communicate with the gateway device (use gateway device's internal IP address) to get the public/external IP address of gateway device. External services from an external network 702 of interconnected devices 704, can be accessed from one or more IP addresses (or Portal) known to the UIDGA 408 when the top level GUI 220 is generated or refreshed in that device 11. In a version, the external home portal IP address is preprogrammed into the UIDGA 408, whereby the UIDGA 408 need not obtain the external address through the gateway device. In one example, each device 704 includes one or more computing/computer systems executing software for providing services (web services), wherein the devices 704 are interconnected via routers and communication links (e.g., Internet).

FIG. 12 illustrates a pictorial outline of the TLNUID 250 showing actual HTML file name reference and address of a logoicon htm file 710A (residing in a server 704 in the external network 702), and an actual HTML file name reference and address of a logoname htm file 712A (residing in a server 704 in the external network 702). FIG. 13 illustrates the Browser rendered GUI 220 based on the TLNUID 250. Content of logoicon and name items 710B, 712B in FIG. 13 for services from the Portal are refreshed whenever the top-level GUI page 220 in that device 11 is updated. Further, Portal or content page hits are generated whenever the network top-level GUI 220 in that device 11 is refreshed (and preferably not when top-level description 250 is generated).

In one example implementation, the manufacturer of a device 11 (e.g., DTV 102) can choose to program the UIDGA 408 in that device 11 to include externally provided service logos icons in the home network top-level GUI 220 of the device 11. Such functionality is built-in to the GUI description generator agent (UIDGA) 408. The service logo page 708B, logo graphics 710B and text 712B, address a web server 704 external to the home network. The logos 710B can represent, and be actively hyper-linked to, services, information, media etc. provided by devices 704 in the external network 702 via the gateway 700. Further, device icon spaces 708B unused in the Top-level Home Network device's page 220 can be filled with service logos or icons 710B and names 712B from an external Web site provided by a server device 704. In one example, there can be as many as 12 unused icon spaces for a minimum home network including one device. Referring to the example TLNUID 250 and the GUI 220 in FIGS. 12-13, there are a minimum of 12 service logo-graphic 710B, logo-name 712B sets for the GUI 220. The logo file names 710A can have a number from 1 to 12 e.g. logoicon1.htm through logoicon12.htm, and are accessed in order from lower to higher numbers. Similarly , the name file names 712A can have a number from 1 to 12 e.g. logoname1.htm through logoname12.htm, and are accessed in order from lower to higher numbers. The following example specification is similar to that for device icon described above.

A logo icon and name file, 710A, 712A, respectively, per service represent the service graphically in the Top-level Home Network devices page 250 shown in FIG. 12, and in the corresponding GUI 220 shown in FIG. 13. A graphic file 710B having a name is referenced in a corresponding HTML page 710A. The graphic 710B is hyper-linked to the service top-level page 710A. An example graphic specification can include: Graphic file type of GIF, JPG or PNG (any name), and Logo icon graphic maximum size of 70(V)x130(H) pixels. An HTML page 250 references the graphic file 710A, with the first accessed file 710A representing the primary service logo graphics 710B named logoicon1.htm 710A. Subsequent logos can use files with incrementing number. It is possible to include more than one graphic reference in logoicon1.htm. In this case the service image is hyper-linked to the service home page and the second image (e.g., logoincon1_1.htm) can be hyper-linked to a different location.

Further, a minimum of one logo name file 712A includes text 712B to augment the logo graphic (logoicon.htm) in the Top-level Home Network devices page 250. The text 712B includes a few words to go with the service logo icon graphic relevant to the service. Name (e.g., "VCR livingroom" as name of a VCR in the livingroom) can include text in an HTML page called logoname1.htm. Subsequent logos can use files with incrementing number. Preferably, only the file name is standardized and not the text. The text can also be hyper-linked. An example specification can include: Text unspecified, without font restriction. As an example with Font size 10, two lines of text can be displayed under the logo icon.

An example discovery process supported by every home device 11 supporting the EIA-1394WEB standard is now described. Because user control of devices indirectly via a Graphical User Interface (GUI) 220 is important for keyboard-less operation of devices 11 anywhere on the Home Network 300, and for services provided by devices 704 outside the home

network 300, one function of the discovery process is to bootstrap Internet Protocol and bootstrap Web based control. The former includes device discovery 404 and IP address configuration 406 and the latter includes generation of a top-level network user interface description (TLNUID) 250 by the UIDGA 408 for the Browser default page that it renders to generate the top-level user control GUI 220. The UI description (GUI source description) 250 in FIG. 12 includes graphical icon reference 706A and a textual name reference 707A representing each device 11 in the home network 300, corresponding to graphic 706B and name 707B, respectively, in FIG. 13. The UI description (GUI source description) 250 further includes the graphical icon reference 710A and a textual name reference 712A representing each external service from the external network 702, corresponding to graphic 710B and name 712B, respectively, in FIG. 13. The Browser collects a graphic image(s) and name from each device and service, as renders the GUI 220 as shown by example in FIG. 13.

Each 1394WEB UI device 11 (e.g., client device 12 such as HDTV 102) separately generates the network top-level UI description 250, allowing the device to give priority to itself in the displayed GUI. In FIGS. 12-13 a host HDTV 102 that generates and presents the top-level GUI 220 assumes priority and uses a 4x large size icon. Different manufacturers can develop their own GUIs and can develop different ones for each device model wherein e.g. a hand-held Web controller generates a much simpler GUI than a HDTV.

For a home network connected 300 to an external network 702 such as the World Wide Web (e.g., via the internet), device (e.g.,TV) manufacturers can design a device UIDGA 408 to include logo or icon pages (e.g., logoicon1.htm and logoname1.htm) hyper-linked from the manufacturer's Web site in a server 704 in the external network 702. In FIGS. 12-13 the bottom row includes e-commerce logos 712B from an example external Web Server or Home Portal, address 209.157.0.2, operated by a TV manufacturer. The primary logo item shown on the left hand side is an example logo graphic 710B

and name 712B from the manufacturers Web site (e.g. domain name homewideweb.net , address 209.157.0.2). In that example, the YAHOO (TM) icon embedded in the second logo page (e.g., logoicon2.htm and logoname2.htm) is obtained from the TV manufacturer's Web site or Home Portal and not directly from the YAHOO web site. The TV manufacturer may allow customization of the GUI 220 wherein service icons and logos are obtained from a Web Server or Portal outside of the manufacturer's control.

In one example, the discovery process reads information from the 1394 address space data storage (e.g., configuration ROM structure), as defined in clause 8 of ISO/IEC 13213. Although called 'ROM' it is assumed that the address space is write-able to allow user configuration and modification of user relevant stored values. The discovery process substantially comprises the steps described hereinabove, with the following additional or different functions for external Web link. Each device 11 keeps an extension data leaf in 1394 ROM space for IP addresses of devices 704 on the non-1394 network 702 (e.g., FIGS. 7, 14), and additionally an immediate data value for the Internet Gateway address as information for all the 1394 devices 11. Any 1394 device 11 can discover the Gateway address. The Internet Gateway device 700 or a device (e.g., DTV 103) communicating with non-1394 network 702 supporting the gateway device 700 includes the IP address of the gateway in ROM space (1212R) as defined. One or more devices 11 (e.g., DTV 102) can make their own icon more prominent (bigger), give the entire GUI 220 a different look and include logos and icons 710B from the external portal (e.g. manufacturer or other website provided by one or more devices 704 in the external network 702). Logos 710B from an external Web site(s) or Portal can be included in the top-level GUI 220 under the control of e.g. the TV manufacturer provided DTV UI description generator 408, for various (e.g., business) purposes. One or more of the devices 11 can further include IP address of Internet Gateway (if gateway or bridge device if present), relevant to the discovery IP address for 1394WEB in the 1394 configuration ROM.

Referring to FIG. 15, during an example operation scenario of a UIDGA 408 in a device 11 (step 800), if a gateway IP address is encountered during the search of 1394 ROM space (step 802), it is noted to allow inclusion of externally accessed logos 710A, 712A in the Top-Level Network UI Description (TLNUID) 250. Then the UIDGA 408 reads the IP address list of devices in the home network 300 (step 804) discovered by the DDA 404, the UIDGA 408 obtains the home portal IP address (step 806) and generates the TLNUID 250 in HTML using the IP address list, including links to external services provided by the network 702 (step 808). As shown by example in FIG. 12, the representative format of the TLNUID 250 comprises a matrix of icon graphics and underlying text representing the functions of the devices or services to the user. The Home Network devices 11 are given priority in the valuable TLNUID device-icon space. According to the TLNUID description 250, for home network devices 11, the icon.htm 706A page contents 706B are placed in the large space and, and the name.htm 707A content 707B in the smaller of the vertically adjacent frames for each device. IP addresses of devices 11 connected to the home network 300 are used in the hypertext links to each device for their icon.htm and name.htm files (shown by examples further below) (step 810).

Further, during operation of the UIDGA 408 in a device 11, if a Gateway 700 is detected (e.g., by the DDA 404), any device-icon GUI spaces remaining as a result of e.g. having a small network, using multiple levels (e.g., moving some device icons to a second level page), etc. can be used for externally accessed logo-items 708A, at the discretion of the UIDGA 408. In the TLNUID 250, the external logo-items 708A (e.g., each a logo graphic file 710A and associated name 710B) are obtained from, for example, a manufacturer's Web server (e.g. home portal) at a fixed external IP address in the external network 702 under the control of the manufacturers UIDGA 408. The logo-items 708A include predefined page names 710A, 712A, and are accessed in number order (e.g., logoicon1.htm, logoname1.htm first and then logoicon2.htm, logoname2.htm and so on) (step 812). The manufacturer (or

operator of the Web server) can insert the appropriate graphics and/or text with hyper-links inside said pages 710A, 712A. As such, in this example, logoicon1.htm 710A and logoname1.htm 712A, get included in the TLNUID 250 more often, and higher numbers are included least. The TLNUID 250 is then utilized by the browser 410 to generate and display the GUI 220 (step 814).

In example versions of the TLNUID 250, HTML files are used to indirectly reference the actual graphics files 710B and name data 712B rather than directly including the raw graphic file name/type and name text. This provides a layer of abstraction that allows the item (e.g., actual graphics files 710B and name data 712B) to be changed on the device side to reflect current status, customized by the manufacturer or user configured at the device without causing any change to the TLNUID HTML 250. Though intended for one graphic, more than one graphic file and text can be referenced by icon.htm or logoiconX.htm and graphics and text referenced in name.htm and logonameX.htm.

In example embodiments, HTML frames are used to implement the UI description 250. Use of frames stabilizes the GUI 220 appearance in the event of 'bad citizen' devices. For example a device presenting too many words or over large text in its 'name' frame will only affect that device's GUI look (by having some of the words truncated and not displayed) and not adversely affect the appearance of the whole Top-level GUI. As the Top-level description 250 is generated independently by UI capable devices (e.g. client devices 12 such as DTV 102), the exact design need not be standardized. The icon and logo graphics and name maximum sizes are standardized to facilitate design of the GUI matrix.

The top-level GUI 220 including many devices 11 and services 708B can be designed according to a prior user access frequency. Devices 11 or services 708B with higher access frequency can be given prominent display on the top-level GUI 220 or higher level GUI pages for ease of use. A

software agent running with the Browser can be utilized to provide such a function. The software agent monitors the user access to each device 11 or service 708B, counts the accesses and saves the number of accesses per device/service IP address to a data file in a place that is accessible by the User Interface description generator agent UIDGA 408. The data file comprises e.g. a simple list of IP addresses and counts. If a file and count already exists for a particular IP address, the new count is added to the existing value.

In one version, the UIDGA 408 is preprogrammed with one or more IP addresses in the external network 702 to access one or more external web sites, wherein a portal comprises one or more fixed web sites. The DDA 404 discovers the devices 11 in the home network 300, while the UIDGA 408 is responsible to generate the top level TLNUID 250. The gateway 700 is used to route the data to external networks 702. Every time there is a request to access an outside network 702, for example, external portal on an internet web site, the request is routed by the gateway 700 to the outside network 702 (specified by network communication). The UIDGA 408 uses the preprogrammed external portal IP address to generate the TLNUID 250 for the top-level GUI 220 including e.g. an icon graphic representation 710B for the external services, then the GUI 200 is presented to the user. When a user accesses the external link/network by clicking on an icon 710B in the GUI 220 representing a device/service in the outside network 702, the request is sent out of home network 300 to the external network 702 through the gateway 700. The Browser 410 is used to display the top level GUI 220, just the same as the case where no external links are used. In one version, the UIDGA 408 only includes a 'base' external service portal IP address (e.g. a device manufacturer's web site or portal address), without the need to know the external link IP addresses of other external services such as yahoo.com, amazon.com, which are stored in the base portal web site and then provided to the GUI 220, in files such as logoicon1.htm, described by example below.

Though in the above description an example implementation describes

manufacturers as placing portal information in the devices, others are possible. Further, though the external web site is described as a device manufacturer's web site, any other external web site can also be utilized.

Referring to Appendices 5-12, illustrative examples for the following htm files for generating the TLNUID and GUI in FIGS. 12-13 are provided:

Appendix 5 - Top-Level Page Example TLNUID (index.htm)
Appendix 6 - background.htm example
Appendix 7 - icon.htm example
Appendix 8 - Example name.htm
Appendix 9 - Example logoicon1.htm
Appendix 10 - Example logoname1.htm
Appendix 11 - Example logoicon2.htm
Appendix 12 - Example logoname2.htm

The Top-Level Page Example TLNUID (index.htm) 250 implements the TLNUID 250 and GUI 220 shown in FIGS. 12-13. Eight Home Network devices 11 are shown represented in the top 75% area of the GUI 200. The lower 25% of area, i.e. the bottom row, shows logo pages 708B from the manufacturer's chosen external Web Server or Portal of a fixed IP address. The TLNUID 250 is generated using frames. Hyper-links to the local device 11 graphics and name pages all use their 10.X.X.X local addresses. Hyper-links for the externally provided logo graphics and names pages 710A, 712A use the single external IP address (e.g., 209.157.0.2) provided by the manufacturer. As such control of the logo display 708B, and services offered, is provided by the TV or device manufacturer i.e. the provider of the TLNUID generator agent 408 in each of one or more devices 11. The "DVD 1" device 11 icon frame includes two graphics from the device 11. This does not affect the TLNUID 250, however when the Browser 410 renders the GUI 220, at least one icon.htm 706A can reference two graphics files, one (device graphic 721) hyper-linked to the device 11 top level control page and the other (logo 720) hyper-linked to the manufacturer Web Server for customer support, service,

help, etc.

The icon.htm 706A example description page is accessed from the device 11 when the Web Browser 410 renders the top-level GUI 220 and used to fill an icon space. The browser 410 reads this page 706A and makes further accesses to the device 11 to fetch the actual graphic icon.gif 706B for display. The icon.htm 706A description shows that the device default control page index.htm is the hyper-link attached to the graphics causing the page to be fetched when invoked. When invoked the device home control page is displayed in a new Browser window.

The name.htm 707A example description page is accessed from the device 11 by the Web Browser 410 when it renders the top-level GUI 220. The text 707B contained in name.htm 707A is placed directly under the icon 706B and provides ability, through facilities provided to the user through the device control pages, to apply user-customized text under the icon.

The logoincon1.htm 710A example description page is kept on an external Web Server 704 operated by the hardware manufacturer (e.g., homewideweb.com). The page 710A can include logo graphics to enable access to a service. A hyper-link in the TLNUID 250 provides access to the external Web Server 704 supporting that particular service. In this example case the address actually corresponds to the same Web Server or the Portal supporting the logo pages themselves -domain name 'homewideweb.com'. The logoicon1.htm 710A example description page is accessed in the Web Server 704 by the Web Browser 410 in the device 11 to render the top-level GUI 220. Similarly the file logoname1.htm 712A in the server 704 is accessed by the browser 410, and the text 712B in logoname1.htm 712A is placed directly under the logo graphic 710B and can be used to augment the graphic in describing the service.

As such there is a first hyper-link between the top level page 250 in the

device 11 and the logoincon1.htm file 710A in a server 704, and there is a second hyper-link between the logoicon1.htm file 710A and the actual logo graphic 710B. The UIDGA 408 places the first hyper-link to the logoincon1.htm file 710A in the top level page 250 for use by the browser 410 to access the logoincon1.htm file 710A kept in the server 704, and the browser 410 utilizes the second hyper-link in the logoincon1.htm file 710A to access the actual logo 710B (e.g., home wide web, Yahoo (TM), Amazon (TM), etc.) to display in the GUI 220 in the device 11.

In one example, the logoicon1.htm file 710A in the home portal (e.g., server 704) includes a hypertext link to the corresponding Home Wide Web icon graphics file 710B in the home portal, and the logoiconr.htm file 710A in the home portal (e.g., server 704) includes a hypertext link to Yahoo(TM) IP address for the corresponding Yahoo icon graphics file 710B.

The logoicon2.htm hyper-link is kept on an external Web Server 704 operated by the hardware manufacturer, and is for an external Web Server supporting a particular service. In this example, the logoicon2.htm includes hyper-link to the IP address of the YAHOO(TM) domain 204.71.200.75 to reference directly to the YAHOO Web site. DNS (providing name address look-up and allowing use of the name) is not required as the user interacts with the Yahoo graphic which does not change, and its hyper-link in the logoicon2.htm page can easily be changed to reflect any new address any time the GUI 220 is redisplayed/refreshed. In one example, the actual GUI 220 is generated from the HTML description 250 at start-up or re-start after a device 11 has been added to the network 300, and at a refresh.

For the example linked external web server implementation, example Table 11 below is used instead of the unit directory table 7 above, showing the EIA-775 Unit Directory, whereby the following EIA-1394WEB specific information should appear in the EIA-1394WEB Unit Directory.

<Table 11>

Directory length	CRC
12_{16}	Unit_specification_ID (EIA = 005068_{16})
13_{16}	Unit_software_version (010100_{16})
38_{16}	Discovery_control_bits
39_{16}	Assigned_Count_of_1394_devices
$3A_{16}$	IP_Address_Built_in
$3B_{16}$	IP_Address_Assigned
BC_{16}	IP_Address_Extension Leaf_for_attached_network
BD_{16}	IP_Address_Internet_Gateways_Leaf
$--_{16}$	<<possibly other fields>>

The Unit_specification_ID specifies the identity of the organization responsible for the architectural interface of the unit and the specification. In this case the directory and identity value=005068_{16}.refers to the EIA as the responsible body and the EIA-1394WEB control architecture specification.

A data leaf contains a table of gateway IP addresses to allow for more than one gateway address. It is intended for communications devices. This may be the same device or in another device on a bridged network (e.g., FIG. 7 including the 1394 and non-1394 device). An IP_Address_Internet_Gateways_Leaf (BD_{16}) directory entry is included for the address offset to the data leaf for the IP_Address_Internet_Gateways_Leaf as shown in example table 12 below. Gateway addresses are used by host client software to direct external addresses to the Internet. Filtering for external addresses is by assumed sub-net mask 255.0.0.0 for the 10.X.X.X private network.

<Table 12>

Leaf Length -1 (n) $_{16}$	CRC-16 $_{16}$
IP Address 1 (32 bit)	
....	
IP Address n (32 bit)	

Further, in addition to the requirement that the Bus_Info_Block, Root_Directory, and Unit Directories be present, it is also required that a Model Directory be present (e.g., Table 13 below). The following fields (defined in IEEE1212r are required of all nodes supporting the EIA-775 specification: Model_ID, Textual descriptor for Model_ID. The Model-Directory portion of the ROM is referenced by the Model_Directory offset field in the Root Directory.

<Table 13>

Model_Directory

directory length	CRC
17_{16}	Model_ID
81_{16}	Device_name_textual_descriptor offset
....	<<possibly other fields>>
....	....

As used herein, in one example, services provided by the network 702, or one or more of the devices 704, includes e.g. services, information, data, transactions, e-commerce, data transfer, news, information, manufacturer web sites, etc. that can be provided by the Internet and Word Wide Web. Other services provided by other external networks are contemplated by the present invention.

<Regional Service Support>

In another aspect, the present invention provides Regional Service Support in home Network Top-level Home Page, and Device Manufacturer's

Portal (e.g., External Web Server) provide services for networks (e.g. home networks) that include externally provided logos or icons in their home network top-level GUI (described above). The regional service support is based on the linked external web server, wherein the functionality is also built into the GUI description generator agent (UIDGA). Regional service provides advantageous features for e.g. home networks because typically information and services are localized by region. For example, such information can comprise local news, weather information, etc., and services can comprise cable service, Internet service, local TV program, etc.. As such, manufacturers that include externally provided logos or icons in their home network top-level GUI can further include regional service support based on the linked external web server.

In one implementation, redirection identification code (RIC), for example regional identification code, is used for User Interface devices 11 in the home networks to identify their geographical location using e.g. one-time user configuration or automatic configuration. For example, area code, IP address or Zip code can be used as RIC. The choice of different RICs does not affect the regional service support.

Referring to FIGS. 17 and 19, in one embodiment, the present invention provides regional service support in home network top-level home page generating process and device manufacturer's portal services using Zip code. Regional service is supported in the top-level homepage generating process UIDGA, wherein RIC is obtained (step 820) and embedded into HTTP links to external web servers by the top-level homepage generating process UIDGA in the top level page 250 (e.g., FIG. 16) (step 822). The browser 410 displays the GUI 220 based on the top level page 250 (step 824). Manufacture's portal services 908 supports regional service, wherein regional service redirection by said manufacturer portal based on RIC is included in HTTP requests from home devices 11. When a user clicks a cable service external link in the top-level home page 250 in a User Interface (UI) device 11 (step 826), the device

11 uses the hyper-link to the portal 908 to send a an HTTP request with RIC to the portal 908 (step 828). After looking up a RIC/local service provider database 900, redirection programs 904 in the manufacturer portal 908 redirects the HTTP request to a destination portal 910 in external network 702 based on the RIC (steps 830, 832), wherein in one example, relative to the portal 908, the destination portal 910 is local to the device 11. Then, the browser 410 displays the web page of the local cable service provider for the user's specific location (region). Manufacture's portal services supports regional service, wherein regional service redirection by said manufacturer portal based on RIC is included in HTTP requests from home devices 11. The external network can comprise multiple portals 908 and multiple portals 910.

Referring to FIG. 18 and 20, the RIC of a device 11 is obtained when the device 11 dials in home portal 908, the portal 908 obtains phone area code (for example, by caller ID) (step 840). The portal 908 can map area code to another RIC, for example zip code, and the software agent 902 in the device 11 receives the RIC. The additional steps 842-852 in FIG. 20 are similar to steps 822-832 in FIG. 19, and are not repeated.

In one example scenario, when a user with a user interface device 11, such as a Samsung (TM) HDTV 102 in Los Angeles, clicks on the external link icon for e.g. cable services, an HTTP request/inquiry is sent to the Samsung Home Network portal with the RIC in the URL from that HDTV 102, wherein said Samsung portal redirects the inquiry to e.g. a cable service provider in Los Angeles based on that RIC. The Samsung portal redirects the inquiry to a cable service local to that HDTV 102 based on the RIC in the inquiry. In this example process, the Samsung portal receives the RIC from the HTTP get message or post message. As such, in this example, an HDTV 102 in a network 300 in New York has a different RIC than the HDTV 102 in Los Angeles in another network 300, wherein each RIC indicates geographical area of a HDTV. The portal 908 redirects requests for service from each HDTV in

a different geographical area to a portal 910 local to the requesting HDTV based on the RIC of that HDTV (FIG. 21).

<Regional Identification Code>

As described, a regional identification code (RIC) is utilized for UI devices 11 to identify geographical location of such devices 11 in different networks. The RIC can comprise e.g. zip code (5 digit or 9 digit), phone area code, IP address of the device or the home network, IP address of the service provider, or any other identification information. The RIC can also comprise a combination of the above examples. For example, using zip code or phone area code, the geographical location of the UI device and the local service provider in the geographical area can be determined. Because each local Internet Service Provider (ISP) is typically assigned fixed IP addresses or IP address block, and they further assign certain IP addresses or blocks to a regional area, this allows determination of the ISP and region information from an IP address. The portal can use this regional information to further provide the web page of the local service provider (e.g., cable or other services). In one version, e.g. a 5-digit Zip code is used as RIC, while in another version e.g. 9-digit Zip code is used for detailed geographical information. The choice of 5-digit or 9-digit Zip code does not affect the regional service support. The choice between Zip code, area code, IP address or other possible codes does not affect the regional service support as describe herein.

<Portal Service with Regional Support>

For portal service with regional support, in one example a home device manufacture's portal services supports regional service (i.e., regional redirect service) based on RIC enclosed in the HTTP request from the home devices 11. The portal with regional support redirects the HTTP request to a URL local to the request based on RIC.

After the UIDGA builds the top level directory 250 in FIG. 16 (the

directory 250 including portal address, RIC and hyperlinks for obtaining name and logo information from the portal for external service), when the browser 410 executes, the portal sends HTML files (logoicon1.html 710A, logoname1.html 712A, etc.) for icon and name representing external services to the device 11 for display on the GUI 220. These html files 710A, 712A can be from the same web site or different web sites (e.g., general web site such as the portal or service provider web site). Referring to FIGS. 17-18, thereafter, when a user clicks on an external link such as e.g. a cable service icon on the GUI 220 of the device 11 (e.g., HDTV), then a hyper link associated with that icon sends a request including RIC of device 11 to the portal 908 with regional support, and that portal 908 based on the RIC, determines region of the device 11.

In a first embodiment of redirection, the portal 908 then redirects the request to a cable service provider 910 in the local region (or any other desired region) associated with the RIC. For example, the portal 908 redirects the request to the URL of that cable service provider 910 (e.g., ATT) whereby the browser 410 in device 11 is redirected to that cable service provider 910. After the redirection by the portal 908 the cable service 910 web page is displayed on the device 11 for user interaction. The HTTP redirect comprises the device 11 sending to the server portal 908 a HTTP request (including RIC) for a URL for service, and based on the RIC in the request the portal 908 provides a new URL of service provider portal 910 for service local to the device 11, wherein the browser 410 shows the contents of the web page of destination service provider 910 at the new URL on the device 11.

In a second embodiment of redirection, the portal 908 includes sets of html files 906 (e.g., including icons, names, URLs) associated with service providers 910. The html files are categorized based on RIC, such that there is a set of html files 906 corresponding to each RIC. Upon receiving an HTTP request with RIC from a device 11, the portal 908 uses the RIC to find the corresponding html files 906 in the portal 908, and sends the html files 906

associated with a destination portal 910 to the browser 410 of device 11 for display. The html files 906 include e.g. icon, name and URL of the destination portal 910 local to the device 11. Thereafter, when the user clicks on the icon/name of the destination portal displayed by the browser 410, the device 11 is directed to the URL of the destination portal 910.

In one implementation, two redirection programs 904 designated logoiconX and logonameX (for redirecting requests based on RIC) in the portal system 908 of external network 702 (FIG. 7) work for each service (e.g., cable, ISP, phone, etc.). The portal site 908 has access to a database of RICs 900 and local service providers, so that the portal 908 can look up the corresponding service provider 910 for different RICs and redirect HTTP requests from each device 11 based on that device's RIC (for displaying the local service provider information for that region on device 11). For example, for Zip code or phone area RIC, the database 900 can be a lookup table of ZIP/local Service or Area Code/Local Service for each service, and for IP address, it can be a database of IP address/Local service provider/HTML name in the portal 908 (the home portal). The database 900 is updated by the service providers, such as cable providers or ISPs 910.

The RIC is embedded into the top-level home network homepage 250 in the homepage generating process by the UIDGA 408. When a user accesses (e.g., clicks on) an RIC embedded HTTP link on the page 220, the HTTP request including an RIC is sent to the portal 908 in external network 702. Upon receiving the HTTP request with embedded RIC: (1) in the first implementation of redirection described above, each redirect program 904 (e.g., logoiconX and logonameX) on the portal 908 redirects the request to the URL of portal service 910 outside the portal 908 based on the RICs (e.g., corresponding to the correct local service providers), or (2) in the second implementation of redirection described above each redirect program 904 uses said html files 906 for redirection, wherein e.g. the logoiconX program redirects the HTTP request from the device 11 (e.g., HDTV 102) to a html file 906

corresponding to the RIC of the device 11 in the HTTP request in the portal 908, wherein the html file 906 includes a link to a destination service provider 910 (e.g., Att.com) corresponding to the RIC. In one example, the portal 908 sends the html files 906 associated with the destination portal 910 to the browser 410 of device 11 for display. The html files 906 include e.g. icon, name and URL of the destination portal 910 local to the device 11. Thereafter, when the user clicks on the icon/name of the destination portal displayed by the browser 410, the device 11 is directed to the URL of the destination portal 910.

The redirect programs can be programmed using any suitable program language, such as Java. There can be many destinations (e.g., URLs)available for one redirect program (e.g., LogoiconX or logonameX) to redirect a request to. The same redirect program can redirect using different kinds of RICs, for example, 5-digit Zip code, 9-digit Zip code, area code and IP address. Therefore, even mixed RICs can be used for the regional service support.

Appendix 14 shows an example redirection program example in Java Servlet, wherein the redirection program is named go.java (same function as the logoiconX or logonameX program). The redirect URL to the program is http://ip address/servlet/go, it will redirect the page immediately to, for example, the local service provider www.att.com. The RIC code can be easily added in the URL request like http:// ip address/servlet/go?arecode=408, then the following program can be changed to get the RIC code, search the database, get the correct URL and then redirect.

Device icon spaces unused in the Top-level Home Network directory page 250 can be filled with service logos or icons and names from an external portal 908 (e.g., web site) provided by devices 704 in external network 702 (FIG. 7). For example, there can be as many as 12 unused icon spaces in the page 250 (FIG. 16) for a minimum network including one UI device 11. In

that case, there are a minimum of 12 sets of redirection programs on the portal, serving different HTML files containing logo-graphic and logo-name for the RIC based GUI 220 (FIG. 12). Said redirection programs can be implemented in different ways such as CGI script/program, Java servlet/program, ASP, etc.. In one example, the redirect program file names have a number from 1 to 12 (e.g., logoicon1 to logoicon12, logoname1 to logoname12), and are accessed in sequential order starting with number 1.

A software agent in each UI device (FIGS. 17-18) can make RICs available to the top-level home network homepage generator UIDGA. Then the RIC is embedded into the top-level home network homepage 250 (e.g., FIG. 16) in the homepage generating process by the UIDGA 408. A default RIC can comprise e.g. all zeros. The home network can propagate identification code to UI devices 11 using the same kind of RIC via e.g. a device-to-device control mechanism.

In one implementation of the UIDGA for regional service, redirection program names in the portal server such as logoiconX (e.g., logoicon1, logoincon2, etc.) and logonameX (e.g., logoname1, logoname2, etc.) are used for the logo and name links in logo-items and name-items in the page 250. These redirection programs redirect the request to specific HTML files according to RIC. The names of the logoicon1.htm, logoname1.htm, logoicon2.htm, logoname2.htm, etc. files are not standardized. The redirect programs 904 (logoiconX and logonameX) in the portal server 908 redirect the request to destination URLs for each local service provider according to RIC (e.g., redirect portal query to a local cable portal site).

In the above example, when a request for e.g. cable service from a device 11 is received by the Samsung portal, the portal uses the RIC information in the request and instead of providing the requested information from its own portal (e.g., yahoo.com or amazon.com), based on the RIC the portal redirects the request to the local cable service portal for services, such

that the service is localized based on the RIC regional information.

<Top-level Homepage with External Links and Regional Service >

As described, an aspect of providing regional service is supported in the top-level homepage generating process UIDGA, wherein an RIC is embedded into the HTTP request to external web servers 908 of network 702 in the top-level homepage 220. For example, if CGI type redirect program logoiconX and logonameX is utilized on the portal, the icon redirection URL can comprise e.g.:

http://209.157.0.2/cgi-bin/logoicon1?zip=95134, or
http://209.157.0.2/cgi-bin/logoicon1?zip=951342111, or
http://209.157.0.2/cgi-bin/logoicon1?ipaddress=165.35.2.1, or
http://209.157.0.2/cgi-bin/logoicon1?areaCode=408.

Similarly, the name redirection URL can comprise e.g.:
http://209.157.0.2/cgi-bin/logoname1?zip=95134, or
http://209.157.0.2/cgi-bin/logoname1?zip=951342111, or
http://209.157.0.2/cgi-bin/logoname1?ipaddress=165.35.2.1, or
http://209.157.0.2/cgi-bin/logoname1?areaCode=408.

In the process of generating the top-level homepage, the UIDGA includes the RIC (e.g., Zip code) of the current UI device 11 into the HTTP link (e.g., logoicon2?zip=95134 in FIG. 16).

<Obtaining RICs>

RICs can be obtained and set up in the following example two methods. The first method comprises one-time user configuration, as shown by example in FIGS. 17 and 19, wherein user can input RIC code such as Zip code or area code into a software agent 902 in a one-time setup step. The second method comprises automatic configuration with the help of service providers as shown in FIGS. 18 and 20. An RIC software agent 902 in the UI device 11 (e.g., HDTV) can collect the RIC from the service provider

automatically, for example, using a trace route program 912 in the portal 908. In cases where the RIC comprises area code or Zip code, said software agent 902 in a UI device 11 (e.g., HDTV 102) can activate a dial-in phone call (wire-based or wireless, directly from the device or through the home network) to the home portal 908. The home portal 908 can obtain the area code e.g., using caller ID. The portal 908 can further map the area code to CIP code. The software agent 902 in the device 11 can obtain this information, such as the area code or zip code as RIC for use by the UIDGA 408. Where the RIC comprises a Device or Home Network IP Address, the software agent 902 in the HDTV 102 can obtain the IP address from the HDTV 102 directly or from home network, then use it as the RIC for the HDTV 102.

In cases where the Service Provider IP Address is used as RIC, the IP address of service provider can be also used as RIC. First the RIC software agent 902 in HDTV 102 can call a TraceRoute program 912 in a portal site 908 of external network 702, and retrieve the intermediate IP addresses list. Then the RIC software agent 902 selects the service provider 910 IP address from the list according to a criteria (e.g., the nearest IP address with a domain name ending with ".net" can be selected). Then this IP address, or even domain name, can be used as RIC. The example steps can be used regardless of the type of RIC.

An example trace route program 912 is shown in Appendix 13, wherein after user configuration or automatic configuration, the RIC code is stored in the UI device 11 (e.g., on a hard disk therein). The trace program 912 traces all the hubs, gateways and routers that a message goes through when it is traversing e.g. the Internet, to discover that for example the message has gone through the cable's head end router, allowing identification of the cable provider. If the request/message went through TCI's router, the portal redirects to TCI's portal.

Though in the examples described herein redirection from a portal to

destination portals is based on a regional identification code, in another example redirection from one portal to another can based on other information in addition to, or in place of, a location or region of a device 11. Such other information can comprise e.g. information (e.g., age, education, etc.) about the user of a device 11, wherein redirection to destination portals is based on such information. Further, the destination service provider can be either external to the portal 908, or within the destination portal 908 for providing services. Therefore, the redirection programs 904 in the portal 908 can redirect a request from a device 11 to a service providers within the portal 908, or to portals 910 external to the portal 908.

Appendices 15, 6, 7, 8, 16, 17, 18, and 19 are illustrative examples for htm files for generating the top level home network user interface description and GUI in FIGS. 13 and 16 including external links with regional support.

Although the present invention has been described in considerable detail with regard to the preferred versions thereof, other versions are possible. Therefore, the appended claims should not be limited to the descriptions of the preferred versions contained herein.

Industrial Applicability

The method and system for providing device communication and control in a home network connected to an external network with regional support, according to the present invention can be applied to home networks having multi-media devices connected, such as PC, VCR, Camcorder, DVD, and HDTV, etc..

