COMPOSITE EXHIBIT A

Index

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Estes

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(54) DIGITAL MEDIA REPRODUCTION AND LICENSING

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G06F 21/00 (2013.01)
G06F 21/10 (2013.01)
G06Q 30/02 (2012.01)

(52) **U.S. Cl.**
CPC *G06F 21/10* (2013.01); *G06Q 30/02* (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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Assistant Examiner — Richard A McCoy
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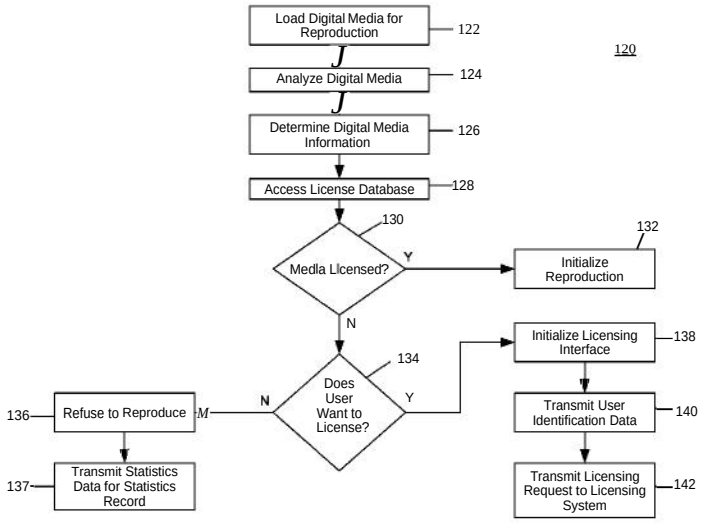
(57) **ABSTRACT**

Systems and methods for monetizing the reproduction of digital media content for the rights-holders of the digital media content. Embodiments of the present disclosure relate to determining whether a user of a media content item has a license to reproduce the media content item. In one embodiment, the media content item may be reproduced when the user is licensed. The user is prompted to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item when the user is not licensed. Further embodiments determine whether a user may receive a license when the user wishes to acquire a license. In an embodiment, the user is declined a license when not approved for the license.

32 Claims, 7 Drawing Sheets



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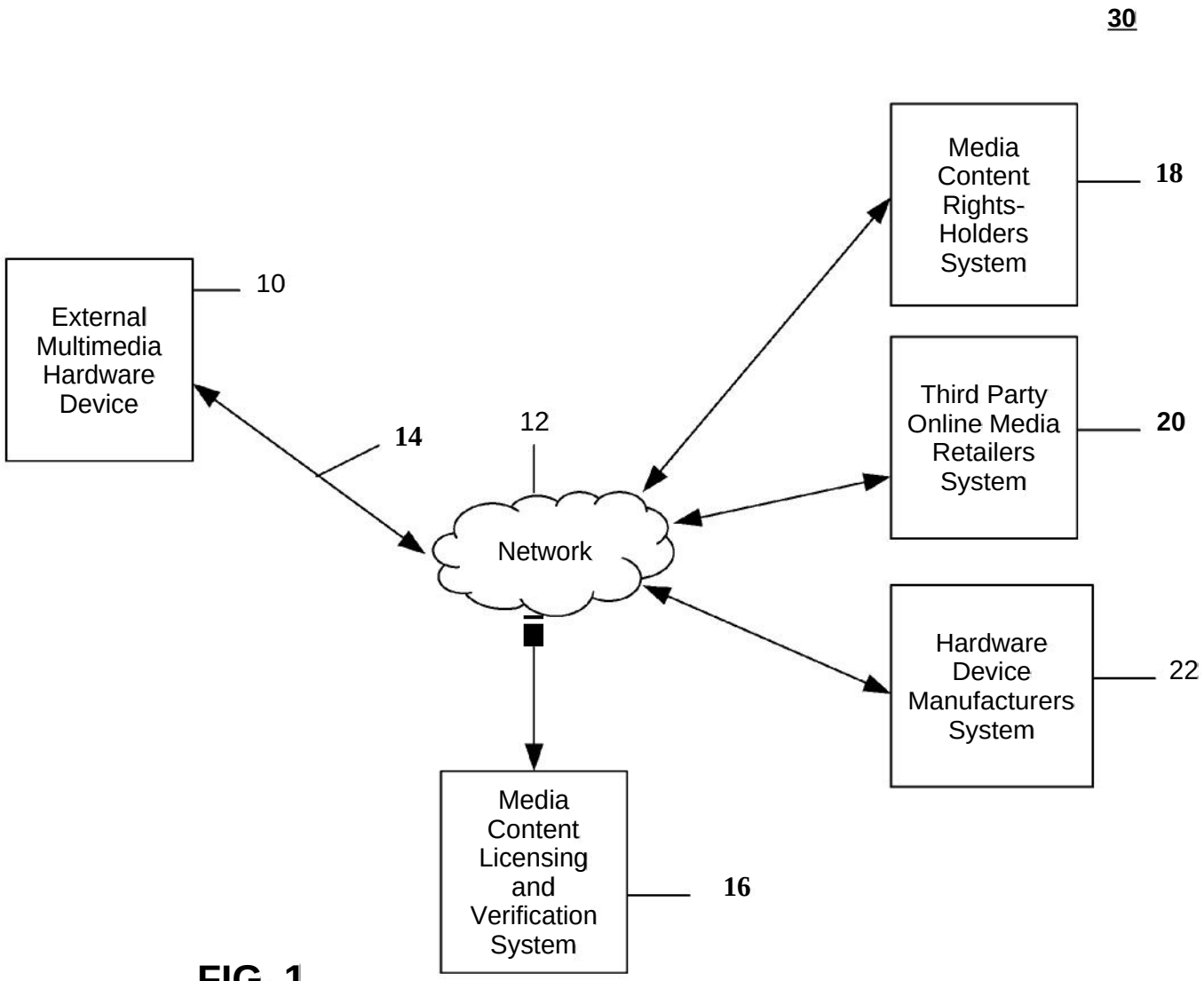

FIG. 1

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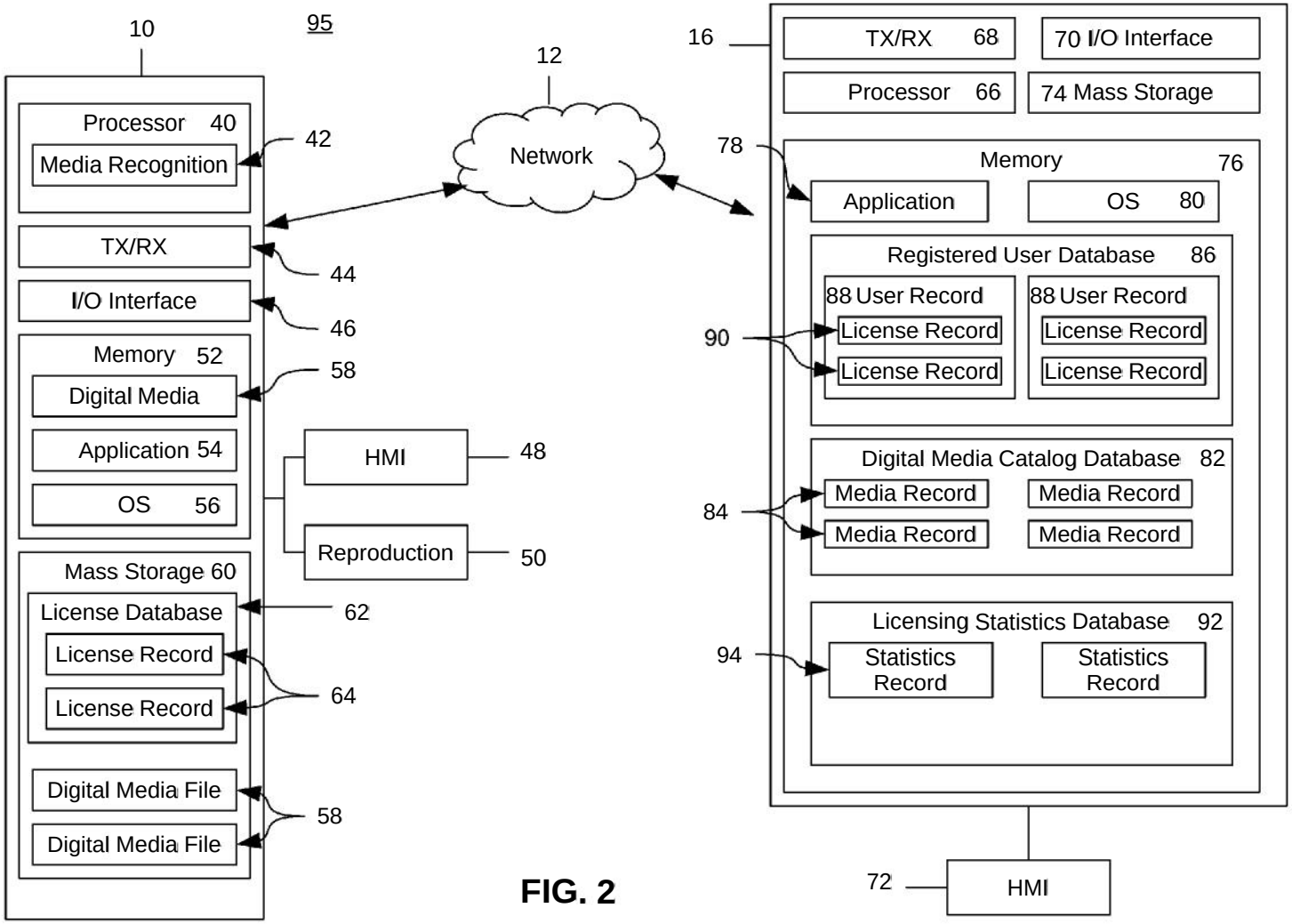

FIG. 2

100

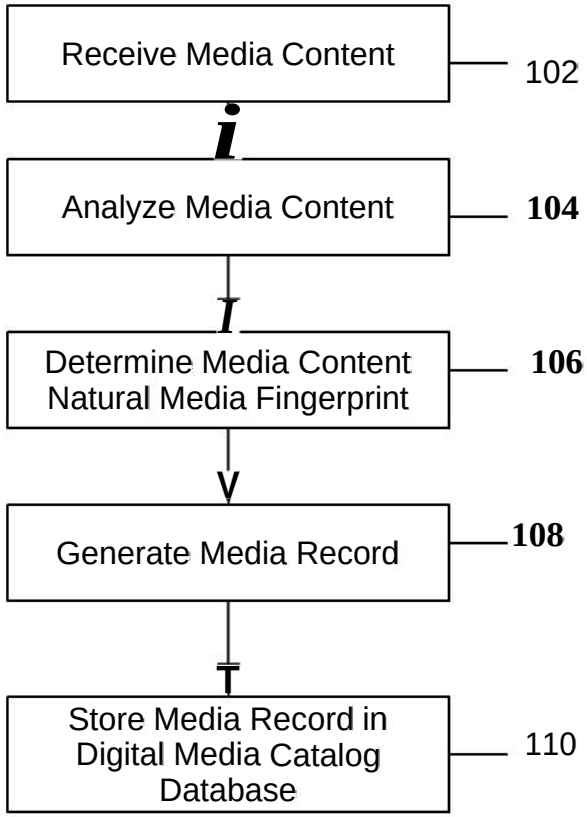
Receive Media Content
102
Analyze Media Content
104
Determine Media Content Natural Media Fingerprint
106
Generate Media Record
108
Store Media Record in Digital Media Catalog Database
110