Appendix 1- Top-Level Page Example

```
<HTML>
<HEAD>
<TITLE>HN Devices Page</TITLE>
</HEAD>

<FRAMESET ROWS="2%, 47%,2%, 22.5%,2%,22.5%, 2%" border=0
color=black>
    <NOFRAMES>Sorry does not support frames</NOFRAMES>
    <FRAMESET ROWS="100%,0%">
      <FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
    </FRAMESET>
    <FRAMESET
COLS="1.2%,23.5%,1.2%,48.2%,1.2%,23.5%,1.2%">
      <FRAMESET ROWS="100%,0%">
       <FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
      </FRAMESET>
      <FRAMESET ROWS="48%,4%,48%">
        <FRAMESET ROWS="73%, 27%">
    <FRAME SRC="http://10.1.1.1/icon.htm" SCROLLING="no"
NORESIZE>
    <FRAME SRC=" http://10.1.1.1/name.htm" SCROLLING="no"
NORESIZE>
        </FRAMESET>
        <FRAMESET ROWS="100%,0%">
          <FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
      </FRAMESET>
        <FRAMESET ROWS="73%, 27%" >
```

```
        <FRAME    SRC="    http://10.1.1.10/icon.htm"    SCROLLING="no"
    NORESIZE>
        <FRAME    SRC="    http://10.1.1.10/name.htm"    SCROLLING="no"
    NORESIZE>
                  </FRAMESET>
                 </FRAMESET>
                 <FRAMESET ROWS="100%,0%">
                  <FRAME      SRC="background.htm"      SCROLLING="no"
    NORESIZE>
                 </FRAMESET>
                 <FRAMESET ROWS="73%, 27%" >
          <FRAME    SRC="    http://10.1.22.1/icon.htm"    SCROLLING="no"
    NORESIZE>
          <FRAME    SRC="    http://10.1.22.1/name.htm"    SCROLLING="no"
    NORESIZE>
                 </FRAMESET>
                 <FRAMESET ROWS="100%,0%">
                  <FRAME      SRC="background.htm"      SCROLLING="no"
    NORESIZE>
                 </FRAMESET>
                 <FRAMESET ROWS="48%,4%,48%">
                   <FRAMESET ROWS="73%, 27%" >
          <FRAME    SRC="    http://10.1.229.1/icon.htm"    SCROLLING="no"
    NORESIZE>
          <FRAME    SRC="    http://10.1.229.1/name.htm"    SCROLLING="no"
    NORESIZE>
                   </FRAMESET>
                   <FRAMESET ROWS="100%,0%">
                     <FRAME    SRC="background.htm"    SCROLLING="no"
    NORESIZE>
                 </FRAMESET>
                   <FRAMESET ROWS="73%, 27%" >
```

```
        <FRAME   SRC="   http://10.30.30.1/icon.htm"   SCROLLING="no"
    NORESIZE>
        <FRAME   SRC="   http://10.30.30.1/name.htm"   SCROLLING="no"
    NORESIZE>
                  </FRAMESET>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
    NORESIZE>
                </FRAMESET>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
    NORESIZE>
              </FRAMESET>
              <FRAMESET
    COLS="1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%">
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
    NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME   SRC="   http://10.41.1.1/icon.htm"   SCROLLING="no"
    NORESIZE>
        <FRAME   SRC="   http://10.41.1.1/name.htm"   SCROLLING="no"
    NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
    NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
```

```
        <FRAME SRC=" http://10.41.21.1/icon.htm" SCROLLING="no"
NORESIZE>
        <FRAME SRC=" http://10.41.21.1/name.htm" SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="73%, 27%" >
      <FRAME   SRC="   http://10.45.1.1/icon.htm"   SCROLLING="no"
NORESIZE>
      <FRAME   SRC="   http://10.45.1.1/name.htm"   SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="73%, 27%" >
      <FRAME   SRC="   http://10.100.1.1/icon.htm"   SCROLLING="no"
NORESIZE>
      <FRAME   SRC="   http://10.100.1.1/name.htm"   SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
            </FRAMESET>
          </FRAMESET>
          <FRAMESET ROWS="100%,0%">
             <FRAME    SRC="background.htm"    SCROLLING="no"
```

```
NORESIZE>
            </FRAMESET>
            <FRAMESET
COLS="1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%">
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME   SRC="   http://10.122.22.1/eia.htm"   SCROLLING="no"
NORESIZE>
      <FRAME   SRC="   http://10.122.22.1/eia.htm"   SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME SRC=" http://10.122.122.122/icon.htm" SCROLLING="no"
NORESIZE>
      <FRAME SRC=" http://10.122.122.122/name.htm" SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME SRC=" http://10.122.122.123/icon.htm" SCROLLING="no"
NORESIZE>
      <FRAME SRC=" http://10.122.122.123/name.htm" SCROLLING="no"
```

```
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME SRC=" http://10.122.122.124/icon.htm" SCROLLING="no"
NORESIZE>
        <FRAME SRC=" http://10.122.122.124/name.htm" SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
                </FRAMESET>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
              </FRAMESET>
        </FRAMESET>
        <BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
        </BODY>
        </HTML>
```

Appendix 2- Background.htm example

```
<HTML>
<HEAD>
<TITLE>Background</TITLE>
</HEAD><BODY BGCOLOR="#007986"></BODY>

</HTML>
```

Appendix 3 - Icon.htm example

```
<HTML>
<HEAD>
<TITLE>Device Icon</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<br><br><CENTER>
<IMG SRC="icon.gif" border=0>
</CENTER>
</BODY>

</HTML>
```

Appendix 4 - Name.htm example

```
<HTML>
<HEAD>
<TITLE>Device Name</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER><FONT size=+0>Samsung Device</font></CENTER>
</BODY>
</HTML>
```

Appendix 5 - Top-Level Page Example TLNUID (index.htm)

```
<HTML>
<HEAD>

<TITLE>HN Devices Page</TITLE>
</HEAD>

<FRAMESET ROWS="2%, 47%,2%, 22.5%,2%,22.5%, 2%"
BORDER=0 COLOR=black>
<NOFRAMES>Sorry does not support frames</NOFRAMES>
<FRAMESET ROWS="100%,0%">
<FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
</FRAMESET>
<FRAMESET
COLS="1.2%,23.5%,1.2%,48.2%,1.2%,23.5%,1.2%">
<FRAMESET ROWS="100%,0%">
<FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
</FRAMESET>
<FRAMESET ROWS="48%,4%,48%">
<FRAMESET ROWS="73%, 27%">
<FRAME SRC="http://10.1.1.2/icon.htm" SCROLLING="no"
NORESIZE>
<FRAME SRC="http://10.1.1.2/name.htm" SCROLLING="no"
NORESIZE>
</FRAMESET>
<FRAMESET ROWS="100%,0%">
<FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
</FRAMESET>
```

```
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.1.1.63/icon.htm"    SCROLLING="no"
NORESIZE>
        <FRAME    SRC="http://10.1.1.63/name.htm"    SCROLLING="no"
NORESIZE>
                </FRAMESET>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
        <FRAME SRC="icon.htm" SCROLLING="no" NORESIZE>
        <FRAME SRC="name.htm" SCROLLING="no" NORESIZE>
                </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="48%,4%,48%">
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.41.1.2/icon.htm"    SCROLLING="no"
NORESIZE>
        <FRAME    SRC="http://10.41.1.2/name.htm"    SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                  <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.10.1.2/icon.htm"    SCROLLING="no"
```

```
NORESIZE>
        <FRAME    SRC="http://10.10.1.2/name.htm"    SCROLLING="no"
NORESIZE>
          </FRAMESET>
        </FRAMESET>
        <FRAMESET ROWS="100%,0%">
         <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
        </FRAMESET>
      </FRAMESET>
      <FRAMESET ROWS="100%,0%">
        <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
      </FRAMESET>
      <FRAMESET
COLS="1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%">
        <FRAMESET ROWS="100%,0%">
         <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
        </FRAMESET>
        <FRAMESET ROWS="73%, 27%" >
      <FRAME    SRC="http://10.1.1.200/icon.htm"    SCROLLING="no"
NORESIZE>
      <FRAME    SRC="http://10.1.1.200/name.htm"    SCROLLING="no"
NORESIZE>
        </FRAMESET>
        <FRAMESET ROWS="100%,0%">
         <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
        </FRAMESET>
        <FRAMESET ROWS="73%, 27%" >
      <FRAME    SRC="http://10.1.10.20/icon.htm"    SCROLLING="no"
```

```
NORESIZE>
        <FRAME  SRC="http://10.1.10.20/name.htm"  SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.1.99.2/icon.htm"    SCROLLING="no"
NORESIZE>
        <FRAME  SRC="http://10.1.99.2/name.htm"  SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.1.99.9/icon.htm"    SCROLLING="no"
NORESIZE>
        <FRAME  SRC="http://10.1.99.9/name.htm"  SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
            </FRAMESET>
          </FRAMESET>
          <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
```

```
            </FRAMESET>
            <FRAMESET
COLS="1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%">
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME SRC="http://209.157.0.2/logoicon1.htm" SCROLLING="no"
NORESIZE>
      <FRAME SRC="http://209.157.0.2/logoname1.htm" SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME SRC="http://209.157.0.2/logoicon2.htm" SCROLLING="no"
NORESIZE>
      <FRAME SRC="http://209.157.0.2/logoname2.htm" SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME SRC="http://209.157.0.2/logoicon3.htm" SCROLLING="no"
NORESIZE>
      <FRAME SRC="http://209.157.0.2/logoname3.htm" SCROLLING="no"
NORESIZE>
```

```
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME SRC="http://209.157.0.2/logoicon4.htm" SCROLLING="no"
NORESIZE>
        <FRAME SRC="http://209.157.0.2/logoname4.htm" SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
                </FRAMESET>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
              </FRAMESET>
        </FRAMESET>

        <BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">

        </BODY>
        </HTML>
```

Appendix 6 - background.htm example

```
<HTML>

<HEAD>
<TITLE>Background</TITLE>
</HEAD>
<BODY BGCOLOR="#007986"></BODY>

</HTML>
```

Appendix 7 - icon.htm example

```
<HTML>

<HEAD>
<TITLE>Device Icon</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<BR><BR>
<CENTER>
<A HREF="index.htm" TARGET="_blank"><IMG SRC="icon.gif"
BORDER=0></A>
</CENTER>
</BODY>

</HTML>
```

Appendix 8 - Example name.htm

```
<HTML>

<HEAD>
<TITLE>Device Name</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER>
<FONT SIZE=+0>HDTV Master Bedroom</FONT></CENTER>
</BODY>

</HTML>
```

Appendix 9 - Example logoicon1.htm

```
<HTML>
<HEAD>
<TITLE>Logo Icon 1</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER>
<A HREF="http://209.157.0.2" TARGET="_blank"><IMG
SRC="hww1.gif" BORDER=0></A>
</CENTER>
</BODY>

</HTML>
```

Appendix 10 - Example logoname1.htm

```
<HTML>

<HEAD>
<TITLE>Logo Name 1</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER>
<A HREF="http://209.157.0.2" target="_blank">Home Wide Web</A>
</CENTER>
</BODY>

</HTML>
```

Appendix 11 - Example logoicon2.htm

```
<HTML>

<HEAD>
<TITLE>Logo Icon 2</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<BR><BR>
<CENTER>
<A HREF="http://204.71.200.75" TARGET="_blank"><IMG
SRC="yahoo.gif" BORDER=0></A>
</CENTER>
</BODY>

</HTML>
```

Appendix 12 - Example logoname2.htm

```
<HTML>

<HEAD>
<TITLE>Logo Name 2</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER>
<A HREF="http://204.71.200.75" TARGET="_blank">Directory
Services</A>
</CENTER>
</BODY>

</HTML>
```

Appendix 13 - Perl Example Program for Trace Route

An Perl trace route example program for regional service using service provider IP address as RIC.

```
#!/usr/bin/perl
# full path to "traceroute" executable
$traceroute = "/usr/sbin/traceroute";
# path to the script
$url = "/cgi-bin/traceroute.cgi";
# your title
$title ="Traceroute Script";

if ($ENV{'CONTENT_LENGTH'} ne '') {
read(STDIN, $buffer, $ENV{'CONTENT_LENGTH'});
      @pairs = split(/&/, $buffer);
      foreach $pair (@pairs)
      {
           ($name, $value) = split(/=/, $pair);
           $value =~ tr/+/ /;
           $value =~ s/%([a-fA-F0-9][a-fA-F0-9])/pack("C", hex($1))/eg;
           $value =~ s/~!/ ~!/g;
           $FORM{$name} = $value;
      }
}
$FORM{'host'} =~ s/(\;)//g;
print "Content-type:text/html\n\n";
print  "<HTML>\n  <HEAD><TITLE>$title</TITLE></HEAD><BODY
BGCOLOR=\"#FFFFFF\"      LINK=\"#FFFFFF\"      VLINK=\"#FFFFFF\"
ALINK=\"#FFFFFF\"> ";
if ($FORM{'host'} eq ''){
     print <<EOFHTML;
```

```
            <FORM METHOD="POST" ACTION="$url">
            <TABLE WIDTH="350"   CELLPADDING="0" CELLSPACING="0"
BORDER="0">
          <TR                                    ALIGN="CENTER"><TD
    BGCOLOR="#ffbc2a"> <BR><INPUT   TYPE="TEXT"   SIZE="18"
    MAXSIZE="40"                                        NAME="host"
    VALUE="domain.com"><BR> </TD><TD
    BGCOLOR="#000000"> <BR><INPUT            TYPE="SUBMIT"
    VALUE="CHECK"><BR> </TD></TR>
          <TR><TD            ALIGN="CENTER"            COLSPAN="2"
    BGCOLOR="#CCCCCC"><FONT COLOR="#FFFFFF" SIZE="-2">All rights
    reserved.    <A    HREF="http://www.fastgraf.com">Fastgraf</A>    (c)
    1998</FONT></TD></TR>
            </TABLE>
      EOFHTML
        }
      else
      {
          $txt = `$traceroute $FORM{'host'}`;
          print <<EOFHTML;
          <TABLE WIDTH="100%" HEIGHT="40">
          <TR><TD BGCOLOR="#ffbc2a"><B>$title</B></TD></TR>
          </TABLE>
         <PRE>$txt</PRE>
          EOFHTML
      }
      print "</BODY></HTML>";
      exit 0;
```

Appendix 14 - Example Redirection Programs

```
package redirect;
import javax.servlet.*;
import javax.servlet.http.*;
import java.io.*;
import java.util.*;

public class go extends HttpServlet {

  //Initialize global variables
  public void init(ServletConfig config) throws ServletException {
    super.init(config);
  }

  //Process the HTTP Get request
  public void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    response.setStatus(response.SC_MOVED_TEMPORARILY);
    response.setHeader("Location", "http://www.att.com");
  }

  //Process the HTTP Post request
  public void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    response.setStatus(response.SC_MOVED_TEMPORARILY);
    response.setHeader("Location", "http://www.att.com");
  }

  //Get Servlet information
  public String getServletInfo() {
    return "redirect.go Information";
```

```
    }
}
```

Appendix 15 - Top-Level Page Example TLNUID (index.htm)

```
<HTML>
<HEAD>

<TITLE>HN Devices Page</TITLE>
</HEAD>

<FRAMESET ROWS="2%, 47%,2%, 22.5%,2%,22.5%, 2%"
BORDER=0 COLOR=black>
    <NOFRAMES>Sorry does not support frames</NOFRAMES>
    <FRAMESET ROWS="100%,0%">
      <FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
    </FRAMESET>
    <FRAMESET
COLS="1.2%,23.5%,1.2%,48.2%,1.2%,23.5%,1.2%">
      <FRAMESET ROWS="100%,0%">
       <FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
      </FRAMESET>
      <FRAMESET ROWS="48%,4%,48%">
       <FRAMESET ROWS="73%, 27%">
    <FRAME SRC="http://10.1.1.2/icon.htm" SCROLLING="no"
NORESIZE>
    <FRAME SRC="http://10.1.1.2/name.htm" SCROLLING="no"
NORESIZE>
      </FRAMESET>
      <FRAMESET ROWS="100%,0%">
        <FRAME SRC="background.htm" SCROLLING="no"
NORESIZE>
    </FRAMESET>
```

```
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.1.1.63/icon.htm"    SCROLLING="no"
NORESIZE>
        <FRAME    SRC="http://10.1.1.63/name.htm"    SCROLLING="no"
NORESIZE>
                </FRAMESET>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
        <FRAME SRC="icon.htm" SCROLLING="no" NORESIZE>
        <FRAME SRC="name.htm" SCROLLING="no" NORESIZE>
                </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="48%,4%,48%">
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.41.1.2/icon.htm"    SCROLLING="no"
NORESIZE>
        <FRAME    SRC="http://10.41.1.2/name.htm"    SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                  <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.10.1.2/icon.htm"    SCROLLING="no"
```

```
NORESIZE>
        <FRAME    SRC="http://10.10.1.2/name.htm"    SCROLLING="no"
NORESIZE>
                  </FRAMESET>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                  <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
                </FRAMESET>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
                <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET
COLS="1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%">
                <FRAMESET ROWS="100%,0%">
                  <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.1.1.200/icon.htm"    SCROLLING="no"
NORESIZE>
        <FRAME   SRC="http://10.1.1.200/name.htm"   SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                  <FRAME      SRC="background.htm"      SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME    SRC="http://10.1.10.20/icon.htm"    SCROLLING="no"
```

```
NORESIZE>
        <FRAME   SRC="http://10.1.10.20/name.htm"   SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="73%, 27%" >
        <FRAME     SRC="http://10.1.99.2/icon.htm"     SCROLLING="no"
NORESIZE>
        <FRAME   SRC="http://10.1.99.2/name.htm"   SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="73%, 27%" >
        <FRAME     SRC="http://10.1.99.9/icon.htm"     SCROLLING="no"
NORESIZE>
        <FRAME   SRC="http://10.1.99.9/name.htm"   SCROLLING="no"
NORESIZE>
            </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
            </FRAMESET>
          </FRAMESET>
            <FRAMESET ROWS="100%,0%">
             <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
```

```
            </FRAMESET>
            <FRAMESET
COLS="1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%,23.5%,1.2%">
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME            SRC="http://209.157.0.2/logoicon1?zip=95134"
SCROLLING="no" NORESIZE>
      <FRAME            SRC="http://209.157.0.2/logoname1?zip=95134"
SCROLLING="no" NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME            SRC="http://209.157.0.2/logoicon2?zip=95134"
SCROLLING="no" NORESIZE>
      <FRAME            SRC="http://209.157.0.2/logoname2?zip=95134"
SCROLLING="no" NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
               <FRAME    SRC="background.htm"    SCROLLING="no"
NORESIZE>
              </FRAMESET>
              <FRAMESET ROWS="73%, 27%" >
      <FRAME            SRC="http://209.157.0.2/logoicon3?zip=95134"
SCROLLING="no" NORESIZE>
      <FRAME            SRC="http://209.157.0.2/logoname3?zip=95134"
SCROLLING="no" NORESIZE>
```

```
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="73%, 27%" >
        <FRAME              SRC="http://209.157.0.2/logoicon4?zip=95134"
SCROLLING="no" NORESIZE>
        <FRAME              SRC="http://209.157.0.2/logoname4?zip=95134"
SCROLLING="no" NORESIZE>
                </FRAMESET>
                <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
                </FRAMESET>
              </FRAMESET>
              <FRAMESET ROWS="100%,0%">
                 <FRAME     SRC="background.htm"     SCROLLING="no"
NORESIZE>
              </FRAMESET>
        </FRAMESET>

        <BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">

        </BODY>
        </HTML>
```

Appendix 16 - Example logoicon1.htm

```
<HTML>

<HEAD>
<TITLE>Logo Icon 1</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER>
<A HREF="http://209.157.0.2/servlets/logoicon1?zip=951342111"
TARGET="_blank"><IMG SRC="hww1.gif" BORDER=0></A>
</CENTER>
</BODY>

</HTML>
```

Appendix 17 - Example logoname1.htm

```
<HTML>

<HEAD>
<TITLE>Logo Name 1</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER>
<A HREF="http://209.157.0.2/servlets/logoicon1?zip=951342111"
target="_blank">Home Wide Web</A>
</CENTER>
</BODY>

</HTML>
```

Appendix 18 - Example logoicon2.htm

```
<HTML>

<HEAD>
<TITLE>Logo Icon 2</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<BR><BR>
<CENTER>
<A HREF="http://204.71.200.75/servlets/logoicon1?zip=951342111"
TARGET="_blank"><IMG SRC="yahoo.gif" BORDER=0></A>
</CENTER>
</BODY>

</HTML>
```

Appendix 19 - Example logoname2.htm

```
<HTML>

<HEAD>
<TITLE>Logo Name 2</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFF0" TEXT="#000070" LINK="#0000ff"
ALINK="#FF0000" VLINK="#007986">
<CENTER>
<A HREF="http://204.71.200.75/servlets/logoicon1?zip=951342111"
TARGET="_blank">Directory Services</A>
</CENTER>
</BODY>

</HTML>
```

What is claimed is:

1. A method for providing user interfaces in a first network including first devices interconnected via a communication medium , and at least one interface device connecting said first network to at least a second network providing services, the user interfaces for controlling the devices that are currently connected to the first network and furnishing services of the second network to at least a user, comprising the steps of:

in each of one or more first devices in the first network:

(a) obtaining information from one or more of said first devices currently connected to the first network, said information including device information; and

(b) generating a user interface description including:

(1) at least one reference associated with the device information of each of said one or more first devices,

(2) at least a redirection identification code (RIC) corresponding to that first device, and

(3) at least one reference associated with the services provided by the second network.

2. The method of claim 1, wherein the first network comprises a 1394 network, and the second network comprises a non-1394 network.

3. The method of claim 1, wherein the interface device comprises a gateway device.

4. The method of claim 1, wherein the second network comprises a plurality of interconnected second devices providing one or more services.

5. The method of claim 4, wherein each of said second devices comprises at least one computer system programmed to provide services.

6. The method of claim 4, wherein:

the second network comprises the Internet, and

at least one of said second devices providing services comprises one or more web servers providing services.

7. The method of claim 6, wherein a service provided by at least one of the devices connected to the second network comprises a web site service.

8. The method of claim 1, wherein each reference in the user interface description associated to services provided by the second network comprises at least one hyper-link to service information in the second network.

9. The method of claim 1 further including the step of:

(c) displaying a user interface based on said user interface description on a device connected to the first network capable of displaying a user interface, for user control of said first devices and communication with the second network.

10. The method of claim 9, wherein the step of displaying each user interface further includes the steps of:

using each reference in the corresponding user interface description to access the associated information in each first device;

using each reference associated with services provided by the second network to access corresponding service information;

generating the user interface including: (1) information corresponding to each first device using the accessed information in each first device, and (2) service information; and

displaying the user interface on said device capable of displaying a user interface.

11. The method of claim 10, wherein:

the step of accessing service information includes the steps of using each reference associated with services provided by the second network to access corresponding service information based on the RIC in the user interface description; and

the step of generating the user interface further includes generating the user interface including service information based on said RIC.

12. The method of claim 1, wherein the step of generating a user interface description further comprises the steps of: associating a hyper-link with the device information of one or more of said first devices, and associating at least a hyper-text link with the service information provided by the second network.

13. The method of claim 1, wherein: (1) the device information in each first device in the first network includes a user interface description for user interaction with that device, and (2) the service information in the second network includes a plurality of user interface descriptions for user interaction with a plurality of services based on RICs.

14. The method of claim 1, wherein each reference associated with services provided by the second network comprises at least one hyper-link to service information in the second network, wherein the service information comprises at least identification information representing services based on RICs.

15. The method of claim 14, wherein the identification information comprises at least a logo information files including links to a logo graphics representing the services.

16. The method of claim 1, wherein the second network includes at least a first portal for providing services, and a reference in the user interface

description associated with services provided by the second network comprises at least one hyper-link to said first portal, wherein the first portal includes service information comprising at least identification information representing said services provided by the first portal.

17. The method of claim 16, wherein said identification information in the first portal further comprises at least hyper-link to service information provided by a second portal in the second network.

18. The method of claim 17, wherein said identification information in the first portal further comprises at a least hyper-link to service information provided by at least a second portal in the second network based on RIC.

19. The method of claim 17, wherein:

the second network comprises a plurality of interconnected computer systems programmed to provide services;

the first portal comprises one or more of said computer systems providing services of the first portal; and

the second portal comprises one or more of said computer systems providing services of the second portal.

20. The method of claim 1, wherein the second network includes at least a first portal and at least a destination service provider for providing services, the method further comprising the steps of:

at least a first device requesting service from the second network by sending a request including an RIC to the first portal using a reference in the user interface description,

the first portal determining a destination service provider based on the received RIC, and

the first portal redirecting the request to the destination service provider.

21. The method of claim 20, wherein the destination service provider

in the second network is internal to the first portal.

22. The method of claim 20, wherein the destination service provider in the second network is external to the first portal.

23. The method of claim 20, wherein a reference associated with services provided by the second network comprises at least one hyper-link to said first portal, wherein the first portal includes service information comprising at least redirection information based on RICs to services provided by other service providers in the second network.

24. The method of claim 20, wherein the first portal further includes a list of RICs and corresponding destination service provider portal addresses, such that the steps of determining a destination service provider further includes the steps of looking up in said list a destination service provider portal address corresponding to a received RIC, and redirecting the request to said destination service provider portal address.

25. The method of claim 24, wherein each destination service provider address comprises a URL.

26. The method of claim 1, further comprising the steps of obtaining an RIC for at least one first device from a user.

27. The method of claim 1, further comprising the steps of automatically obtaining an RIC for at least one first device within the first network.

28. The method of claim 1, wherein for at least one first device the corresponding RIC comprises an identifier representing the geographical region of the first device.

29. A network system for performing services, comprising:

a first network of first devices interconnected via a communication medium;

an interface device connecting the first network to an external network providing services,

a user interface description generation agent in at least one of said first devices configured for:

(a) obtaining information from one or more of said first devices currently connected to the local network, said information including device information; and

(b) generating a user interface description including:

(1) at least one reference associated with the device information of each of said one or more first devices,

(2) at least a redirection identification code (RIC) corresponding to that first device, and

(3) at least one reference associated with the services provided by the external network.

30. The network system of claim 29, wherein the first network comprises a 1394 network, and the external network comprises a non-1394 network.

31. The network system of claim 29, wherein the interface device comprises a gateway device.

32. The network system of claim 29, wherein the external network comprises a plurality of interconnected second devices providing one or more services.

33. The network system of claim 32, wherein each of said second devices comprises at least one computer system programmed to provide services.

34. The network system of claim 32, wherein:

the second network comprises the Internet, and

at least one of said second devices providing services comprises one or more web servers providing services.

35. The network system of claim 34, wherein a service provided by at least one of the devices connected to the second network comprises a web site service.

36. The network system of claim 39, wherein each reference in the user interface description associated to services provided by the external network comprises at least one hyper-link to service information in the external network.

37. The network system of claim 29, wherein:

at least one of the first devices in the first network includes a user interface device capable of displaying a user interface, the user interface device including a user interface generation agent configured for: displaying a user interface based on said user interface description, for user control of said first devices and communication with the external network.

38. The network system of claim 37, wherein the user interface generation agent in the user interface device is further configured for:

using each reference in the corresponding user interface description to access the associated information in each first device;

using each reference associated with services provided by the external network to access corresponding service information;

generating the user interface including: (1) information corresponding to each first device using the accessed information in each first device, and (2) service information; and

displaying the user interface on said user interface device.

39. The network system of claim 38, wherein each reference associated with services provided by the external network comprises at least one hyper link to service information in the external network, wherein the service information comprises at least identification information representing a service.

40. The network system of claim 39, wherein the identification information comprises a logo information file including a link to a logo graphic representing the service.

41. The network system of claim 38 wherein the external network includes at least a first portal for providing services, and a reference in the user interface description associated with services provided by the external network comprises at least one hyper-link to said first portal, wherein the first portal includes service information comprising at least identification information representing said services provided by the first portal.

42. The network system of claim 41, wherein said identification information in the first portal further comprises at least a hyper-link to service information provided by at least a second portal in the external network based on RIC.

43. The network system of claim 42, wherein:

the external network comprises a plurality of interconnected computer systems programmed to provide services;

the first portal comprises one or more of said computer systems providing services of the first portal; and

the second portal comprises one or more of said computer systems providing services of the second portal.

44. The network system of claim 29, wherein:

the external network includes at least a first portal and at least a destination service provider for providing services;

the first portal configured such that, in response to a service request from at least one first device based on a reference in the user interface description of that first device in the first network, the service request including an RIC of that first device, the first portal determines a destination service provider based on the received RIC, and the first portal redirects the request to the destination service provider.

45. The network system of claim 44, wherein the destination service provider in the external network is internal to the first portal.

46. The network system of claim 44, wherein the destination service provider in the external network is external to the first portal.

47. The network system of claim 44, wherein a reference associated with services provided by the external network comprises at least one hyper-link to said first portal, wherein the first portal includes service information comprising at least redirection information based on RICs to services provided by other service providers in the external network.

48. The network system of claim 44, wherein the first portal further includes a list of RICs and corresponding destination service provider portal addresses, and the first portal is configured for determining a destination service provider by looking up in said list a destination service provider portal address corresponding to a received RIC, and redirecting the request to said destination service provider portal address.

49. The network system of claim 48, wherein each destination service provider address comprises a URL.

50. The network system of claim 44, wherein the first portal is

configured for automatically obtaining an RIC code at least one first device within the first network.

51. The network system of claim 29, wherein at least a first device further includes a software agent for obtaining an RIC for that first device from a user.

52. The network system of claim 29, wherein for at least one first device the corresponding RIC comprises an identifier representing the geographical region of the first device.

53. A control device for providing a user device communication and control in a first network of interconnected first devices, the first network connected via an interface device to an external network providing services, the control device comprising:

a user interface description generation agent configured for:

(a) obtaining information from one or more of said first devices currently connected to the first network, said information including device information; and

(b) generating a user interface description including:

(1) at least one reference associated with the device information of each of said one or more first devices,

(2) at least a redirection identification code (RIC) corresponding to that first device, and

(3) at least one reference associated with the services provided by the external network.

54. The control device of claim 53, wherein the first network comprises a 1394 network, and the external network comprises a non-1394 network.

55. The control device of claim 53, wherein the interface device

comprises a gateway device.

56. The control device of claim 53, wherein the external network comprises a plurality of interconnected second devices providing one or more services.

57. The control device of claim 56, wherein each of said second devices comprises at least one computer system programmed to provide services.

58. The control device of claim 56, wherein:

the external network comprises the Internet, and

at least one of said second devices providing services comprises one or more web servers providing services.

59. The control device of claim 58, wherein a service provided by at least one of the devices connected to the external network comprises a web site service.

60. The control device of claim 53, wherein each reference in the user interface description associated to services provided by the external network comprises at least one hyper-link to service information in the external network.

61. The control device of claim 53 further comprising:

a user interface device capable of displaying a user interface; and

a user interface generation agent configured for displaying a user interface based on said user interface description, for user control of said first devices and communication with the external network.

62. The control device of claim 61, wherein the user interface generation agent is further configured for:

using each reference in the corresponding user interface description to access the associated information in each first device;

using each reference associated with services provided by the external network to access corresponding service information;

generating the user interface including: (1) information corresponding to each first device using the accessed information in each first device, and (2) service information; and

displaying the user interface on said user interface device.

63. The control device of claim 62, wherein each reference associated with services provided by the external network comprises at least one hyper-link to service information in the external network, wherein the service information comprises at least identification information representing a service.

64. The control device of claim 63, wherein the identification information comprises a logo information file including a link to a logo graphic representing the service.

65. The control device of claim 62, wherein the external network includes at least a first portal for providing services, and a reference in the user interface description associated with services provided by the external network comprises at least one hyper-link to said first portal, wherein the first portal includes service information comprising at least identification information representing said services provided by the first portal.

66. The control device of claim 65, wherein said identification information in the first portal further comprises at least a hyper-link to service information provided by at least second portal in the external network.

67. The control device of claim 66 wherein said identification information in the first portal further comprises at least a hyper-link to service

information provided by at least a second portal in the external network based on RIC.

68. The control device of claim 66, wherein:

the external network comprises a plurality of interconnected computer systems programmed to provide services;

the first portal comprises one or more of said computer systems providing services of the first portal; and

the second portal comprises one or more of said computer systems providing services of the second portal.

69. The control device of claim 53, wherein the user interface description generation agent further associates a hyper-link with the device information of one or more of said first devices, and associates at least a hyper-link with the service information provided by the external network, in the user interface description.

70. The control device of claim 53, wherein: (1) the device information in each device in the first network includes a user interface description for user interaction with that device, and (2) the service information in the external network includes at least a user interface description for user interaction with a service.

71. The control device of claim 53, wherein:

the external network includes at least a first portal and at least a destination service provider for providing services;

the first portal configured such that, in response to a service request from at least one first device based on a reference in the user interface description of that first device in the first network, the service request including an RIC of that first device, the first portal determines a destination service provider based on the received RIC, and the first portal redirects the request to the destination service provider.

72. The control device of claim 62, wherein the destination service provider in the external network is internal to the first portal.

73. The control device of claim 62, wherein the destination service provider in the external network is external to the first portal.

74. The control device of claim 62, wherein a reference associated with services provided by the external network comprises at least one hyper-link to said first portal, wherein the first portal includes service information comprising at least redirection information based on RICs to services provided by other service providers in the external network.

75. The control device of claim 62, wherein the first portal further includes a list of RICs and corresponding destination service provider portal addresses, and the first portal is configured for determining a destination service provider by looking up in said list a destination service provider portal address corresponding to a received RIC, and redirecting the request to said destination service provider portal address.

76. The control device of claim 66, wherein each destination service provider address comprises a URL.

77. The control device of claim 62, wherein the first portal is configured for automatically obtaining an RIC for at least one first device within the first network.

78. The control device of claim 53, wherein at least a first device further includes a software agent for obtaining an RIC for that first device from a user.

79. The control device of claim 53, wherein for at least one first

device the corresponding RIC comprises an identifier representing the geographical region of the first device.

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FIG. 1

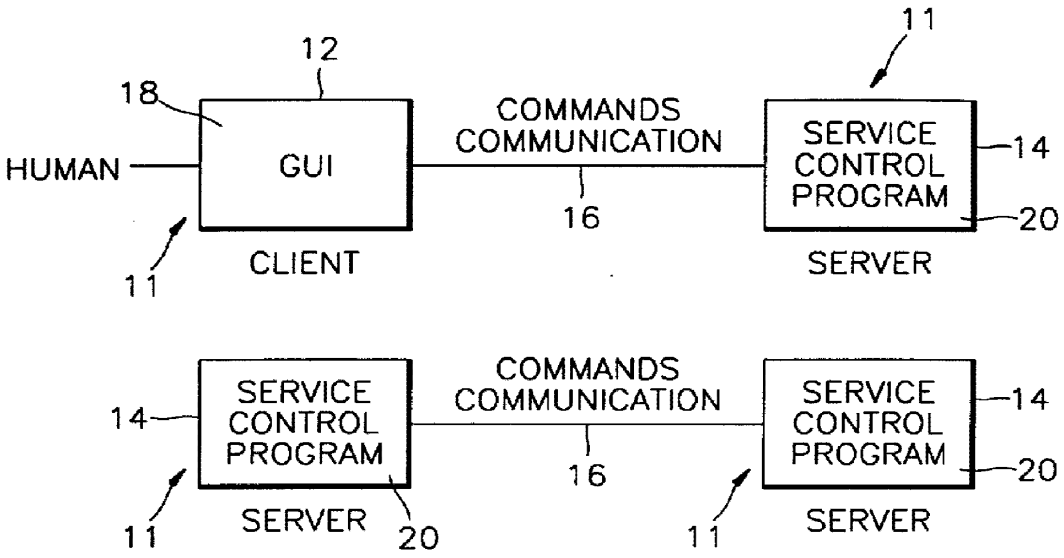

11
12
18
COMMANDS
COMMUNICATION
SERVICE
CONTROL
PROGRAM
14
HUMAN
GUI
16
20
11
CLIENT
SERVER
COMMANDS
COMMUNICATION
14
SERVICE
CONTROL
PROGRAM
SERVICE
CONTROL
PROGRAM
14
16
20
11
SERVER
20
11
SERVER
10

FIG. 2

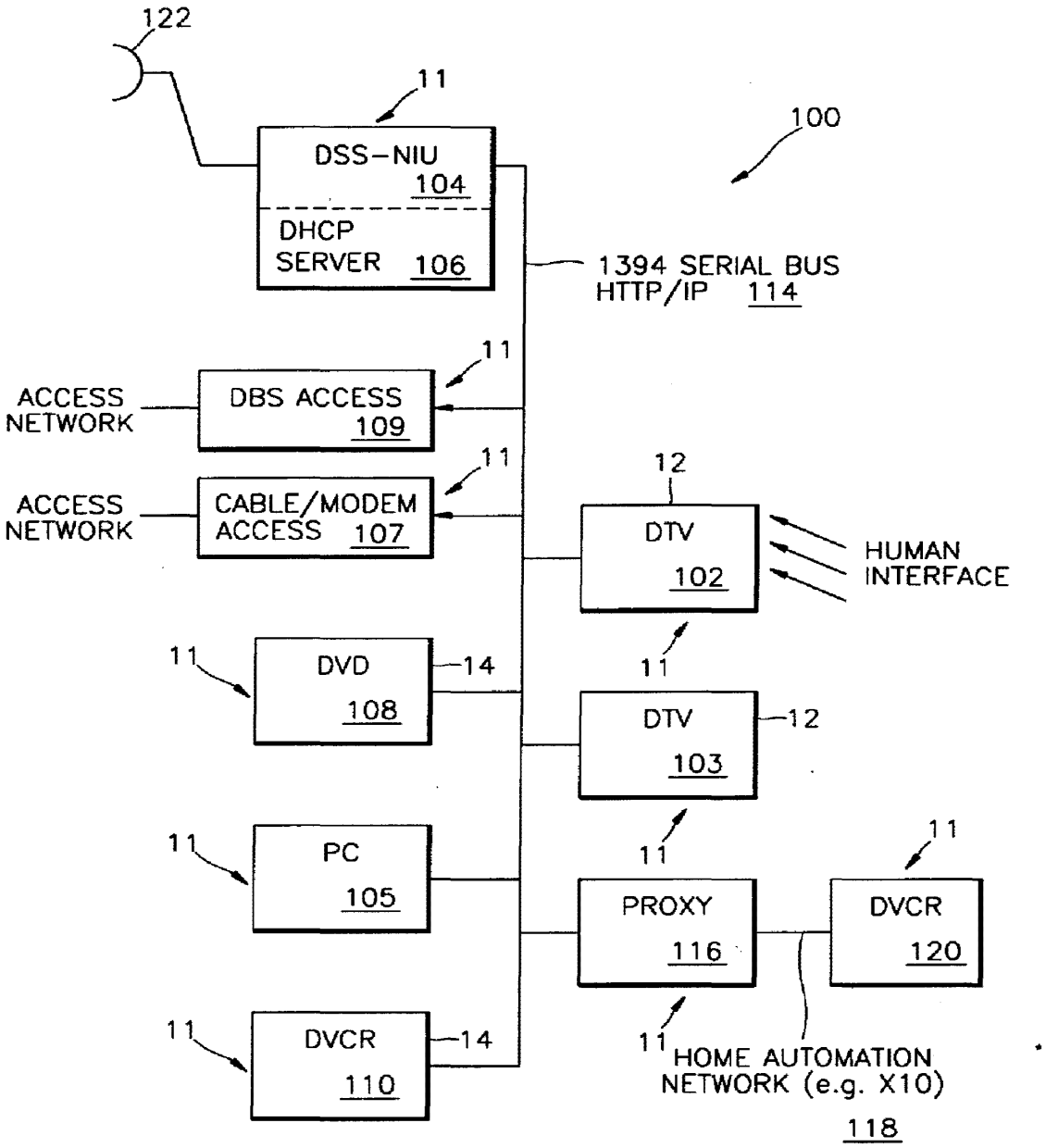

122
11
DSS–NIU
104
DHCP
SERVER 106
100
1394 SERIAL BUS
HTTP/IP 114
11
ACCESS
NETWORK
DBS ACCESS
109
11
ACCESS
NETWORK
CABLE/MODEM
ACCESS 107
12
DTV
102
HUMAN
INTERFACE
11
DVD
108
14
11
DTV
103
12
11
PC
105
11
PROXY
116
11
DVCR
120
11
DVCR
110
14
11
HOME AUTOMATION
NETWORK (e.g. X10)
118

FIG. 3

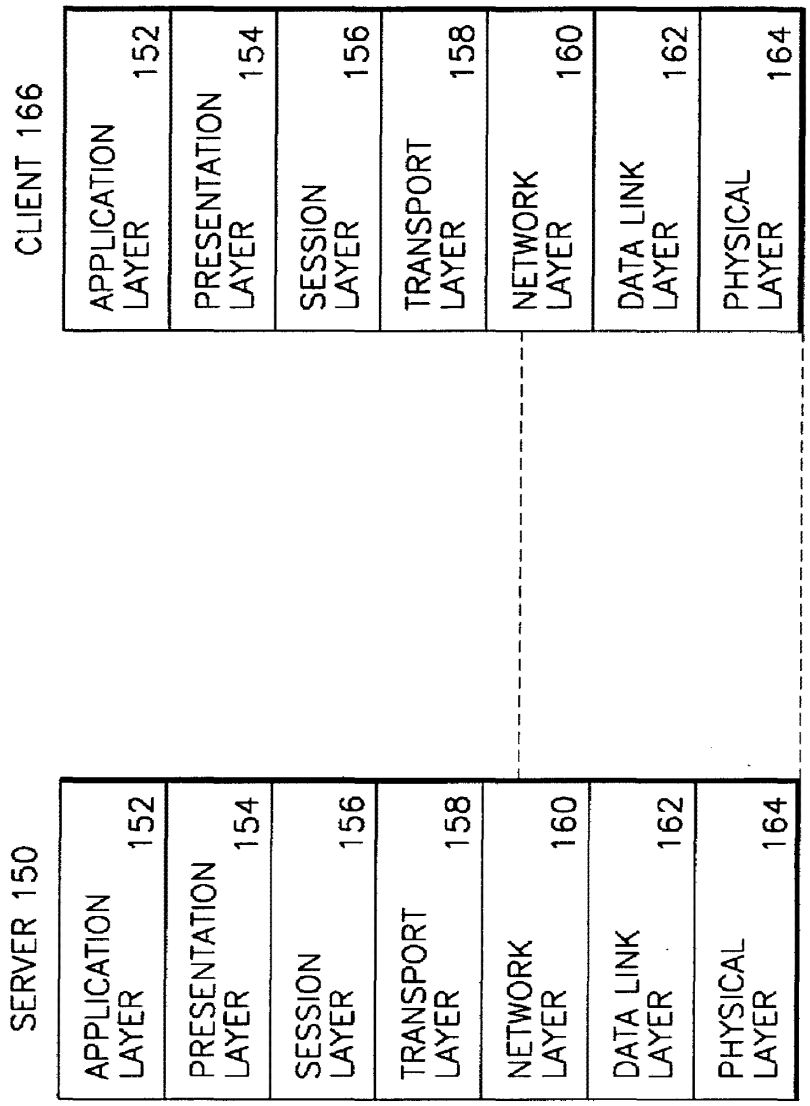

CLIENT 166
APPLICATION LAYER 152
PRESENTATION LAYER 154
SESSION LAYER 156
TRANSPORT LAYER 158
NETWORK LAYER 160
DATA LINK LAYER 162
PHYSICAL LAYER 164
SERVER 150
APPLICATION LAYER 152
PRESENTATION LAYER 154
SESSION LAYER 156
TRANSPORT LAYER 158
NETWORK LAYER 160
DATA LINK LAYER 162
PHYSICAL LAYER 164

FIG. 4A

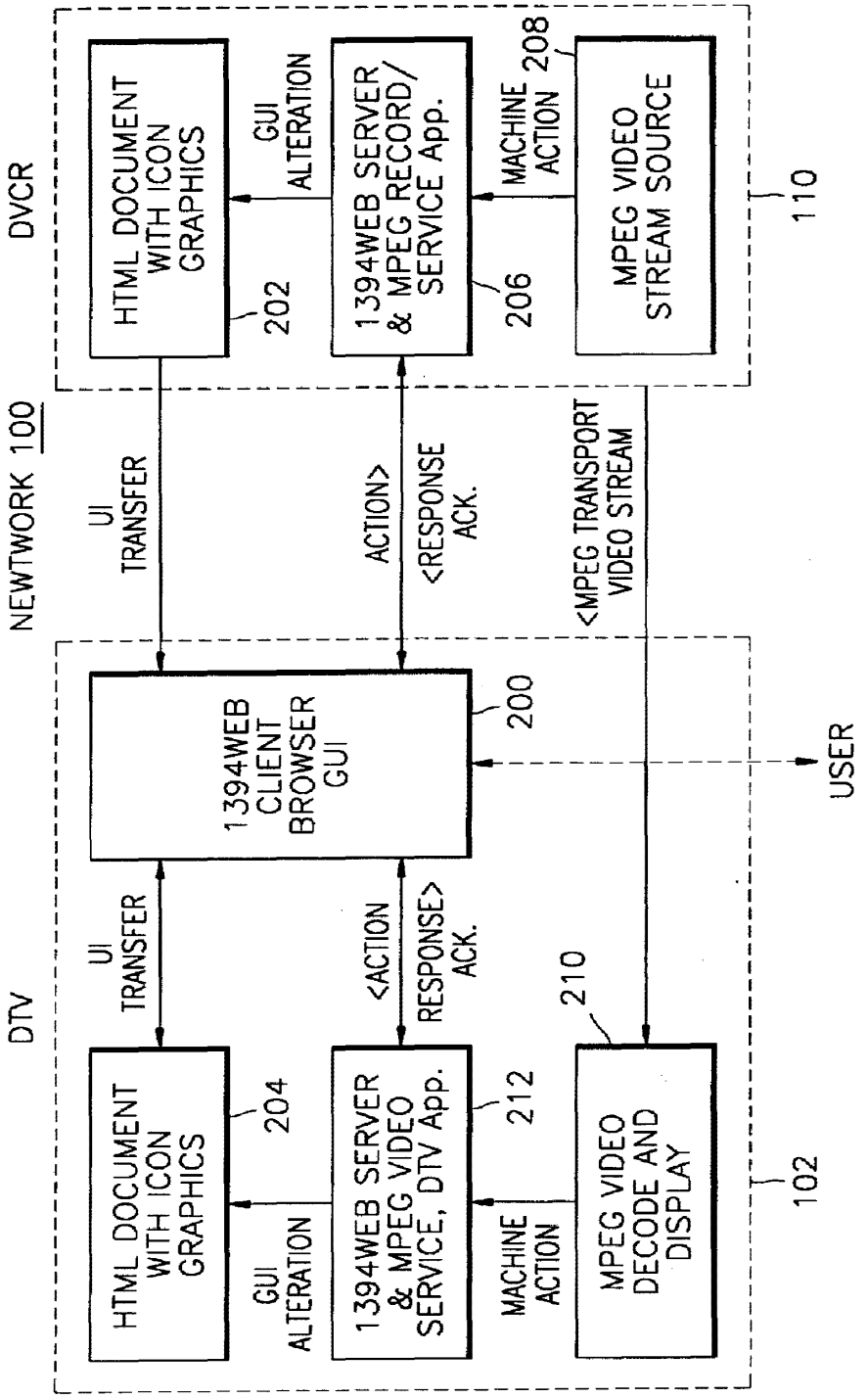

NEWTWORK 100
DVCR
HTML DOCUMENT WITH ICON GRAPHICS
202
GUI ALTERATION
1394WEB SERVER & MPEG RECORD/ SERVICE App.
206
MACHINE ACTION
208
MPEG VIDEO STREAM SOURCE
110
UI TRANSFER
ACTION>
<RESPONSE ACK.
<MPEG TRANSPORT VIDEO STREAM
1394WEB CLIENT BROWSER GUI
200
USER
DTV
UI TRANSFER
<ACTION
RESPONSE> ACK.
210
HTML DOCUMENT WITH ICON GRAPHICS
204
GUI ALTERATION
1394WEB SERVER & MPEG VIDEO SERVICE, DTV App.
212
MACHINE ACTION
MPEG VIDEO DECODE AND DISPLAY
102

FIG. 4B

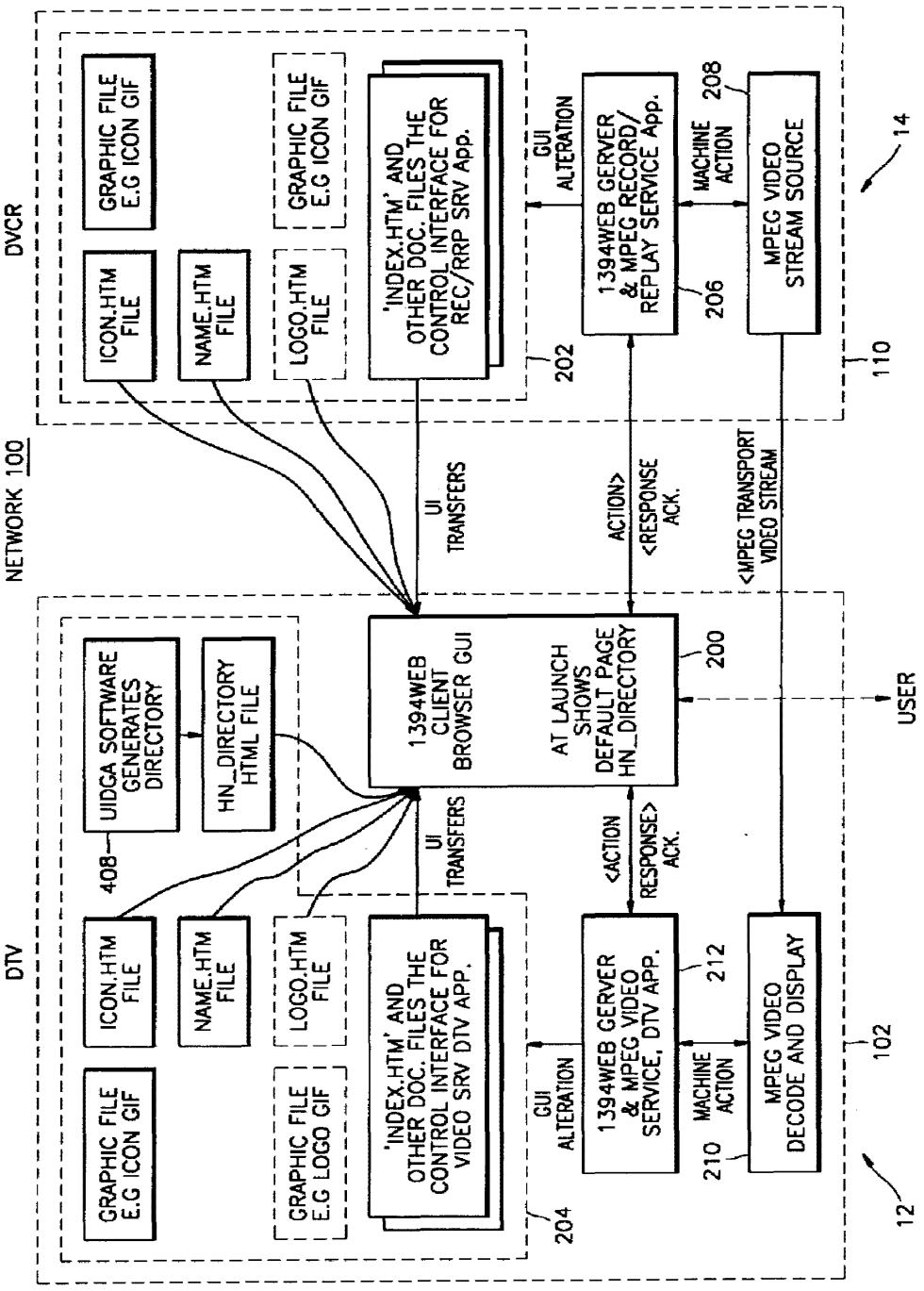

NETWORK 100
DVCR
DTV
GRAPHIC FILE E.G ICON GIF
ICON.HTM FILE
NAME.HTM FILE
LOGO.HTM FILE
GRAPHIC FILE E.G ICON GIF
'INDEX.HTM' AND OTHER DOC. FILES THE CONTROL INTERFACE FOR REC/RRP SRV App.
202
GUI ALTERATION
1394WEB GERVER & MPEG RECORD/ REPLAY SERVICE App.
206
MACHINE ACTION
208
MPEG VIDEO STREAM SOURCE
14
110
UI TRANSFERS
ACTION>
<RESPONSE ACK.
<MPEG TRANSPORT VIDEO STREAM
UIDGA SOFTWARE GENERATES DIRECTORY
HN_DIRECTORY HTML FILE
408
1394WEB CLIENT BROWSER GUI
AT LAUNCH SHOWS DEFAULT PAGE HN_DIRECTORY
200
USER
UI TRANSFERS
<ACTION
RESPONSE> ACK.
GRAPHIC FILE E.G ICON GIF
ICON.HTM FILE
NAME.HTM FILE
LOGO.HTM FILE
GRAPHIC FILE E.G LOGO GIF
'INDEX.HTM' AND OTHER DOC. FILES THE CONTROL INTERFACE FOR VIDEO SRV DTV APP.
204
GUI ALTERATION
1394WEB GERVER & MPEG VIDEO SERVICE, DTV APP.
212
MACHINE ACTION
210
MPEG VIDEO DECODE AND DISPLAY
102
12

FIG. 5

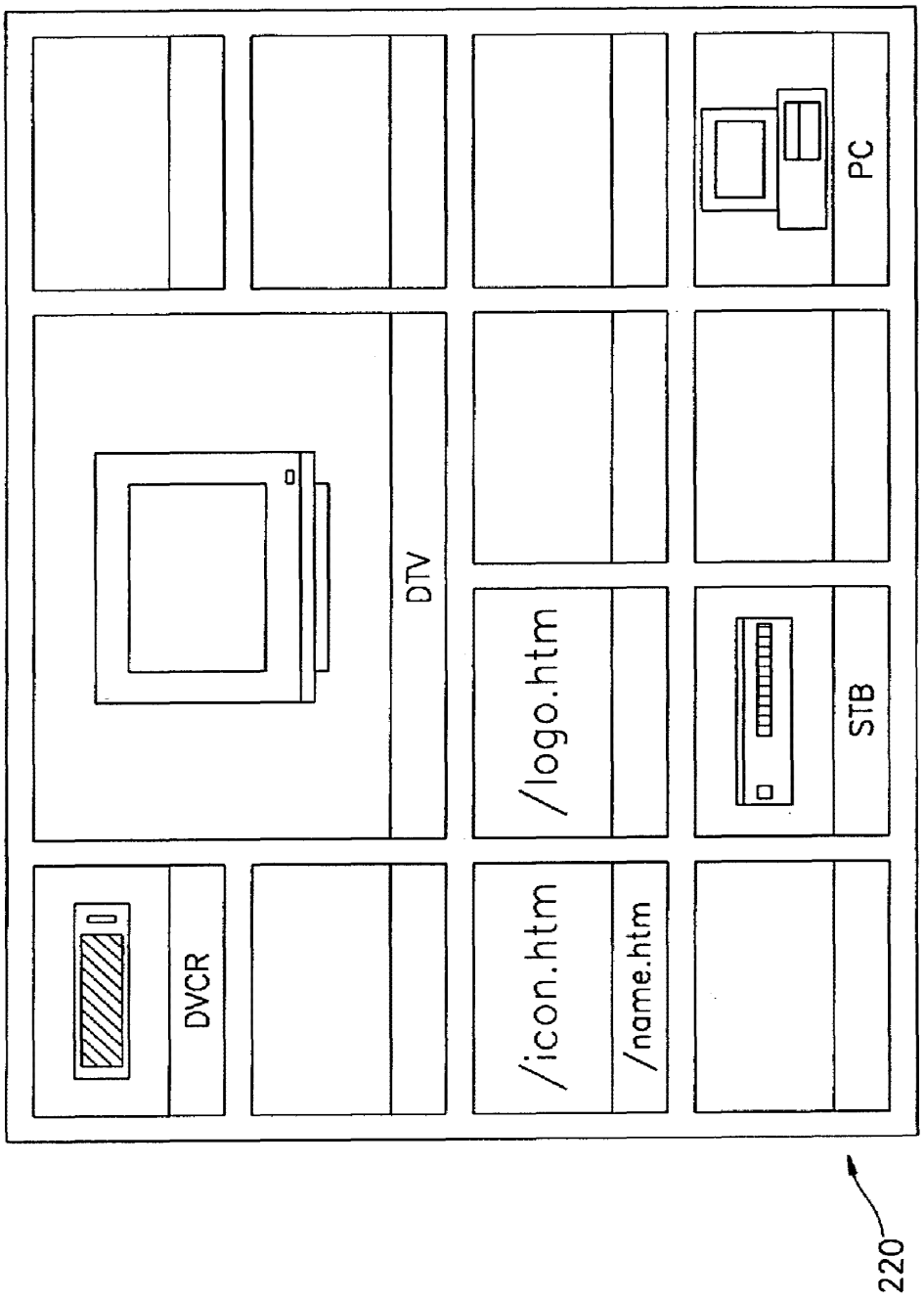
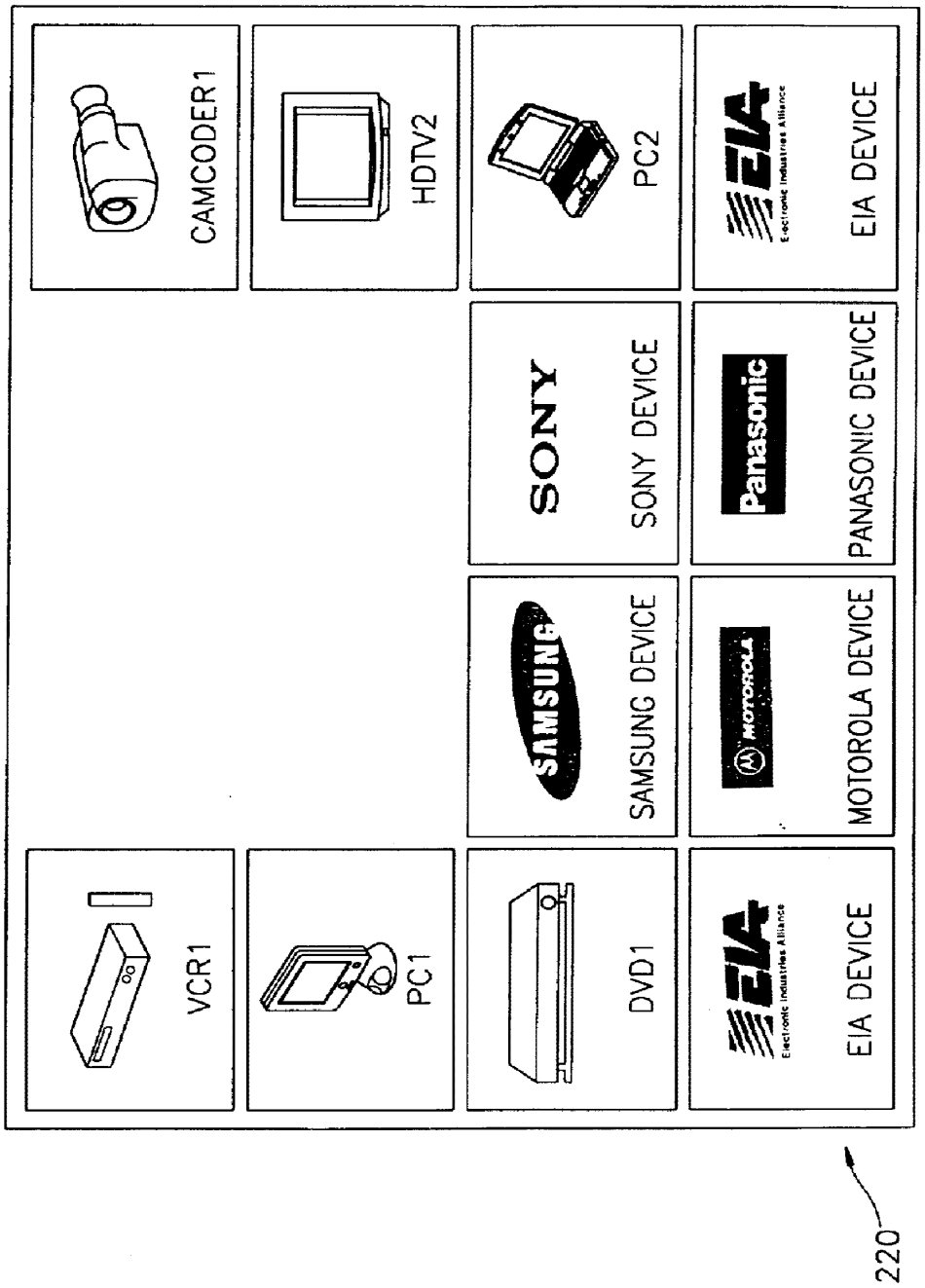

DVCR
DTV
/icon.htm
/name.htm
/logo.htm
STB
PC
EXAMPLE NETWORK TOP-LEVEL DEVICES GUI
220

FIG. 6



ALTERNATIVE EXAMPLE OF NETWORK TOP-LEVEL DEVICES GUI

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FIG. 7

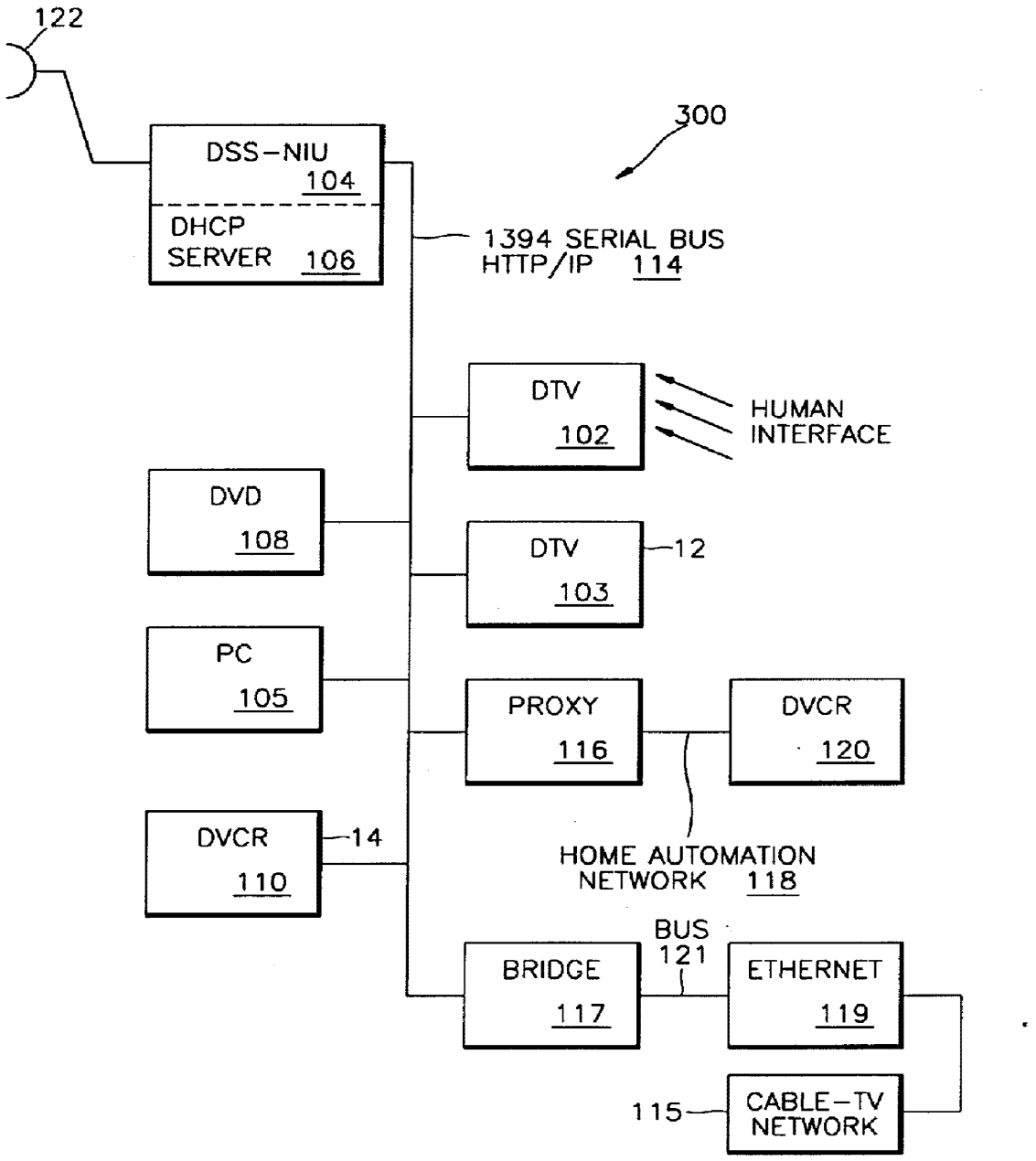
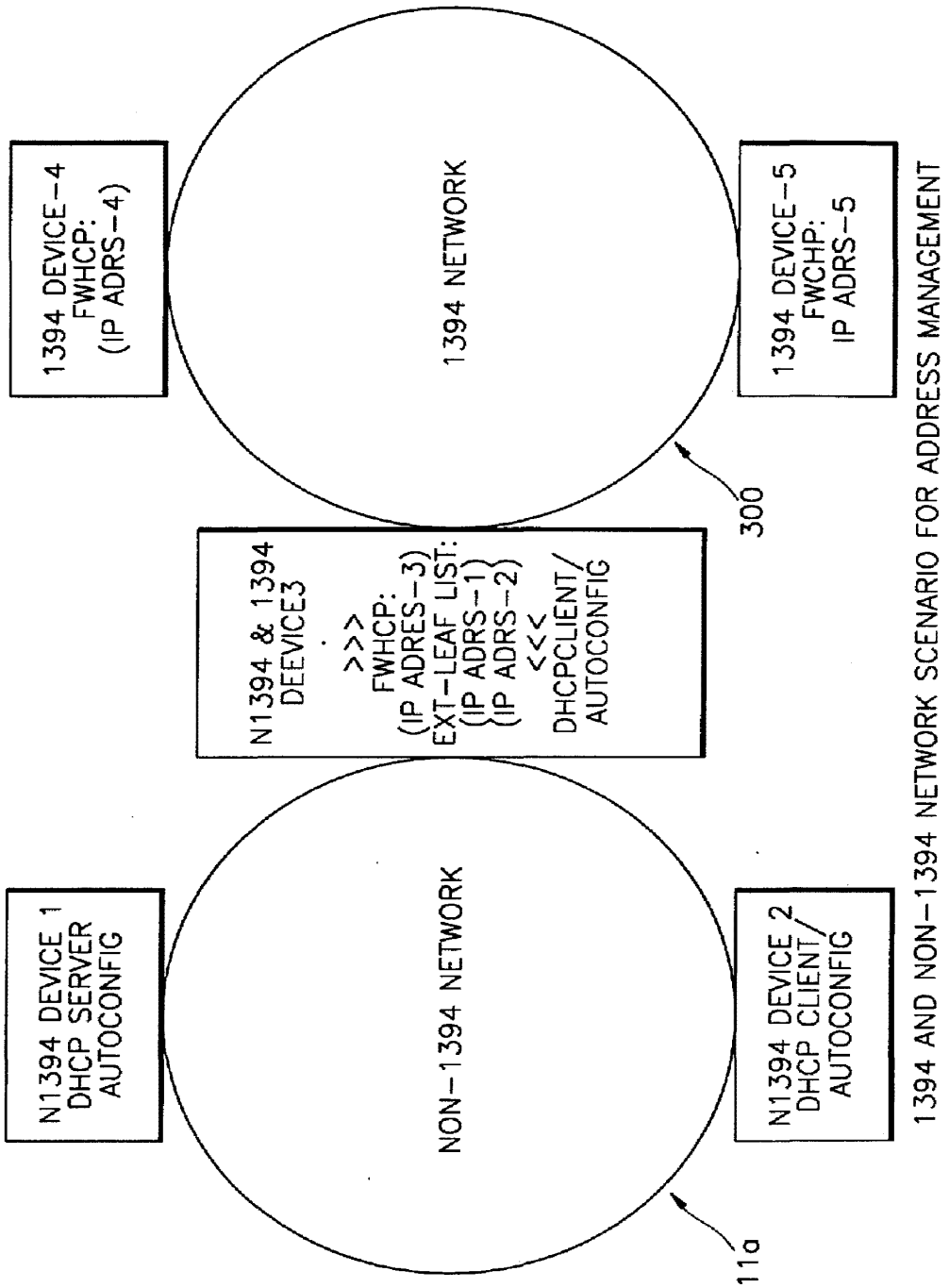

122
300
DSS-NIU
104
DHCP
SERVER 106
1394 SERIAL BUS
HTTP/IP 114
DTV
102
HUMAN
INTERFACE
DVD
108
DTV
103
12
PC
105
PROXY
116
DVCR
120
DVCR
110
14
HOME AUTOMATION
NETWORK 118
BUS
121
BRIDGE
117
ETHERNET
119
115
CABLE-TV
NETWORK