FIG. 3

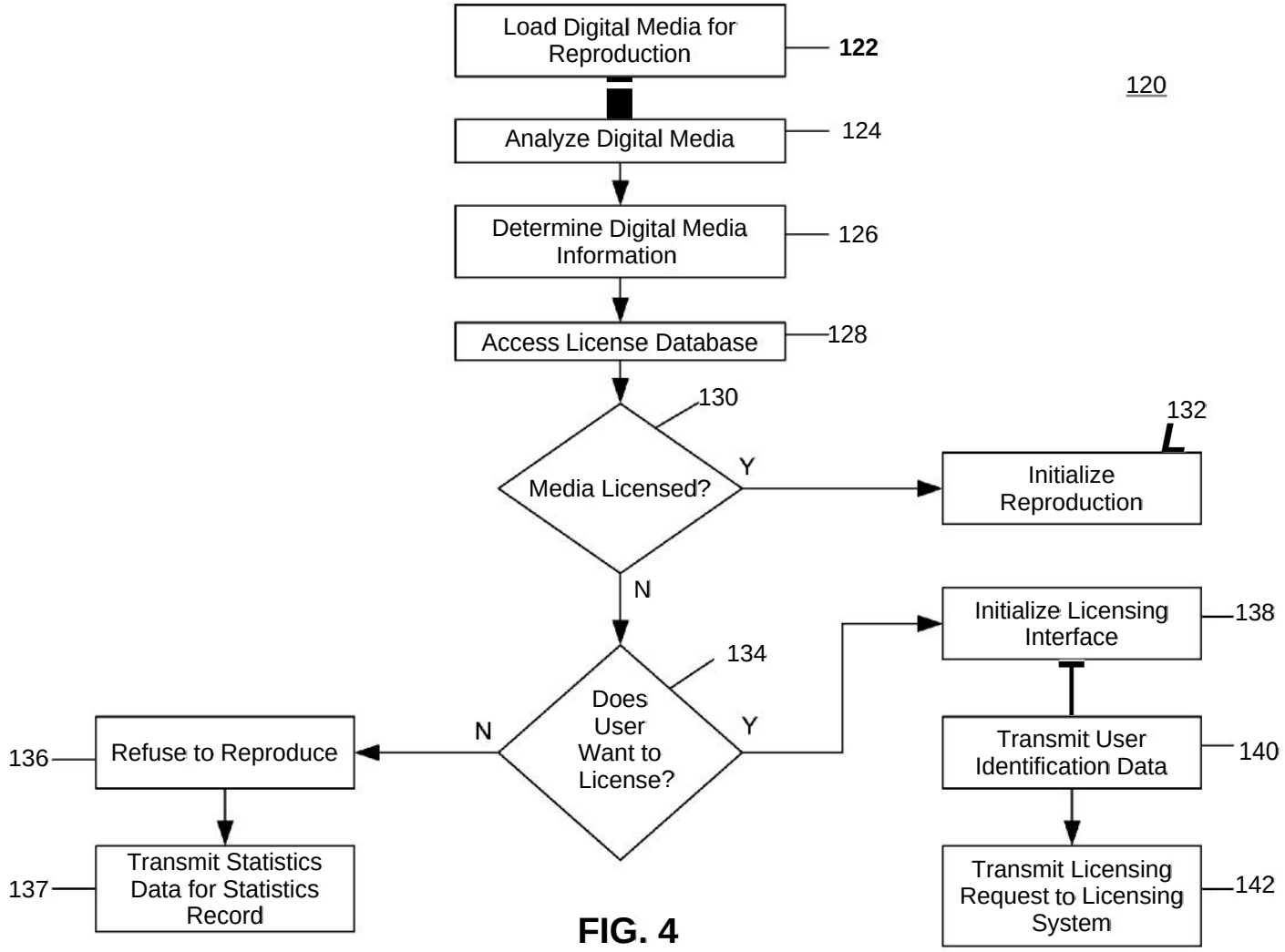

FIG. 4

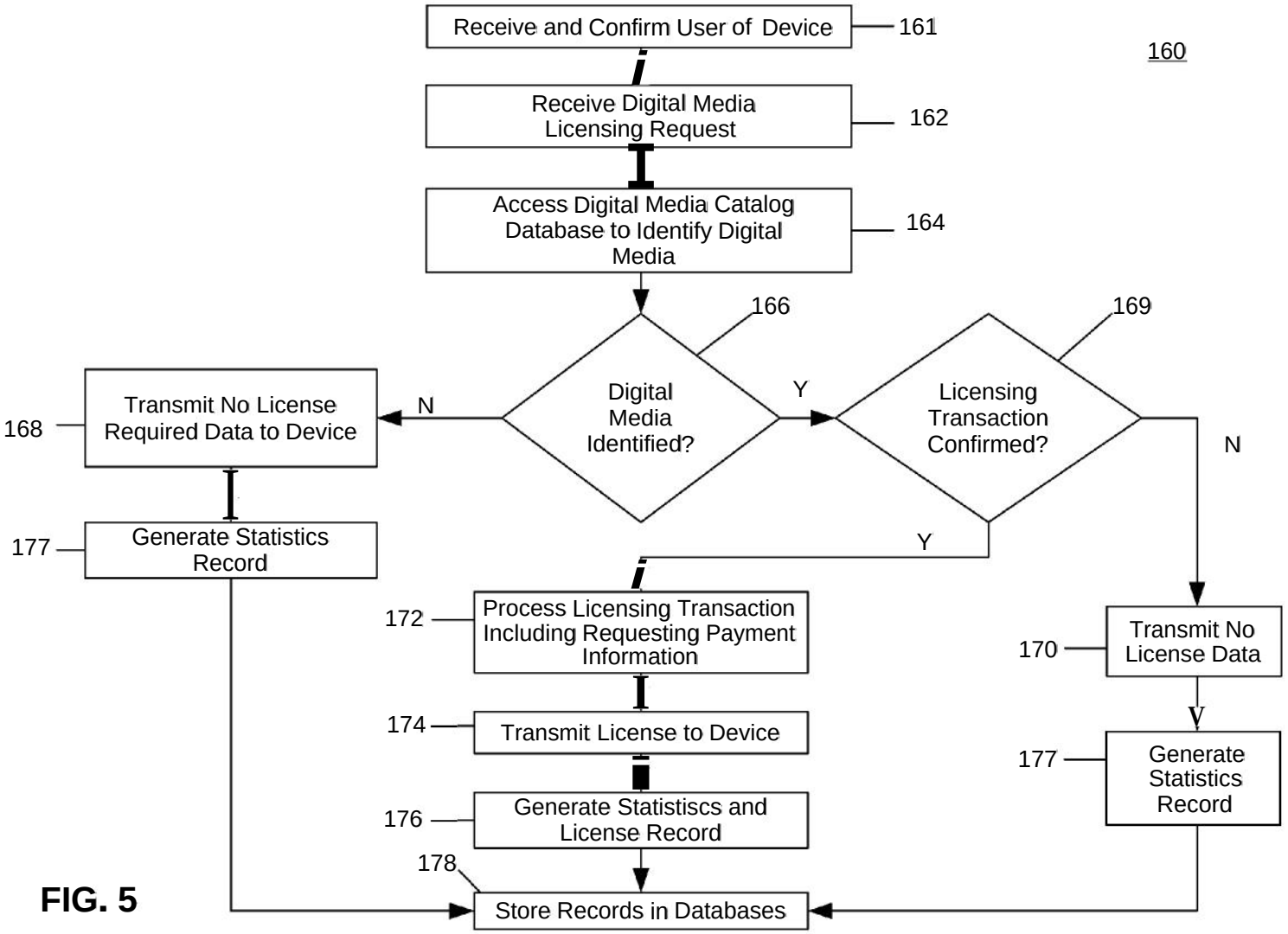
Receive and Confirm User of Device
161
160
Receive Digital Media Licensing Request
162
Access Digital Media Catalog Database to Identify Digital Media
164
166
Digital Media Identified?
N
Y
169
Licensing Transaction Confirmed?
N
Y
168
Transmit No License Required Data to Device
177
Generate Statistics Record
172
Process Licensing Transaction Including Requesting Payment Information
174
Transmit License to Device
176
Generate Statistiscs and License Record
178
Store Records in Databases
170
Transmit No License Data
177
Generate Statistics Record

FIG. 5

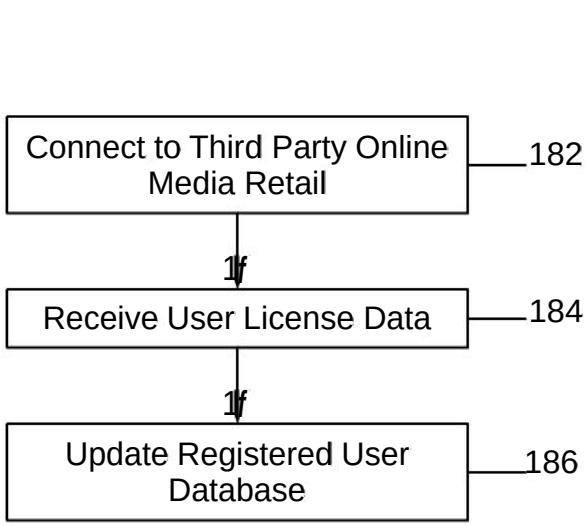
180
Connect to Third Party Online Media Retail
182
Receive User License Data
184
Update Registered User Database
186

FIG. 6

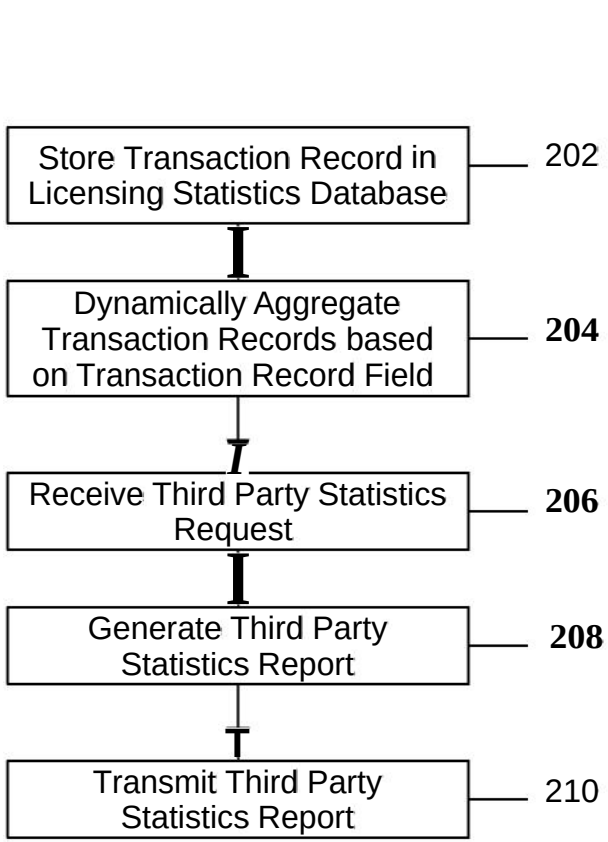
200
Store Transaction Record in Licensing Statistics Database
202
Dynamically Aggregate Transaction Records based on Transaction Record Field
204
Receive Third Party Statistics Request
206
Generate Third Party Statistics Report
208
Transmit Third Party Statistics Report
210

FIG. 7

DIGITAL MEDIA REPRODUCTION AND LICENSING

FIELD

Embodiments relate to licensing digital media for reproduction, and more specifically to a digital media licensing system for licensing and enabling reproduction of digital media on a reproduction device.

BACKGROUND

Conventionally, the distribution of media content, such as music, movies, and books for example, is in large part controlled by owners who are the rights-holders of the media content. In conventional systems, the media content is incorporated into a physical media such as a compact disk (CD), a digital video disk (DVD), a printed publication, and/or any other physical media. In such conventional systems, the rights-holders of the media content are able to control licensing of the media content, the production of physical media copies of the media content, and/or the distribution of the media content to customers and/or third party retailers and thereby monetize the media content.

There has been a dramatic shift in the marketplace away from media content distributed on physical media to digital media content that may be distributed via the internet. Conventionally, rights-holders of digital media content have significantly less control over the distribution of such digital media content as compared to the distribution of physical media. For example, a party that does not hold rights of the digital media content may reproduce the digital media content and then distribute the digital media content via the internet without the permission of the actual rights-holder of the digital media content. As a result, the actual-rights holder of the digital media content cannot monetize the unauthorized distribution of the digital media content.

The inability of rights-holders of digital media content to monetize the unauthorized distribution of the digital media content limits the financial gain that rights-holders of the digital media content obtain in creating the original digital media content. Often times such unauthorized distribution of the digital media content prohibits the rights-holders of the digital media from covering the costs of creating the original digital media content which discourages creation of digital media content.

BRIEF SUMMARY

Embodiments relate to monetizing the reproduction of digital media content for the rights-holder of the digital media content. In an embodiment, a computer implemented method provides a multimedia hardware device a capability to generate an authorized reproduction of a media content item included in a digital media file. A digital media file that includes a media content item may be loaded for reproduction. The digital media file may be analyzed to identify digital media information associated with the media content item. A license database may be accessed to determine whether a user is licensed to reproduce the media content item based on the digital media information. The media content item may be reproduced when the user is licensed to reproduce the media content item based on the digital media information. A licensing query may be provided to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item.

In another embodiment, a system provides a media content licensing and verification system to license media content for reproduction. A transceiver may receive a media licensing request from an external device associated with a user. The media licensing request may include digital media information associated with a media content item included in a digital media file. A processor may access a media catalog database that includes a plurality of media content records where a media content record from the plurality of media content records is associated with the media content item. The processor may also determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item. The processor may grant the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device. The processor may also decline the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content item to the external device.