FIG. 8



1394 AND NON-1394 NETWORK SCENARIO FOR ADDRESS MANAGEMENT

FIG. 9A

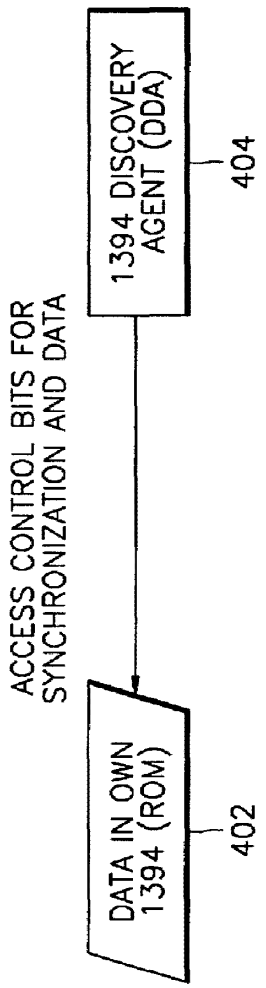

ALL DEVICES
ACCESS CONTROL BITS FOR SYNCHRONIZATION AND DATA
1394 DISCOVERY AGENT (DDA)
404
DATA IN OWN 1394 (ROM)
402

FIG. 9B

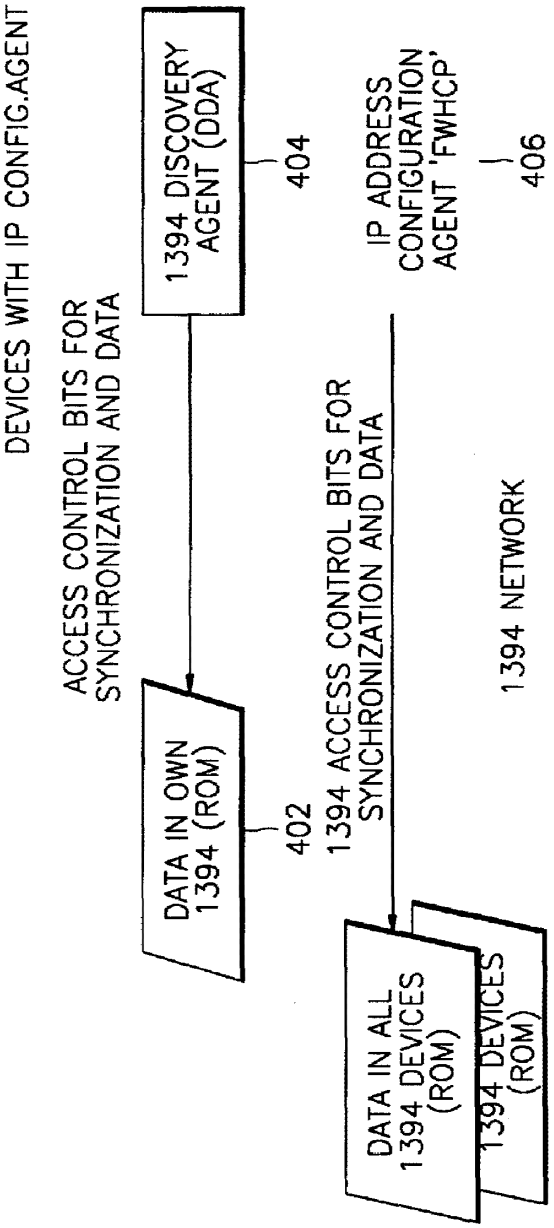
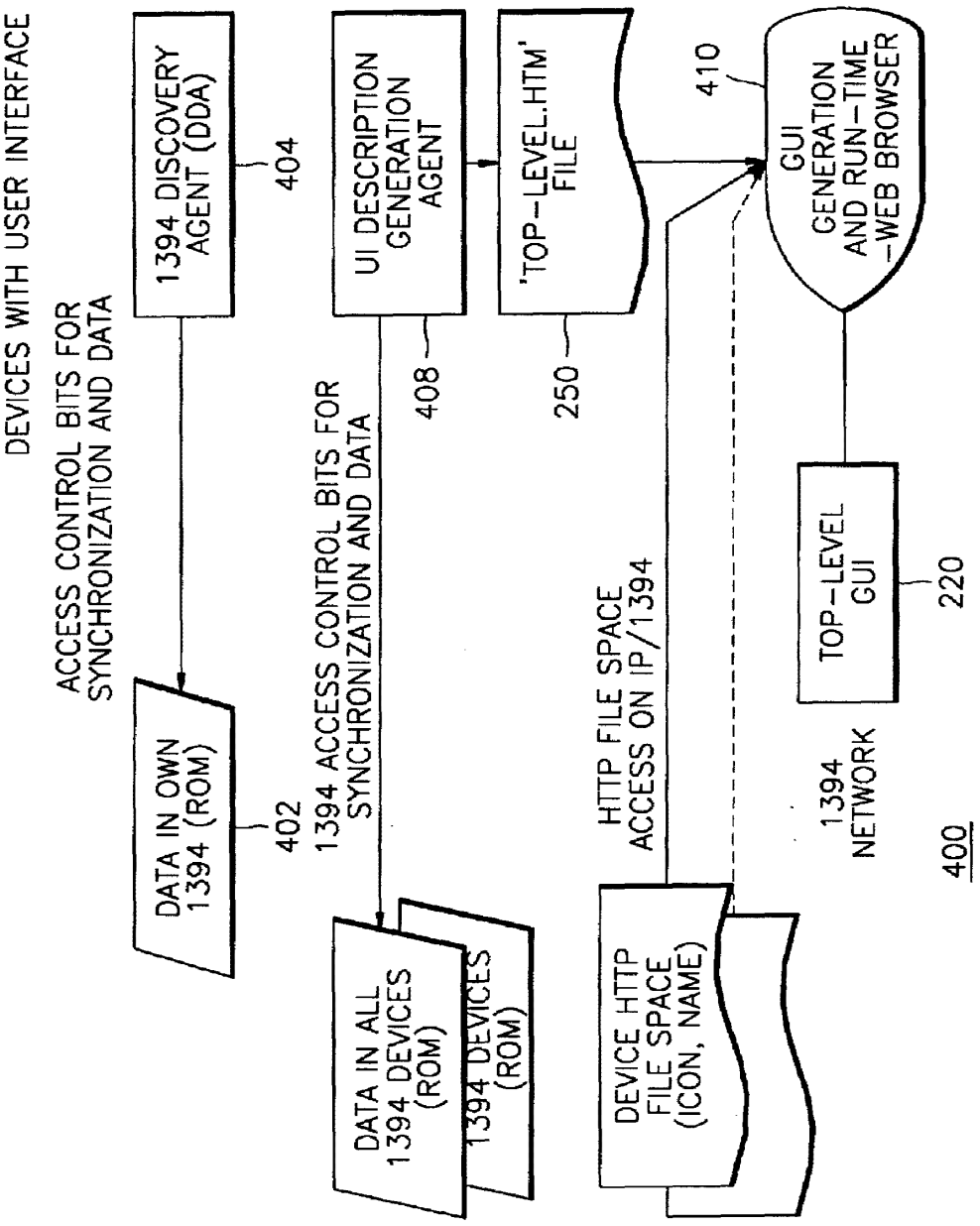

DEVICES WITH IP CONFIG.AGENT
ACCESS CONTROL BITS FOR SYNCHRONIZATION AND DATA
1394 DISCOVERY AGENT (DDA)
404
IP ADDRESS CONFIGURATION AGENT 'FWHCP'
406
DATA IN OWN 1394 (ROM)
402
1394 ACCESS CONTROL BITS FOR SYNCHRONIZATION AND DATA
1394 NETWORK
DATA IN ALL 1394 DEVICES (ROM)
1394 DEVICES (ROM)

FIG. 9C


DEVICES WITH USER INTERFACE
ACCESS CONTROL BITS FOR SYNCHRONIZATION AND DATA
1394 DISCOVERY AGENT (DDA)
404
UI DESCRIPTION GENERATION AGENT
'TOP-LEVEL.HTM' FILE
410
GUI GENERATION AND RUN-TIME -WEB BROWSER
DATA IN OWN 1394 (ROM)
402
1394 ACCESS CONTROL BITS FOR SYNCHRONIZATION AND DATA
408
250
HTTP FILE SPACE ACCESS ON IP/1394
TOP-LEVEL GUI
220
DATA IN ALL 1394 DEVICES (ROM)
1394 DEVICES (ROM)
DEVICE HTTP FILE SPACE (ICON, NAME)
1394 NETWORK
400

12/23

FIG. 10

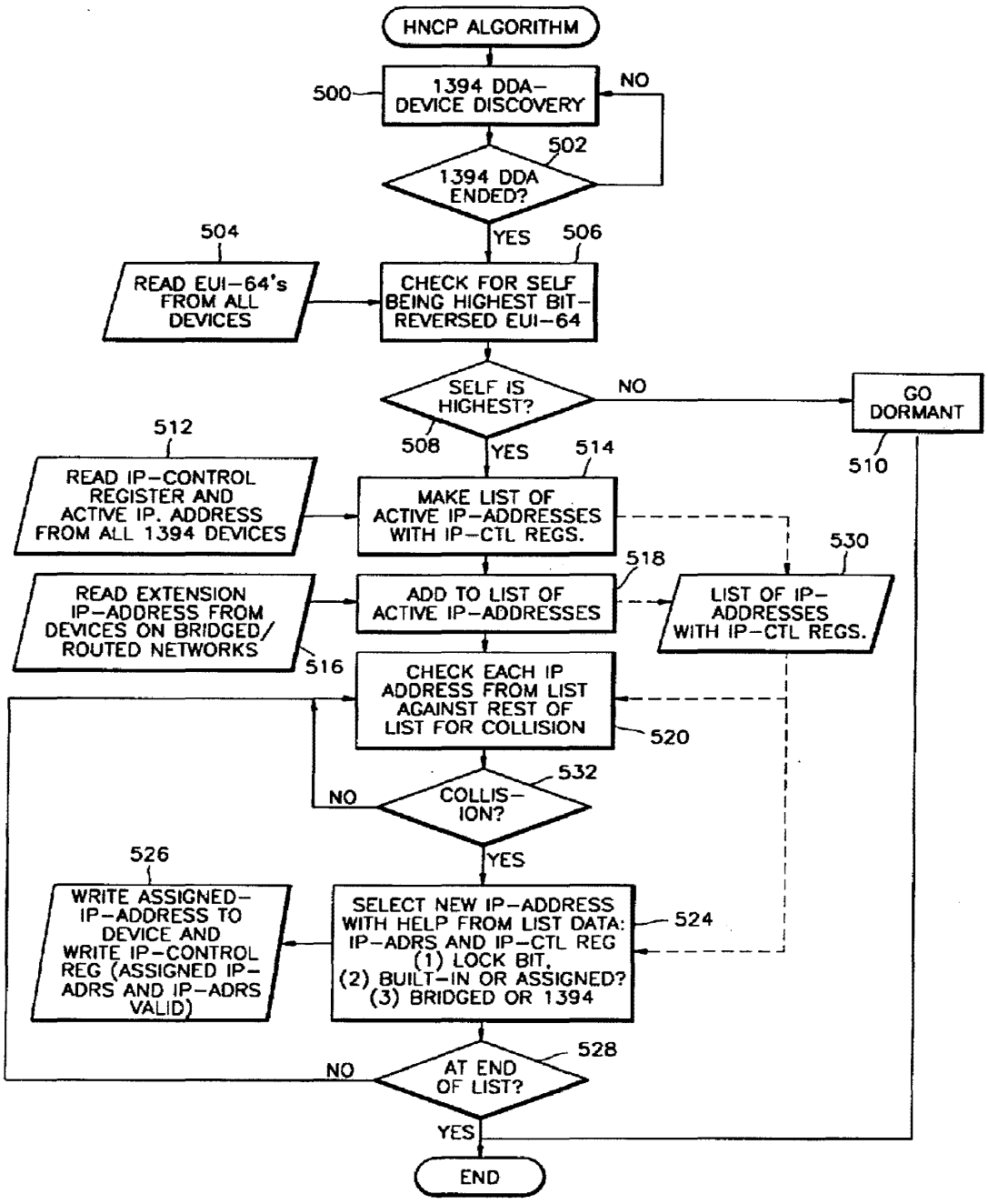
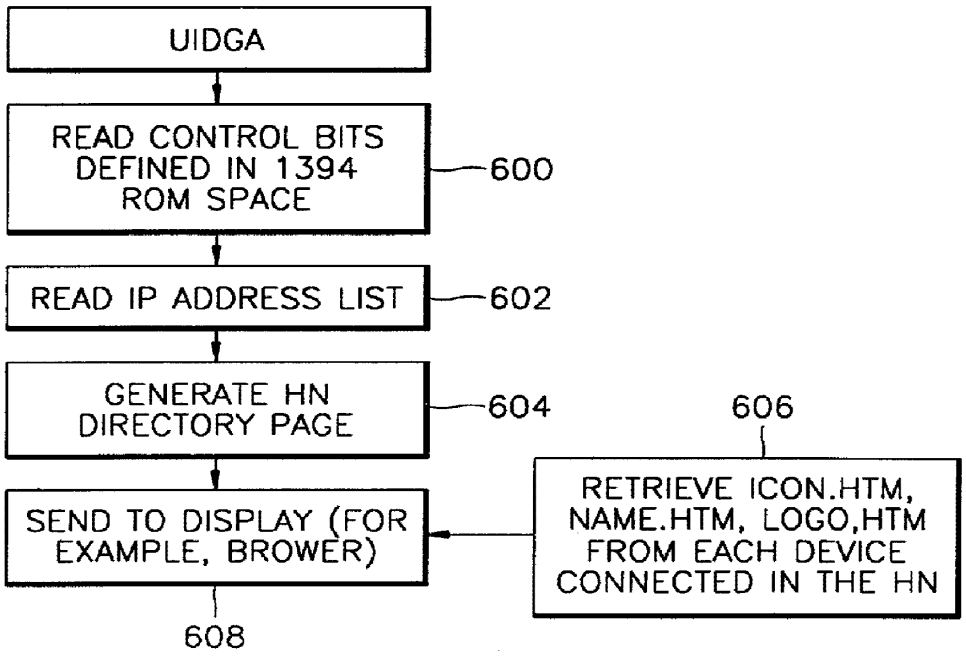

HNCP ALGORITHM
500
1394 DDA–DEVICE DISCOVERY
NO
502
1394 DDA ENDED?
YES
504
READ EUI–64's FROM ALL DEVICES
506
CHECK FOR SELF BEING HIGHEST BIT–REVERSED EUI–64
SELF IS HIGHEST?
NO
GO DORMANT
508
YES
510
512
READ IP–CONTROL REGISTER AND ACTIVE IP. ADDRESS FROM ALL 1394 DEVICES
514
MAKE LIST OF ACTIVE IP–ADDRESSES WITH IP–CTL REGS.
530
518
READ EXTENSION IP–ADDRESS FROM DEVICES ON BRIDGED/ ROUTED NETWORKS
ADD TO LIST OF ACTIVE IP–ADDRESSES
LIST OF IP–ADDRESSES WITH IP–CTL REGS.
516
CHECK EACH IP ADDRESS FROM LIST AGAINST REST OF LIST FOR COLLISION
520
532
NO
COLLIS–ION?
YES
526
WRITE ASSIGNED–IP–ADDRESS TO DEVICE AND WRITE IP–CONTROL REG (ASSIGNED IP–ADRS AND IP–ADRS VALID)
SELECT NEW IP–ADDRESS WITH HELP FROM LIST DATA: IP–ADRS AND IP–CTL REG (1) LOCK BIT, (2) BUILT–IN OR ASSIGNED? (3) BRIDGED OR 1394
524
528
NO
AT END OF LIST?
YES
END

FIG. 11


UIDGA
READ CONTROL BITS DEFINED IN 1394 ROM SPACE
600
READ IP ADDRESS LIST
602
GENERATE HN DIRECTORY PAGE
604
606
RETRIEVE ICON.HTM, NAME.HTM, LOGO,HTM FROM EACH DEVICE CONNECTED IN THE HN
SEND TO DISPLAY (FOR EXAMPLE, BROWER)
608

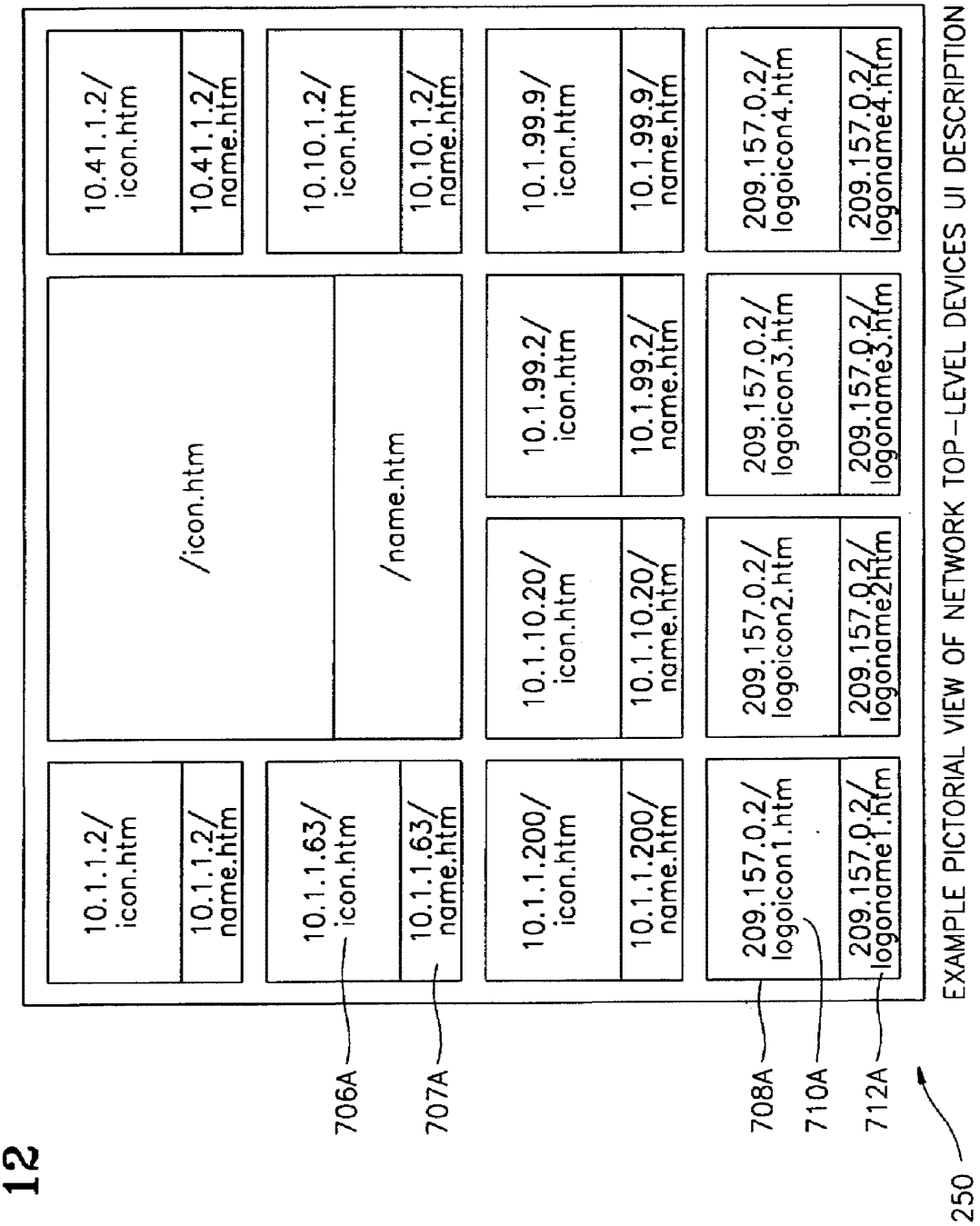

10.1.1.2/ icon.htm
10.1.1.2/ name.htm
10.1.1.63/ icon.htm
10.1.1.63/ name.htm
/icon.htm
/name.htm
10.41.1.2/ icon.htm
10.41.1.2/ name.htm
10.10.1.2/ icon.htm
10.10.1.2/ name.htm
10.1.1.200/ icon.htm
10.1.1.200/ name.htm
10.1.10.20/ icon.htm
10.1.10.20/ name.htm
10.1.99.2/ icon.htm
10.1.99.2/ name.htm
10.1.99.9/ icon.htm
10.1.99.9/ name.htm
209.157.0.2/ logoicon1.htm
209.157.0.2/ logoname1.htm
209.157.0.2/ logoicon2.htm
209.157.0.2/ logoname2htm
209.157.0.2/ logoicon3.htm
209.157.0.2/ logoname3.htm
209.157.0.2/ logoicon4.htm
209.157.0.2/ logoname4.htm
706A
707A
708A
710A
712A
250
EXAMPLE PICTORIAL VIEW OF NETWORK TOP-LEVEL DEVICES UI DESCRIPTION

FIG. 12

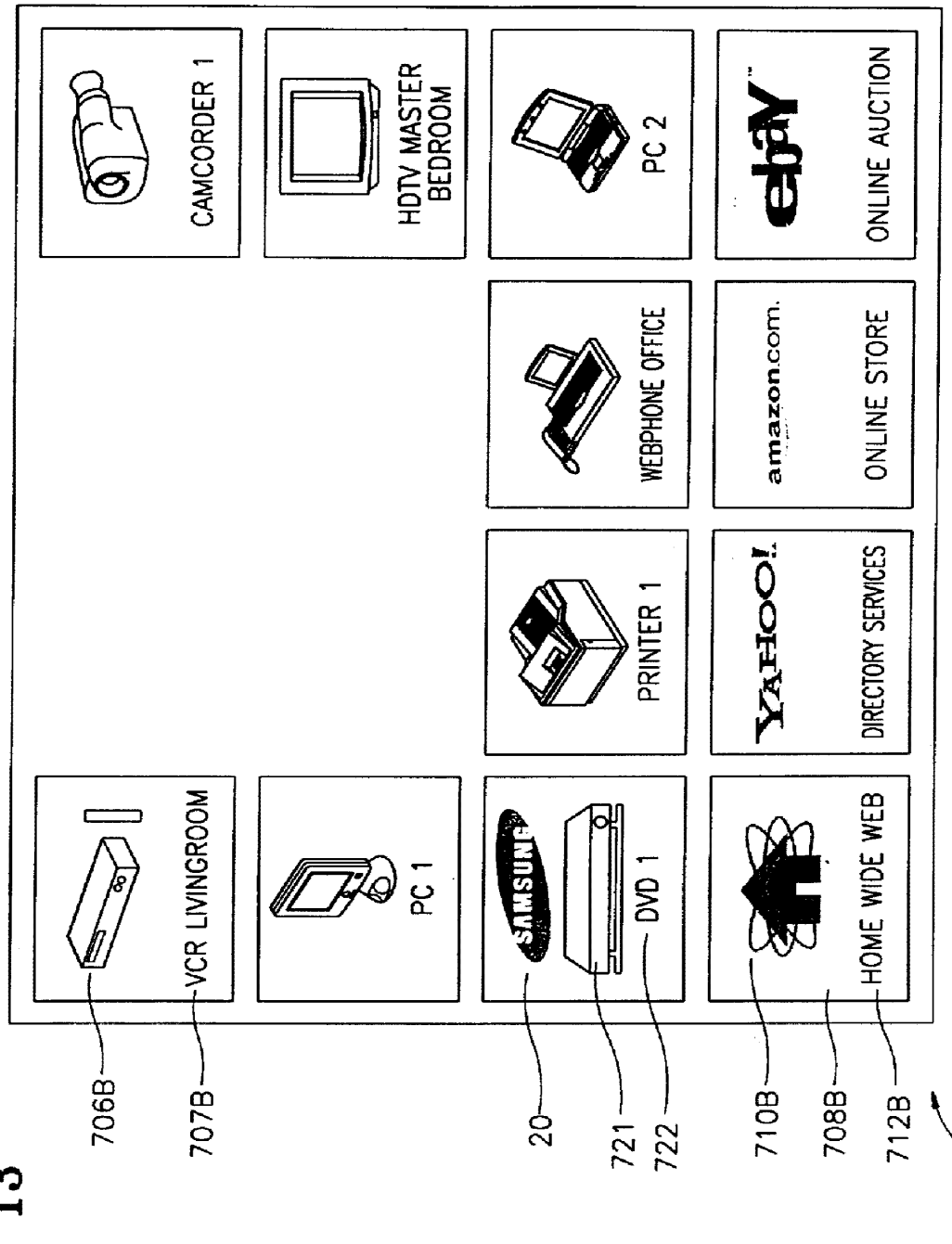
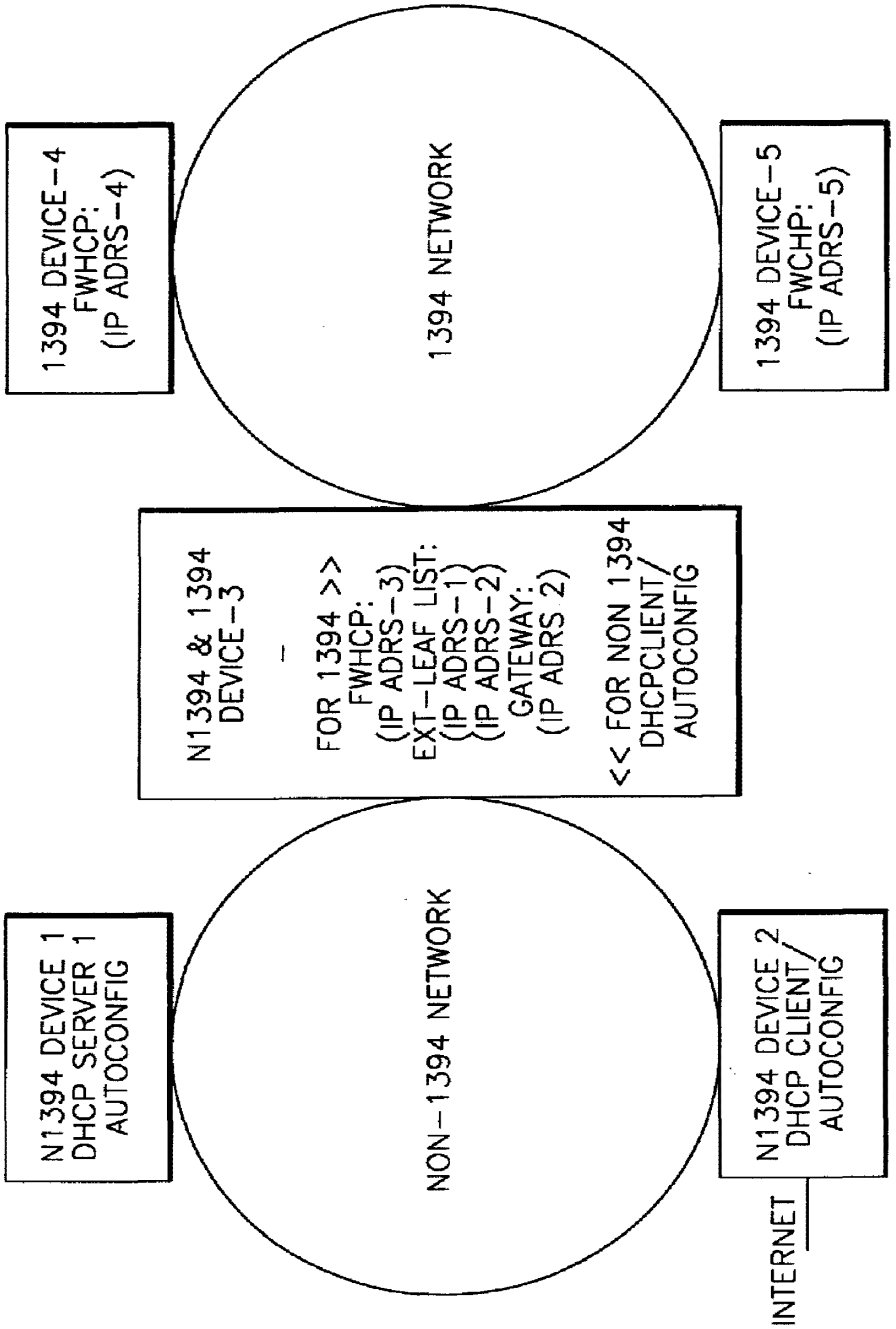

CAMCORDER 1
HDTV MASTER BEDROOM
PC 2
ONLINE AUCTION
WEBPHONE OFFICE
ONLINE STORE
PRINTER 1
DIRECTORY SERVICES
VCR LIVINGROOM
PC 1
DVD 1
HOME WIDE WEB
706B
707B
20
721
722
710B
708B
712B
220
EXAMPLE OF NETWORK TOP-LEVEL DEVICES GUI

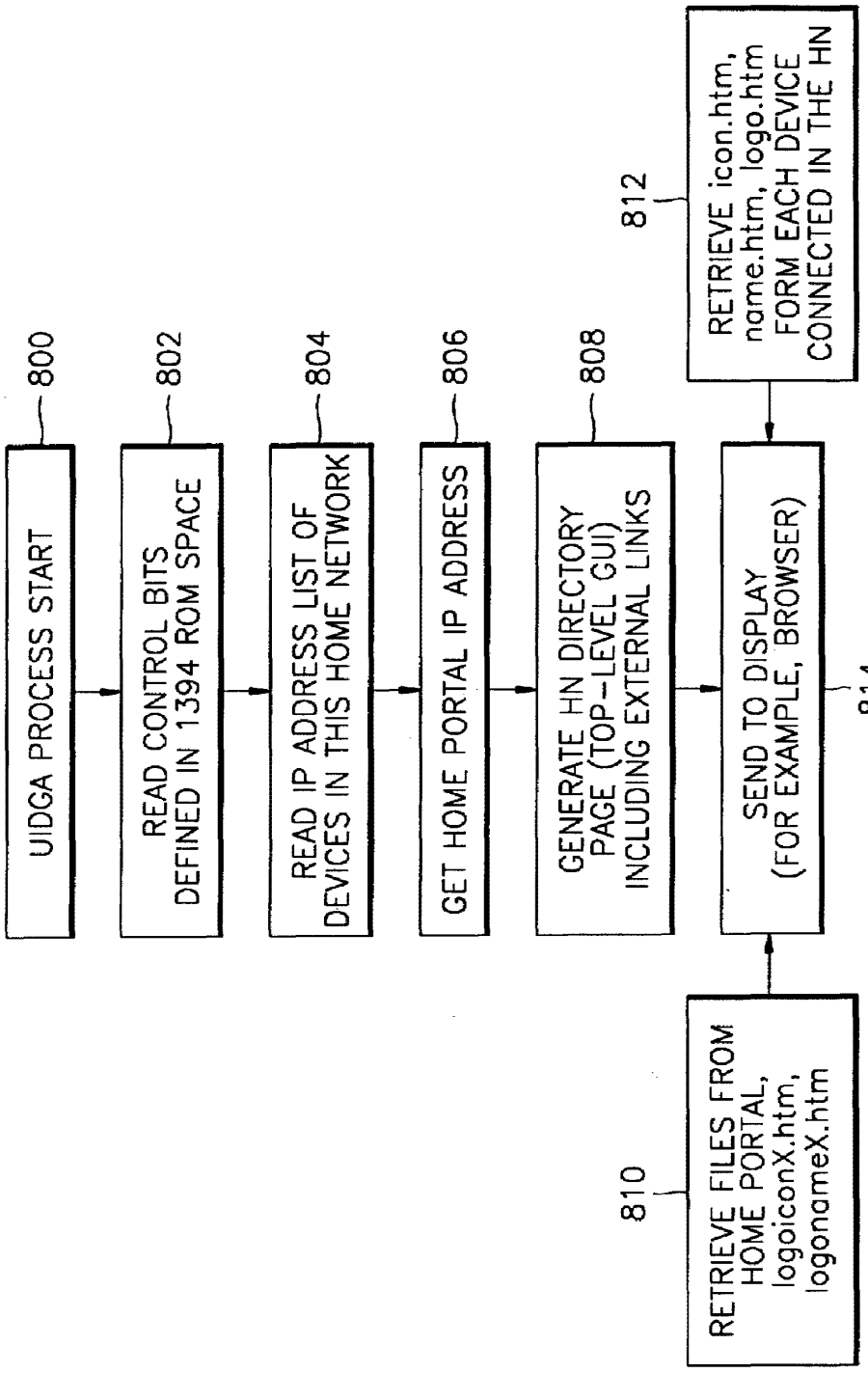
FIG. 13

FIG. 14



1394 AND NON-1394 NETWORK SCENARIO FOR ADDRESS MANAGEMENT

FIG. 15


800
UIDGA PROCESS START
802
READ CONTROL BITS DEFINED IN 1394 ROM SPACE
804
READ IP ADDRESS LIST OF DEVICES IN THIS HOME NETWORK
806
GET HOME PORTAL IP ADDRESS
808
GENERATE HN DIRECTORY PAGE (TOP-LEVEL GUI) INCLUDING EXTERNAL LINKS
810
RETRIEVE FILES FROM HOME PORTAL, logoiconX.htm, logonameX.htm
812
RETRIEVE icon.htm, name.htm, logo.htm FORM EACH DEVICE CONNECTED IN THE HN
814
SEND TO DISPLAY (FOR EXAMPLE, BROWSER)

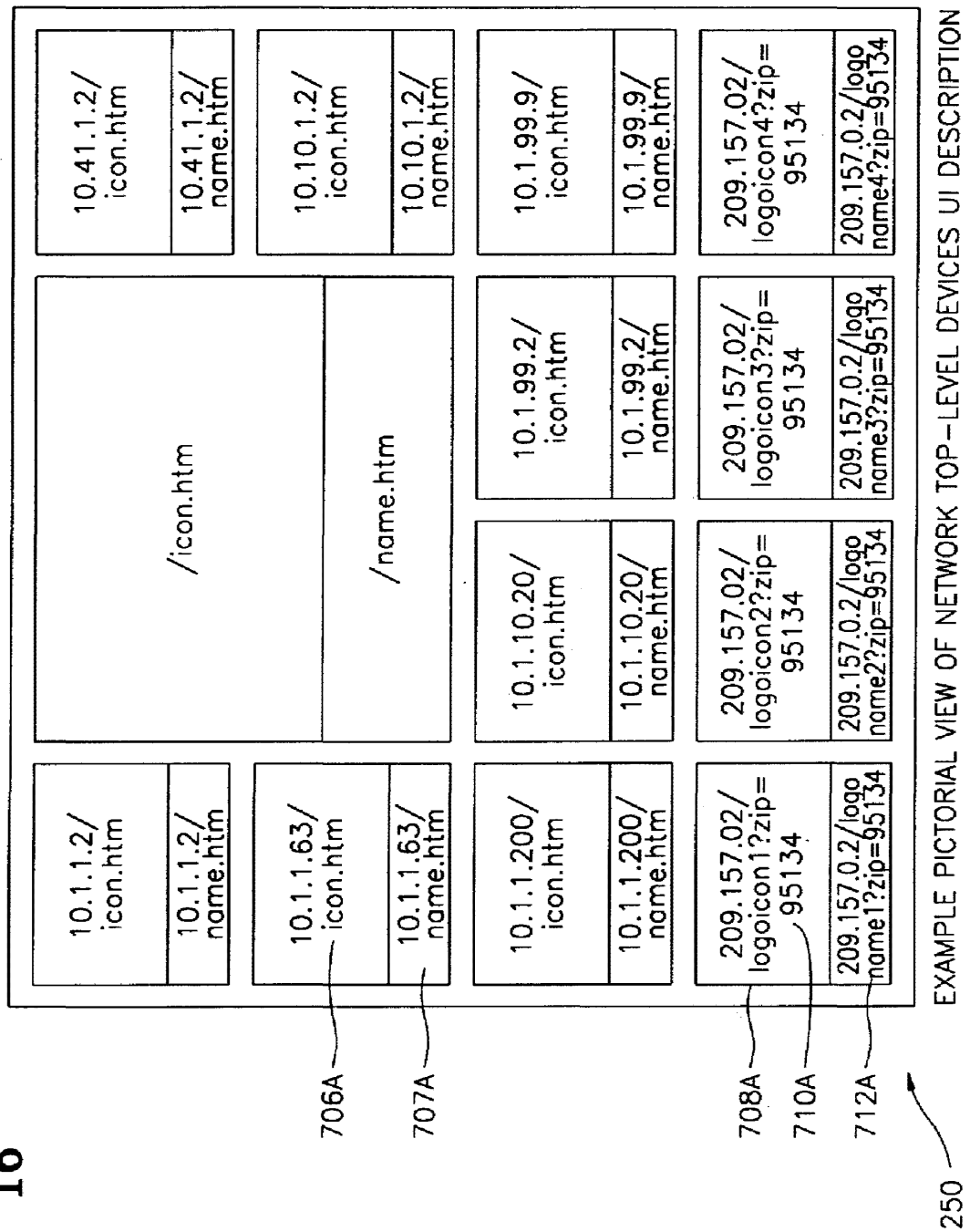

10.1.1.2/ icon.htm
10.1.1.2/ name.htm
10.1.1.63/ icon.htm
10.1.1.63/ name.htm
/icon.htm
/name.htm
10.1.1.200/ icon.htm
10.1.1.200/ name.htm
10.1.10.20/ icon.htm
10.1.10.20/ name.htm
209.157.02/ logoicon1?zip= 95134
209.157.0.2/logo name1?zip=95134
209.157.02/ logoicon2?zip= 95134
209.157.0.2/logo name2?zip=95134
10.1.99.2/ icon.htm
10.1.99.2/ name.htm
209.157.02/ logoicon3?zip= 95134
209.157.0.2/logo name3?zip=95134
10.41.1.2/ icon.htm
10.41.1.2/ name.htm
10.10.1.2/ icon.htm
10.10.1.2/ name.htm
10.1.99.9/ icon.htm
10.1.99.9/ name.htm
209.157.02/ logoicon4?zip= 95134
209.157.0.2/logo name4?zip=95134
706A
707A
708A
710A
712A
250
EXAMPLE PICTORIAL VIEW OF NETWORK TOP-LEVEL DEVICES UI DESCRIPTION

FIG. 16

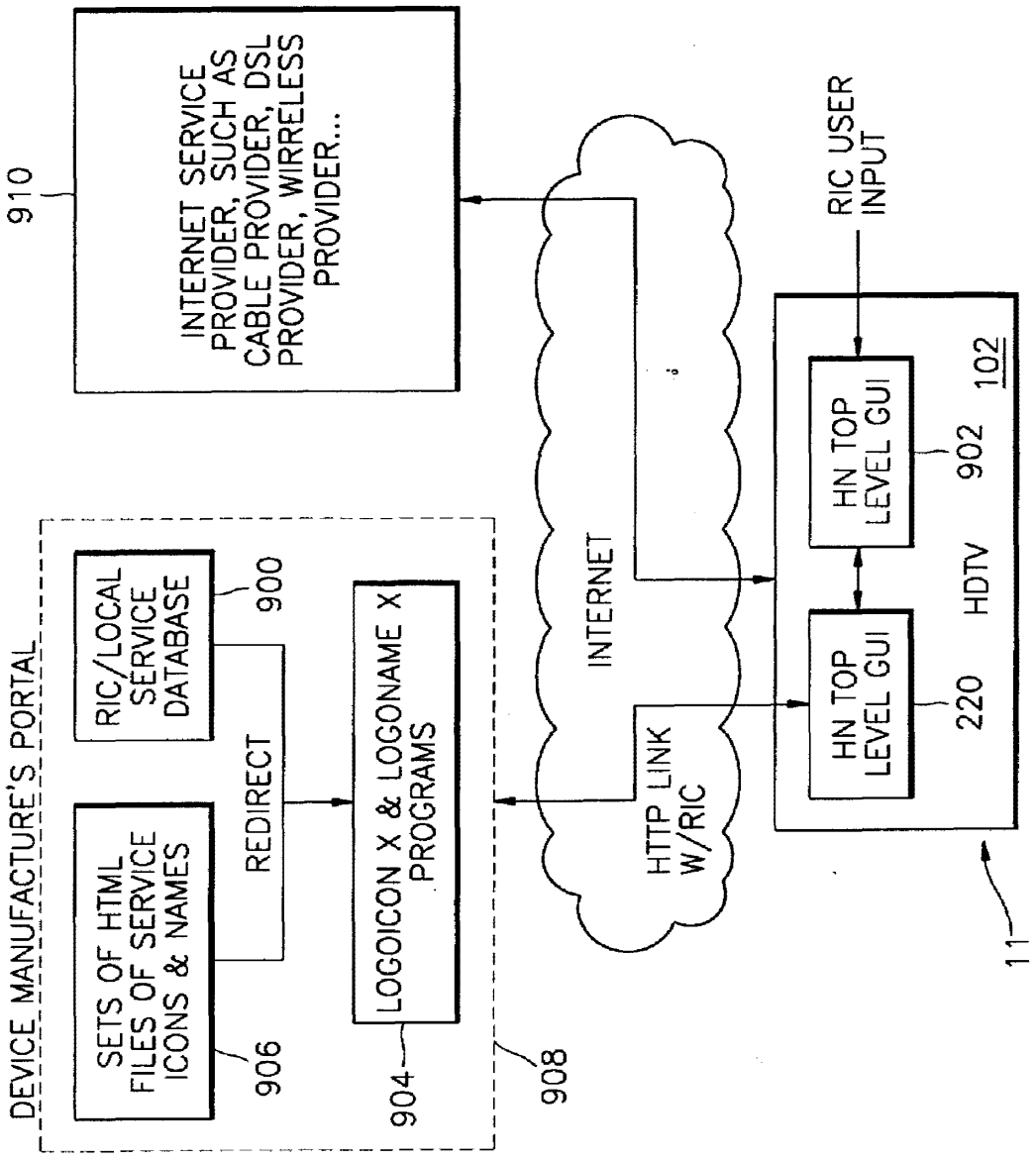

910
INTERNET SERVICE PROVIDER, SUCH AS CABLE PROVIDER, DSL PROVIDER, WIRRELESS PROVIDER...
RIC USER INPUT
INTERNET
HTTP LINK W/RIC
HN TOP LEVEL GUI
902
HN TOP LEVEL GUI
220
HDTV
102
11
DEVICE MANUFACTURE'S PORTAL
RIC/LOCAL SERVICE DATABASE
900
SETS OF HTML FILES OF SERVICE ICONS & NAMES
REDIRECT
LOGOICON X & LOGONAME X PROGRAMS
906
904
908

FIG. 17

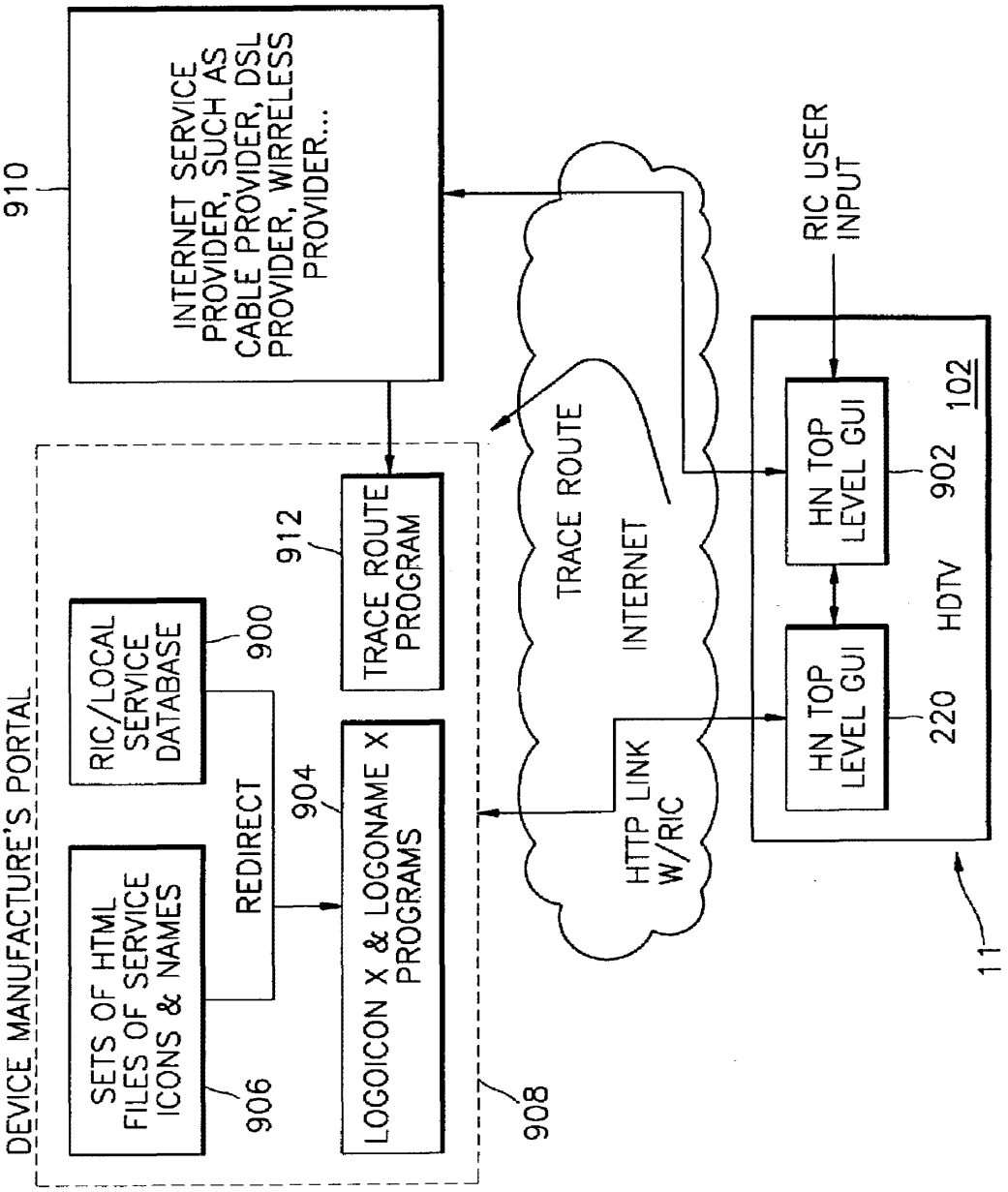

910
INTERNET SERVICE PROVIDER, SUCH AS CABLE PROVIDER, DSL PROVIDER, WIRRELESS PROVIDER...
RIC USER INPUT
TRACE ROUTE
INTERNET
HTTP LINK W/RIC
DEVICE MANUFACTURE'S PORTAL
912
TRACE ROUTE PROGRAM
900
RIC/LOCAL SERVICE DATABASE
904
REDIRECT
906
SETS OF HTML FILES OF SERVICE ICONS & NAMES
LOGOICON X & LOGONAME X PROGRAMS
908
HN TOP LEVEL GUI
902
HN TOP LEVEL GUI
220
HDTV
102
11

FIG. 18

FIG. 19

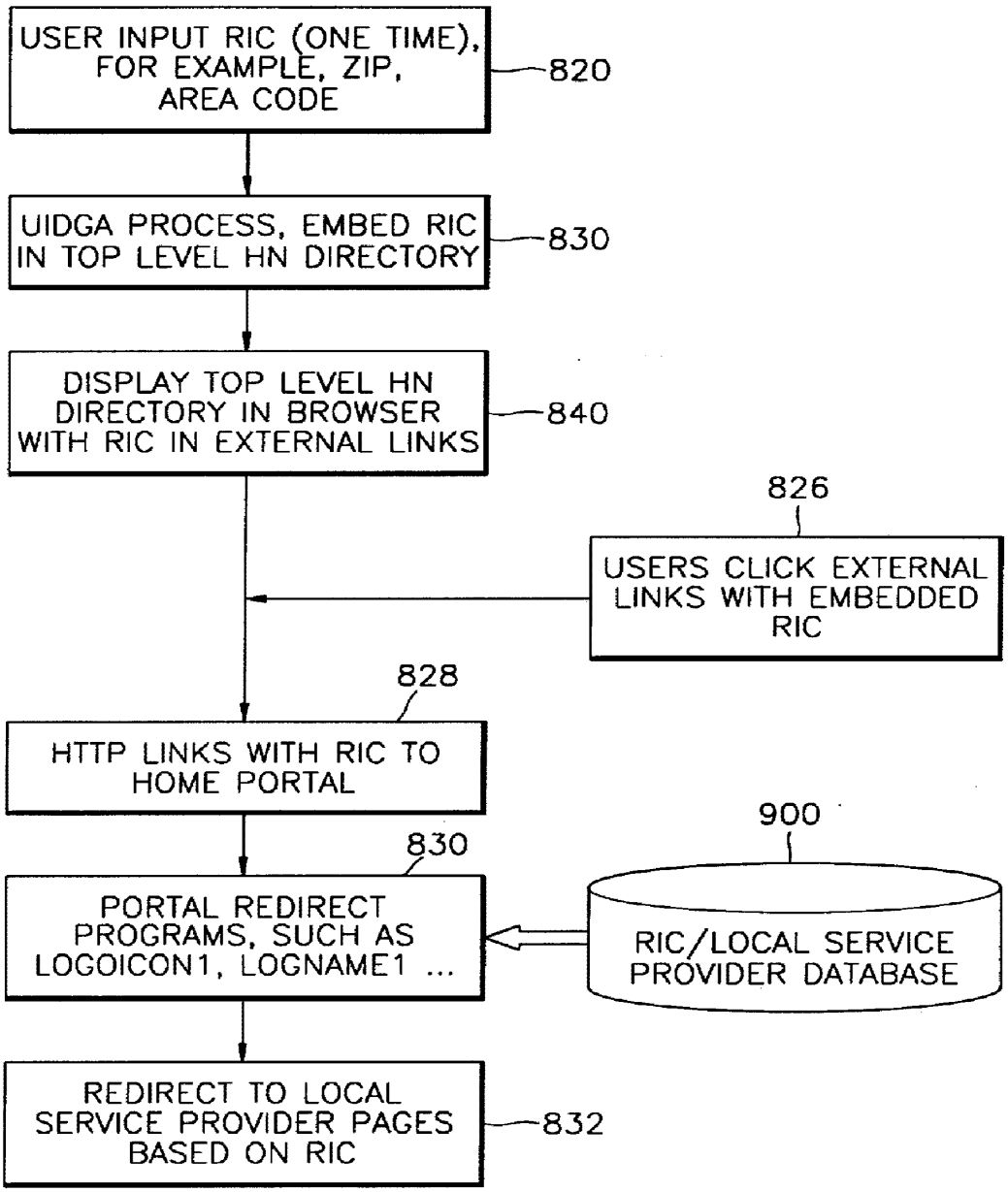

USER INPUT RIC (ONE TIME), FOR EXAMPLE, ZIP, AREA CODE
820
UIDGA PROCESS, EMBED RIC IN TOP LEVEL HN DIRECTORY
830
DISPLAY TOP LEVEL HN DIRECTORY IN BROWSER WITH RIC IN EXTERNAL LINKS
840
826
USERS CLICK EXTERNAL LINKS WITH EMBEDDED RIC
828
HTTP LINKS WITH RIC TO HOME PORTAL
900
830
PORTAL REDIRECT PROGRAMS, SUCH AS LOGOICON1, LOGNAME1 ...
RIC/LOCAL SERVICE PROVIDER DATABASE
REDIRECT TO LOCAL SERVICE PROVIDER PAGES BASED ON RIC
832

FIG. 20

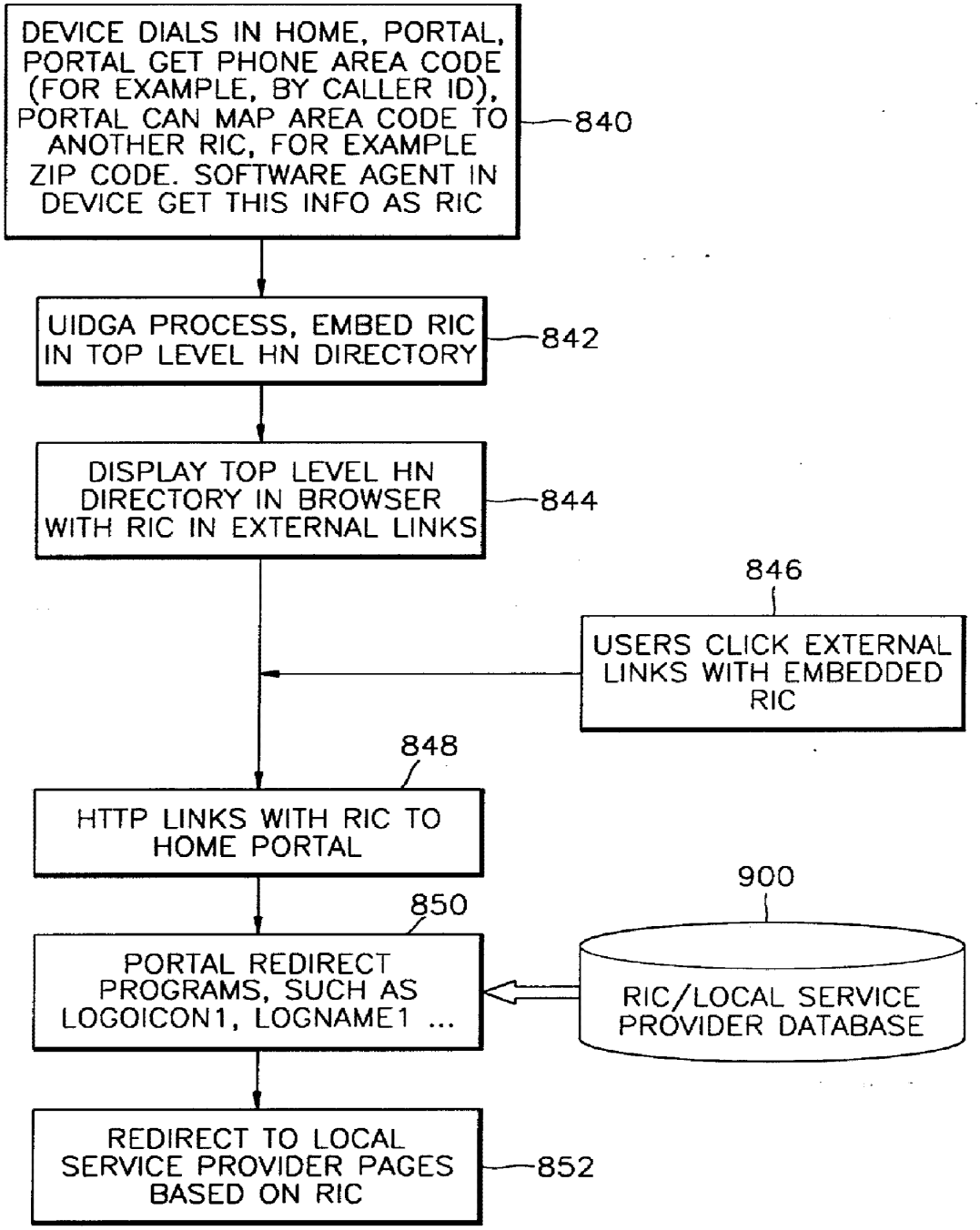
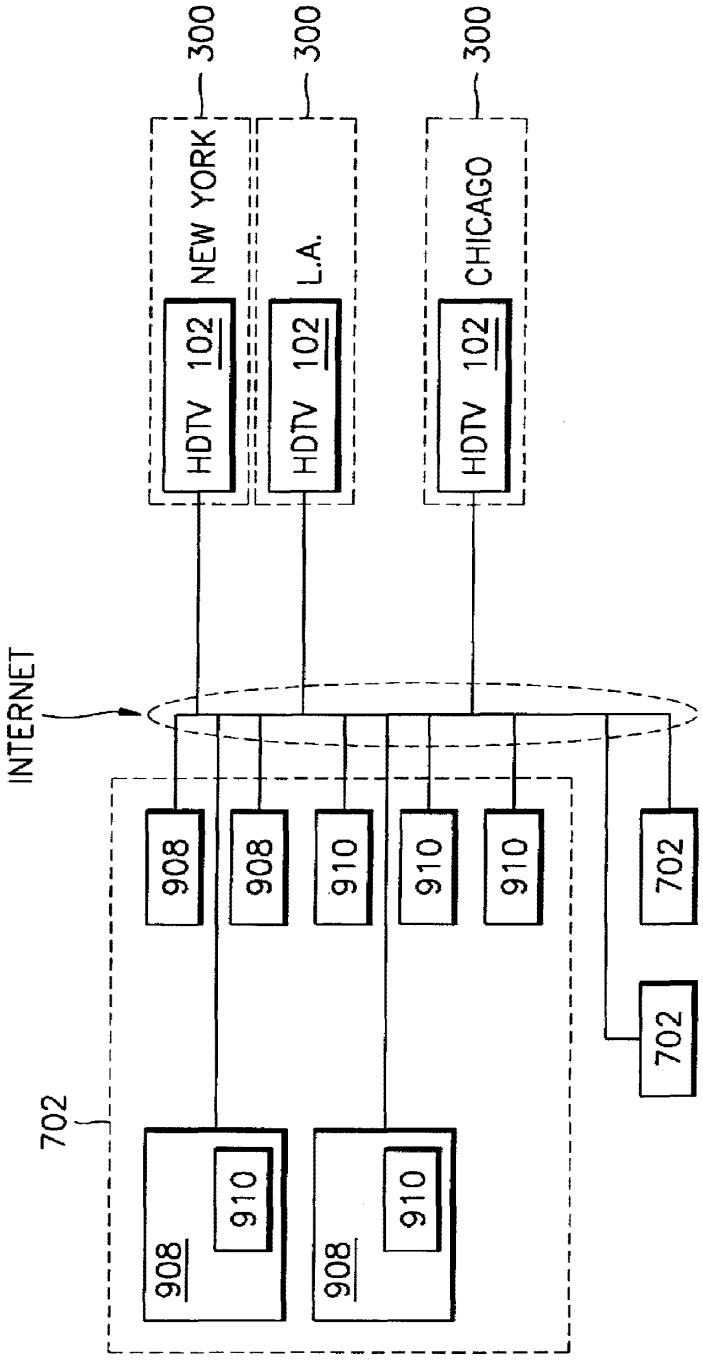

DEVICE DIALS IN HOME, PORTAL, PORTAL GET PHONE AREA CODE (FOR EXAMPLE, BY CALLER ID), PORTAL CAN MAP AREA CODE TO ANOTHER RIC, FOR EXAMPLE ZIP CODE. SOFTWARE AGENT IN DEVICE GET THIS INFO AS RIC
840
UIDGA PROCESS, EMBED RIC IN TOP LEVEL HN DIRECTORY
842
DISPLAY TOP LEVEL HN DIRECTORY IN BROWSER WITH RIC IN EXTERNAL LINKS
844
846
USERS CLICK EXTERNAL LINKS WITH EMBEDDED RIC
848
HTTP LINKS WITH RIC TO HOME PORTAL
900
850
PORTAL REDIRECT PROGRAMS, SUCH AS LOGOICON1, LOGNAME1 ...
RIC/LOCAL SERVICE PROVIDER DATABASE
REDIRECT TO LOCAL SERVICE PROVIDER PAGES BASED ON RIC
852

FIG. 21


300
300
300
NEW YORK
L.A.
CHICAGO
HDTV 102
HDTV 102
HDTV 102
INTERNET
908
908
910
910
910
702
702
702
908
910
908
910

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International Bureau

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PCT

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(74) Agent: **HAMRICK, Claude, A., S.**; Oppenheimer Wolff & Donnelly LLP, 1400 Page Mill Road, Palo Alto, CA 94304 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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(54) Title: CONTENT AND APPLICATION DOWNLOAD BASED ON A HOME NETWORK SYSTEM CONFIGURATION PROFILE

(57) Abstract: A system and method is provided for identifying, accessing, and managing service applications for use with associated consumer electronic devices in a home network system (12). A client side process, executed by a client computing system (50) in the home network system (12), operates in conjunction with a server side process executed by a server computing system (20, 23) that is coupled with the client computing system via the Internet (18). The client computing system is implemented by a gateway device (14) coupled with each of the devices (30) via the home network (34). The client side process includes the steps of: determining device ID information (202) associated with at least one selected one of the consumer electronic devices in the home network system; determining a home network system configuration profile (210) based at least on the device ID information; providing the home network system configuration profile to a selected server (234) computing system via the Internet; downloading an application (238) form the selected server computing system, the application being operative to provide a process associated with the selected electronic devices; and executing the downloaded application at the gateway device to provide a remote interactive process associated with the selected electronic devices.

CONTENT AND APPLICATION DOWNLOAD BASED ON A HOME NETWORK SYSTEM CONFIGURATION PROFILE

Specification

Cross Reference to Related Applications:

Reference is made to U.S. patent application entitled "Residential Gateway System For Managing Service Applications Associated With Electronic Devices", serial No.09/705,472, filed on November 2, 2000, and also to U.S. patent application entitled "Remote Manual, Maintenance, and Diagnostic Services for Networked Electronic Devices", serial No.09/705,478, filed on November 2, 2000.

Background of the Invention:

Field of the Invention:

The present invention relates generally to home network systems, and more specifically to a system and method for downloading selected multimedia content and applications based on a home network system configuration profile.

Description of the Prior Art:

Modern home network systems provide interoperability of a variety of different types of consumer electronics devices used in a common home environment. Examples of such devices include workstations, personal computers, digital televisions, Personal Video Recorders (PVR's), set-top boxes, digital video recorders, game devices, personal digital assistants (PDA's), printers, audio devices (e.g., jukebox AV systems, CD players and mini-disc players), and audio/video (AV) hard drives providing additional storage of AV data that may be streamed to other devices. Home network systems provide for sharing of the resources of each of the electronics device in order to accomplish more sophisticated applications by providing seamless exchange of instructions and AV data between the peripheral devices.

In order to handle the exchange of both commands and multiple digital AV streams, a home network must employ a networking standard that guarantees quality of service. A number of flexible home network standards have been developed. As an example, the Home Audio Video interoperability (HAVi) standard, developed by eight major Consumer Electronics companies including Sony Corporation, provides a home network architecture is open, scaleable in implementation complexity, platform independent, and language neutral. The HAVi architecture uses the digital IEEE-1394 serial interface standard which is a high speed bus that meets the required multimedia bandwidth requirements and provides quality of

service. HAVi is based on the IEEE-1394 standard, to allow devices to send and receive digital commands and streams of digital AV content at speeds up to 400 Mbps. Other home networks use Ethernet.

It is common that at least one of the devices in a home network system, such as a PC, will be configured to access the Internet. The Open Services Gateway Initiative (OSGi) is an industry group working to define and promote an open standard for connecting the coming generation of smart consumer and small business appliances with commercial Internet services. The Open Services Gateway specification will provide a common foundation for Internet Service Providers, network operators and equipment manufacturers to deliver a wide range of e-services via gateway servers running in the home or remote office. However, there as yet no system and method for providing e-services for operating, maintaining, and diagnosing problems associated with consumer electronic devices via gateway servers running in the home or remote office.

The benefit of a network of interoperable devices is that the whole is greater than the sum of all the components. Home networks enable sharing of device resources in order to accomplish sophisticated applications by providing seamless exchange of instructions and AV data between electronic devices in the home network. Home network systems typically allow for configuring at least one device (e.g., a personal computer system) to be a controlling device that is operative to provide for remotely controlling other electronic devices in the home network system. For example, a user may program a recording on a VCR following a menu generated by the TV on the TV screen.

In HAVi standard home networks, there is no single controlling device. Any device in the network that has been designed to do so can control other devices. In order for a controlling device to control a particular controlled device in a home network, the controlling device must be able to access a particular application having instructions executable by the controlling device for controlling a particular controlled device, or providing other services associated with the device.

Some of the electronic devices in a home network system may be packaged and sold with a disk having an associated control application stored thereon for controlling the device. For these devices, the control application could be loaded to the controlling device from the disk. However, for other electronic devices, it may be that no compatible application is available.

The types of applications and media contents which may be used in a particular home network system depends on the particular configuration and capabilities of the system. Each

home network system may include different types of consumer electronic devices and different types of means for interconnecting the devices. Adding new electronics devices to a home network system often expands the capabilities of the home network to execute different types of applications and media content. Because there are so many different configurations for a home network system, it is difficult for a user to be able to determine what types of applications and media content may be used in his or her home network as it is currently configured.

What is needed is a system and method for identifying and accessing applications and media content that may be used in a particular home network system.

Summary of the Invention:

It is an object of the present invention to provide a system and method for identifying and accessing applications and media content that may be used in a particular home network system.

Briefly, a presently preferred embodiment of the present invention provides a system and method of identifying, accessing, and managing service applications for use with associated consumer electronic devices in a home network system. A client side process, executed by a client computing system in the home network system, operates in conjunction with a server side process executed by a server computing system that is communicatively coupled with the client computing system via the Internet. In one embodiment, the client computing system is implemented by a gateway device communicatively coupled with each of the electronic devices via the home network. The gateway device is operative to access the Internet and is communicatively coupled with a display unit.

The client side process includes the steps of: determining device ID information associated with at least one selected one of the consumer electronic devices in the home network system; determining a home network system configuration profile based at least on the device ID information; providing the home network system configuration profile to a selected server computing system via the Internet; downloading an application from the selected server computing system, the application being operative to provide a process associated with the selected electronic devices; and executing the downloaded application at the gateway device to provide a remote interactive process associated with the selected electronic devices.

The home network system configuration profile may also be determined based on additional home network configuration parameters including the bandwidth capacity of the home network, a user profile for a user of the home network system, a history of use of the

home network system, a total storage capacity of memory devices available in the home network system, content decoding capabilities available in the home network system, security and decryption capabilities available in the home network system.

In an embodiment, the device ID information associated with each of the selected electronic devices includes vendor information indicative of a vendor of the associated device, model information indicative of the model of the associated device, and a serial number of the associated device.

In one embodiment, the device ID information identifies at least two selected consumer electronic devices in the home network system. In this embodiment, the downloaded application is a device interplay application that is operative to provide synergistic functions utilizing the resources of each of the selected devices.

The server side process, executed by the server computing system, includes the steps of: receiving a home network system configuration profile from a client computing system, the profile including device ID information indicating at least one selected consumer electronic device in a home network system; determining a selected application associated with the selected devices based on the configuration profile; and providing the selected application to the client computing system, the application including instructions executable by the client computing system for providing a process associated with the selected devices.

An important advantage of the system and method of the present invention is that it automatically provides users of a home network system with applications and media content that may be used in their particular home network systems.

The foregoing and other objects, features, and advantages of the present invention will become apparent from the following detailed description of the preferred embodiment which makes reference to the several figures of the drawing.

In The Drawing:

FIG. 1 is a block diagram generally illustrating a home network system including a plurality of electronic devices each being coupled with a residential gateway that is operative to access the Internet, and to provide a service management process in accordance with the present invention;

FIG. 2 is a block diagram generally illustrating hardware components of the gateway device of FIG. 1;

FIG. 3 is a block diagram generally illustrating software components of a service management system including: a plurality of modules having at least one home network bridge, a service manager, a resource manager, an Internet bridge, and applications associated

with devices of the home network; and a platform for supporting the modules, and for dynamically loading and unloading the applications;

FIG. 4 is a flow diagram generally illustrating a client side process in accordance with the present invention for identifying and accessing selected multimedia content and applications based on a home network system configuration profile; and

FIG. 5 is a flow diagram generally illustrating a service side process in accordance with the present invention for identifying and providing selected multimedia content and applications based on a home network system configuration profile.

Detailed Description of the Preferred Embodiments:

FIG. 1 shows a block diagram generally illustrating a home network system 12 including a gateway device 14 having a port 16 communicatively coupled with an internet protocol (IP) network 18 such as the Internet thereby enabling the gateway device 14 to access a plurality of different server sites including a remote manual server site 20 having a computer system 21 operative to access at least one associated database 22, and a remote manual server site 23 having a computer system 24 operative to access at least one associated database 25 as further explained below.

The home network system 12 also includes: a first group of electronic devices 30 communicatively coupled with a port 32 of the gateway device 14 via a first home network 34 designated NETWORK_1; a second group of electronic devices 36 communicatively coupled with a port 38 of the gateway device via a second home network 40 designated NETWORK_2; and a display device 42 communicatively coupled with port 44 of the gateway device. In accordance with the present invention, the first and second home networks 34 and 40 may be implemented using any technology that provides for a quality of service including reliable exchange of service application commands and timely delivery of multiple digital audio-video (AV) streams between each of the electronic devices 30 and 36 respectively, and between the gateway device 14 and the electronic devices 30 and 36 respectively. The display device 42 may be a television or any other type of display device such as a CRT or flat panel display.

In the described embodiment, NETWORK_1 is implemented in accordance with the Home Audio Video interoperability (HAVi) standard based on the digital IEEE-1394 serial interface standard which currently allows for each of the devices 30 and the gateway device 14 to send and receive service commands and streams of digital AV content at speeds up to 400 Mbps. The HAVi standard provides a home network architecture is open, scaleable, platform independent, and language neutral. Also in the described embodiment,

NETWORK_2 is implemented in accordance with the universal serial bus (USB) communications standard which currently allows for each of the devices 36 and gateway device 14 to send and receive service commands and streams of digital AV content at speeds up to12Mbps. In an alternative embodiment, either of the networks 34 and 40 may be implemented in accordance with the Ethernet standard or any other connection providing adequate quality of service for commands and streams of digital AV content.

The first group of electronic devices 30, each of which is connected to the gateway device via NETWORK_1, include: a first personal computer (PC) system 50 having a system memory (not shown) for storing computer readable instructions, and a processor (not shown) for executing computer readable instructions; a personal digital assistant (PDA) 52; at least one game device 54 (e.g., Sony Play Station); audio devices 56 (e.g., a compact disk player, jukebox AV system, or mini-disc player) including speakers (not shown); a set top box 58 connected to a television (TV) 60 to provide the TV with satellite/cable television services; a digital video recorder 62 (e.g., a TIVO^{TM} system) which may use a digital cable service; a camcorder 64; and a hard disk storage device 66 providing additional storage of media assets including digital video content (e.g., MPEG format video content). The second group electronic devices 36 includes a second personal computer 70, a camcorder 72, a Sony Music clip 74, and a digital camera 76 each being a connected to the gateway device via NETWORK_2. In the described embodiment, each of the devices 36 is a USB compatible device.

The home network system 12 provides interoperability of the networked electronic devices 30, 36. The networks 30 and 36 provide quality of service connection between networked devices in order to handle the exchange of both commands and multiple digital AV streams between the devices 30, 36 and the gateway device 14. The benefit of the network 12 of interoperable devices is that it enables sharing of device resources in order to accomplish sophisticated applications by providing seamless exchange of instructions and AV data between electronic devices in the home network.

In one embodiment, the network system 12 allows for configuring at least one of the devices (e.g., a personal computer system) to be a controlling device that is operative to provide for remotely controlling other electronic devices in the home network system. For example, a user may program a recording on a VCR following a menu generated by the TV on the TV screen. In accordance with the HAVi standard, there is no single controlling device. Any device in the network that has been designed to do so can control other devices.

In order for a controlling device to control a particular controlled device in a home network, the controlling device must be able to access a particular control application having executable code for controlling the particular controlled device. Some of the electronic devices in the home network may be provided with an internal ROM unit having stored thereon an associated control application for controlling the device. For these devices, the control application may be transmitted from the controlled device to the controlling device. Also, some of the electronic devices may be packaged and sold with a disk having an associated control application stored thereon. For these devices, the application could be loaded to the controlling device from the disk. However, for other electronic devices, it may be that no compatible application is available.

The gateway device 14 further includes a port 80 communicatively coupled with an electromagnetic detector 82 that is responsive to signals transmitted by a wireless remote control device 84 via a wireless link 86. In one embodiment wherein the wireless link 86 is a radio frequency (RF) link, each of the remote control device 84 and gateway device 14 includes an RF transceiver, and the detector 82 is an RF antenna. The wireless link 86 may also be an infrared (IR) link.

As further explained below, the gateway device 14 is operative to access, load, and execute a wide variety of different types of device interplay applications providing home network services associated with selected sets of the electronic devices 30, 36 in the home network system. Each of the service applications is operative to provide synergistic functions utilizing the resources of the associated selected set of the devices 30, 36. In an embodiment, each of the service applications is operative to remotely control each device of the selected set in order to provide an interplay between the devices for the purpose of achieving synergistic functions. The device interplay applications may utilize the communicative coupling provided by the home network between the selected devices in order to exchange instructions and AV data therebetween. In one example, the device interplay application is a video editing application executed by the gateway device 14, as further explained below, for controlling the camcorder 64 and digital video recorder 62 in order to copy video data from the camcorder to the digital video recorder 62 in accordance with editing and control functions.

In one embodiment, the device interplay applications executed by the gateway device 14 provide for displaying a graphical user interface (GUI) on the display device 42 enabling a user to initiate and control the performance of the device interplay applications associated with selected sets of electronic devices in the network. As an example, the video editing

application for controlling the camcorder 64 and digital video recorder 62 may be executed by the gateway device 14 to provide a GUI enabling a user to control the copying of the video data from the camcorder to the digital video recorder 62.

In another embodiment that does not require a graphical user interface, the remote control device 84 includes: a display unit 88; and a select button 90 for receiving user input. In this embodiment, the remote control device is operative to display indicia of possible actions on the display device 88, and the select button 90 is responsive to user input indicative of a selected one of the possible actions.

Note that each selected set of the devices may require a different device interplay application which may be determined based on the vendor, model number, and serial number of the devices of the selected set as further explained below. Some of the electronic devices 30 and 36 may be provided with an internal ROM unit having stored thereon an associated service application. For these devices, the service application may be transmitted from the device to the gateway and executed by the gateway as further explained below. Also, some of the electronic devices may be packaged and sold with a disk having an associated service application stored thereon. For these devices, the service application could be loaded to the gateway from the disk. However, for other electronic devices, it may be that no compatible service application is available on the local home network. As further explained below, the gateway device 14 is operative to download device interplay applications associated with selected sets of devices via the Internet.

The gateway device 14 provides the home network system 12 with access to a wide variety of different types of useful applications that are available via the IP network 18. As further explained below, the gateway device 14 is operative to access, load, and execute a wide variety of different types of applications including: device control applications, device interplay applications, remote manual support service applications, remote interactive diagnosis support service applications, and remote maintenance support service applications.

The gateway device includes a processor (shown in FIG. 2 and described below) for executing a home network device service management system 92 in accordance with the present invention. As further explained below, execution of the system 92 provides service management functions including: communicating with the devices 30, 36 of the network system 12 to identify particular applications that are compatible with selected one of the devices; accessing and downloading applications from remote servers via the Internet if required; providing a centralized graphical user interface on the display device 42 enabling a user of the home network system to select from a plurality of applications for performing

services associated with corresponding ones of the devices; and executing a selected application.

In one embodiment, the gateway device 14 provides a GUI service selection menu on the display device 42 enabling a user to select a particular device and an associated application. Also in an embodiment, the wireless remote control device 54 may be used to interact with the service selection menu by providing user input indicative of a selected one of the devices and associated applications.