Further embodiments, features, and advantages, as well as the structure and operation of the various embodiments, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS/FIGURES

Embodiments are described with reference to the accompanying drawings. In the drawings, like reference numbers may indicate identical or functionally similar elements.

FIG. **1** illustrates a digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. 2 illustrates a second digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. 3 illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to analyze a received catalog of media content and manage the catalog of media content, according to an embodiment;

FIG. 4 illustrates a flowchart illustrating an exemplary aspect of operation for the external multimedia hardware device, according to an embodiment;

FIG. 5 illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a payment for a license to reproduce a digital media file, according to an embodiment;

FIG. 6 illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive licensing information from a third party media retailer, according to an embodiment; and

FIG. 7 illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a third-party request for licensing statistics.

DETAILED DESCRIPTION

The digital media file licensing and authorized reproduction system provides a capability to ensure that a user possesses a license to reproduce a digital media file and if the user does not have a license, providing to the user the

option to obtain such a license. In the Detailed Description herein, references to "one embodiment", "an embodiment", an "example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, by every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic may be described in connection with an embodiment, it may be submitted that it may be within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

Overview

FIG. **1** illustrates a digital media file licensing and authorized reproduction system 30 in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system 30 includes an external multimedia hardware device 10, a network 12, a media content licensing and verification system 16, a media content rights-holders system 18, a third party online media retailers system 20, and a hardware device manufacturers system 22.

System 30 may monetize the reproduction of a media content item included within a digital media file. Reproduction of a media content item may include reproducing sound from a digital audio file, reproducing video from a digital video file, reproducing text from a digital text file, and/or any other reproduction of a digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Reproduction may be defined as a first use by a user of the media content item. For example, reproduction of the media content item may include when a user first accesses a media content item where the user obtained the media content item from an outside source, such as but not limited to a third party online media distributor. Reproduction may also be defined as further distribution of the media content item by the user after the user has initially accessed the media content item. For example, reproduction of the media content item may include when the user distributes the media content item to other parties after the user has obtained the media content item from the third party online media distributor.

A digital media file may represent a MPEG Layer 3 (MP3) file, a RealAudio (RA) file, a raw sample (RAW) file, a Microsoft wave (WAV) file, a Windows Media Audio (WMA) file, and/or any other suitable digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. The media content item may include any portion of data included in the digital media file. A user of external multimedia hardware device 10 may reproduce the media content item with external multimedia hardware device 10. Device 10 may represent a smart phone, a smart tablet, a mobile telephone, a television, an audio system, a personal music player, a portable computing device, other computing devices such as a personal computer, a laptop, or a desktop computer, computer peripheral such as a printer, a portable audio/or a video player, and/or any other suitable electronic device that can reproduce a media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

However, the user may not have a license that authorizes the user to reproduce the media content item. The digital media file including the media content item may have been procured from various sources that are not licensed to reproduce the media content item and do not collect licensing fees for use of the media content item. As such, when the user loads the digital media file for reproduction, device 10 may analyze the digital media file to determine the media content item included in the file and determine whether the user of device 10 is authorized. For example, the device may analyze a digital music file to identify the song and artist of the media content item that may be a track included in the digital music file. The user may be authorized when the user has a license to load and/or reproduce a media content item included in the digital media file.

In an embodiment, device 10 may analyze a plurality of identifying characteristics associated with the media content item to identify the media content item and to determine whether the user of device 10 is authorized. The plurality of identifying characteristics may be an identifying characteristic associated with the media content item inherently present in the media content item such that the media content item is not remastered to include the identifying characteristic after the media content item is initially recorded. The plurality of identifying characteristics can represent a fingerprint, digital watermarking, and/or any other suitable algorithm to identify copyright ownership of the media content item included in the digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. In an embodiment, device 10 may analyze metadata included in the loaded digital media file to identify the media content item included in the digital media file.

System 30 may query a license database locally and/or remotely located to system 30 to determine whether the user of device 10 has the appropriate license for the media content item. Device 10 may refuse to play the digital media file and query the user to determine whether the user wishes to purchase the appropriate license when the user does not have the appropriate license.

Device 10 may communicate with media content licensing and verification system 16 over network 12 and transmit the fingerprint of the media content item to media content licensing and verification system 16 when the user selects to purchase the appropriate license. Licensing system 16 may identify the media content item based on the received fingerprint. Licensing system 16 may transmit back to device 10 the title and/or other information associated with the identified media content item and request the user to confirm purchase of the license. The user may interface with device 10 to conduct the licensing transaction with licensing system 16, and after purchasing the license, licensing system 16 may transmit a license to device 10. After receiving the license from licensing system 16, device 10 may commence reproduction of the media content item. Moreover, licensing system 16 may store a record of the transaction for statistical purposes, and/or store a copy of the license in a database under a user record associated with the user of device 10.

Device 10 and licensing system 16 may provide data associated with the use of the media content item to media content rights-holders system 18 over network 12. Rights-holders system 18 may be accessed by an owner of a copyright for the media content item. For example, device 10 and licensing system 16 may provide data to rights-holders system 18 that includes the user who is accessing the media content item, the geographic location of the user who is accessing the media content item, other media content items that the user may be accessing, the quantity of times the media content item is accessed, and/or any other data associated with the use of the media content item that will

be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

The data provided by device 10 and licensing system 16 to rights-holders system 18 for the media content item may be used by the copyright owner to develop future licensing agreements that may be provided to the user of device 10 by licensing system 16 for future use of the media content item. Payments for the license to use the media content item may be received from the user via device 10 and licensing system 16. Payments may also be distributed to the copyright owner via rights-holders system 18.

Device 10 and licensing system 16 may also provide data associated with the use of the media content item to third party online media retailers system 20. The data provided to retailers system 20 may be similar to the data provided to rights-holders system 18. However, retailers system 20 may be accessed by third party online media retailers who have been selected by the copyright owner of the media content item to distribute the media content item via the Internet.

The data provided by device 10 and licensing system 16 to retailers system 20 for the media content item may be used by the third party online retailers to develop future pricing for their online media content item distribution including which media content items to distribute in the future. The data provided to retailers system 20 may also be used to help third party online media retailers target the marketing of the media content item to demographics that have shown a trend of interest in the media content item. Payments for the distribution of the media content item by the third party online media retailer may be received from the user via device 10 and licensing system 16. Payments may also be distributed to the third party online media retailer via retailers system 20.

Device 10 and licensing system 16 may also provide data associated with the use of the media content item to hardware device manufactures system 22. The data provided to manufactures system 22 may be similar to the data provided to rights-holders system 18 and retailer system 20. However, manufactures system 22 may be accessed by hardware device manufacturers who manufacture the hardware that may be implemented in device 10 that provides device 10 with the capabilities to limit reproduction of the media content item to when the user has a license to reproduce the media content item. Payments for use of the hardware provided by the hardware device manufacturers implemented in device 10 by the user of device 10 may also be distributed to the hardware device manufacturer via manufacturers system 20.

Device 10 may be configured to connect to network 12. Network 12 may include one or more networks, such as the Internet. In some examples, network 12 may include one or more network technologies such as Ethernet, Fast Ethernet, Gigabit Ethernet, a variant of the IEEE 802.11 standard such as WiFi, and the like. Communication over network 12 takes place using one or more network communication protocols including reliable streaming protocols such as transmission control protocol (TCP). These examples are illustrative and not intended to limit the present disclosure. As shown in FIG. **1**, device 10 may engage in communication with network 12 via connection 14, where connection 14 may be a wireless, wired, a secured communication connection, any combination thereof, and/or any other communication connection that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Licensing system 16 may be configured to engage in communication with network 12. As such, device 10 may communicate with licensing system 16 via network 12. Additionally, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may also communicate with licensing system 16 and device 10 via network 12. Licensing system 16, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may engage in communication with network 12 via a communication connection similar to connection 14.

Device 10, licensing system 16, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may have a cloud computing configuration. Device 10, licensing system 16, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may share resources via network 12. For example, device 10 may retrieve licensing information for the user of device 10 who wishes to reproduce the media content item via network 12. Licensing system 16 may also update rights-holders system 18 with the user information for the user who wishes to reproduce the media content item. Based on the cloud computing configuration, the interaction between device 10, licensing system 16, and rights-holders system 18 may not be limited to a single external multimedia hardware device. A plurality of external multimedia hardware devices may update licensing system 16 and rights-holders system 18 via network 12 with user information of users wishing to reproduce the media content item. Licensing system 16 may provide each of these updates for the user information to any media content rights-holders system that requests the user information.

Digital Media File Licensing and Authorized Reproduction System

FIG. 2 illustrates a second digital media file licensing and authorized reproduction system 95 in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system 95 includes external multimedia hardware device 10, media content licensing and verification system 16, and network 12. External multimedia hardware device 10 includes a processor 40, a transceiver 44, an input/output interface 46, a memory 52, a mass storage 60, a human machine interface (HMI) 48 and a reproduction module 50. Processor 40 may be a hardware based processor that includes a general purpose microcontroller, a special purpose microcontroller and/or any other controller that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Processor 40 includes a media recognition module 42. Media recognition module 42 may be configured to analyze a loaded digital media file to identify the media content item included in the digital media file and/or determine an identifying characteristic, such as a fingerprint for example, of the media content item. In an embodiment, the media recognition module 40 may include hardware based circuitry configured to analyze a loaded digital media file. In an embodiment, the media recognition module 42 may include program code executing on the processor 40 configured to cause the processor 40 to analyze a loaded digital media file.

Memory 52 includes a digital media file 58, an application 54, and an operating system (OS) 56. Memory 52 may be accessed by processor 40, such that processor 40 may read data from memory 52 and write data to memory 52. In some embodiments, application 54 and/or OS 56 may include program code including one or more instructions, that when executed by processor 40 cause device 10 to perform the steps necessary to execute steps or elements embodying the various aspects of the disclosure. Furthermore, digital media file 58 may be loaded for reproduction.

Mass storage 60 includes a license database 62 and digital media file 58. License database 62 includes a license record 64. Mass storage 60 may be utilized in addition to memory 52, or may not be included at all, in which case the data elements illustrated as stored on mass storage 60 would be stored in memory 52. For exemplary purposes, mass storage 60 includes digital media files 58, illustrating that one or more digital media files 58 may be stored in mass storage 60 of device 10. Moreover, mass storage 60 includes a license database 62, where license database 62 includes one or more license records 64. In an embodiment, license database 62 includes license records 64, where license records 64 indicate a media content item that a user of the device may be licensed to reproduce.

Media content licensing and verification system 16 includes a transceiver 68, a processor 66, an input/output interface 70, a mass storage 74, a memory 76, and a HMI 72. Memory 76 includes an application 78, an OS 80, a registered user database 86, a digital media catalog database 82, and a licensing statistics database 92. Application 78 and/or the OS 80 may include program code including one or more instructions configured to be executed by processor 66 to cause licensing system 16 to perform steps necessary to perform embodiments of the disclosure.

Registered user database 86 includes a user record 88. User record 88 includes a license record 90. Digital media catalog database 82 includes a media record 84. Each media record 84 includes data associated with a unique media content item loaded into the licensing system 16. As such, a rights-holder or content creator may load a catalog of media content items that may include but not limited to a song, a movie, a television show, a novel, and/or any other media content item into licensing system 16. Licensing system 16 may analyze each media content item in the catalog, and generate a media record corresponding to each media content item. In some embodiments, each media record may include data indicating various information of the corresponding media content item, including but not limited to the rights-holder of the media content item, the title of the media content item, the plurality of identifying characteristics, and/or any other information associated with the corresponding media content item that will be apparent to the those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Each user record 88 may be associated with a unique user and indicates all media content items the user has purchased a license for. Each user record 88 may include one or more license records 90, where each license record may include data indicating a media content item that the user is licensed to reproduce.

Licensing statistics database 92 includes a statistics record 94. Each statistics record 94 may include data indicating a license purchased by a user connecting to licensing system 16. The data may include, for example, whether a user that purchased a license for a particular media content item, how many users refused to license a particular media content item, the rights-holder of the media content item for which the license was purchased, the title of the media content item, demographic information for the user that may include but is not limited to age, gender, location, and/or any other data that may be associated with the user and/or license obtained by the user that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments of the present disclosure can be implemented on any type of processing (or computing) device having one or more processors. For example, embodiments can be implemented on a workstation, mobile device, computer, cluster of computers, set-top box, or other devices having at least one processor. In an embodiment, multiple modules may be implemented on the same processing device. Software can include one or more applications and an operating system. Hardware can include, but may not be limited to, a processor, memory, and/or graphical user interface display.

Method 100

FIG. 3 illustrates a flowchart of an exemplary method 100 of processing a digital media catalog for use in a media content licensing and verification system. At step 102, the media content licensing and verification system receives digital media catalog. At step 104, each media content item of the received catalog may be analyzed.

At step 106, a plurality of identifying characteristics associated with the media content item may be determined. For example, the fingerprint of the media content item may be determined. Determining a media content fingerprint may include one or more steps for analyzing the digital file including the media content item to determine one or more characteristics that uniquely identify the media content item stored therein. For example, if the media content item were a book stored in a digital text file, the natural media fingerprint may be determined to be a predefined number of words from the beginning of the text file.

In another exemplary embodiment, the media content item may be a song stored in a digital music file, and the system may determine the natural media fingerprint by analyzing the digital music file to identify lyrics included in the song, notes played in the song, and/or a sampled sound wave included in the song. These characteristics may be considered individually or in various combinations to uniquely identify the song. Moreover, in many digital media file formats, one or more information fields related to the media content item stored in the file are included in metadata of the file. In an embodiment of the invention, the system may analyze metadata included in the digital media file to identify the media content item stored thereon.

In step 108, the system generates a media record for each media content item, where the media record includes data indicating the fingerprint, rights-holder information, title, and/or any other media content item data. In step 110, the media record is stored in a digital media catalog database accessible by the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 120

FIG. 4 illustrates a flowchart of an exemplary method 120 of verifying that a digital media file has been licensed prior to reproduction and facilitating the purchase of a license if the digital media file has not been properly licensed prior to reproduction. At step 122, a digital media file is loaded for reproduction on the external multimedia hardware device. At step 124, the device analyzes the digital media file.

At step 126, information associated with the digital media file is determined. Information associated with the digital media file may include a fingerprint associated with the media content item included in the digital media file, the rights-holder of the media content item, the title of the media content item, and/or any other digital media file information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. For example, as described above with respect to FIG. 3, the

device may analyze the digital media file to determine one or more characteristics of the media content item stored thereon, where the characteristics may be utilized alone and/or in various combinations to identify the media content item.

The selected characteristics may be referred to as the natural media fingerprint of the media content item. Advantageously, the natural media fingerprint identifies a media content item, even considering the possibility of different versions of the same media content item. For example, multiple versions of a song are recorded at various times and may be stored as digital music files, such as a live version and a studio version. However, by analyzing the characteristics of a media content item, different versions of the same song may be consistently identified. For example, analyzing characteristics may include analyzing word recognition of lyrics, the occurrence of various frequencies at particular points in time in relation to the occurrence of the lyrics, and/or any other media content item characteristic that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 128, the device accesses a license database. At step 130, whether a user of the device has a license for the digital media file may be determined based on the natural media fingerprint and/or other digital media information, such as metadata, included in the digital media file. At step 132, the device initializes reproduction of the digital media file in response to the determining that the user has the appropriate license.

At step 134, the device generates a display query asking the user whether the user would like to purchase a license for the digital media file in response to determining that the user does not have the appropriate license. The device generates a display query asking the user whether the user would like to purchase a license for the digital media file.

At step 136, the device indicates to the user that the digital media file cannot be played in response to the user indicating that the user would not like to purchase a license. At step 137, the device transmits statistics related to the media content item stored on the digital media file to the media content licensing and verification system. The statistics information may include, for example, the determined natural media fingerprint of the media content item stored in the digital media file and/or any other such information related to the media content item, the digital media file, the external multimedia hardware device, and/or the user of the device.

At step 138, the device initializes a licensing interface in response to the user indicating that the user would like to purchase the license. The device initializes a licensing interface that includes establishing a secure communication connection to a media content licensing and verification system.

At step 140, the device transmits user identification data to the system, such that the user of the device may be identified to log into a user account associated with the user, process the licensing transaction, and/or for other such reasons to facilitate purchasing a license for the media content item. The user identification data may include for example, a user name and password, a unique identifier associated with the user, the user's billing information, and/or any other user identification data that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 142, the device transmits a licensing request to the system, where the request includes information corresponding to the digital media file and the media content item included in the digital media file, such as the fingerprint of the media content item, the title of the media content item, the rights-holder of the digital media file, and/or other media content item information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 160

FIG. 5 illustrates a flowchart of an exemplary method 160 of processing a license request from an external multimedia hardware device. At step 161, prior to initializing the licensing transaction, the system receives the user identification data and confirms the user's identity. For example, the system logs the device into a secured transaction interface associated with an account of the user.

At step 162, the system receives a digital media licensing request from an external multimedia hardware device over a network where the licensing request includes data indicating a media content item that a user of the device wishes to acquire a license for. In an embodiment, the licensing request includes a fingerprint of the media content item, information identifying the rights-holder of the media content item, the title of the media content item, and/or other media content item information.

At step 164, the system accesses a digital media catalog database to identify the media content item indicated by the request. At step 166, the system matches the fingerprint of the media content item included in the license request to a fingerprint in the digital media catalog database to identify the media content item associated with the licensing request, the rights-holder associated with the media content item, the price required for a license for the media content item, and/or any other identification information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 168, the system transmits data to the device indicating that a license is not required for reproduction in response to determining that a record corresponding to the media content item is not in the digital media catalog database. At step 169, the system transmits data to the device such that a user of the device may confirm a transaction to acquire the license associated with the media content item in response to identifying the media content item associated with the licensing request. In an embodiment, the system transmits data indicating the title of the media content item, the rights-holder of the media content item, an artist associated with the media content item, and/or other media content information such that the device presents this information to the user when asking the user whether to confirm the transaction.

At step 170, the system transmits data to the device indicating that the license has not been purchased in response to the user declining the licensing transaction, at which point, the device may refuse to reproduce the digital media file for the user. At step 172, the system processes the licensing transaction in response to the user confirming the licensing transaction and the system receiving confirmation data from the device. The processing may include collecting payment information, charging previously known payment information, debiting a user account, and/or any other such payment processing methods.

At step 174, the system transmits a license associated with the media content item over the communication network to the device in response to processing the licensing transac-

tion. At step 176, the system generates a license record indicating the user and the media content item in response to processing the transaction, the system generates a transaction record including data that identifies the user, the media content item, demographic information about the user, and/or any other license record information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 177, the user has not purchased a license for a media content item, either because the media content item is not identified in the database or because the user refuses to make the purchase. However, a statistics record may be generated. The statistics data may include for example the natural media fingerprint associated with the media content item, the rights-holder of the media content item, the title of the media content item, and/or any other statistical data. The statistics data generated may be utilized for a variety of purposes, including for example, encouraging non-participating rights-holders from participating in the system by identifying the number of times a license was requested for a media content item owned by the non-participating rights-holder. At step 178, the statistics record is stored in the licensing statistics database, and the license record is stored in the registered user database in a user record associated with the user.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 180

FIG. 6 illustrates a flowchart of an exemplary method 180 of loading licenses for media content items associated with a user from third party sources. At step 182, the system connects to a third party online media retailer. At step 184, licenses purchased from the third party retailers may be uploaded into a registered user database of the system. At step 186, after receiving the user license data, the system updates the registered user database of the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 200

FIG. 7 illustrates a flowchart of an exemplary method 700 of providing statistics associated with licensing transactions performed by the system to a third party over a communication network consistent with embodiments of the invention. At step 202, the system stores one or more transaction records in a connected licensing statistics database.

At step 204, the system dynamically aggregates the transaction records in relation to one or more fields of information included in each transaction record. For example, the system may aggregate all transaction records stored in the licensing statistics database where the media content item of the transaction record has a desired title, and as such, data and statistics related to how many times a license was purchased for the media content item having the desired title may be retrieved. In an embodiment, similar aggregation may be performed to determine how many licenses were purchased for a particular rights-holder, titles of media content items that users of a particular demographic purchased, and/or other such relevant data and statistics.

At step 206, the system may receive a statistics request from a third party that may include but not limited to a rights-holder, a hardware manufacturer, a marketing/analytics partner, and/or other such third parties that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 208, the system may generate a statistics report based on the received request. At step 210, the system may transmit the statistics report to the third party over the communication network. As such, in an embodiment a participating rights-holder may quickly retrieve licensing data and statistics for media content items that the rights-holder owns. In another embodiment, a marketing and/or analytics company may receive valuable licensing and statistics data for media content items for particular demographics of users, genres of media content items, and/or other such categories.

Embodiments can work with software, hardware, and/or operating system implementations, other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Conclusion

As such, in general, some embodiments of the invention are directed to a system for recognizing licensed and unlicensed multi-media content by use of a natural media fingerprint recognition and license verification database and system. The system disables the use of unlicensed content and provides a secure method to license unlicensed multi-media content and distribute the licensing revenue to content owners, rights-holders, participating third-party hardware and software manufacturers, and/or other additional third parties. In some embodiments, an external multi-media hardware device includes a hardware or software read/write licensed media database module, operatively connected to a hardware or software natural media fingerprint recognition and license verification module, where the recognition and license verification module may be operatively connected to a hardware or software data encryption module. Moreover the device may include an operating system and/or application stored on memory associated with the external multi-media hardware device. Where the operating system and/or application may be executed by a processor associated with the device to cause the processor to control one or more of the modules to perform one or more tasks associated with the one or more modules. In addition, media reproduction (e.g., audio and video playback) hardware and/or software module may be monitored and controlled by processor of the device operatively connected to, executing, and/or accessing the content fingerprint recognition and license verification module. Moreover, a physical memory device (e.g., a memory and/or a mass storage device) may be accessible by the processor during execution of the one or more operations of the operating system and/or application residing on a memory associated with the external multi-media hardware device. In some embodiments, the operating system and/or application may cause the processor to drive a peripheral device using an I/O interface to present a user of the device with a graphic user interface.

Furthermore, the external multimedia hardware device may communicate over a communication network (e.g., an internet connection, a cellular communication network connection, etc.). In some embodiments, the external multimedia hardware device may be connected to a one or more servers functioning as a media content licensing and verification system over the communication network, such as a media content licensing and verification system shown in FIGS. **1** and 2. In other embodiments, the external multi-media hardware device may be connected to a personal computer functioning as a media content licensing and

verification system. For example, an external multimedia hardware device may connect to a user's personal computer over a Wi-Fi connection to verify a user has the appropriate license to reproduce a particular media content item, where the personal computer may include a plurality of licensing records associated with the user. In some embodiments, the communication connection between the device and the server may be a secure internet connection. In addition, the media content licensing and verification system may receive multi-media content items (e.g., songs, videos, books, etc.) from participating copyright owners and/or rights-holders through a catalog submissions module operatively connected to the system and executing thereon. The catalog submissions may be loaded into a natural media fingerprint creation module to generate a natural media fingerprint catalog. In addition, the system may be operatively connected to a storage device storing a registered users and licensed media database.

In addition, the media content licensing and verification system may be operatively connected to and/or execute a secure license verification and payment collection module stored on a connected storage device and/or executing on a computing system connected over the communication network. Such that the the content fingerprint and licenses verification module associated with the external multimedia hardware device may conduct license purchasing transactions by communicating over the communication network with the media licensing and verification system and/or the secure license verification and payment collection module. The secure license verification and payment collection module may be connected through the central computer controlled sub-system server (e.g. a media content licensing and verification system) and/or through a computing system in communication with the media content licensing and verification system over the communication network.

As such, the application and/or operating system executing on the external multi-media hardware device may facilitate licensing transactions for various media content items stored in the media content licensing and verification system. Furthermore the media content licensing and verification system may include a payments distribution with real-time statistics module that may execute on the media content licensing and verification system, such that copyright owners, rights-holders, and/or participating hardware manufacturers may receive payments and statistics associated with the licensing of media content items using the media content licensing and verification system.

In some embodiments, pre-existing licenses may be submitted to the media content licensing and verification system such that the registered users and licensed media master database may be updated to include licenses for registered users purchased from third party sources, such as third party online media retailers. Where the previously purchased license data may be imported into the system over the communication network to the media content licensing and verification system from the third party sources, such as databases maintained by third parties.

It will therefore be appreciated that the invention may be implemented, for example, using program code implemented on one or more hardware-based computers, one or more processors, and/or one or more integrated circuits (e.g., semiconductors). Program code typically comprises one or more instructions that are resident at various times in various memory and storage devices in a computer, and that, when read and executed by one or more processors in a computer, cause that computer to perform the steps necessary to execute steps or elements embodying the various aspects of the invention. Moreover, while the invention has and hereinafter will be described in the context of fully functioning computers and computer systems, those skilled in the art will appreciate that the various embodiments of the invention are capable of being distributed as a program product in a variety of forms, and that the invention applies equally regardless of the particular type of computer readable media used to actually carry out the distribution. Examples of computer readable media include but are not limited to tangible, recordable type media such as volatile and non-volatile memory devices, floppy and other removable disks, hard disk drives, magnetic tape, optical disks (e.g., CD-ROMs, DVDs, etc.) among others.