In the described embodiment, the service management system 92 is executed by the gateway device 14. However, in an alternative embodiment, a personal computer could be configured to provide the gateway device by being configured to access the Internet, and to execute the service management system 92. Note that in accordance with the HAVi architecture, all of the electronic devices 30 may control functions performed by other ones of the electronic devices 30 if configured to do so. Therefore, in accordance with the present invention, any of the electronic devices 30 could be configured to provide the gateway device.

FIG. 2 shows a generalized block diagram illustrating components at 110 of the gateway device 14 (FIG. 1) in accordance with the present invention. The gateway device 14 generally includes: a central processing unit (CPU) 112 communicatively coupled with a system bus 114; an input/output unit 116 such as a keyboard and mouse coupled with the CPU via the system bus; a system memory unit 118 (including both volatile and non-volatile memory units) for storing computer readable instructions including instructions of the service management system 92 (FIG. 1), and being coupled with the CPU via the system bus; a display driver unit 120 for providing display data to the display device 42 (FIG. 1) via port 44 of the gateway device, and being coupled with the system bus; a modem 122 for connection with the IP network 18 (FIG. 1) via port 16 of the gateway device, and also being connected to the system bus; a transceiver unit 124 connected to the electromagnetic detector 82 via port 80, and also being connected to the system bus; a first home network interface 126 for connection with NETWORK_1 (FIG. 1) via port 32 of the gateway device, and also being connected to the system bus; and a second home network interface 128 for connection with NETWORK_2 via port 38 of the gateway device, and also being connected to the system bus.

As mentioned above, in the described embodiment, the transceiver unit 124 is an RF transceiver. As is well understood, the modem 122 may be implemented by a cable modem allowing for Internet access via cable television service, a DSL modem allowing for Internet access via plain old telephone service (POTS), or a wireless IP interface such as a

Bluetooth™ wireless technology connection. In the described embodiment, the first network interface 126 is an IEEE 1394 interface, and the second network interface 128 is a USB interface.

FIG. 3 shows a block diagram generally illustrating software components of the service management system 92 that is executed by the gateway device 14 (FIG. 1) in accordance with the described embodiment of present invention. As mentioned, the system 92 may also be executed by a personal computer system configured to access the Internet. The service management system 92 includes a plurality of modules having: a first home network bridge 154 providing an interface for communicating with each of the first group of devices 30 (FIG. 1) via NETWORK_1; a second home network bridge 158 providing an interface for communicating with each of the second group of devices 36 (FIG. 1) via NETWORK_2; an Internet network bridge 162 providing an interface for accessing Internet services via the IP network 18 (FIG. 1); a service manager 166 providing service management functions as further explained below; a resource management unit 168 for managing the limited resources of the gateway device including the system memory unit 118 and CPU 112 (FIG. 2), and resources of the display device 42 (FIG. 1); and a plurality of applications 170 designated APP_1, APP_2, ..., APP_N each being operative to provide an associated service to at least one of the electronic devices of the home network system.

The system 92 also includes a platform 172 for supporting and providing communication between each of the modules 154,158, 162, 166, 168, and 170. The platform 172 is also operative to dynamically load and unload the applications 170 under control of the service manager 166. The service manager 166 is operative to communicate with each of the devices 30, 36 (FIG. 1) of the home network system via the platform 172 and the bridges 154 and 158, and is also operative to communicate with server sites accessed via the Internet bridge 152 for the purpose of downloading required applications 170 as further explained below.

In one embodiment, the platform 172 includes a Java virtual machine, and each of the applications 170 is an application bundle that may be interpretively executed by the Java virtual machine. In an alternative embodiment wherein the platform 172 is a Java virtual machine, each of the applications 170 may be an applet, or a Havlet which is a Java applet defined in accordance with the HAVi standard. In one embodiment, each of the applications 170 is downloaded from a server via the IP network under control of the service manager 166, and stored in volatile memory of the gateway device. In another embodiment, each of

the applications 170 may be downloaded and stored in the gateway device system memory 118 (FIG. 2) for later use.

Service management functions provided by the service manager 166 include: communicating with each of the electronic devices of the home network system via the home network bridges 154 and 158 in order to determine device ID information; accessing applications from remote servers via the Internet 18 (FIG. 1) in response to messages received from the devices and/or user input as further explained below; generating a mapping between the electronic devices and applications; providing a GUI service selection menu on the display device enabling a user to select an application for providing processes associated with at least one of the devices of the home network system; and dynamically loading and unloading selected ones of the applications 170 to initiate the performance of processes associated with the selected devices.

As mentioned above, each of the applications 170 includes computer readable and executable instructions for providing a particular process associated with at least one of the electronic devices of the home network system. A plurality of applications 170 may be stored in the system memory unit 118 (FIG. 2). As mentioned, applications needed for providing specific services for associated devices may or may not be available in the system memory unit. When a new device is connected to the home network system 12 (FIG. 1) by connecting it to one of the first and second home networks 34 and 40 (FIG. 1), the new device is detected by the associated one of the home network bridges 154 and 158 in accordance with a process further explained below. Device ID information indicative of the vendor, model number, and serial number of the new device is determined by the associated network bridge and provided to the service manager 166 which is operative to determine whether any applications 170 that are compatible with the new device (either alone or in combination with any other device) are stored in the system memory unit 118. If not, the service manager 166 accesses a server computing system 22 (FIG. 1) via the Internet to download an application.

The applications provided by the server computing system 22 (FIG. 1) include: device control applications for remotely controlling associated ones of the electronic devices; device interplay applications that are operative to provide synergistic functions utilizing the resources of each a selected set of the devices; remote manual support service applications for helping users to learn how to use associated devices; remote interactive diagnosis support service applications enabling a user to remotely and/or interactively diagnose problems with

associated devices; and remote maintenance support service applications providing for the performance of remote maintenance functions on associated devices.

FIG. 4 shows a flow diagram generally illustrating an exemplary client-side process at 200 for identifying and accessing applications and media content for use in a home network system in accordance with the present invention. In the described embodiment, the process is implemented by the content/application download system 92 (FIG. 3).

The process 200 begins with a step 202 in which the system determines device ID information associated with each of the devices 30, 36 (FIG. 1) in the home network system. In an embodiment, the device ID information includes an associated manufacturer ID, model number, and serial number. The device ID information may be determine by the system 92 (FIG. 3) by communicating with each of the devices via the home network. In steps 206 through 226, the system determines a plurality of home network configuration parameters that may be used to describe the current configuration of the home network system.

In step 206, the system determines the bandwidth capacity of one of the home network 34, 40 (FIG. 1). For example, in the embodiment wherein NETWORK_1 is a HAVi standard network, the bandwidth capacity of NETWORK_1 can be 400 Mbps. In step 210, the system reads a user profile to determine home network user preferences. In one embodiment, the home network user preferences may be selected by a user using a user preferences Wizard which is a software module enabling the user to select preferences. User preferences may also be determined based on a user profile that is automatically generated based on media content previously accessed by the user in the home network system.

In step 214, the system reads log files to determine a history of use of the devices 30, 36 (FIG. 1) in the home network. The log files, which may be stored in the system memory unit of the gateway device, include information indicating applications and media contents previously used in the home network system.

In step 218, the system determines the storage capacity of memory devices (e.g., the hard drive 66 of FIG. 1, and memory storage capacity in the personal computer system 50 of FIG. 1) available in the home network system. In step 222, the system determines content decoding capabilities in the home network system. As an example, the personal computer system 50 (FIG. 1) may have applications for reading JPEG files, GIF files, or any other file types. In step 226, the system determines security and decryption capabilities available in the home network system.

In step 230, the system determines a home network configuration profile based on the device ID information, the bandwidth capacity, the home network user preferences, the

history of use, the available storage capacity, the content decoding capabilities, and the security and decryption capabilities.

In step 234, the system transmits the home network configuration profile to a server computing system such as the server computing system 22 (FIG. 1) via the IP network 18. In step 238, the system downloads content and applications adapted for use in the home network system. The downloaded applications may include device control applications for remotely controlling associated ones of the electronic devices 30, 36 (FIG. 1), device interplay applications that are operative to provide synergistic functions utilizing the resources of each a selected set of the devices, remote manual support service applications for helping users to learn how to use associated devices, remote interactive diagnosis support service applications, and remote maintenance support service applications.

FIG. 5 shows a flow diagram generally illustrating an exemplary server-side support service process at 250 that is executed by a server computing system 22 (FIG. 1) in conjunction with execution of the client-side support service process 200 (FIG. 4). In step 254, the server computing system receives a home network system configuration profile from a client computing system. The profile includes the device ID information indicating at least one selected consumer electronic device 30, 36 (FIG. 1) in a home network system. In step 258, the system determines a selected application and/or media content associated with the selected devices based on the configuration profile. In step 262, the system provides the selected application and/or media content to the client computing system.

Although the present invention has been particularly shown and described above with reference to a specific embodiment, it is anticipated that alterations and modifications thereof will no doubt become apparent to those skilled in the art. It is therefore intended that the following claims be interpreted as covering all such alterations and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

CLAIMS

1. A process of identifying and managing applications for use with associated consumer electronic devices (30) in a home network system, the process for execution by a gateway device (14) communicatively coupled with each of the electronic devices via a home network, the gateway device being operative to access the Internet, comprising the steps of:

(a) determining device ID information (202) associated with at least one selected one of the consumer electronic devices in the home network system;

(b) determining a home network system configuration profile (230) based at least on said device ID information;

(c) providing said home network system configuration profile to a selected server computing system via the Internet (234);

(d) downloading an application from the selected server computing system (238), the application being operative to provide a process associated with said selected electronic devices; and

(e) executing said downloaded application at the gateway device to provide a remote interactive process associated with said selected electronic devices.

2. A process of identifying and managing applications as recited in claim 1 further comprising a step of determining a bandwidth capacity of the home network (206), and wherein said step (b) further includes determining said home network system configuration profile based on said bandwidth capacity (230).

3. A process of identifying and managing applications as recited in claim 1 further comprising a step of determining a user profile for a user of the home network system (210), and wherein said step (b) further includes determining said home network system configuration profile based on said user profile (230).

4. A process of identifying and managing applications as recited in claim 1 further comprising a step of determining a history of use of the home network system (214), and wherein said step (b) further includes determining said home network system configuration profile based on said history of use (230).

5. A process of identifying and managing applications as recited in claim 1 further comprising a step of determining a total storage capacity of memory devices (218) available in the home network system, and wherein said step (b) further includes determining said home network system configuration profile based on said total storage capacity (230).

6. A process of identifying and managing applications as recited in claim 1 further comprising a step of determining content decoding capabilities (222) available in the home network system, and wherein said step (b) further includes determining said home network system configuration profile based on said content decoding capabilities (230).

7. A process of identifying and managing applications as recited in claim 1 further comprising a step of determining security and decryption capabilities (226) available in the home network system, and wherein said step (b) further includes determining said home network system configuration profile based on said bandwidth capacity (230).

8. A process of identifying and managing applications as recited in claim 1 wherein said step (b) of determining device ID information associated with the selected devices connected with the home network comprises communicating with the selected devices (234) via the home network.

9. A process of identifying and managing applications as recited in claim 1 wherein said device ID information associated with each of said selected electronic devices comprises vendor information indicative of a vendor of the associated device, and model information indicative of the model of the associated device (202).

10. A process of identifying and managing applications as recited in claim 1 wherein said step of downloading an application comprises the steps of:

determining a search key based on said device ID information (222); and

querying said server using said search key (226) for an application associated with said selected devices.

11. A process of identifying and managing applications as recited in claim 1 wherein said device ID information identifies at least two selected consumer electronic devices in the home network system (202), and wherein said downloaded application is a device interplay

application (238) that is operative to provide synergistic functions utilizing the resources of each of said selected devices.

12. A process of identifying and managing applications as recited in claim 11 wherein said downloaded application (238) is operative to remotely control said selected devices.

13. A process of identifying and managing applications as recited in claim 12 wherein the home network provides for communicative coupling between said selected devices in order to exchange instructions and AV data between said selected devices (238).

14. A process of identifying and managing applications as recited in claim 12 further comprising a step (e) of downloading content from the selected server computing system (238).

15. A process of identifying and providing applications associated with consumer electronic devices, the process for execution by a server computing system that is communicatively coupled with at least one client computing system via the Internet, comprising the steps of:

receiving a home network system configuration profile (254) from a client computing system, the profile including device ID information indicating at least one selected consumer electronic device in a home network system;

determining a selected application (258) associated with said selected devices based on said configuration profile; and

providing said selected application (262) to the client computing system, said application including instructions executable by the client computing system for providing a process associated with said selected devices.

16. A process as recited in claim 15 wherein said device ID information comprises vendor information indicative of the vendor of each of said selected devices, and model information indicative of the model of each of said selected devices (254).

17. A process as recited in claim 15 wherein the device ID information further comprises a serial number of each of said selected devices (202).

18. A process as recited in claim 15 wherein said home network system configuration profile further comprises information indicating a bandwidth capacity (206) of the home network.

19. A process as recited in claim 15 wherein said home network system configuration profile further comprises information indicating a user profile (210) for a user of the home network system.

20. A process as recited in claim 15 wherein said home network system configuration profile further comprises information indicating a history (214) of use of the home network system.

21. A process as recited in claim 15 wherein said home network system configuration profile further comprises information indicating a total storage capacity (218) of memory devices available in the home network system.

22. A process as recited in claim 15 wherein said home network system configuration profile further comprises information indicating content decoding capabilities (222) available in the home network system.

23. A process as recited in claim 15 wherein said home network system configuration profile further comprises information indicating security and decryption capabilities (226) available in the home network system.

24. A process as recited in claim 15 wherein the client computer system is communicatively coupled with each of said selected devices (254), and wherein said selected application includes instructions executable by the client computing system for remotely controlling said selected devices (262).

25. A process as recited in claim 15 wherein said device ID information identifies at least two selected consumer electronic devices in the home network system (202), wherein the client computer system is communicatively coupled with each of said selected devices (254), and wherein said selected application is a device interplay application that includes

instructions executable by the client computing system (262) for providing synergistic functions utilizing the resources of each of said selected devices.

26. A process as recited in claim 15 wherein said device ID information identifies at least two selected consumer electronic devices in the home network system, wherein the client computing system is a gateway device (14) communicatively coupled with said selected devices (30) via a home network that enables exchange of instructions and AV data between said selected devices, and wherein said selected application comprises instructions executable by the gateway device (262) for providing synergistic functions utilizing the resources of each of said selected devices.

27. A process as recited in claim 15 further comprising the steps of:
determining selected media content based on said configuration profile (258); and
providing said selected media content to the client computing system (262).

28. A process of identifying and accessing media content for use with associated consumer electronic devices in a home network system, the process for execution by a gateway device communicatively coupled with each of the electronic devices via a home network, the gateway device being operative to access the Internet, comprising the steps of:
(a) determining device ID information (202) associated with at least one selected one of the consumer electronic devices in the home network system;
(b) determining a home network system configuration profile based at least on said device ID information (230);
(c) providing said home network system configuration profile to a selected server computing system via the Internet (234); and
(d) downloading selected media content (238) from the selected server computing system.

29. A process of identifying and managing applications as recited in claim 28 further comprising a step of determining a bandwidth capacity (206) of the home network, and wherein said step (b) further includes determining said home network system configuration profile based on said bandwidth capacity (230).

30. A process of identifying and managing applications as recited in claim 28 further comprising a step of determining a user profile for a user of the home network system (210), and wherein said step (b) further includes determining said home network system configuration profile based on said user profile (230).

31. A process of identifying and managing applications as recited in claim 28 further comprising a step of determining a history of use of the home network system (214), and wherein said step (b) further includes determining said home network system configuration profile based on said history of use (230).

32. A process of identifying and managing applications as recited in claim 28 further comprising a step of determining a total storage capacity of memory devices (218) available in the home network system, and wherein said step (b) further includes determining said home network system configuration profile based on said total storage capacity (230).

33. A process of identifying and managing applications as recited in claim 28 further comprising a step of determining content decoding capabilities (222) available in the home network system, and wherein said step (b) further includes determining said home network system configuration profile based on said content decoding capabilities (230).

34. A process of identifying and managing applications as recited in claim 28 further comprising a step of determining security and decryption capabilities (226) available in the home network system, and wherein said step (b) further includes determining said home network system configuration profile based on said bandwidth capacity (230).

35. A process of identifying and managing applications as recited in claim 28 wherein said step (b) of determining device ID information comprises communicating with the selected devices via the home network (254).

36. A process of identifying and managing applications as recited in claim 28 wherein said device ID information associated with each of said selected electronic devices comprises vendor information indicative of a vendor of the associated device, and model information indicative of the model of the associated device (202).

37. A process of identifying and managing applications as recited in claim 28 wherein said step of downloading selected media content comprises the steps of:

determining a search key based on said device ID information (230); and

querying said server using said search key for selected media content (234).

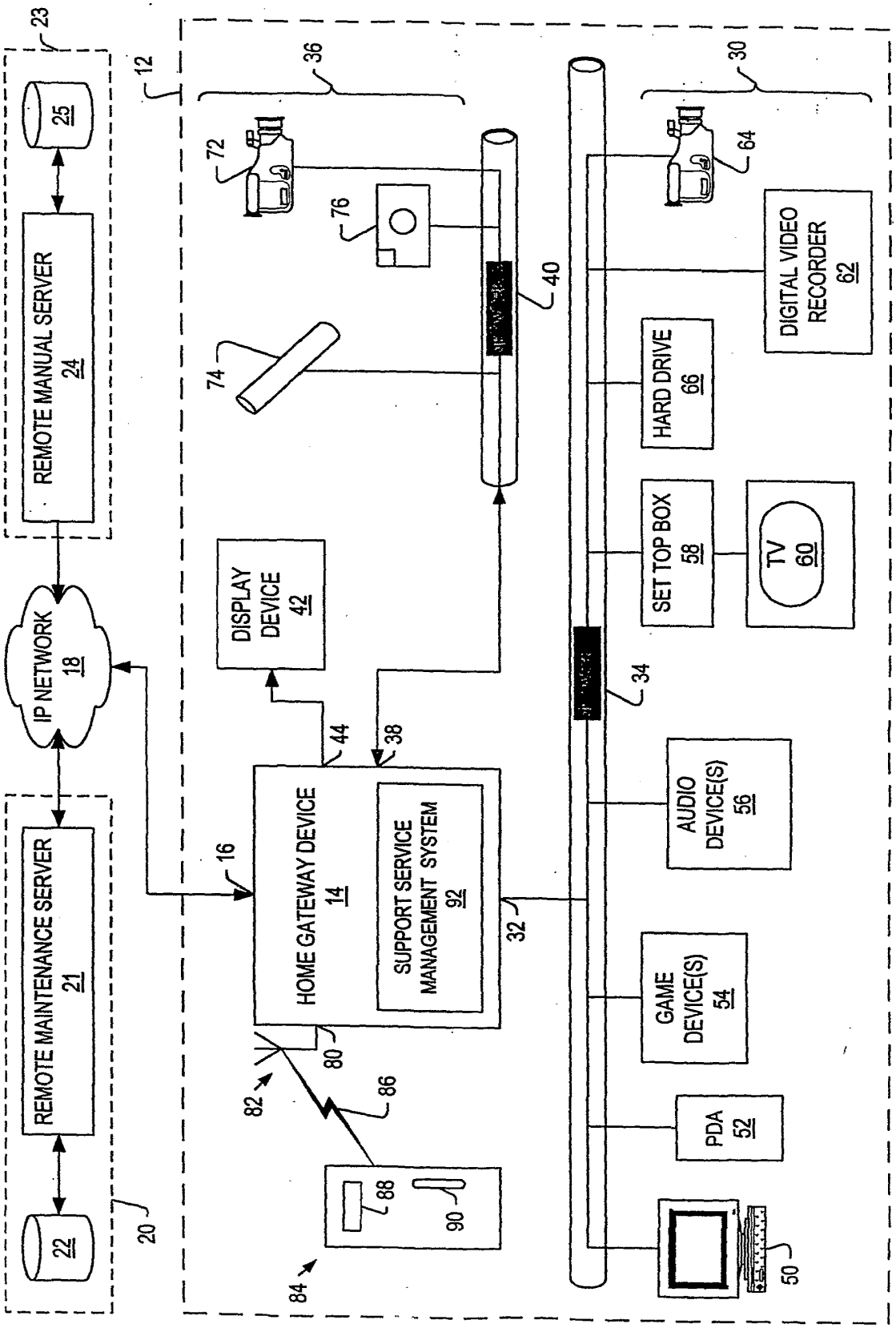
23
25
REMOTE MANUAL SERVER
24
12
36
30
72
64
76
40
74
DIGITAL VIDEO
RECORDER
62
HARD DRIVE
66
IP NETWORK
18
DISPLAY
DEVICE
42
SET TOP BOX
58
TV
60
34
44
38
HOME GATEWAY DEVICE
14
SUPPORT SERVICE
MANAGEMENT SYSTEM
92
AUDIO
DEVICE(S)
56
16
32
REMOTE MAINTENANCE SERVER
21
GAME
DEVICE(S)
54
80
82
86
PDA
52
88
90
22
20
84
50

FIG. 1

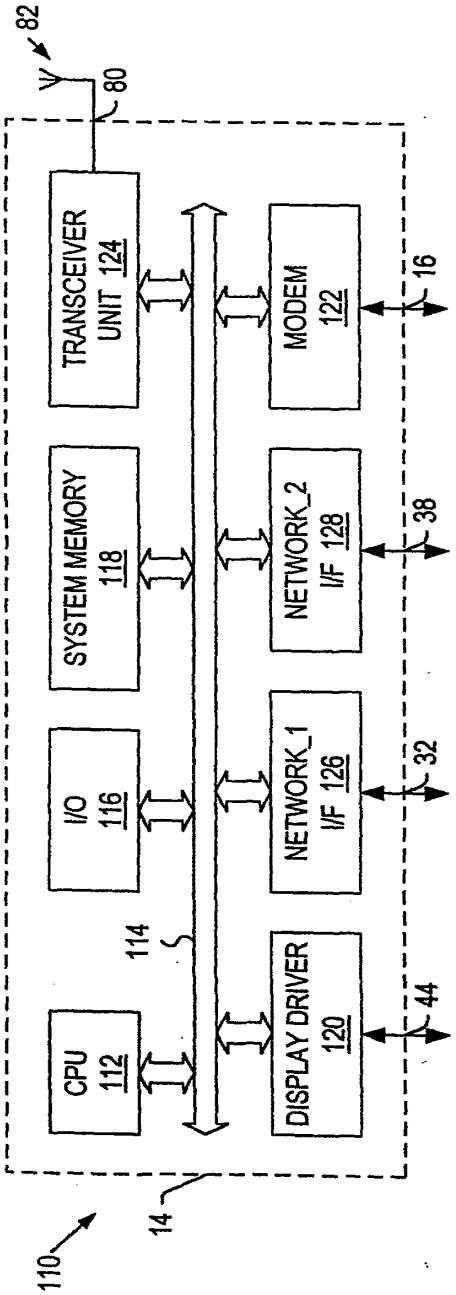
82
80
TRANSCEIVER UNIT 124
MODEM 122
16
SYSTEM MEMORY 118
NETWORK_2 I/F 128
38
I/O 116
NETWORK_1 I/F 126
32
114
CPU 112
DISPLAY DRIVER 120
44
110
14

FIG. 2

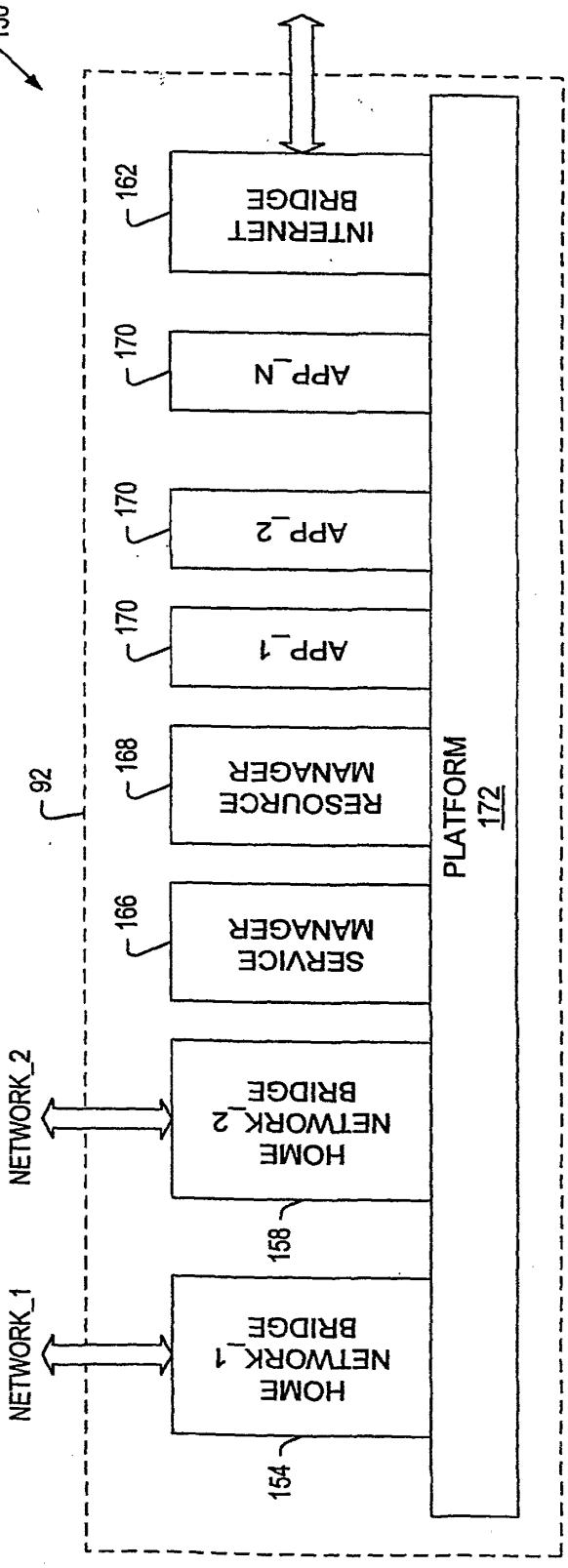
150
INTERNET BRIDGE
162
APP_N
170
APP_2
170
APP_1
170
RESOURCE MANAGER
168
92
SERVICE MANAGER
166
PLATFORM 172
NETWORK_2
HOME NETWORK_2 BRIDGE
158
NETWORK_1
HOME NETWORK_1 BRIDGE
154

FIG. 3

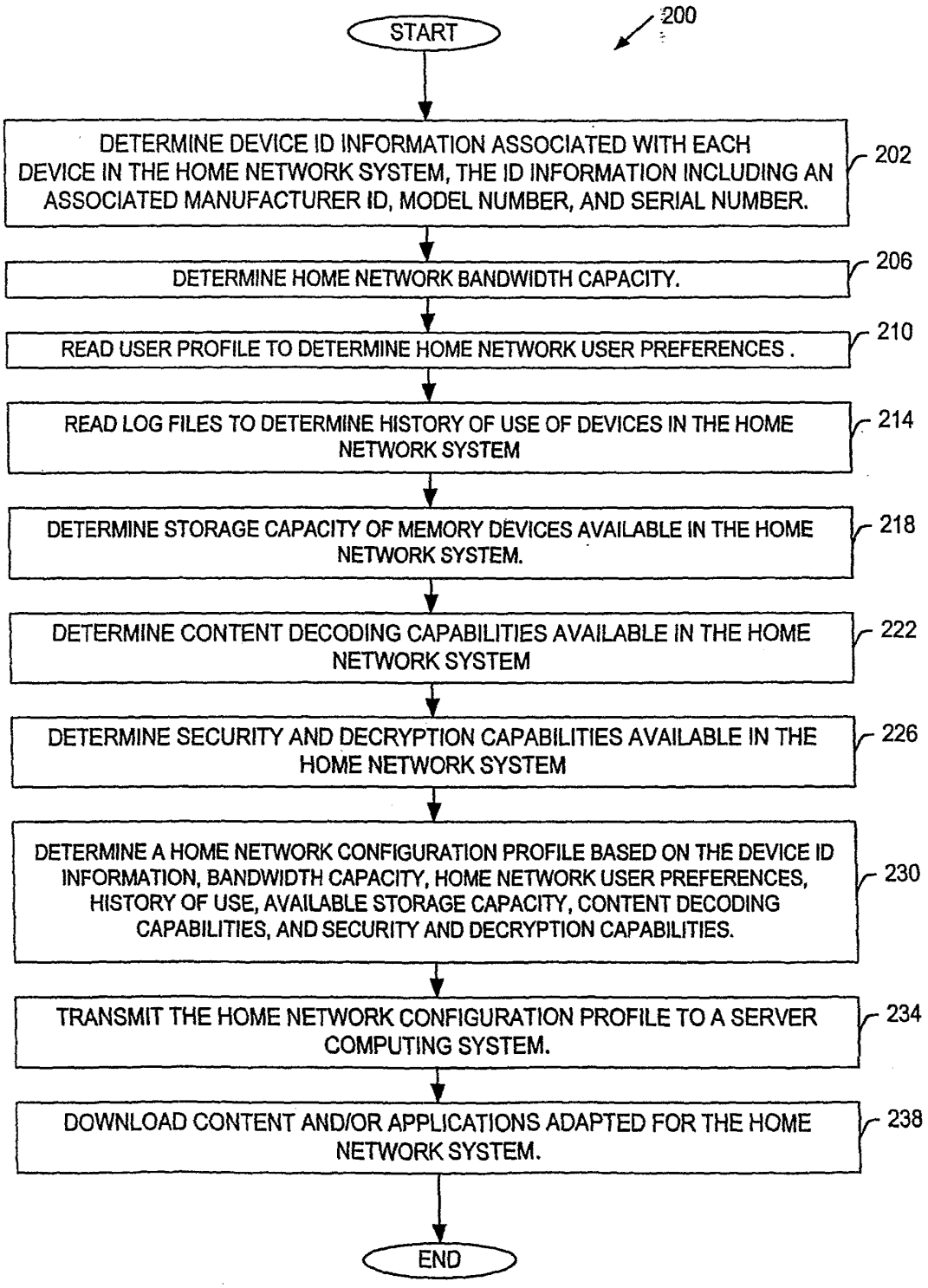
200
START
DETERMINE DEVICE ID INFORMATION ASSOCIATED WITH EACH DEVICE IN THE HOME NETWORK SYSTEM, THE ID INFORMATION INCLUDING AN ASSOCIATED MANUFACTURER ID, MODEL NUMBER, AND SERIAL NUMBER.
202
DETERMINE HOME NETWORK BANDWIDTH CAPACITY.
206
READ USER PROFILE TO DETERMINE HOME NETWORK USER PREFERENCES .
210
READ LOG FILES TO DETERMINE HISTORY OF USE OF DEVICES IN THE HOME NETWORK SYSTEM
214
DETERMINE STORAGE CAPACITY OF MEMORY DEVICES AVAILABLE IN THE HOME NETWORK SYSTEM.
218
DETERMINE CONTENT DECODING CAPABILITIES AVAILABLE IN THE HOME NETWORK SYSTEM
222
DETERMINE SECURITY AND DECRYPTION CAPABILITIES AVAILABLE IN THE HOME NETWORK SYSTEM
226
DETERMINE A HOME NETWORK CONFIGURATION PROFILE BASED ON THE DEVICE ID INFORMATION, BANDWIDTH CAPACITY, HOME NETWORK USER PREFERENCES, HISTORY OF USE, AVAILABLE STORAGE CAPACITY, CONTENT DECODING CAPABILITIES, AND SECURITY AND DECRYPTION CAPABILITIES.
230
TRANSMIT THE HOME NETWORK CONFIGURATION PROFILE TO A SERVER COMPUTING SYSTEM.
234
DOWNLOAD CONTENT AND/OR APPLICATIONS ADAPTED FOR THE HOME NETWORK SYSTEM.
238
END

FIG. 4

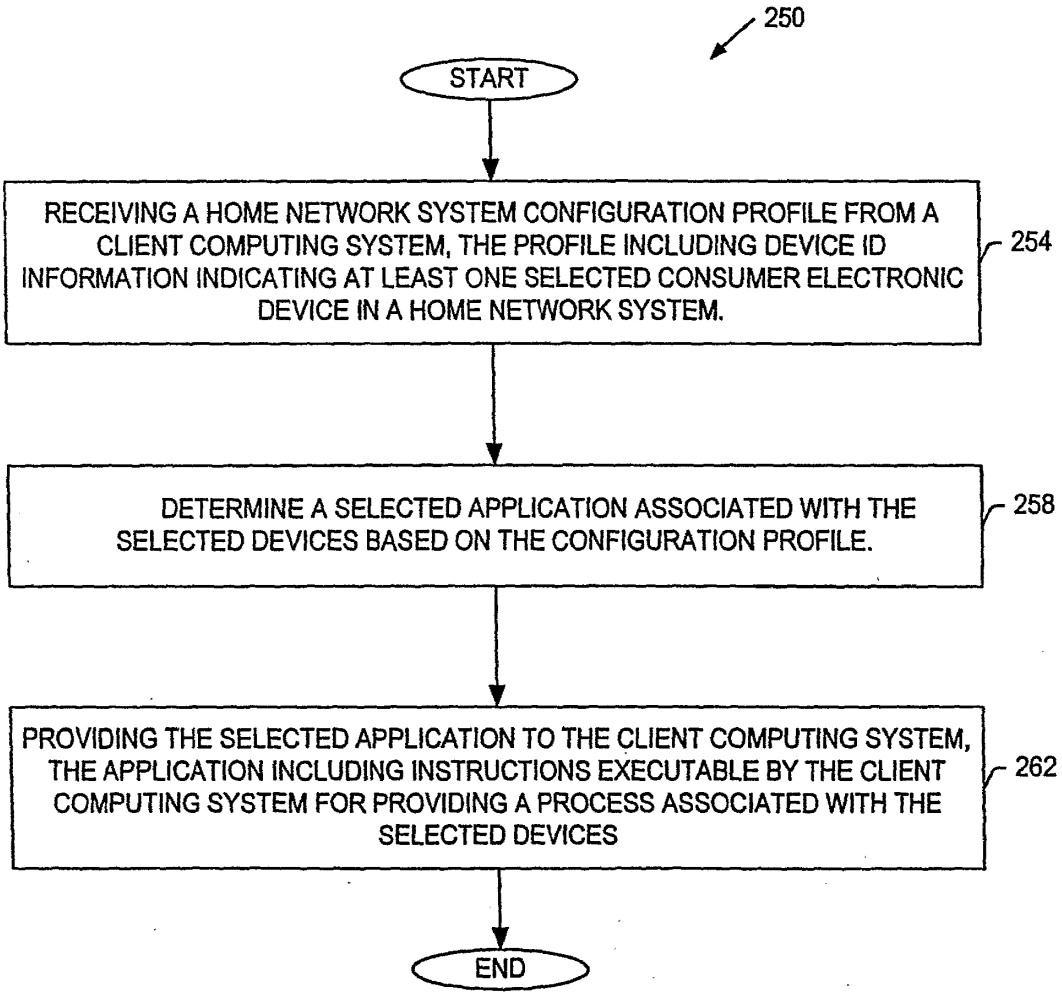
250
START
RECEIVING A HOME NETWORK SYSTEM CONFIGURATION PROFILE FROM A CLIENT COMPUTING SYSTEM, THE PROFILE INCLUDING DEVICE ID INFORMATION INDICATING AT LEAST ONE SELECTED CONSUMER ELECTRONIC DEVICE IN A HOME NETWORK SYSTEM.
254
DETERMINE A SELECTED APPLICATION ASSOCIATED WITH THE SELECTED DEVICES BASED ON THE CONFIGURATION PROFILE.
258
PROVIDING THE SELECTED APPLICATION TO THE CLIENT COMPUTING SYSTEM, THE APPLICATION INCLUDING INSTRUCTIONS EXECUTABLE BY THE CLIENT COMPUTING SYSTEM FOR PROVIDING A PROCESS ASSOCIATED WITH THE SELECTED DEVICES
262
END

FIG. 5

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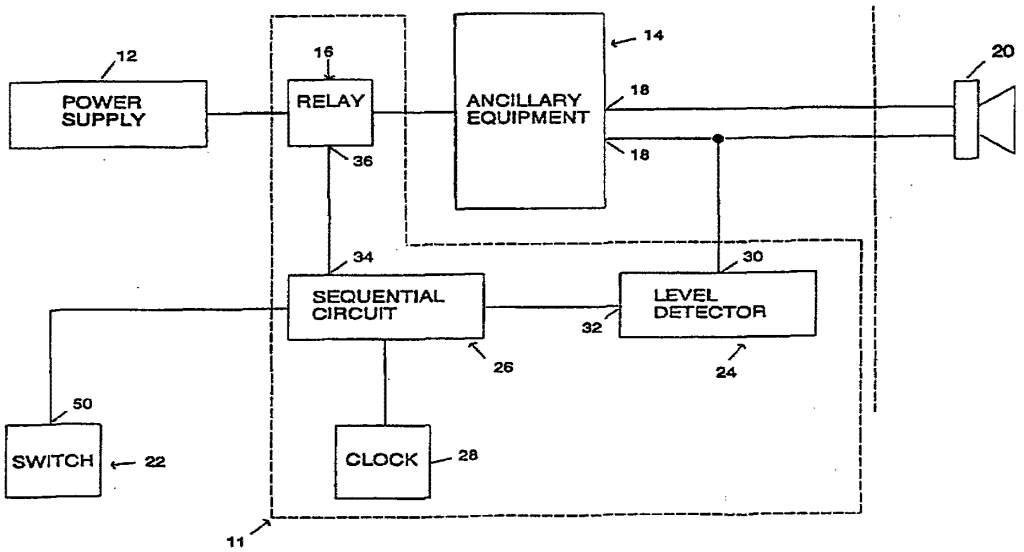

(57) Abstract

An audio output signal generated by audio, audio/visual, or electronic musical instrument equipment is monitored. If the level of the output signal falls below a predetermined threshold for a predetermined period of time, then power to the equipment is automatically shut off, resulting in a state that is the same as or similar to that which occurs when the normal user power switch is turned off. The equipment may also be turned on and turned off with the normal user power switch.