Moreover, while the invention has and hereinafter will been described in the context of digital media files resident on a memory, the invention is not so limited. Those skilled in the art will appreciate that embodiments of the invention are capable of facilitating licensing transactions with respect to streaming digital media. For example, a media content item may be streamed to an external multimedia hardware device over a communication network, and a portion of the media content item may be stored in a local memory (e.g., buffered in a cache of a processor associated with the external multimedia hardware device) while a portion may be stored remotely on a memory device accessible by the external multimedia hardware device over a communication network. For example, a media content item may be streamed to an external multimedia hardware device over a communication network from a cloud based storage system, a digital media streaming service (e.g., Pandora, Last.fm, Spotify, iTunes, iCloud, Netflix, and/or other such services) and embodiments of the invention may analyze the media content item when loaded for reproduction and perform the operations consistent with embodiments of the invention to confirm that a user of the device has the appropriate license for the streaming media content item prior to reproducing the streaming media content item.

While the invention has been illustrated by a description of the various embodiments and the examples, and while these embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any other way limit the scope of the invention to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Thus, the invention in its broader aspects is therefore not limited to the specific details, representative apparatus and method, and illustrative example shown and described. In particular, any of the blocks of the above flowcharts may be deleted, augmented, made to be simultaneous with another, combined, or be otherwise altered in accordance with the principles of the invention. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants' general inventive concept.

What is claimed is:

1. A computer implemented method for providing a multimedia hardware device to generate an authorized reproduction of a media content item included in a digital media file, comprising:

loading a digital media file for reproduction, wherein the digital media file includes the media content item;

analyzing the digital media file to identify digital media information associated with the media content item;

receiving a license request from a user requesting to engage in a license transaction to reproduce the media content item;

evaluating the license transaction to determine whether the user has acquired a license to reproduce the media content item;

accessing a license database to determine whether the user is licensed to reproduce the media content item based on the digital media information;

reproducing the media content item when the user is licensed to reproduce the media content item based on the digital media information;

providing a licensing query to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item;

after the evaluation of the license transaction, extracting from the license transaction user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner of the media content item to gauge a demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for is the media content item of the copyright owner;

aggregating the user data into a statistics record for the license request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the license request;

storing in the license database the statistics record so that the user data is accessible to the copyright owner of the media content item; and

analyzing a plurality of statistics records aggregated from each license request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each license request of the media content item when the license is acquired by the user and when the license is declined by the user.

2. The method of claim 1, further comprising:

receiving from the user a licensing response to the licensing query, wherein the licensing response indicates whether the user has selected to acquire the license to reproduce the media content item or to decline the license to reproduce the media content item or to decline the license to reproduce the media content item.

3. The method of claim 2, further comprising:

providing a licensing request to a licensing system when the user desires to acquire the license to reproduce the media content item based on the licensing response from the user; and

preventing reproduction of the media content item when the user declines the license to reproduce the media content item.

4. The method of claim 3, further comprising:

receiving a license to reproduce the media content from the licensing system when the licensing request is granted by the licensing system; and

preventing reproduction of the media content item when the licensing request is declined by the licensing system.

5. The method of claim 4, further comprising:

reproducing the media content item based on a plurality of reproduction parameters in the license that is received from the licensing system.

6. A computer implemented method for providing a media content licensing and verification system to license media content for reproduction, the method comprising:

receiving a media licensing request from an external device associated with a user, wherein the media licensing request includes digital media information associated with the media content item included in a digital media file;

accessing a media catalog database that includes a plurality of media content records, wherein a media content record from the plurality of media content records is associated with the media content item;

determining whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item;

granting the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device;

declining the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content to the external device;

after the determination of the media licensing request, extracting from the media licensing request user data that is specific to the user that is attempting to reproduce the media content item when the user is granted the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner to gauge a demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for the media content item of the copyright owner;

aggregating the user data into a statistics record for the media licensing request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the media licensing request;

storing in a license database the statistics record so that the user data is accessible to the copyright owner of the media content item; and

analyzing a plurality of statistics records aggregated from each media licensing request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each media licensing request of the media content item when the license is acquired by the user and when the license is declined by the user.

7. The method of claim 6, wherein the determining comprises:

requesting payment information from the external device when the media content record associated with the media content item requires payment of the license for the media content item.

8. The method of claim 7, wherein the granting comprises:

granting the media licensing request for the external device when payment of the license for the media content item is completed.

9. The method of claim 6, further comprising:

generating a license record that includes license granting information associated with the license granted to the external device; and

storing the license record in a registered user database that is associated with the user.

10. The method of claim 6, wherein the digital media information includes a fingerprint associated with the media content item.

11. A system for providing a multimedia hardware device to generate an authorized reproduction of a media content item included in a digital media file, comprising:

a processor configured to:

receive a license request from a user requesting to engage in a license transaction to reproduce the media content item;

load a digital media file for reproduction, wherein the digital media file includes the media content item requested by the user to reproduce,

analyze the digital media file to identify digital media information associated with the media content item,

evaluate the license transaction to determine whether the user has acquired a license to reproduce the media content item;

access a licensing database to determine whether the user is licensed to reproduce the media content item based on the digital media information,

after the evaluation of the license transaction, extract from the license transaction user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner to gauge a demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for the media content item of the copyright owner,

aggregating the user data into a statistics record for the license request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the license request,

store in the license database the statistics record so that the user data is accessible to the copyright owner of the media content item, and

analyze a plurality of statistics records aggregated from each license request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each license request of the media content item when the license is acquired by the user and when the license is declined by the user,

a user interface configured to provide a licensing query to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item.

12. The system of claim 11, wherein the user interface is further configured to receive from the user a licensing response to the licensing query, wherein the licensing response indicates whether the user has selected to acquire the license to reproduce the media content item or to decline the license to reproduce the media content item.

13. The system of claim 12, wherein the processor is further configured to:

provide a licensing request to a licensing system after the user has completed the licensing response; and

prevent reproduction of the media content item when the user selects to decline the license to reproduce the media content item.

14. The system of claim 13, wherein the processor is further configured to:

receive a license to reproduce the media content item from the licensing system when the licensing request is granted by the licensing system; and

prevent reproduction of the media content item when the licensing request is declined by the licensing system.

15. The system of claim 14, wherein the processor is further configured to reproduce the media content item based on a plurality of reproduction parameters included in the license that is received from the licensing system.

16. A system for providing a media content licensing and verification system to license media content for reproduction, comprising:

a transceiver configured to receive a media licensing request from an external device associated with a user, wherein the media licensing request includes digital media information associated with the media content item included in a digital media file; and

a processor configured to:

access a media catalog database that includes a plurality of media content records, wherein a media content record from the plurality of media content records is associated with the media content item,

determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item,

grant the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device,

decline the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content item to the external device,

after the determination of the media licensing request, extracting from the media licensing request user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner to gauge a demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for the media content item of the copyright owner,

aggregate the user data into a statistics record for the media licensing request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the media licensing request, and

store in a license database the statistics record so that the user data is accessible to the copyright owner of the media content item, and

analyze a plurality of statistics records aggregated from each media licensing request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each license request of the media content item when the license is acquired by the user and when the license is declined by the user.

17. The system of claim 16, wherein the processor is further configured to request payment information from the

external device when the media content record associated with the media content item verifies payment of the license for the media content item.

18. The system of claim 17, wherein the processor is further configured to process the media licensing request for the external device when the payment of the license for the media item is received.

19. The system of claim 16, wherein the processor is further configured to:

generate a license record that includes license granting information associated with the license granted to the external device; and

store the license record in a registered user database that is associated with the user.

20. The system of claim 16, wherein the digital media information includes a fingerprint associated with the media content item.

21. The computer implemented method of claim **1**, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

22. The computer implemented method of claim **1**, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

23. The computer implemented method of claim 6, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

24. The computer implemented method of claim 6, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

25. The system of claim 11, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

26. The system of claim 11, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

27. The system of claim 18, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

28. The system of claim 18, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

29. The computer implemented method of claim **1**, wherein the user data includes a geographic location of the user who is accessing the media content item.

30. The computer implemented method of claim 6, wherein the user data includes additional media content items that the user has previously accessed.

31. The system of claim 11, wherein the user data includes a quantity of times that the user has previously accessed the media content item and additional media content items.

32. The system of claim 16, wherein the user data includes a geographic location of the user who is accessing the media content item that enables the copyright owner to gauge geographic locations where the media content item is being accessed.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,715,581 B1
APPLICATION NO. : 13/667629
DATED : July 25, 2017
INVENTORY) : Christopher A. Estes

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

At FIG. 5, box #176, “Statistics” should read “Statistics”

Column 1, Line approx. 36 reads “... As a result, the actual-rights holder ...” should read “... As a result, the actual rights-holder ...”

Column 3, Line approx. 5 reads “... characteristic, by every embodiment may not necessarily ...” should read “... characteristic, but every embodiment may not necessarily ...”

Column 3, Line approx. 17 reads “... portions thereof, may be implemented.” should read “... portions thereof may be implemented.”

Column 7, Line approx. 42-43 reads “... [cor-]responding media content item that will be apparent to the those skilled in the ...” should read “... [cor-]responding media content item that will be apparent to those skilled in the ...”

Column 7, Line approx. 54-55 reads “... The data may include, for example, whether a user that purchased a license ...” should read “... The data may include, for example, whether a user purchased a license ...”

Column 10, Line approx. 57 reads “... which point, the device may refuse to ...” should read “... which point the device may refuse to ...”

Column 12, Line approx. 61 reads “... [multime-]dia hardware device may be connected to a one or more ...” should read “... [multime-]dia hardware device may be connected to one or more ...”

Column 13, Line approx. 24 reads “... Such that the the content fingerprint ...” should read “... Such that the content fingerprint ...”

Signed and Sealed this
Thirty-first Day of July, 2018

Andrei Iancu
Director of the United States Patent and Trademark Office

Column 14, Line approx. 14-15 reads “Moreover, while the invention has and hereinafter will been described in the context of digital media ...” should read “Moreover, while the invention has and hereinafter will be described in the context of digital media ...”

Column 14, Line approx. 41-42 reads “... detail, it is not the intention of the applicants to restrict or in ...” should read “... detail, it is not the intention of the Applicant to restrict or in ...”

Column 14, Line approx. 52 reads “... without departing from the spirit or scope of applicants’ ...” should read “... without departing from the spirit or scope of Applicant’s ...”

Column 15, Line 24-25, Claim 1 reads “... owner and a demographic that declined the license for is the media content item of the copyright owner;” should read “... owner and a demographic that declined the license for the media content item of the copyright owner;”

Column 15, Line 41-46, Claim 2 reads “... receiving from the user a licensing response to the licensing query, wherein the licensing response indicates whether the user has selected to acquire the license to reproduce the media content item or to decline the license to reproduce the media content item or to decline the license to reproduce the media content item.” should read “... receiving from the user a licensing response to the licensing query, wherein the licensing response indicates whether the user has selected to acquire the license to reproduce the media content item or to decline the license to reproduce the media content item.”

Column 19, Line 30, Claim 22 reads “... device manufacturer that manufacturers hardware that ...” should read “... device manufacturer that manufactures hardware that ...”

Column 20, Line 2, Claim 24 reads “... device manufacturer that manufacturers hardware that...” should read “... device manufacturer that manufactures hardware that ...”

Column 20, Line 14, Claim 26 reads “... hardware device manufacturer that manufacturers hardware ...” should read “... hardware device manufacturer that manufactures hardware ...”

Column 20, Line 26, Claim 28 reads “... hardware device manufacturer that manufacturers hardware ...” should read “... hardware device manufacturer that manufactures hardware ...”

UNITED STATES PATENT AND TRADEMARK OFFICE

Assignment abstract of title for Application 13667629

Invention title/Inventor	Patent	Publication	Application	PCT	International registration
Digital Media Reproduction and Licensing Christopher Estes	9715581 Jul 25, 2017		13667629 Nov 2, 2012		

Assignments (1 total)

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Reel/frame	Execution date	Date recorded	Properties	Pages
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Conveyance
ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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(12) **United States Patent**
Estes

(10) **Patent No.: US 9,898,590 B2**
(45) **Date of Patent: *Feb. 20, 2018**

(54) **DIGITAL MEDIA REPRODUCTION AND LICENSING**

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(72) Inventor: **Christopher A. Estes**, Mountain View, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) Filed: **Jul. 25, 2017**

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(60) Provisional application No. 61/555,810, filed on Nov. 4, 2011.

(51) **Int. Cl.**
G06F 21/10 (2013.01)
G06Q 30/02 (2012.01)

(52) **U.S. Cl.**
CPC ***G06F 21/10*** (2013.01); ***G06Q 30/02*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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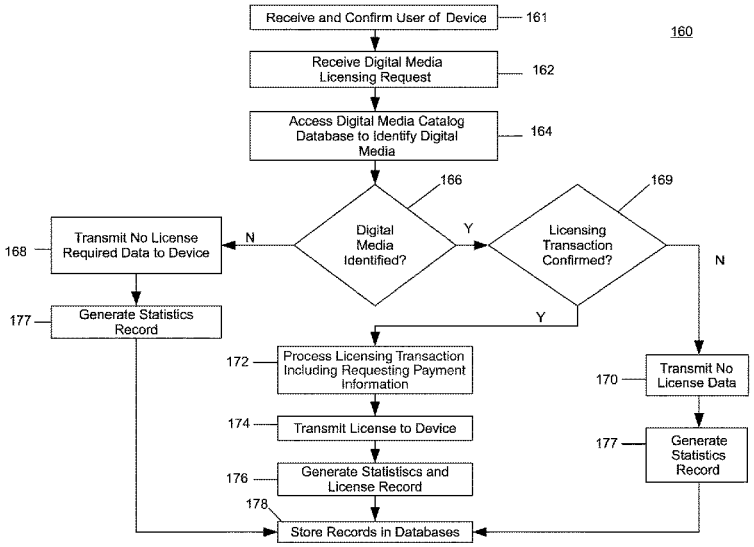
(Continued)

Primary Examiner — Michael R Vaughan
Assistant Examiner — Richard A McCoy
(74) *Attorney, Agent, or Firm* — Wood Herron & Evans LLP

(57) **ABSTRACT**

Systems and methods for monetizing the reproduction of digital media content for the rights-holders of the digital media content. Embodiments of the present disclosure relate to determining whether a user of a media content item has a license to reproduce the media content item. In one embodiment, the media content item may be reproduced when the user is licensed. The user is prompted to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item when the user is not licensed. Further embodiments determine whether a user may receive a license when the user wishes to acquire a license. In an embodiment, the user is declined a license when not approved for the license.

23 Claims, 7 Drawing Sheets



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2012/0124638 A1* 5/2012 King G06Q 10/101 726/1
2012/0303490 A1* 11/2012 Hill G06Q 30/00 705/27.2
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2014/0108029 A1* 4/2014 Kim G06Q 50/22 705/2
2015/0040002 A1* 2/2015 Kannan G06F 3/0482 715/246

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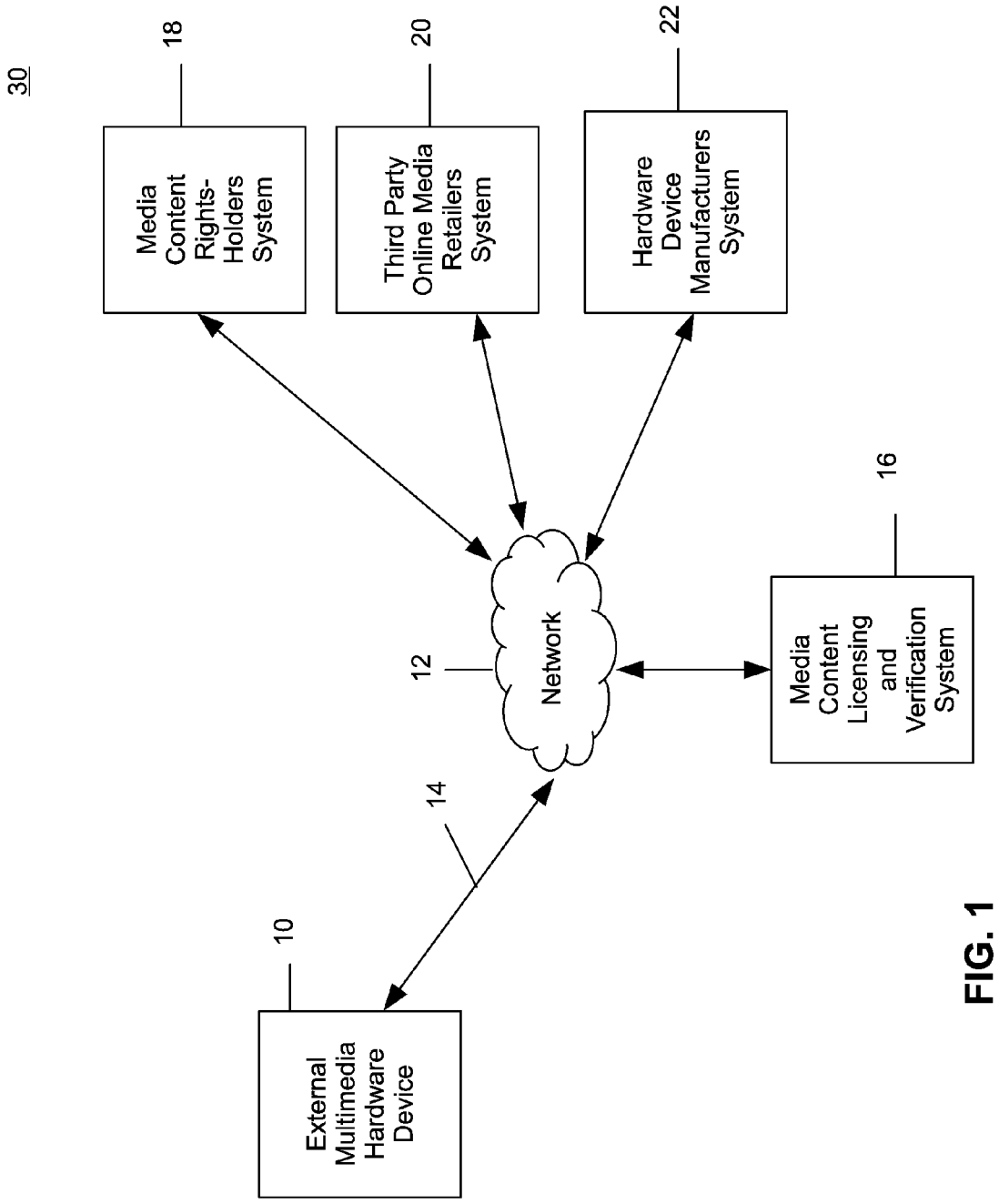
30
18
Media Content Rights-Holders System
20
Third Party Online Media Retailers System
22
Hardware Device Manufacturers System
Network
12
16
Media Content Licensing and Verification System
14
10
External Multimedia Hardware Device

FIG. 1

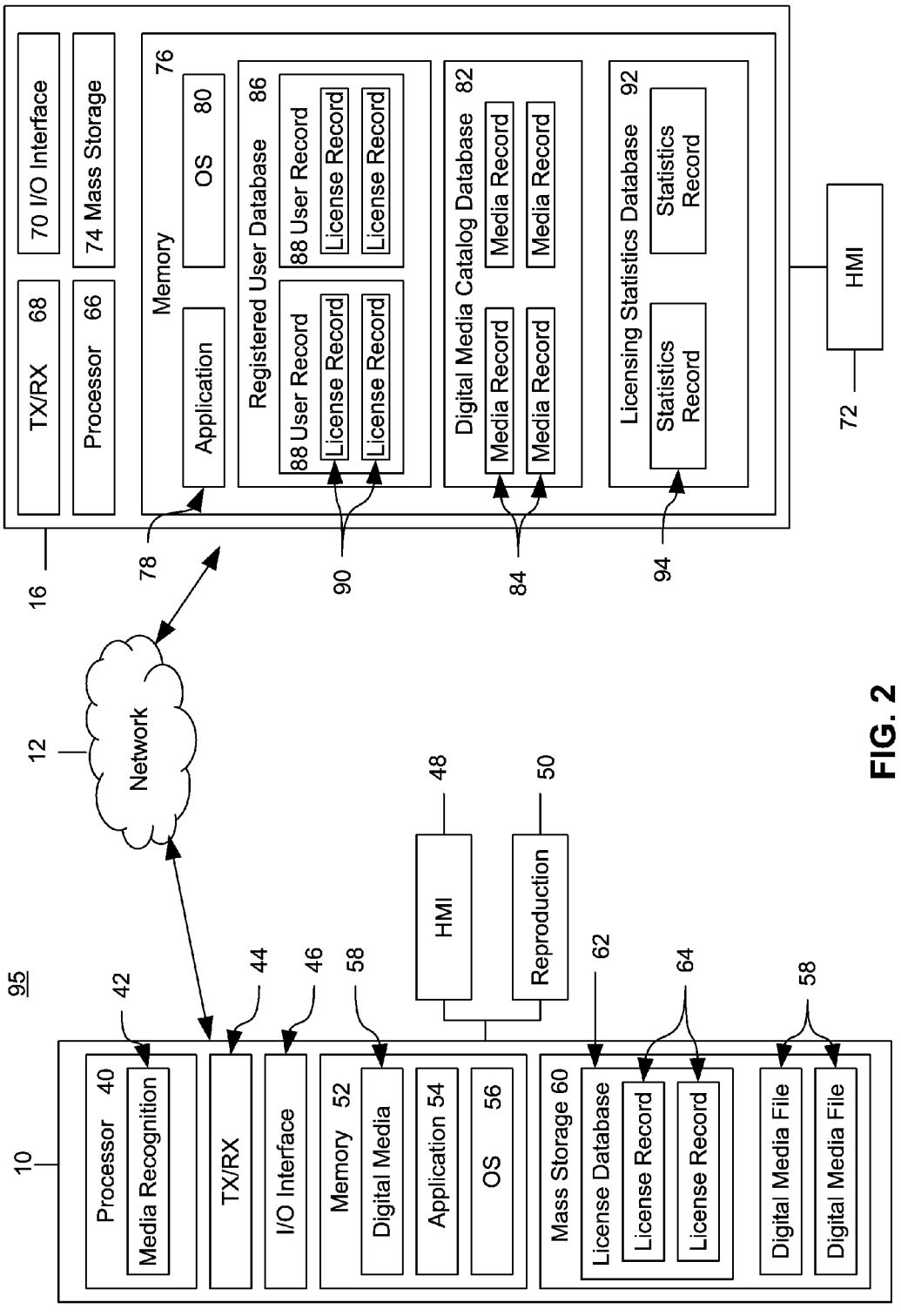
16
70 I/O Interface
74 Mass Storage
TX/RX 68
Processor 66
Memory 76
OS 80
Application
Registered User Database 86
88 User Record
License Record
License Record
88 User Record
License Record
License Record
Digital Media Catalog Database 82
Media Record
Media Record
Media Record
Media Record
Licensing Statistics Database 92
Statistics Record
Statistics Record
HMI
72
78
90
84
94
12
Network
95
10
Processor 40
Media Recognition
TX/RX
I/O Interface
Memory 52
Digital Media
Application 54
OS 56
Mass Storage 60
License Database
License Record
License Record
Digital Media File
Digital Media File
HMI
Reproduction
42
44
46
58
48
50
62
64
58

FIG. 2

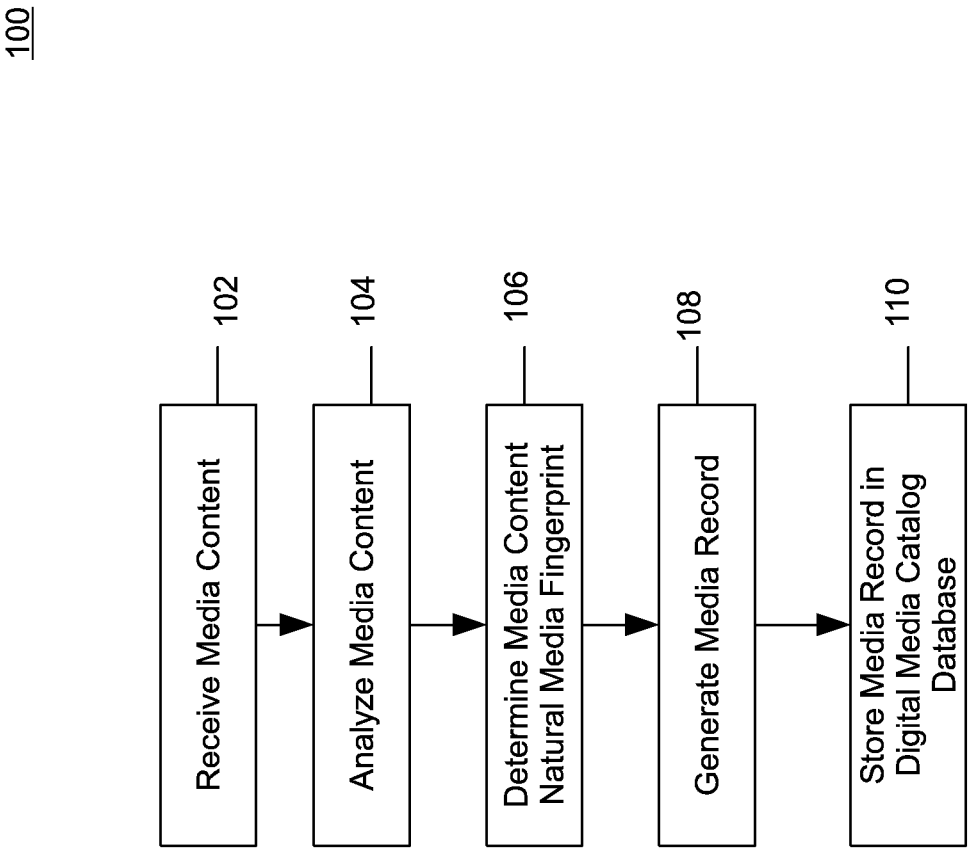
100
102
Receive Media Content
104
Analyze Media Content
106
Determine Media Content Natural Media Fingerprint
108
Generate Media Record
110
Store Media Record in Digital Media Catalog Database