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Method and Apparatus for Automatic Shut Off of Electronic Equipment

FIELD OF THE INVENTION

The present invention relates generally to automatic shut off devices, and more particularly to methods and apparatus for automatically shutting off electronic devices having an audio signal output.

BACKGROUND

Many electronic devices having an audio signal output (such as audio tape decks, CD players, electronic keyboards, amplifiers, pre-amplifiers, video tape players, video disk players, etc.) will remain in a powered on state indefinitely, even if no audio signal output is being generated. Thus, users of such audio, audio/visual, or electronic musical instrument devices may not be aware that the device is or remains powered on after they have finished using it. For example, the user of a CD player may listen to one or more CDs, and then forget to turn off the CD player after a CD has stopped playing. Since no sound is generated after a CD has stopped playing, the user may leave the CD player and its associated amplifier powered on for hours, days, or even weeks, wasting energy, causing excessive equipment wear, and posing a potential fire hazard.

Similar drawbacks and hazards are presented to users of amplified musical instruments, such as electronic keyboards. Again, these instruments and devices cease to provide an audible sound output after the user stops playing or otherwise interacting with the instrument. Therefore, the user may forget to turn off the instrument or amplifier after she has finished playing, and the device will stay powered on indefinitely. Clearly, any device which can remain powered on indefinitely, but which generates no audio output signal when not in use, presents similar problems.

Prior art devices have been described which turn off electronic equipment after sensing the presence of a

specific signal. For example, U.S. Patent 5,170,159 to Kawabata et al., discloses an apparatus which has an auto-sleep mode. In this mode, a C.P.U. monitors for the presence of specific electronic signals which indicate that the end of the source audio material (such as a cassette tape or CD) has been reached. When such a signal is detected, the equipment is turned off. As noted in the Kawabata patent, these signals may be in the form of the output of a photo interrupter (which generates an output when the playback of a cassette tape is complete), or an end code, such as is detected by a CD player when a CD has finished playing.

During normal daytime use of audio or audio/visual equipment (such as stereo equipment) the user might wish to play many successive tapes or CDs. In this situation, the user may not want the equipment to shut off at the end of each tape or CD. Therefore, devices such as those disclosed in the Kawabata patent are primarily useful for bedtime application, or when the user wants the unit to specifically shut off once the audio material (e.g., tape or CD) has been played. Such prior art devices also cannot be modified for use in devices such as electronic keyboards or musical instrument amplifiers.

Other prior art techniques for shutting off electronic equipment incorporate sleep timers which shut off the equipment after a pre-selected period of time. Such sleep timers, which are commonly used in television sets, require human intervention for their operation. For example, the Kawabata patent discloses a device in which a sleep key must be depressed for the auto-sleep mode to be entered. That is, a conscious decision and intervention by the user of the electronic equipment must be made to insure that the equipment will shut itself off automatically at a later time. If this human intervention does not take place, the device may remain powered on indefinitely.

In addition, and perhaps most importantly, prior art sleep timer devices cannot practically be used to prevent the user from inadvertently leaving equipment on after normal

daily use. During such normal daily use, the user would not want the device to automatically shut off after a predetermined period of time, since it is not always clear how long the equipment will be in use.

Accordingly, there remains a need in the art for a device which can automatically, and without human intervention, shut off audio, audio/visual, or electronic musical instrument equipment generating an audio output signal, after the equipment has ceased to generate an audio output signal for a period of time, indicating that a user is no longer using the equipment.

SUMMARY

The present invention meets these needs by providing a device which automatically shuts off audio, audio/visual, or electronic musical instrument equipment generating an audio signal output after a period of non-use, without prior intervention on the part of the operator of the equipment.

In such a device, the audio output level is preferably continuously monitored. If the audio output level falls below a predetermined threshold for some predetermined (and possibly user programmable) length of time, power to at least a portion of the electronic equipment is cut off. Power to the equipment may in this way be turned off, resulting in a state identical or similar to that which occurs when the normal user controlled power switch is turned off. The user can restore power by pressing a single power switch, most ideally the normal user controlled power switch.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic showing audio, audio/visual, or electronic musical instrument equipment including a preferred digital embodiment of an automatic shut off device.

Figure 2 is a schematic showing audio, audio/visual, or electronic musical instrument equipment

including a preferred alternative digital embodiment of an automatic shut off device.

Figure 3 is a schematic showing audio, audio/visual, or electronic musical instrument equipment including a preferred analog embodiment of an automatic shut off device.

DETAILED DESCRIPTION

The structure and function of the preferred embodiments can best be understood by reference to the drawings. The reader will note that the same reference numerals appear in multiple figures. Where this is the case, the numerals refer to the same or corresponding structure in those figures.

Referring now to **Figure 1**, a schematic of audio, audio/visual, or electronic musical instrument equipment **10** including automatic shut off device **11** is shown. As will be made clear by the discussion below, equipment **10** is preferably not electronic equipment that receives a continuously broadcast signal, such as a television or radio receiver. Automatic shut off device **11** preferably works with audio, audio/visual, or electronic musical instrument equipment in which an audio output signal ceases when either a) a prerecorded program (such as on a tape or CD) finishes; or b) the user ceases interaction with the equipment.

Equipment **10** includes a conventional power supply **12**, and ancillary equipment **14**. Ancillary equipment **14** includes the electronics and mechanisms (such as amplifiers, motors, optics, etc.) necessary to generate an analog or digital audio signal either from a prerecorded medium (such as a tape or CD), or from the input of a user (such as would occur with the use of a musical instrument). Ancillary equipment **14** may also include other power consuming devices (such as displays, lights, LEDs, etc.) that are normally in use when the power switch **22** of equipment **10** is turned on. Thus, the power status or state of ancillary equipment **14** (i.e., whether or not ancillary equipment **14** is on or off) is normally controlled by the user operated power switch **22**

associated with equipment **10**. Equipment **10** may also include power consuming devices (such as clocks, memories, etc.) that are always in use when equipment **10** is plugged in, regardless of whether or not the power switch is on.

Power supply **12** supplies electrical power to ancillary equipment **14** via power coupling device, or relay **16**. Relay **16** may be replaced with a semiconductor switch such as a transistor, or by any other switching device controllable by an input signal. Depending upon the desired configuration, a portion of power supply **12** may be included within ancillary equipment **14**.

Ancillary equipment **14** includes one or more outputs **18** upon which one or more audio output signals appear. Audio output **18** may be coupled directly to an external speaker **20**, or to some other piece of audio equipment such as an amplifier or mixer (not shown). The operation of relay **16** (and thus whether or not ancillary equipment **14** will receive power) is controlled by switch **22**, level detector **24**, sequential circuit **26**, and clock **28**. Power may be supplied to elements **22** through **28** in a conventional manner, such as directly from power supply **12**, or from some other source of electrical energy, such as a battery or capacitor (not shown).

Level detector **24** has an input **30** which is connected to one or more audio outputs **18** of ancillary equipment **14**. Level detector **24** preferably has two output states which are representative of the level of the audio signal detected at input **30**. For example, if the detected audio signal has a level above a predetermined threshold, a logic 1 may be generated at output **32**. If the detected audio signal has a level below a predetermined threshold, a logic 0 may be generated at output **32**. The chosen threshold level should be appropriate for the type of equipment that automatic shut off device **11** is to be used with. For example, with certain types of audio equipment, there may be a certain amount of noise which is generated at the outputs,

regardless of whether or not the audio equipment is "in use" in the conventional sense.

If ancillary equipment **14** can reproduce sound from a prerecorded program (such as from a tape or CD), ancillary equipment **14** may include certain components (such as motors, lasers, etc., not shown) that receive or draw power (or more power) when an audio signal is being generated at output **18**. Thus, such a component would generally be in a "powered on" state when an audio signal is generated at output **18**, and would generally be in a "powered off" state when no audio signal is generated at output **18**. For example, a CD player may include a motor which causes a CD to rotate when the player generates an audio signal output. CD players are typically configured such that this motor turns off after a CD has finished playing.

In equipment **10** including components which are generally powered on only when an audio signal output is being generated, level detector **24** could be coupled to a power or control input of such a component (instead of output **18**), and level detector **24** could be configured such that its two output states reflect whether or not the component it is coupled to is in a powered on or powered off state.

Sequential circuit **26** preferably receives as inputs electrical or other signals received from level detector **24**, clock **28**, and switch **22**. Clock **28** may also be incorporated in sequential circuit **26**. Depending upon the signals received from switch **22** and level detector **24**, sequential circuit **26** generates at its output **34** a voltage which is received by input **36** of relay **16**. If sequential circuit **26** is in a state which indicates that power should be supplied to ancillary equipment **14**, the signal generated at output **34** is of the type that would allow relay **16** to pass power from power supply **12** to ancillary equipment **14**. Otherwise, the voltage or signal generated at output **34** is of the type that would prevent relay **16** from passing power from power supply **12** to ancillary equipment **14**. Again, it should be understood that ancillary equipment **14** can include power consuming

devices that are normally turned on (including audio generating electronics and any associated displays, keyboards, etc.) when the power to equipment **10** is turned on.

The operational requirements of sequential circuit **26** are as follows: at any time, the user of equipment **10** should be able to either turn on or turn off equipment **10** by pressing switch **22**, which is preferably a momentary contact switch in this embodiment. If sequential circuit **26** receives an input from level detector **24** indicating that the audio signal output level of ancillary equipment **14** is below a predetermined threshold, then a timing operation is begun. This timing operation will continue until either: (a) an audio signal having a level above a predetermined threshold is detected; (b) an input is received from switch **22** indicating that power should be turned off immediately; or (c) a predetermined or programmable time-out period has elapsed. Under circumstances (b) and (c), sequential circuit **26** generates an output which will cause relay **16** to shut off power to ancillary equipment **14**.

As will be apparent to those skilled in the art, sequential circuit **26**, which may include both logical and memory elements, may be configured in any of a number of different ways to provide the proper output necessary to control relay **16**. Sequential circuit **26** may be implemented with a registered programmable array logic (PAL) device, or with any other elements which can be combined to form an appropriate sequential circuit. Again, clock **28** may be external to sequential circuit **26**, or may form a part of sequential circuit **26**.

Referring now to **Figure 2**, an alternative embodiment of automatic shut off device **11** is shown. In **Figure 2**, the functions of sequential circuit **26** and clock **28** are performed specifically by the combination of OR gate **40**, timer **42**, AND gate **44**, and memory element or flip flop **46**. Memory element **46** is preferably a positive- or negative- edge triggered DQ flip flop which can be reset or cleared if desired.

Timer 42 may be preprogrammed to measure a certain length of time. The length of time measured may also be programmable by the user of equipment 10. When reset input 48 of timer 42 receives the appropriate signal (i.e., either a logic 0 or a logic 1 signal) timer 42 is reset to zero. In the embodiment shown in Figure 2, timer 42 is reset when reset input 48 receives a logic 1 signal. Reset input 48 receives the output of OR gate 40. OR gate 40 receives as its inputs the output 32 of level detector 24, and the output 50 of switch 22. Switch 22 is preferably a momentary contact switch which generates at its output 50 a single positive going pulse when switch 22 is depressed or otherwise activated. Thus, timer 42 is reset either when switch 22 is depressed, or when level detector 24 generates a logic 1 at its output 32, indicating that the audio signal present at output 18 is above a predetermined threshold.

In a preferred embodiment, timer 42 generates at its output 52 a logic 1 when timer 42 has not yet timed out; and timer 42 generates at its output 52 a logic 0 when it has timed out, i.e., when the predetermined time has elapsed. Output 52 of timer 42 is used as an input by AND gate 44.

Memory element 46 is preferably configured as a divide-by-two counter with the inverted Q output ($\bar{Q}$) fed back into the D input. The Q output is used as an input by AND gate 44. Upon initial power up of equipment 10 (i.e., when power supply 12 first plugged in), memory element 46 may be reset so that it generates a logic 0 at its Q output. Thus, on initial power up, AND gate 44 receives from the Q output of memory element 46 a logic 0. Regardless of what logic signal timer 42 generates at its output 52, AND gate 44 generates at its output 34A a logic 0 which is received by input 36 of relay 16. Thus, as described above, relay 16 prevents power from flowing between power supply 12 and ancillary equipment 14.

At this time, if the user of equipment 10 presses or otherwise activates switch 22, the following events occur: timer 42 is reset, thus generating a logic 1 at its output

52; the Q output of memory element 46 toggles to a logic 1; AND gate 44 generates at its output 34A a logic 1, and relay 16 closes the circuit between power supply 12 and ancillary equipment 14.

If the user of equipment 10 desires to turn the equipment off, switch 22 is depressed or otherwise activated again. When this occurs, timer 42 is again reset, the Q output of memory element 46 toggles to a logic 0, and AND gate 44 generates at its output 34A a logic 0. Again, this causes relay 16 to open the circuit between power supply 12 and ancillary equipment 14, shutting off power to ancillary equipment 14. The user may turn the power on again by pressing switch 22.

If ancillary equipment 14 is in a powered on state but ceases to generate an audio signal at its output 18 (as may occur when a CD has stopped playing, or when the user stops playing a musical instrument) level detector 24 generates at its output 32 a logic 0. If switch 22 is not depressed or otherwise activated, reset input 48 of timer 42 receives a logic 0, and timer 42 begins the timing operation. If switch 22 is not depressed before the timing operation is complete, timer 42 will generate at its output 52 a logic 0 when timing is complete. Thus, AND gate 44 will generate at its output 34A a logic 0, causing relay 16 to shut off power to ancillary equipment 14, as described above. Memory element 46 may be configured such that it is cleared or reset (so that its Q output is at a logic 0) whenever timer 42 generates at its output 52 a logic 0. Again, if the user of equipment 10 wishes to restore power, all he or she needs to do is press or activate switch 22.

Referring now to **Figure** 3, a preferred analog embodiment of automatic shut off device 11 is shown.

Ancillary equipment 14 receives power from power supply 12 via relay 16, in the manner discussed above with respect to **Figures** 1 and 2.

Again, the audio outputs 18 of ancillary equipment 14 may be directly coupled to an external speaker 20, or may

be coupled to another piece of audio equipment such as an amplifier, mixer, recorder, etc.

Output **18** is coupled to an input of amplifier **62**. An output of amplifier **62** is coupled to rectifier **66**, which is in turn coupled to an input of OR gate **68**.

Switch **22** is preferably a toggle switch in this embodiment. The 'ON' contact of switch **22** is connected to switch debouncer **70**, which is in turn coupled to differentiator circuit **72**. The output of differentiator circuit **72** is fed into an input of amplifier **74**. The output of amplifier **74** is coupled to an input of monostable multivibrator (or one-shot) **76** via diode or rectifier **78**. The output of monostable multivibrator **76** is coupled to a second input of OR gate **68**.

The OFF contact of switch **22** is coupled to an input of switch debouncer **80**. The output of switch debouncer **80** is coupled to an input of differentiator **82**. Differentiator **82** generates an output signal which is used as an input by amplifier **84**. The output of amplifier **84** is coupled to an input of monostable multivibrator (or one-shot) **86**. The output of monostable multivibrator **86** controls a transistor switch **88**, which is operatively coupled to discharge the capacitor in parallel RC circuit **90**.

The output of OR gate **68** is coupled to transistor switch **92**. Transistor switch **92** is coupled to RC circuit **90**, and can rapidly charge the capacitor in RC circuit **90** to a predetermined voltage. The output voltage of RC circuit **90** is used as an input by high impedance comparator **94**. The output of comparator **94** controls transistor switch **96**. Transistor switch **96** has an output **34B** which is coupled to input **36** of relay **16**.

The operation of the circuit shown in **Figure 3** is as follows: when switch **22** in the OFF position, relay **16** is turned off and power supply **12** does not provide power to ancillary equipment **14**. When switch **22** is in the ON position, a predetermined voltage (labeled V+ here) appears at the input of switch debouncer **70** in a stepwise fashion.

Switch debouncer 70 removes any switch bounce transient signals. A clean step waveform is then fed from switch debouncer 70 into differentiator 72. Differentiator 72 produces a single short pulse, which is received by amplifier 74.

Amplifier 72 then amplifies the pulse to provide a suitable triggering pulse for monostable multivibrator 76. Rectifier 78 assures that monostable multivibrator 76 only receives triggering pulses of one polarity. Should monostable multivibrator 76 require negative trigger pulses, then rectifier 78 could be oriented in the opposite way.

Monostable multivibrator 76 produces a wide output pulse which is coupled into an input of OR gate 68. Subsequently, a pulse appears at the output of OR gate 68. This output pulse is coupled into transistor switch 92. During the time that transistor switch 92 is ON, the power supply voltage V+ appears at the input to parallel RC circuit 90, charging the capacitor in the circuit 90.

Comparator 94 senses the output voltage of RC in circuit 90, and produces a step voltage at its output, if the output voltage of RC circuit 90 is above a predetermined threshold. This step voltage activates transistor switch 96, which then turns on relay 16. The contacts of relay 16 are then closed, thereby allowing power to flow from power supply 12 to ancillary equipment 14.

When an audio signal above a predetermined level is present at output 18, this signal is amplified by amplifier 62, rectified by rectifier 66, and then presented as an input to OR gate 68. Depending upon the nature of the audio signal generated by ancillary equipment 14, OR gate 68 may generate a series of logic 1 pulses, a constant logic 1 output, or a series of logic 1 pulses of varying length. Whenever a logic 1 is generated by OR gate 68, transistor switch 92 is turned on, and the capacitor in RC circuit 90 is charged. RC circuit 90 is thereby maintained in a fully charged state, which keeps relay 16 in an ON state through the actions of comparator 94 and transistor switch 96, discussed above.

Should ancillary equipment **14** stop generating an audio output signal, OR gate **68** will generate a logic 0 output, transistor switch **92** will turn off, and RC circuit **90** will discharge. The voltage on the capacitor in RC **90** circuit will decay over a user selected, or preselected time interval until it drops below the threshold required for comparator **94** to stay ON (i.e., to generate a logic 1 output). Comparator **94** will turn OFF (i.e., generate a logic 0 output) thereby turning OFF transistor switch **96** and subsequently turning OFF relay **16**.

If the user of desires to resume operation of equipment **10**, then a cycling of switch **22** from ON to OFF back to ON again will duplicate the aforementioned sequence of events, resulting in re-activation of ancillary equipment **14**.

Ancillary equipment **14** may also be immediately turned OFF by turning switch **22** to OFF. This results in a similar sequence of signals passing through switch debouncer **80**, differentiator **82**, amplifier **84**, rectifier **85** and monostable multivibrator **86**. Transistor switch **88** momentarily grounds the capacitor in RC circuit **90**, thereby turning OFF comparator **94**, then transistor switch **96** and ultimately relay **16**.

It will be understood that certain conventional elements, well known to those skilled in the art, which are necessary to implement the disclosed embodiments (such as certain wiring, buffers, inverters, switch debouncers, etc.) have not been described in detail to avoid obscuring the invention.

The present invention has been described in terms of a preferred embodiment. The invention, however, is not limited to the embodiment depicted and described. Rather, the scope of the invention is defined by the appended claims.

WHAT IS CLAIMED IS:

1. A device for automatically shutting off audio, audio/visual, or electronic musical instrument equipment generating an audio output signal, comprising:

means for detecting the presence of the audio output signal; and

means for shutting off power to the equipment if the audio output signal has not been detected for a predetermined period of time.

2. The device of claim 1 wherein the audio output signal is an analog signal.

3. The device of claim 1 wherein the audio output signal is a digital signal.

4. A method for controlling the supply of power to audio, audio/visual, or electronic musical instrument equipment generating an output signal with a variable level, the method comprising the steps of:

detecting the audio output signal;

beginning a timing operation if the level of the audio output signal falls below a predetermined threshold; and

shutting off the equipment if the level of the output signal does not rise above a predetermined threshold for a predetermined period of time.

5. The method of claim 4 wherein the output signal is an analog audio signal.

6. The method of claim 4 wherein the output signal is a digital audio signal.

7. A device for automatically shutting off audio, audio/visual, or electronic musical instrument equipment generating an audio output signal with a variable level, comprising:

means for detecting the audio output signal;

means for beginning a timing operation if the level of the audio output signal falls below a predetermined threshold; and

means for shutting off the equipment if the level of the audio output signal does not rise above a predetermined threshold for a predetermined period of time.

8. In audio, audio/visual, or electronic musical instrument equipment including a power supply, a user-controlled power switch, and ancillary equipment whose power state is normally controlled by the power switch, the ancillary equipment generating an audio output signal, an automatic shut off device comprising:

a power coupling device coupling the power supply to the ancillary equipment, the power coupling device having a first state in which power is transmitted to the ancillary equipment, and a second state in which power is not transmitted to the ancillary equipment;

a level detector coupled to the audio output signal, the level detector generating a first output if the level of the audio output signal is above a predetermined threshold, and generating a second output if the level of the audio output signal is below a predetermined threshold; and

a sequential circuit having inputs coupled to the power switch and to the level detector;

the sequential circuit having an output which controls the state of the power coupling device;

the sequential circuit configured such that its output will cause the power coupling device to be in its first state if the user has activated the power switch to turn on the audio, audio/visual, or electronic musical instrument equipment, and if the level detector has not generated its second output for more than a predetermined period of time;

the sequential circuit also configured such that its output will cause the power coupling device to be in its

second state if the user has activated the power switch to turn off the audio, audio/visual, or electronic musical instrument equipment, or if the level detector has generated its second output for more than a predetermined period of time.

9. The automatic shut off device of claim 8 wherein the sequential circuit includes both logic and memory elements.

10. The automatic shut off device of claim 8 wherein the sequential circuit includes a timer, a flip flop, and at least one logic gate.

11. The automatic shut off device of claim 8 wherein the user controlled power switch is a momentary contact switch.

12. The automatic shut off device of claim 8 wherein the sequential circuit includes an external clock.

13. The automatic shut off device of claim 8 wherein the sequential circuit includes an internal clock.

14. The automatic shut off device of claim 8 wherein the ancillary equipment generates a digital audio output signal.

15. The automatic shut off device of claim 8 wherein the ancillary equipment generates an analog audio output signal.

16. The automatic shut off device of claim 8 wherein the power coupling device is a relay.

17. The automatic shut off device of claim 8 wherein the power coupling device is a semiconductor device.

18. The automatic shut off device of claim 8 wherein the power coupling device is a transistor.

19. In audio, audio/visual, or electronic musical instrument equipment including a power supply, a user-controlled power switch, and ancillary equipment whose power state is normally controlled by the power switch, the ancillary equipment generating an audio output signal, an automatic shut off device comprising:

a power coupling device coupling the power supply to the ancillary equipment, the power coupling device having a first state in which power is transmitted to the ancillary equipment, and a second state in which power is not transmitted to the ancillary equipment;

means, coupled to the audio output signal, for generating a first output if the level of the audio output signal is above a predetermined threshold, and for generating a second output if the level of the audio output signal is below a predetermined threshold;

an RC circuit, coupled to the means for generating, in which the capacitor is quickly charged when the means for generating generates the first output, and in which the capacitor is slowly discharged when the means for generating generates the second output;

the RC circuit having an output voltage which controls the state of the power coupling device, the power coupling device being in its first state when the output voltage of the RC circuit is above a predetermined threshold, and the power coupling device being in its second state when the voltage of the RC circuit is below a predetermined threshold; and

means for quickly discharging the capacitor in the RC circuit, the means for quickly discharging activated if the user turns off the power switch.

20. The automatic shut off device of claim 19 wherein the user controlled power switch is a toggle switch.

21. The automatic shut off device of claim 19 wherein the ancillary equipment generates an analog audio output signal.

22. The automatic shut off device of claim 19 wherein the ancillary equipment generates a digital audio output signal.

23. The automatic shut off device of claim 19 wherein the power coupling device is a relay.

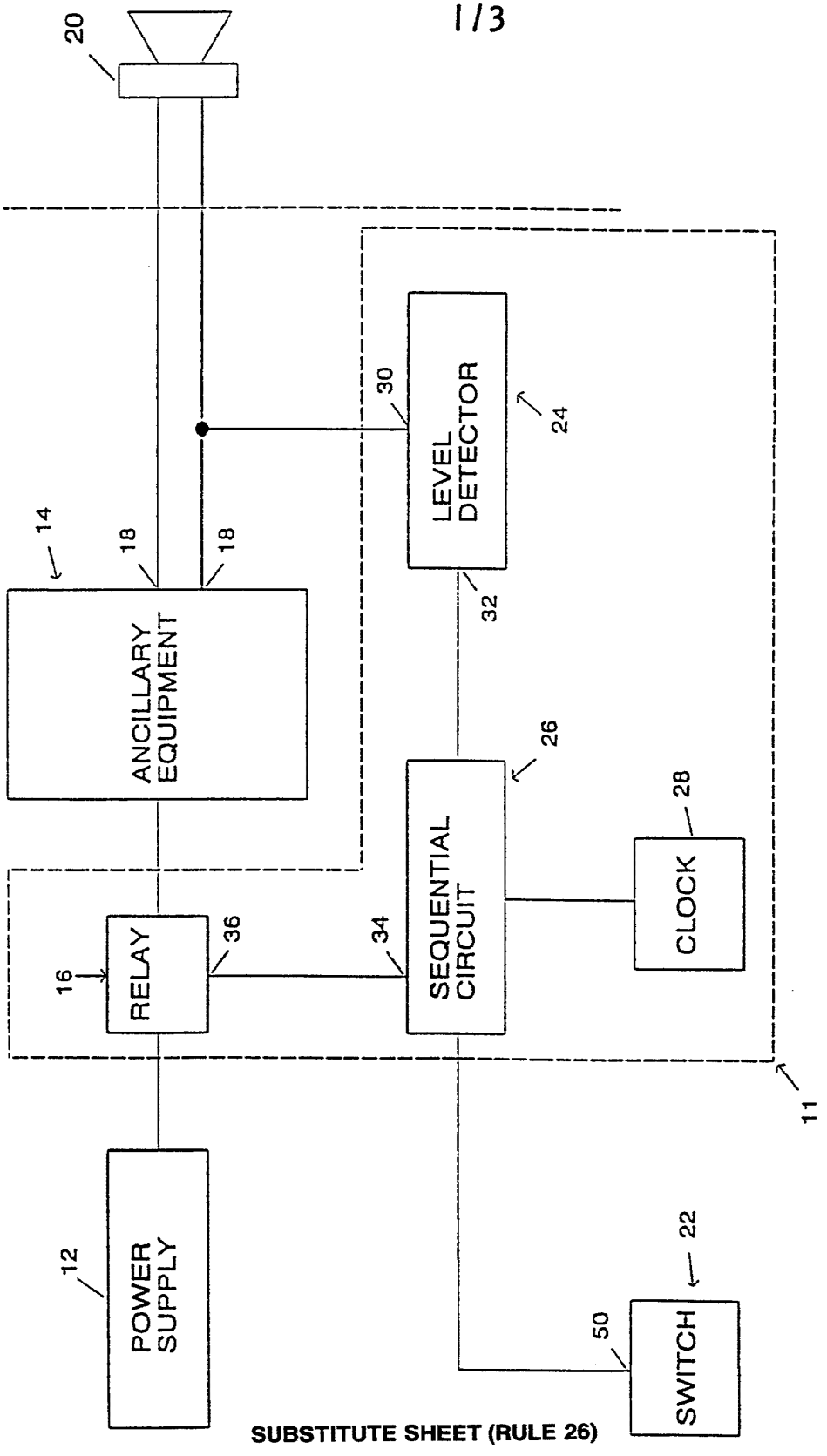
24. The automatic shut off device of claim 19 wherein the power coupling device is a semiconductor device.

25. The automatic shut off device of claim 19 wherein the power coupling device is a transistor.

26. In audio, audio/visual, or electronic musical equipment generating an audio output signal, and having a component which is generally in a powered on state when the audio output signal is being generated and which is generally in a powered off state when the audio output signal is not being generated, a device for automatically shutting off the audio or audio/visual equipment comprising:

means for detecting whether the component is in a powered on or powered off state; and

means for shutting off power to the equipment if the component is in a powered off state for a predetermined period of time.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LEVEL DETECTOR
24
30
14
18
18
ANCILLARY EQUIPMENT
32
26
28
SEQUENTIAL CIRCUIT
CLOCK
16
RELAY
36
34
11
12
POWER SUPPLY
22
50
SWITCH

FIGURE 1

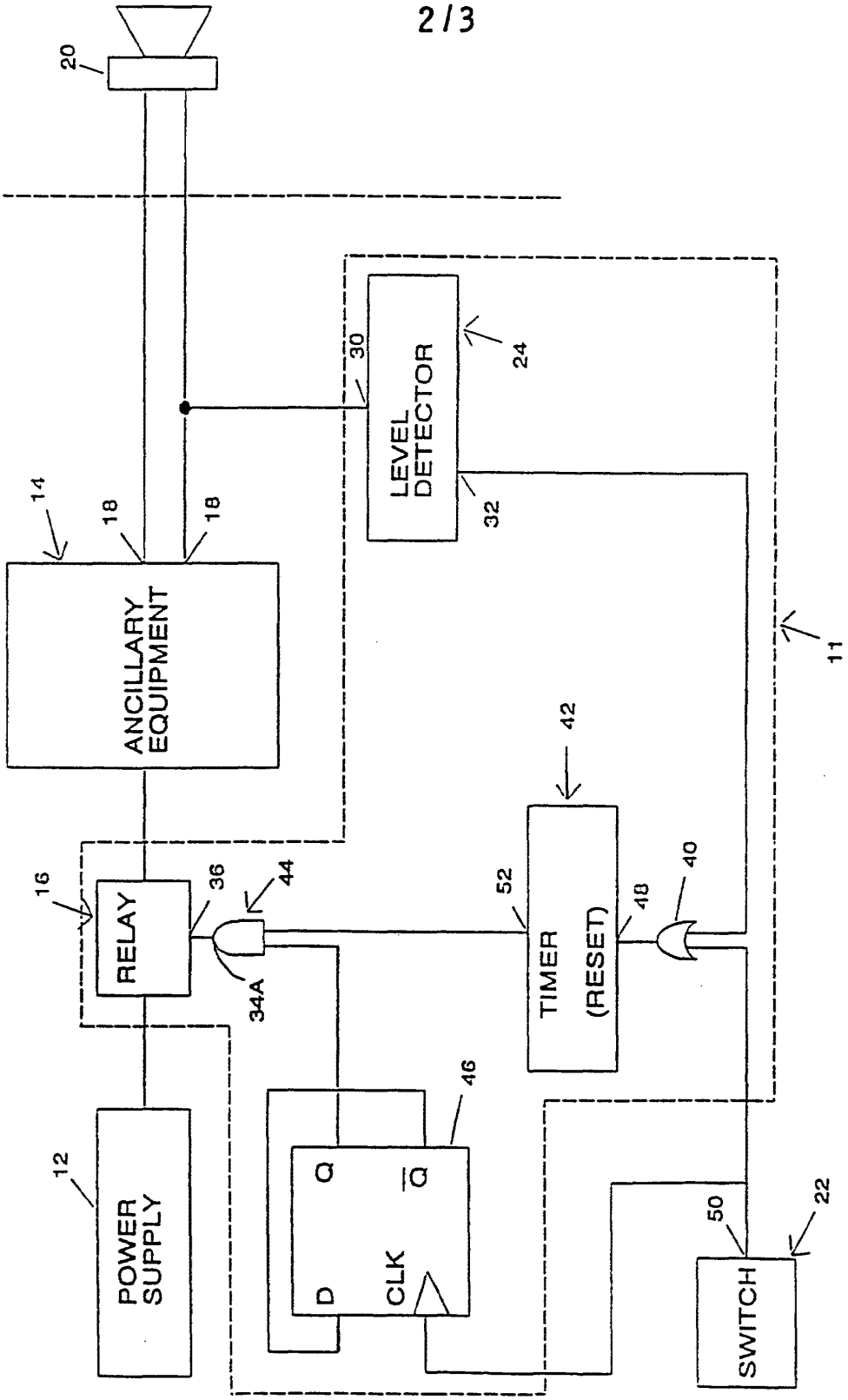
20
LEVEL DETECTOR
24
30
32
14
18
18
ANCILLARY EQUIPMENT
11
42
16
RELAY
36
44
34A
52
TIMER (RESET)
48
40
46
12
POWER SUPPLY
Q
$\overline{Q}$
D
CLK
50
22
SWITCH

FIGURE 2

3/3

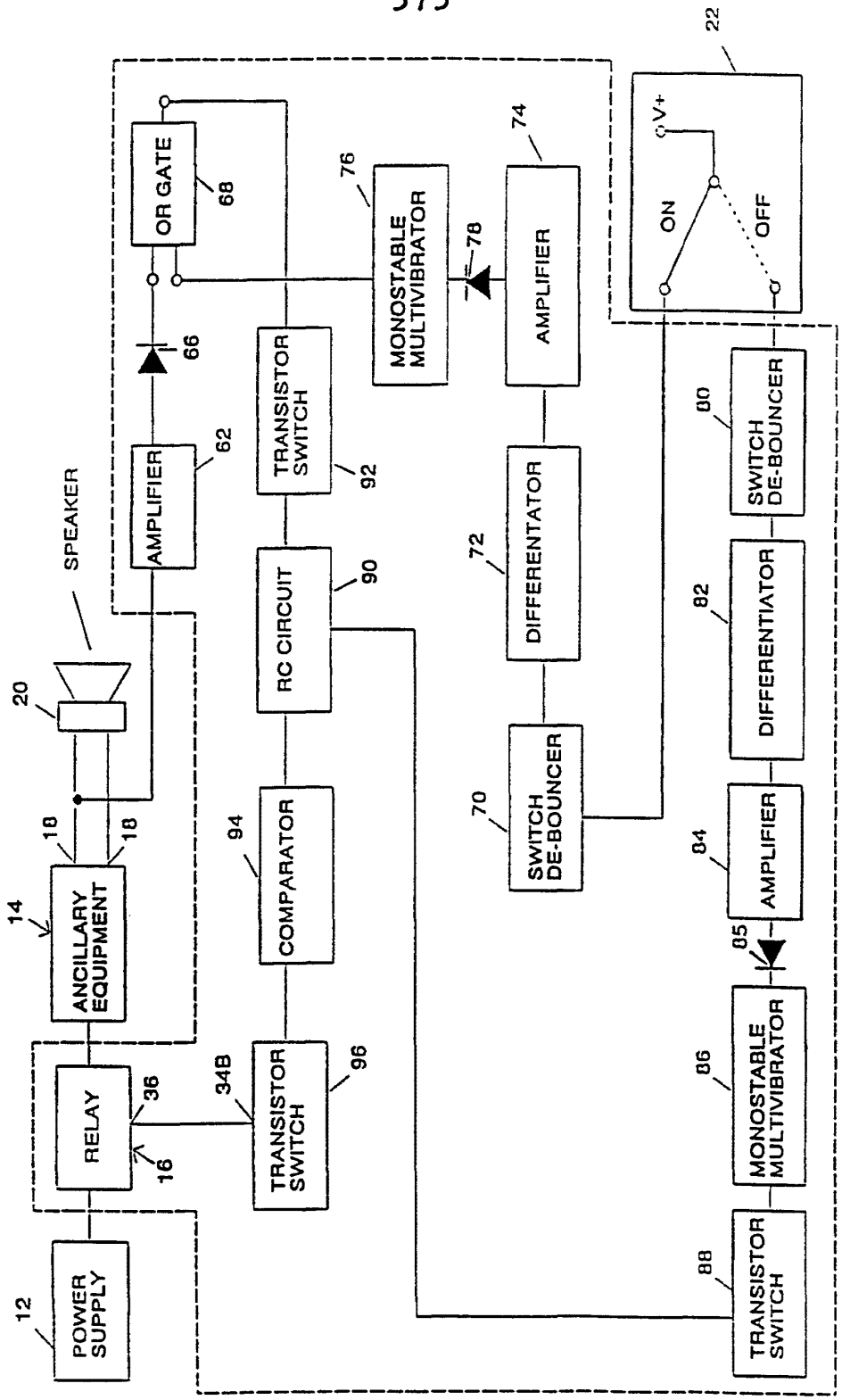
POWER SUPPLY
12
ANCILLARY EQUIPMENT
14
18
18
SPEAKER
20
RELAY
16
36
34B
TRANSISTOR SWITCH
96
COMPARATOR
94
RC CIRCUIT
90
TRANSISTOR SWITCH
92
AMPLIFIER
62
66
OR GATE
68
MONOSTABLE MULTIVIBRATOR
76
78
AMPLIFIER
74
DIFFERENTATOR
72
SWITCH DE-BOUNCER
70
TRANSISTOR SWITCH
88
MONOSTABLE MULTIVIBRATOR
86
85
AMPLIFIER
84
DIFFERENTIATOR
82
SWITCH DE-BOUNCER
80
22
V+
ON
OFF

FIGURE 3

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

135176 7590 11/05/2019

LS3 Sonos
Lee Sullivan Shea & Smith LLP
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

EXAMINER	
MADAMBA, GLENFORD J	

ART UNIT	PAPER NUMBER
2451	

NOTIFICATION DATE	DELIVERY MODE
11/05/2019	ELECTRONIC

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

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

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

ls3_docketing@cardinal-ip.com
york@ls3ip.com

PTOL-90A (Rev. 04/07)

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 16/298,515	**Applicant(s)** Millington et al.	
	Examiner CHERYL P GIBSON BAYLOR	**Art Unit** OPET	**AIA (FITF) Status** No

1. THE REQUEST FILED 28 October 2019 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 CHERYL GIBSON BAYLOR at (571)272-3213. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/CHERYL GIBSON BAYLOR/ Paralegal Specialist, OPET	

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

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NOTICE OF ALLOWANCE AND FEE(S) DUE

135176 7590 11/15/2019

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Chicago, IL 60661

EXAMINER
MADAMBA, GLENFORD J

ART UNIT	PAPER NUMBER
2451	

DATE MAILED: 11/15/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

TITLE OF INVENTION: PLAYBACK DEVICE CONNECTION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$1000.00	$0	02/18/2020

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

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

By mail, send to: Mail Stop ISSUE FEE
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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)

135176 7590 11/15/2019

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656 W. Randolph St.
Floor 5W
Chicago, IL 60661

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.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

TITLE OF INVENTION: PLAYBACK DEVICE CONNECTION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$1000.00	$0	02/18/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
MADAMBA, GLENFORD J	2451	709-222000

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. _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

135176 7590 11/15/2019

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Lee Sullivan Shea & Smith LLP
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

EXAMINER	
MADAMBA, GLENFORD J	
ART UNIT	PAPER NUMBER
2451	

DATE MAILED: 11/15/2019

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. 16/298,515	Applicant(s) Millington et al.	
	Examiner GLENFORD J MADAMBA	Art Unit 2451	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 28 October 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 1-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

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

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

   * Certified copies not received: _____ .