FIG. 3

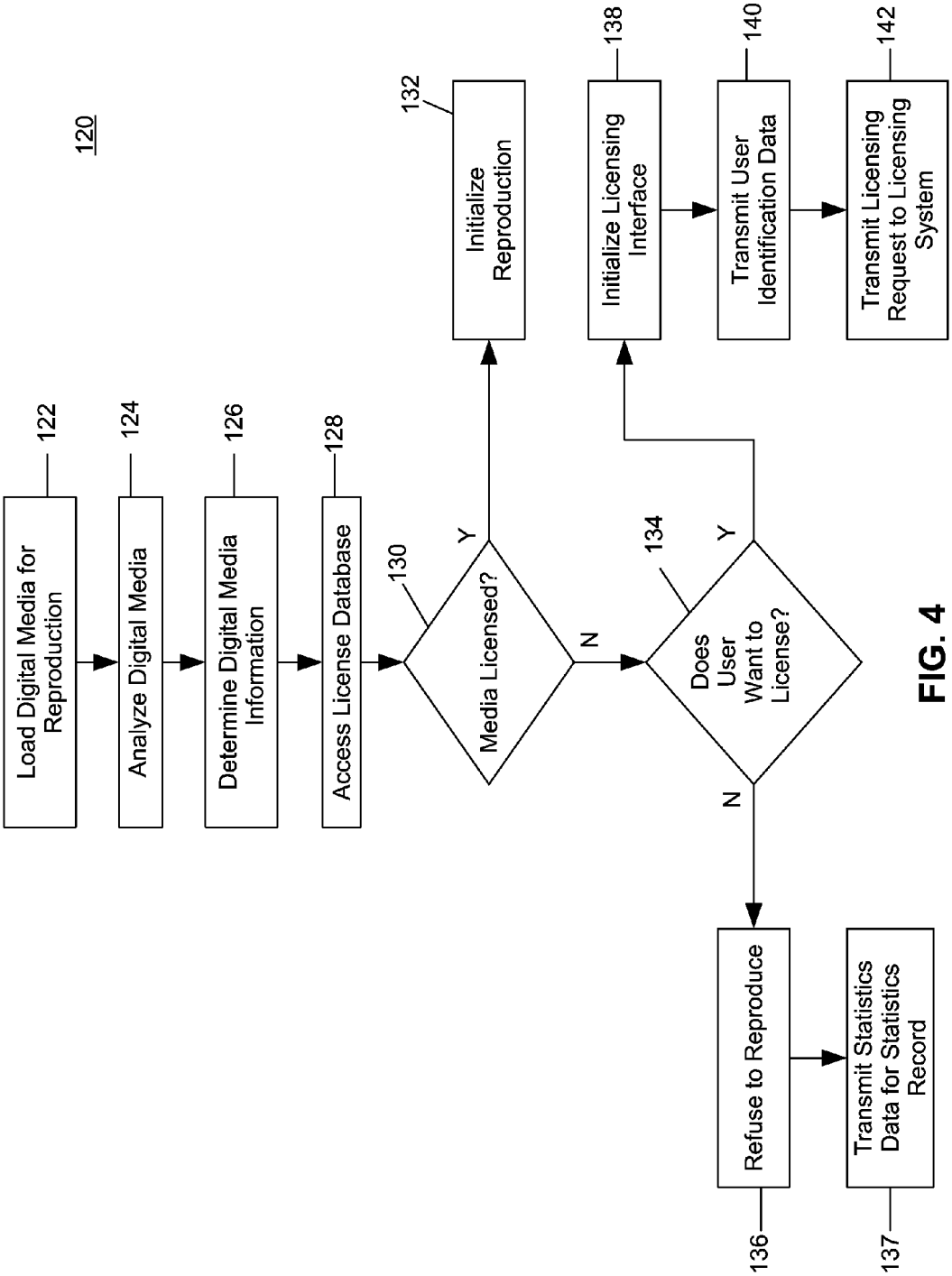
120
Load Digital Media for Reproduction
122
Analyze Digital Media
124
Determine Digital Media Information
126
Access License Database
128
Media Licensed?
130
Y
N
Initialize Reproduction
132
Does User Want to License?
134
Y
N
Initialize Licensing Interface
138
Transmit User Identification Data
140
Transmit Licensing Request to Licensing System
142
Refuse to Reproduce
136
Transmit Statistics Data for Statistics Record
137

FIG. 4

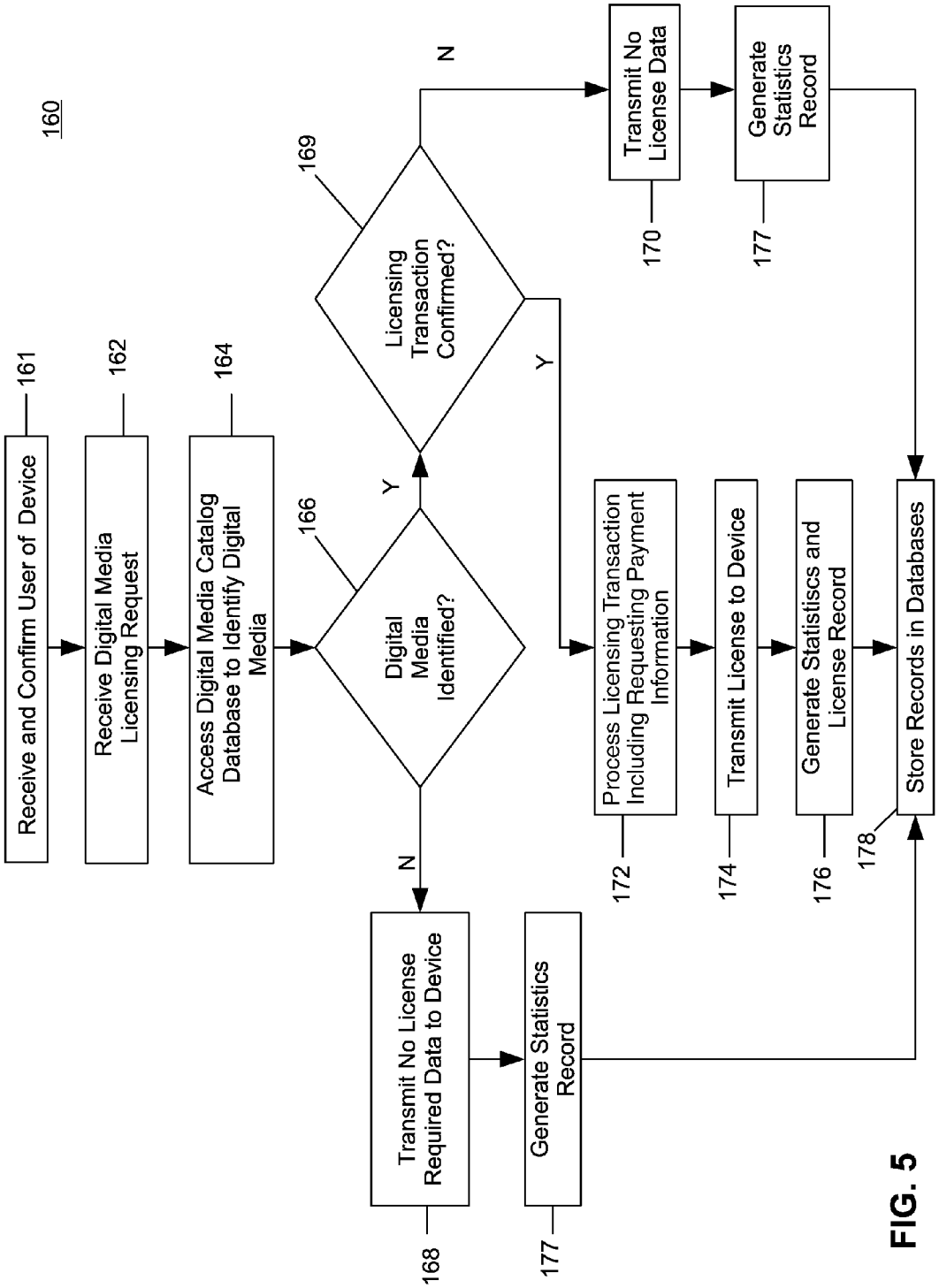
160
Receive and Confirm User of Device
161
Receive Digital Media Licensing Request
162
Access Digital Media Catalog Database to Identify Digital Media
164
Digital Media Identified?
166
Y
N
Licensing Transaction Confirmed?
169
Y
N
Transmit No License Required Data to Device
168
Generate Statistics Record
177
Transmit No License Data
170
Generate Statistics Record
177
Process Licensing Transaction Including Requesting Payment Information
172
Transmit License to Device
174
Generate Statistics and License Record
176
Store Records in Databases
178

FIG. 5

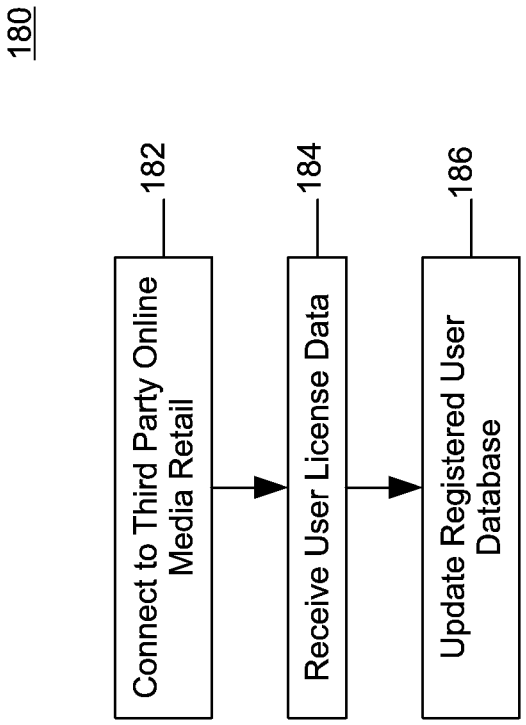
180
182
Connect to Third Party Online Media Retail
184
Receive User License Data
186
Update Registered User Database

FIG. 6

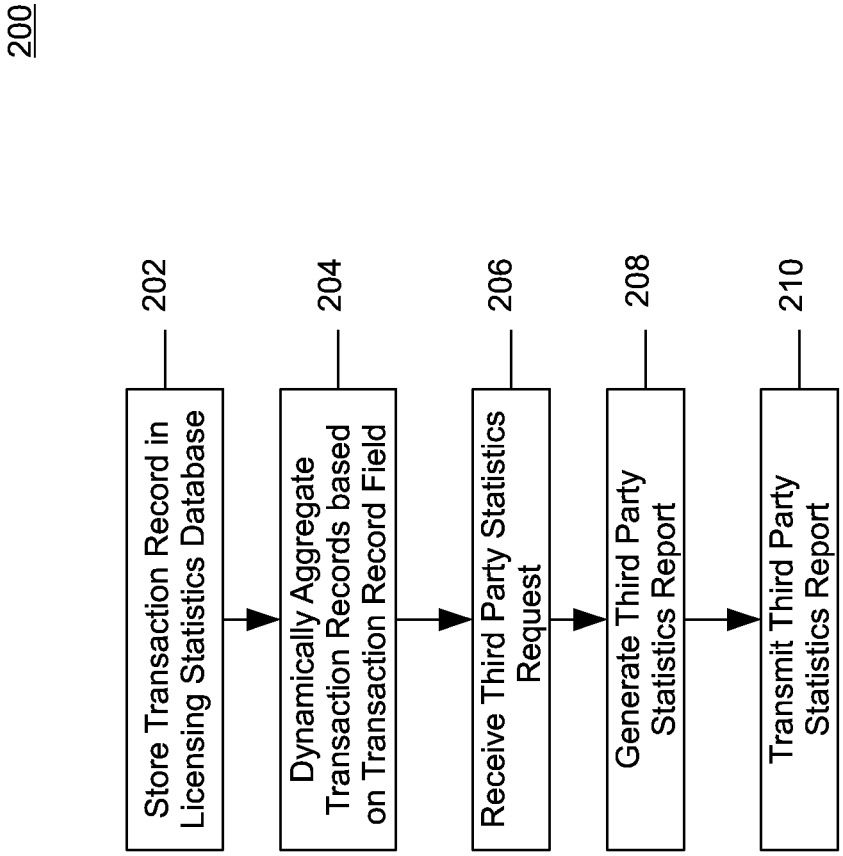
200
202
Store Transaction Record in Licensing Statistics Database
204
Dynamically Aggregate Transaction Records based on Transaction Record Field
206
Receive Third Party Statistics Request
208
Generate Third Party Statistics Report
210
Transmit Third Party Statistics Report

FIG. 7

DIGITAL MEDIA REPRODUCTION AND LICENSING

CROSS-REFERENCE

The present application is a continuation application of U.S. patent application Ser. No. 13/667,629, filed Nov. 2, 2012, and claims the benefit of U.S. Provisional Patent Application No. 61/555,810, filed Nov. 4, 2011, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

Embodiments relate to licensing digital media for reproduction, and more specifically to a digital media licensing system for licensing and enabling reproduction of digital media on a reproduction device.