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

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

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

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

Attachment(s)

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

/GLENFORD J MADAMBA/
Primary Examiner, Art Unit 2451

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's claim amendments and IDS submission dated October 28, 2019 has been entered.

Allowable Subject Matter

1. 1. The numbering of original claims 1-20 is maintained. No claims have been canceled, and no new claims have been added.

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

The Office has considered Applicant's IDS references filed post-allowance on 10/28/2019, and maintains the allowability of the application as none of the references of the IDS include teachings or disclosures that fully disclose the previously allowed claims and/or necessitate withdrawal of the previous allowance of the application. No other pertinent candidate prior art has been identified to fully and reasonably disclose the claims, either individually or in combination, and the Office accordingly maintains the allowance of the claims.

The Office also notes and remarks that the application claims are re-allowed for the reasons stated previously on the Notice of Allowance dated October 24, 2019:

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".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenford Madamba whose telephone number is 571-272- 7989. The examiner can normally be reached on Monday-Friday 7:00AM-4: 30PM, first Fridays OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Parry can be reached on 571-272-8328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, .contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). 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.

/GLENFORD J MADAMBA/
Primary Examiner, Art Unit 2451

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

CPC						
Symbol					Type	Version
H04L	/	41	/	22	F	2013-01-01
H04L	/	65	/	60	I	2013-01-01
G06F	/	3	/	04842	I	2013-01-01
G06F	/	3	/	0482	I	2013-01-01
H04L	/	63	/	20	I	2013-01-01
H04L	/	67	/	02	I	2013-01-01
H04L	/	67	/	10	I	2013-01-01
H04L	/	12	/	2809	I	2013-01-01
H04L	/	41	/	0809	I	2013-01-01
H04W	/	12	/	08	I	2013-01-01
H04W	/	12	/	003	I	2019-01-01
H04W	/	12	/	04	I	2013-01-01
H04L	/	63	/	10	I	2013-01-01
H04L	/	41	/	0803	I	2013-01-01
H04L	/	12	/	2807	I	2013-01-01
H04L	/	12	/	28	I	2013-01-01
G06F	/	3	/	0481	I	2013-01-01
G06F	/	3	/	04847	I	2013-01-01
H04L	/	67	/	141	I	2013-01-01
H04L	/	12	/	2803	I	2013-01-01
H04L	/	41	/	28	A	2013-01-01
H04L	/	63	/	0823	A	2013-01-01
H04W	/	84	/	12	A	2013-01-01
H04L	/	2012	/	2841	A	2013-01-01
H04L	/	2012	/	2849	A	2013-01-01
H04L	/	63	/	065	A	2013-01-01

CPC Combination Sets						
Symbol					Type	Set	Ranking	Version
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/GLENFORD J MADAMBA/ Primary Examiner, Art Unit 2451	11 November 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.: 20191111

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	**Art Unit**
	GLENFORD J MADAMBA	2451

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H04L	/	12	/	24	

NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
709	222

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

NONE (Assistant Examiner) (Date)	**Total Claims Allowed:** 20	
/GLENFORD J MADAMBA/ Primary Examiner, Art Unit 2451 (Primary Examiner) 11 November 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office Part of Paper No.: 20191111

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	**Art Unit**
	GLENFORD J MADAMBA	2451

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

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/GLENFORD J MADAMBA/ Primary Examiner, Art Unit 2451 (Primary Examiner)	11 November 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office Part of Paper No.: 20191111

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

✓	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	05/27/2019	09/16/2019	11/11/2019						
1	1	✓	=	=						
2	2	✓	=	=						
3	3	✓	=	=						
4	4	✓	=	=						
5	5	✓	=	=						
6	6	✓	=	=						
7	7	✓	=	=						
8	8	✓	=	=						
9	9	✓	=	=						
10	10	✓	=	=						
11	11	✓	=	=						
12	12	✓	=	=						
13	13	✓	=	=						
14	14	✓	=	=						
15	15	✓	=	=						
16	16	✓	=	=						
17	17	✓	=	=						
18	18	✓	=	=						
19	19	✓	=	=						
20	20	✓	=	=						

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

CPC - Searched*		
Symbol	Date	Examiner
709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc. or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.	05/01/2019	GJM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
709	222	05/01/2019	GJM

* 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
DBs searched: USPAT, USPGPUB, USOCR, DERWENT, EPO, JPO, IBM-TDB	05/01/2019	GJM
Claim amendments / remarks received in response to non-final action issued, and amended independent claim 1 appears to be in condition for allowance. Updated search conducted, and no additional / pertinent candidate prior art found to fully / reasonably disclose the independent claims. Case is allowed.	09/16/2019	GJM
RCE with IDS filed post-allowance for consideration. The Office has considered the references listed in the IDS, but maintains the allowanbility of the claim set as there appears to be no additional reference that reasonably and/or fully discloses the currently claimed features and/or limitations. Case is re-allowed.	11/12/2019	GJM

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/298,515	Millington et al.
	Examiner	Art Unit
	GLENFORD J MADAMBA	2451

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
709/H04L41	222/28	09/16/2019	GJM

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2451
Examiner Name	MADAMBA, Glenford J.
Attorney Docket Number	05-0601-CON0319A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5642171		1997-06-24	BAUMGARTNER; Donn M. et al.	
	2	6006275		1999-12-21	PICAZO et al.	
	3	6119239		2000-09-12	FUJII; Kazuo	
	4	6122749		2000-09-19	GULICK; Dale A.	
	5	6703940		2004-03-09	ALLEN; William A. et al.	
	6	6801507		2004-10-05	HUMPLEMAN; Richard et al.	
	7	7058719		2006-06-06	MOTOYAMA; Tetsuro	
	8	7269338		2007-09-11	JANEVSKI; Angel	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	9	7313384		2007-12-25	MEENAN; Patrick et al.	
	10	7321784		2008-01-22	SERCEKI; Zeljko John et al.	
	11	8064904		2011-11-22	JAIN; Nikhil et al.	
	12	8601394		2013-12-03	SHEEHAN; Conor et al.	
	13	8688431		2014-04-01	LYONS; Kenneth S. et al.	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020161865		2002-10-31	NGUYEN; Brian G.	
	2	20050198221		2005-09-08	MANCHESTER; Scott et al.	
	3	20060161635		2006-07-20	LAMKIN; Allan B. et al.	
	4	20070220150		2007-09-20	GARG; Gopal K.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	MILLINGTON; Nicholas A.J.
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	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	5	20080109852		2008-05-08	KRETZ; Martin H. et al.			

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

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2371747	CA	A1	2001-05-25	SAMSUNG ELECTRONICS CO LTD [KR]		
	2	0237217	WO	A2	2002-05-10	SONY ELECTRONICS INC [US]		
	3	9709756	WO	A2	1997-03-13	BUCALO BRIAN D [US], et al.		

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

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Sonos, Inc. v. Implicit, LLC: Declaration of Roman Chertov in Support of the Inter Partes Review of U.S. Patent No. 7,391,791 dated March 9, 2018, 92 pages.	
	2	Sonos, Inc. v. Implicit, LLC: Declaration of Roman Chertov in Support of the Inter Partes Review of U.S. Patent No. 8,942,252 dated March 9, 2018, 81 pages.	
	3	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit A, filed October 14, 2019, 3 pages.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

	4	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit C, filed October 14, 2019, 16 pages.	
	5	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit D, filed October 14, 2019, 36 pages.	
	6	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint - Exhibit E, filed October 14, 2019, 21 pages.	
	7	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' Answer to Plaintiff's Complaint, filed October 14, 2019, 66 pages.	

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

EXAMINER SIGNATURE

Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	11/11/2019

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	MADAMBA, Glenford J.
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-10-28
Name/Print	Brandon J. Kennedy	Registration Number	67894

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

EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1985	709/220.ccls.	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:13
S2	2193	ad$1hoc adj network$1	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:13
S3	438682	(wired, wireless)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S4	1521	S2 and S3	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S5	1082	S2 same S3	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S6	8	S5 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:14
S7	29	S5 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:17
S8	6	S7 and zone	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:18
S9	262	zone adj players	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:18
S10	4904	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:18
S11	728858	(wired, wireless)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2009/01/09 12:19

			IBM_TDB			
S12	4102	S10 and S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:19
S13	2968	S10 same S11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/09 12:19
S14	8	S13 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:19
S15	8	S14 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:19
S16	29	S13 and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S17	0	S9 and S16	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S18	26	S9 and network	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2009/01/09 12:20
S20	8	(US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$).did.	USPAT; DERWENT	OR	ON	2009/01/13 13:01
S21	4909	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:26
S22	593	S21 and broadcast$3 near3 (period$6, interval$1, time)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:27
S23	122	S21 and broadcast$3 adj (period$6, interval$1, time)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2009/01/13 13:27

			IBM_TDB			
S24	0	S21 and broadcast$3 adj (period$6, interval$1, time) with expir$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:27
S25	2	S21 and broadcast$3 adj (period$6, interval$1, time) with (end$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:28
S26	7	S23 and (wep, ssid)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 13:30
S27	0	zone adj player$1 same configur$5 with mode	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:04
S28	18	zone adj player$1 same configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:04
S29	29	prob$3 near3 message and SSID and WEP	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:10
S30	4	S29 and flag same broadcast	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:10
S31	0	broadcast adj storm same flag same probe	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:12
S32	2	broadcast adj storm and flag same probe	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2009/01/13 17:13

			EPO; JPO; DERWENT; IBM_TDB			
S33	0	configuration adj mode and zone adj player	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S34	2308	configuration adj mode and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S35	528	configuration adj mode same controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:14
S36	0	S35 and "zone player"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:15
S37	0	S35 and "synchrony group"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:16
S38	266	S35 and group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/13 17:16
S39	14	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/01/14 11:26
S40	2	zone adj player and (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2009/01/14 11:28

			IBM_TDB			
S41	1909	zone and (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S42	153	zone same (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S43	51	zone with (self, auto) near2 configur$5	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/01/14 11:30
S44	447	zone adj players	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S45	5809	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S46	1	S44 and S45	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:34
S47	101	S44 and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:35
S48	79	S47 and (synchrony, group)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:36
S49	1404	zone near3 player$1	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2009/11/06 15:46

			EPO; JPO; DERWENT; IBM_TDB			
S50	2	S45 and S49	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:46
S51	12	S45 same zone with (player$1, device$1, terminal$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:47
S52	2085	controller and ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:52
S53	1707	S52 and (configur$5, synchroni$7)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:53
S54	57	S53 and (synchroniz$7) near5 operation$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:54
S55	14	S54 and (broadcast$3) with (packet, data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 15:55
S56	2	"20080267218"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/11/06 16:19
S57	22	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$).did. or (US-7469139-$ or US-	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:16

		7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$).did.				
S58	2	"6349352".pn.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:17
S59	23	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:19
S60	15	S59 and synchron$7	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:20
S61	2	"20090259762"	US-PGPUB; USPAT; DERWENT	OR	ON	2009/11/25 15:40
S62	51442	(zone, media) near3 player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S63	20532	S62 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S64	514	S63 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:08
S65	218	S64 and playback	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:09
S66	24	S65 and join$3 near3 network	US-PGPUB; USPAT; USOCR;	OR	ON	2011/03/03 18:09

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S67	1599	zone near3 player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S68	473	S67 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S69	6	S68 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:15
S70	496	zone adj player$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S71	1	S70 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S72	145	S70 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:16
S73	0	S72 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:17
S74	71	S72 and network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:17
S75	151	(audio, media) adj player$1 with	US-PGPUB;	OR	ON	2011/03/03

		zone$2	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			18:22
S76	93	S75 and controller	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:22
S77	0	S76 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:22
S78	0	S75 and ad$1hoc	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:23
S79	0	S76 and IP near2 broadcast	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:24
S80	0	S76 and datagrams near2 prob$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/03 18:24
S81	22189	secure near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:21
S82	10665	(unsecure, ad$1hoc) near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S83	978	S81 and S82	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S84	0	S83 and zone near2 player$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:22
S85	509	zone adj players	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:22

S86	0	S85 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S87	8495	ad$1hoc adj network$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S88	1	S85 and S87	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:23
S89	9	S85 and (secure, private) near2 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:25
S90	473	zone adj player$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:27
S91	94	S90 and (secure, ad$1hoc)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S92	37	S91 and network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S93	8	S92 and join$3	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:28
S94	29	S92 not S93	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:30
S95	0	S90 and "wep key"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S96	0	S90 and "wired equivalent privacy"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S97	2098	media near2 player with (zones, area)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:31
S98	3	S97 and "wired equivalent privacy"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:32
S99	45961	Home near2 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S100	374	S99 and ("wired equivalent privacy",	US-PGPUB;	OR	ON	2011/10/11

		HHID)	USPAT; DERWENT			12:33
S101	374	S99 and ("wired equivalent privacy")	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S102	0	S101 and HHID	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:33
S103	0	S99 and HHID	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S104	67	S101 and join$3 near5 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S105	61	S101 and join$3 near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:34
S106	27	S81 and S105	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:35
S107	39	S105 and (secure, private) near2 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 12:35
S108	14	S82 and S107	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:35
S109	4	S108 and (media, playback, zone) near2 (device, terminal, apparatus)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:42
S110	31	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 12:48
S111	358248	(media, playback, zone) near2 (device, terminal, apparatus, player)	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:20
S112	10969	S111 and home near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:20

S113	1507	S112 and zone$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:21
S114	34	S113 and WEP	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:21
S115	2	"20100245582"	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:31
S116	743	wep and home near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:34
S117	98	S116 and zone$1	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:34
S118	10	S117 and join$4 near3 network	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/11 13:35
S119	0	S85 and WEp	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:37
S120	665	home near2 network and WEP	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S121	357	S120 and (audio, music)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S122	76	S121 and (connect44, join$4) near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/11 13:38
S123	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:40

		or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.				
S124	30	S123 and wired and wireless	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:40
S125	9	S123 and "network interface" same wired same wireless	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/13 15:43
S126	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	ON	2011/10/22 21:43
S127	16	S126 and configuration near3 (setting$1, information)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/22 21:44
S128	393	wep and request with configuration	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/23 00:47

S129	78	S128 and join$3 with network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/10/23 00:47
S130	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	OFF	2012/06/12 14:09
S131	21	S130 and button	US-PGPUB; USPAT; DERWENT	OR	OFF	2012/06/12 14:11
S132	5224	709/231.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:22
S133	4802	370/254.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:22
S134	0	S132 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S135	17	S133 and SSID and WEP	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S136	2189	"L5" and (wired, wireless)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2012/07/15 11:24
S147	77	(US-20060142034-$ or US-	US-PGPUB;	OR	OFF	2019/05/03

		20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	USPAT; DERWENT			17:04
S148	77	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or US-7792311-$).did.	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:49
S150	19	S148 and wlan	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:50
S151	7	S148 and wlan with secure	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 17:50
S152	45	S148 and configuration	US-PGPUB; USPAT;	OR	OFF	2019/05/15 18:34

			DERWENT			
S153	1737	zone near2 players	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S154	875	S153 and audio	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S155	19	S154 and wlan	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:20
S156	531	networked with audio near3 system	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:22
S157	71	S156 and synchronized near3 playback	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:22
S158	39	S157 and (@ad<"20150604" or @rlad<"20050604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:23
S159	4	S157 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:24
S160	793	(media, zone) near2 players and synchronized with playback	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S161	72	S156 and S160	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S162	1	S161 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:26
S163	4974	(media, zone, audio) near2 players with (group$1, zone$1)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:27
S164	250	S163 and wlan	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 19:28
S165	27	S164 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:28
S166	310	S154 and grouping	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/15 19:31
S167	35	S166 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO;	OR	ON	2019/05/15 19:31

			DERWENT			
S168	257	(media, audio) adj player near2 (zone$1, group$1, grouping$1)	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:36
S169	505	(media, audio) adj player with player near2 (zone$1, group$1, grouping$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/15 19:36
S170	52	S169 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:37
S171	874	networked same audio near3 system	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:39
S172	265	S171 and (@ad<"20040604" or @rlad<"20040604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S173	419	S156 and (@ad<"20150604" or @rlad<"20050604")	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S174	105	S173 and group$4 with player$1	USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/05/15 19:40
S175	1	"20040168081"	US-PGPUB	OR	ON	2019/05/20 16:00
S176	43	(US-20060142034-$ or US-20050170781-$ or US-20070038999-$ or US-20070022156-$ or US-20040103282-$ or US-20060280131-$ or US-20050283779-$ or US-20070022207-$ or US-20060205510-$ or US-20060075439-$ or US-20050058149-$ or US-20040022221-$ or US-20060287099-$ or US-20020124097-$ or US-20070168553-$ or US-20060224885-$ or US-20060221858-$ or US-20020176366-$ or US-20070264973-$ or US-20070233860-$ or US-20070106898-$ or US-20070061575-$ or US-20070050615-$ or US-20060251258-$ or US-20060045267-$ or US-20050266826-$).did. or (US-20040168081-$ or US-20040133689-$).did. or (US-7469139-$ or US-7434166-$ or US-7433324-$ or US-7263070-$ or US-7218930-$ or US-7571014-$ or US-6349352-$ or US-7792311-$ or US-7805682-$ or US-7546357-$).did. or (US-20070022207-$ or US-20070022156-$ or WO-2005013047-$ or US-20070214229-$ or	US-PGPUB; USPAT; DERWENT	OR	OFF	2019/05/20 17:37

		US-7792311-$).did.				
S177	3	S176 and audio near2 (network, system) and playback near3 (device, terminal, ue)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/05/20 17:38
S178	2	"20020124097"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/05/20 17:39
S179	475824	709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc. or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S180	629	S179 and ssid and wep near2 (key, password)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S181	236	S180 and wlan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:20
S182	51	S181 and join$3 near3 network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:21
S183	51	S182 and access near2 point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/26 18:21
S184	450103	709/222.ccls. or H04L41/22.cpc. or G06F3/0481.cpc. or G06F3/0482.cpc. or G06F3/04842.cpc. or G06F3/04847.cpc. or H04L12/28.cpc. or H04L12/2803.cpc. or H04L12/2807.cpc. or H04L12/2809.cpc. or H04L41/0809.cpc. or H04L63/10.cpc. or H04L65/60.cpc. or H04L67/02.cpc. or H04L67/10.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 13:59

		or H04L67/141.cpc. or H04W12/04.cpc. or H04W12/08.cpc.				
S185	75	S184 and ssid and wep and (join$3, access$3) near3 secure near network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 14:03
S186	38	S185 and wlan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 14:05
S187	242	((("MILLINGTON") near3 ("Nicholas")) OR (("HAINSWORTH") near3 ("Paul"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2019/09/16 14:06
S188	3	S187 and ssid and wep and (join$3, access$3) near3 secure near network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/09/16 14:06
S193	18	("20020161865" | "20050198221" | "20060161635" | "20070220150" | "20080109852" | "5642171" | "6006275" | "6119239" | "6122749" | "6703940" | "6801507" | "7058719" | "7269338" | "7313384" | "7321784" | "8064904" | "8601394" | "8688431").PN.	US-PGPUB; USPAT	OR	ON	2019/11/10 19:30
S194	4	S193 and access adj point and (mobile, controller)	US-PGPUB; USPAT	OR	ON	2019/11/10 19:50

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	9128	709/220.ccls.	US-PGPUB; USPAT	OR	OFF	2019/11/11 23:58
L2	4916	L1 and (wired, wireless)	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
L3	90	L2 and ssid and wep	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
L4	14	L3 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
L5	1765	H04L41/28$2.cpc.	US-PGPUB; USPAT	OR	OFF	2019/11/11 23:58
L6	39	L5 and ssid and wep	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
L7	14	L6 and wlan	US-PGPUB; USPAT	OR	OFF	2019/11/11 23:58
L8	14	L7 and (join$3, access$3) near3	US-PGPUB;	OR	ON	2019/11/11

		network	USPAT			23:58
L9	1092542	@ad >="20040606" and @ad<="20060606"	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
L10	1287	L1 and L9	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
L11	19	L10 and ssid and wep	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
L12	2	L11 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2019/11/11 23:58
S137	6339	709/220.ccls.	US-PGPUB; USPAT	OR	OFF	2012/07/15 11:24
S138	3105	S137 and (wired, wireless)	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S139	58	S138 and ssid and wep	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S140	4	S139 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2012/07/15 11:25
S143	1080521	@ad >="20040606" and @ad<="20060606"	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S144	1141	S137 and S143	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S145	17	S144 and ssid and wep	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S146	1	S145 and (zone, media) near2 player	US-PGPUB; USPAT	OR	ON	2012/07/15 11:29
S189	1691	H04L41/28$2.cpc.	US-PGPUB; USPAT	OR	OFF	2019/09/16 14:07
S190	38	S189 and ssid and wep	US-PGPUB; USPAT	OR	ON	2019/09/16 14:08
S191	13	S190 and wlan	US-PGPUB; USPAT	OR	OFF	2019/09/16 14:08
S192	13	S191 and (join$3, access$3) near3 network	US-PGPUB; USPAT	OR	ON	2019/09/16 14:09

11/12/2019 12:04:16 AM
C:\Users\gmadamba\Documents\EAST\Workspaces\16298515_2019-05-02_CON of 15091113.wsp

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

PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

	1	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' First Amended Answer and Counterclaims to Plaintiff's Complaint, filed November 14, 2019, 66 pages.	

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-11-18
Name/Print	Brandon J. Kennedy	Registration Number	67,894

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

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

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

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

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

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

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

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

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

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

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

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

Electronic Patent Application Fee Transmittal	
Application Number:	16298515
Filing Date:	11-Mar-2019
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Filer:	Brandon Jacob Kennedy/Jaden Knosher
Attorney Docket Number:	05-0601-CON0319A
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	37781766
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	18-NOV-2019
Filing Date:	11-MAR-2019
Time Stamp:	17:41:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$240
RAM confirmation Number	E2019AHH42225011
Deposit Account	506632
Authorized User	Brandon Kennedy
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	Information Disclosure Statement (IDS) Form (SB08)	05-0601-CON0319A_0_IDS_20191118151657.pdf	1053244 eed4da93bfe3f54c4968263b4b2196f06691317b	no	4
Warnings:					
Information:					
2	Non Patent Literature	Bluesound_First_Amended_Answer.pdf	1317454 9ebf190de9e7198eb282fa710e55437a5f286ffb	no	66
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30446 d1fdb1a87ca10190b427e2a942bbc527daba8a7d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2401144		

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.

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
16298515	11-Mar-2019	Nicholas Millington	05-0601-CON0319A	7686

OPAP NOV 19 2019 PATENT & TRADEMARK OFFICE

TITLE OF INVENTION :

PLAYBACK DEVICE CONNECTION

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Regular Undiscounted	Utility under 35 USC 111(a)	2451	222000	GLENFORD MADAMBA

Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
$1000	$0	$1000	18-Feb-2020	$1000

1.Change of Correspondence Address and/or Indication Of Fee Address (37 CFR 1.33 & 1.363)

Current Correspondence Address:	Current Indicated Fee Address :
135176 LS3 Sonos Lee Sullivan Shea & Smith LLP 656 W. Randolph St. Floor 5W Chicago IL 60661 UNITED STATES 312-754-9602 ls3_docketing@cardinal-ip.com	LS3 Sonos Lee Sullivan Shea & Smith LLP 656 W. Randolph St. Floor 5W Chicago IL 60661 UNITED STATES 312-754-9602 ls3_docketing@cardinal-ip.com
☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☐ Fee Address indication requested, system generated SB/47-EFS form attached

2.Entity Status

Change in Entity Status

○ Applicant certifying micro entity status; system generated Micro Entity certification form attached. See 37 CFR 1.29.
Note: Absent a valid certification of micro entity status, issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment. If this box is checked, you will be prompted to choose a micro entity status on the gross income basis (37 CFR 1.29(a)) or the institution of higher education basis (37 CFR 1.29(d)), and make the applicable certification online.

○ Applicant asserting small entity status. See 37 CFR 1.27.
Note: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

◉ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

Document Description: Issue Fee Payment (PTO-85B)

3.The Following Fee(s) Are Submitted:

☐ Issue Fee	☒ I authorize USPTO to apply my previously paid issue fee to the current fees due
☐ Publication Fee	☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____
☐ Advance Order - # of copies _____	☒ If **in addition to** the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency or credit any overpayment, to Deposit Account Number 506632. The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

1.

2.

3.

5.Assignee Name(s) and Residence Data To Be Printed

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

Name	City	State	Country	Category
Sonos, Inc.	Santa Barbara	CALIFORNIA	united states	corporation

6.Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/Brandon J. Kennedy/	**Date**	11-18-2019
Name	Brandon Jacob Kennedy	**Registration Number**	67894

WEB IFEE 1.0

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 05-0601-CON0319A)

In re Application of:		)	
		)	Confirmation No.: 7686
Sonos, Inc.		)	
		)	Group Art Unit: 2451
Serial No.:	16/298,515	)	
		)	Examiner: Madamba, Glenford J.
Filed:	March 11, 2019	)	
		)	
Title:	PLAYBACK DEVICE CONNECTION	)	

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

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Applicant thanks Examiner Madamba for the thorough examination and for recognizing the allowability of the subject matter of the claims.

Applicant respectfully submits that the Reasons for Allowance may not take into account the entirety of the Applicant's claimed invention as reflected in the claims, the specification, and the prosecution history of the application. Applicant believes that the claims, specification, and prosecution history in their entirety provide an adequate basis for allowability of the claims.

The Applicant also notes that there are additional reasons that one or more of the claims are allowable that have not been specifically included in the Reasons for Allowance. The Applicant respectfully submits that, notwithstanding the Reasons for Allowance, it is believed that each of the allowed claims is patentable in its own right, for other reasons raised during prosecution and/or explained in the Specification of the present application.

For example, while the Reasons for Allowance focus on certain aspects of the independent claims, there are many aspects of the independent claims that distinguish the allowed claims from the cited art of record. All of these distinctions, made apparent in the prosecution history of the present application, should be considered when evaluating the allowability of the claims.

To the extent that specific parts of the Examiner's Statement of Reasons for Allowance or other statements in the Notice of Allowance may pertain to features appearing in some but not all claims, Applicant respectfully submits that the Examiner has thoroughly examined the claims, recognized the features appearing or not appearing in each of the claims, and properly found each of the claims to be allowable. To the extent that the Examiner has paraphrased claim features, Applicant respectfully submits that the claims have been construed in view of their language in light of the specification and not limited by any of the Examiner's statements or by the recitation therein of any specific claim features.

Respectfully submitted,

Date: November 18, 2019 By: /Brandon J. Kennedy/
Brandon J. Kennedy
Registration No. 67,894

Doc Code: IFEE PTOL/85B-EFS

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
16298515	11-Mar-2019	Nicholas Millington	05-0601-CON0319A	7686

TITLE OF INVENTION :

PLAYBACK DEVICE CONNECTION

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Regular Undiscounted	Utility under 35 USC 111(a)	2451	222000	GLENFORD MADAMBA

Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
$1000	$0	$1000	18-Feb-2020	$1000

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☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☐ Fee Address indication requested, system generated SB/47-EFS form attached

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Note: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

◉ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

WEB IFEE 1.0

3.The Following Fee(s) Are Submitted:

☐ Issue Fee	☒ I authorize USPTO to apply my previously paid issue fee to the current fees due
☐ Publication Fee	☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____
☐ Advance Order - # of copies _____	☒ If **in addition to** the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency, or credit any overpayment, to Deposit Account Number 506632 . The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

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

Name	City	State	Country	Category
Sonos, Inc.	Santa Barbara	CALIFORNIA	united states	corporation

6.Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/Brandon J. Kennedy/	**Date**	11-18-2019
Name	Brandon Jacob Kennedy	**Registration Number**	67894

Electronic Acknowledgement Receipt	
EFS ID:	37778615
Application Number:	16298515
International Application Number:	
Confirmation Number:	7686
Title of Invention:	PLAYBACK DEVICE CONNECTION
First Named Inventor/Applicant Name:	Nicholas A.J. Millington
Customer Number:	135176
Filer:	Brandon Jacob Kennedy
Filer Authorized By:	
Attorney Docket Number:	05-0601-CON0319A
Receipt Date:	18-NOV-2019
Filing Date:	11-MAR-2019
Time Stamp:	17:45:01
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	Amendment after Notice of Allowance (Rule 312)	05-0601-CON0319A_Comments_on_Statement.pdf	67402 c45c48f66f08e075c3375743c1702394efaaa3f1	no	2

Warnings:

Information:					
2	Issue Fee Payment (PTO-85B)	Web85b.pdf	46138 f0f20f6da592f35e09258744fdde25aa8d35ef92	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	113540	

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
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United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C46472

Sale Accounting Date:11/19/2019

Sale Item Reference Number	Effective Date
16298515	11/18/2019

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I2019AIA44080665	1501	UTILITY APPL ISSUE FEE	$1,000.00	Salea

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/298,515	03/11/2019	Nicholas A.J. Millington	05-0601-CON0319A	7686

135176 7590 12/05/2019

LS3 Sonos
Lee Sullivan Shea & Smith LLP
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

EXAMINER	
MADAMBA, GLENFORD J	

ART UNIT	PAPER NUMBER
2451	

NOTIFICATION DATE	DELIVERY MODE
12/05/2019	ELECTRONIC

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

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

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

ls3_docketing@cardinal-ip.com
york@ls3ip.com

PTOL-90A (Rev. 04/07)

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
16/298,515	03/11/2019	Millington et al.	05-0601-CON0319A

		EXAMINER	
LS3 Sonos Lee Sullivan Shea & Smith LLP 656 W. Randolph St. Floor 5W Chicago, IL 60661		GLENFORD J MADAMBA	
		ART UNIT	PAPER
		2451	20191202

DATE MAILED: _____

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

Commissioner for Patents

This communication is being sent out to indicate that the reference(s) included in IDS filed /dated November 18, 2019 has / have been considered and/or initialed by the Office.

/GLENFORD J MADAMBA/
Primary Examiner, Art Unit 2451

PTO-90C (Rev.04-03)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16298515
Filing Date	2019-03-11
First Named Inventor	MILLINGTON; Nicholas A.J.
Art Unit	2451
Examiner Name	Glenford J. Madamba
Attorney Docket Number	05-0601-CON0319A

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	None				

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

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	None						

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

NON-PATENT LITERATURE DOCUMENTS Remove

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

EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

	1	Sonos, Inc. v. Lenbrook Industries Limited et al., Defendants' First Amended Answer and Counterclaims to Plaintiff's Complaint, filed November 14, 2019, 66 pages.	

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

EXAMINER SIGNATURE

Examiner Signature	/GLENFORD J MADAMBA/	Date Considered	12/02/2019

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	16298515
	Filing Date	2019-03-11
	First Named Inventor	MILLINGTON; Nicholas A.J.
	Art Unit	2451
	Examiner Name	Glenford J. Madamba
	Attorney Docket Number	05-0601-CON0319A

CERTIFICATION STATEMENT

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

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Brandon J. Kennedy/	Date (YYYY-MM-DD)	2019-11-18
Name/Print	Brandon J. Kennedy	Registration Number	67,894

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /G.J.M/

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

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

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

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/298,515	01/21/2020	10541883	05-0601-CON0319A	7686

135176 7590 01/01/2020

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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):

SONOS, INC., Santa Barbara, CA;
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Paul V. Hainsworth, Foxboro, MA;

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IR103 (Rev. 10/09)