BACKGROUND

Conventionally, the distribution of media content, such as music, movies, and books for example, is in large part controlled by owners who are the rights-holders of the media content. In conventional systems, the media content is incorporated into a physical media such as a compact disk (CD), a digital video disk (DVD), a printed publication, and/or any other physical media. In such conventional systems, the rights-holders of the media content are able to control licensing of the media content, the production of physical media copies of the media content, and/or the distribution of the media content to customers and/or third party retailers and thereby monetize the media content.

There has been a dramatic shift in the marketplace away from media content distributed on physical media to digital media content that may be distributed via the internet. Conventionally, rights-holders of digital media content have significantly less control over the distribution of such digital media content as compared to the distribution of physical media. For example, a party that does not hold rights of the digital media content may reproduce the digital media content and then distribute the digital media content via the internet without the permission of the actual rights-holder of the digital media content. As a result, the actual-rights holder of the digital media content cannot monetize the unauthorized distribution of the digital media content.

The inability of rights-holders of digital media content to monetize the unauthorized distribution of the digital media content limits the financial gain that rights-holders of the digital media content obtain in creating the original digital media content. Often times such unauthorized distribution of the digital media content prohibits the rights-holders of the digital media from covering the costs of creating the original digital media content which discourages creation of digital media content.

BRIEF SUMMARY

Embodiments relate to monetizing the reproduction of digital media content for the rights-holder of the digital media content. In an embodiment, a computer implemented method provides a multimedia hardware device a capability to generate an authorized reproduction of a media content item included in a digital media file. A digital media file that includes a media content item may be loaded for reproduction. The digital media file may be analyzed to identify digital media information associated with the media content item. A license database may be accessed to determine whether a user is licensed to reproduce the media content item based on the digital media information. The media content item may be reproduced when the user is licensed to reproduce the media content item based on the digital media information. A licensing query may be provided to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item.

In another embodiment, a system provides a media content licensing and verification system to license media content for reproduction. A transceiver may receive a media licensing request from an external device associated with a user. The media licensing request may include digital media information associated with a media content item included in a digital media file. A processor may access a media catalog database that includes a plurality of media content records where a media content record from the plurality of media content records is associated with the media content item. The processor may also determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item. The processor may grant the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device. The processor may also decline the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content item to the external device.

Further embodiments, features, and advantages, as well as the structure and operation of the various embodiments, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described with reference to the accompanying drawings. In the drawings, like reference numbers may indicate identical or functionally similar elements.

FIG. **1** illustrates a digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **3** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to analyze a received catalog of media content and manage the catalog of media content, according to an embodiment;

FIG. **4** illustrates a flowchart illustrating an exemplary aspect of operation for the external multimedia hardware device, according to an embodiment;

FIG. **5** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a payment for a license to reproduce a digital media file, according to an embodiment;

FIG. **6** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive licensing information from a third party media retailer, according to an embodiment; and

FIG. **7** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a third-party request for licensing statistics.

DETAILED DESCRIPTION

The digital media file licensing and authorized reproduction system provides a capability to ensure that a user possesses a license to reproduce a digital media file and if the user does not have a license, providing to the user the option to obtain such a license. In the Detailed Description herein, references to "one embodiment", "an embodiment", an "example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, by every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic may be described in connection with an embodiment, it may be submitted that it may be within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

Overview

FIG. **1** illustrates a digital media file licensing and authorized reproduction system **30** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **30** includes an external multimedia hardware device **10**, a network **12**, a media content licensing and verification system **16**, a media content rights-holders system **18**, a third party online media retailers system **20**, and a hardware device manufacturers system **22**.

System **30** may monetize the reproduction of a media content item included within a digital media file. Reproduction of a media content item may include reproducing sound from a digital audio file, reproducing video from a digital video file, reproducing text from a digital text file, and/or any other reproduction of a digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Reproduction may be defined as a first use by a user of the media content item. For example, reproduction of the media content item may include when a user first accesses a media content item where the user obtained the media content item from an outside source, such as but not limited to a third party online media distributor. Reproduction may also be defined as further distribution of the media content item by the user after the user has initially accessed the media content item. For example, reproduction of the media content item may include when the user distributes the media content item to other parties after the user has obtained the media content item from the third party online media distributor.

A digital media file may represent a MPEG Layer 3 (MP3) file, a RealAudio (RA) file, a raw sample (RAW) file, a Microsoft wave (WAV) file, a Windows Media Audio (WMA) file, and/or any other suitable digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. The media content item may include any portion of data included in the digital media file. A user of external multimedia hardware device **10** may reproduce the media content item with external multimedia hardware device **10**. Device **10** may represent a smart phone, a smart tablet, a mobile telephone, a television, an audio system, a personal music player, a portable computing device, other computing devices such as a personal computer, a laptop, or a desktop computer, computer peripheral such as a printer, a portable audio/or a video player, and/or any other suitable electronic device that can reproduce a media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

However, the user may not have a license that authorizes the user to reproduce the media content item. The digital media file including the media content item may have been procured from various sources that are not licensed to reproduce the media content item and do not collect licensing fees for use of the media content item. As such, when the user loads the digital media file for reproduction, device **10** may analyze the digital media file to determine the media content item included in the file and determine whether the user of device **10** is authorized. For example, the device may analyze a digital music file to identify the song and artist of the media content item that may be a track included in the digital music file. The user may be authorized when the user has a license to load and/or reproduce a media content item included in the digital media file.

In an embodiment, device **10** may analyze a plurality of identifying characteristics associated with the media content item to identify the media content item and to determine whether the user of device **10** is authorized. The plurality of identifying characteristics may be an identifying characteristic associated with the media content item inherently present in the media content item such that the media content item is not remastered to include the identifying characteristic after the media content item is initially recorded. The plurality of identifying characteristics can represent a fingerprint, digital watermarking, and/or any other suitable algorithm to identify copyright ownership of the media content item included in the digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. In an embodiment, device **10** may analyze metadata included in the loaded digital media file to identify the media content item included in the digital media file.

System **30** may query a license database locally and/or remotely located to system **30** to determine whether the user of device **10** has the appropriate license for the media content item. Device **10** may refuse to play the digital media file and query the user to determine whether the user wishes to purchase the appropriate license when the user does not have the appropriate license.

Device **10** may communicate with media content licensing and verification system **16** over network **12** and transmit the fingerprint of the media content item to media content licensing and verification system **16** when the user selects to purchase the appropriate license. Licensing system **16** may identify the media content item based on the received fingerprint. Licensing system **16** may transmit back to device **10** the title and/or other information associated with the identified media content item and request the user to confirm purchase of the license. The user may interface with device **10** to conduct the licensing transaction with licensing system **16**, and after purchasing the license, licensing system **16** may transmit a license to device **10**. After receiving the license from licensing system **16**, device **10** may commence reproduction of the media content item. Moreover, licensing system **16** may store a record of the transaction for statistical purposes, and/or store a copy of the license in a database under a user record associated with the user of device **10**.

Device **10** and licensing system **16** may provide data associated with the use of the media content item to media content rights-holders system **18** over network **12**. Rights-holders system **18** may be accessed by an owner of a copyright for the media content item. For example, device **10** and licensing system **16** may provide data to rights-holders system **18** that includes the user who is accessing the

media content item, the geographic location of the user who is accessing the media content item, other media content items that the user may be accessing, the quantity of times the media content item is accessed, and/or any other data associated with the use of the media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

The data provided by device **10** and licensing system **16** to rights-holders system **18** for the media content item may be used by the copyright owner to develop future licensing agreements that may be provided to the user of device **10** by licensing system **16** for future use of the media content item. Payments for the license to use the media content item may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the copyright owner via rights-holders system **18**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to third party online media retailers system **20**. The data provided to retailers system **20** may be similar to the data provided to rights-holders system **18**. However, retailers system **20** may be accessed by third party online media retailers who have been selected by the copyright owner of the media content item to distribute the media content item via the Internet.

The data provided by device **10** and licensing system **16** to retailers system **20** for the media content item may be used by the third party online retailers to develop future pricing for their online media content item distribution including which media content items to distribute in the future. The data provided to retailers system **20** may also be used to help third party online media retailers target the marketing of the media content item to demographics that have shown a trend of interest in the media content item. Payments for the distribution of the media content item by the third party on line media retailer may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the third party online media retailer via retailers system **20**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to hardware device manufactures system **22**. The data provided to manufactures system **22** may be similar to the data provided to rights-holders system **18** and retailer system **20**. However, manufactures system **22** may be accessed by hardware device manufacturers who manufacture the hardware that may be implemented in device **10** that provides device **10** with the capabilities to limit reproduction of the media content item to when the user has a license to reproduce the media content item. Payments for use of the hardware provided by the hardware device manufacturers implemented in device **10** by the user of device **10** may also be distributed to the hardware device manufacturer via manufacturers system **20**.

Device **10** may be configured to connect to network **12**. Network **12** may include one or more networks, such as the Internet. In some examples, network **12** may include one or more network technologies such as Ethernet, Fast Ethernet, Gigabit Ethernet, a variant of the IEEE 802.11 standard such as WiFi, and the like. Communication over network **12** takes place using one or more network communication protocols including reliable streaming protocols such as transmission control protocol (TCP). These examples are illustrative and not intended to limit the present disclosure. As shown in FIG. **1**, device **10** may engage in communication with network **12** via connection **14**, where connection **14** may be a wireless, wired, a secured communication connection, any combination thereof, and/or any other communication connection that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Licensing system **16** may be configured to engage in communication with network **12**. As such, device **10** may communicate with licensing system **16** via network **12**. Additionally, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may also communicate with licensing system **16** and device **10** via network **12**. Licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may engage in communication with network **12** via a communication connection similar to connection **14**.

Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may have a cloud computing configuration. Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may share resources via network **12**. For example, device **10** may retrieve licensing information for the user of device **10** who wishes to reproduce the media content item via network **12**. Licensing system **16** may also update rights-holders system **18** with the user information for the user who wishes to reproduce the media content item. Based on the cloud computing configuration, the interaction between device **10**, licensing system **16**, and rights-holders system **18** may not be limited to a single external multimedia hardware device. A plurality of external multimedia hardware devices may update licensing system **16** and rights-holders system **18** via network **12** with user information of users wishing to reproduce the media content item. Licensing system **16** may provide each of these updates for the user information to any media content rights-holders system that requests the user information.

Digital Media File Licensing and Authorized Reproduction System

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system **95** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **95** includes external multimedia hardware device **10**, media content licensing and verification system **16**, and network **12**. External multimedia hardware device **10** includes a processor **40**, a transceiver **44**, an input/output interface **46**, a memory **52**, a mass storage **60**, a human machine interface (HMI) **48** and a reproduction module **50**. Processor **40** may be a hardware based processor that includes a general purpose microcontroller, a special purpose microcontroller and/or any other controller that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Processor **40** includes a media recognition module **42**. Media recognition module **42** may be configured to analyze a loaded digital media file to identify the media content item included in the digital media file and/or determine an identifying characteristic, such as a fingerprint for example, of the media content item. In an embodiment, the media recognition module **40** may include hardware based circuitry configured to analyze a loaded digital media file. In an embodiment, the media recognition module **42** may include program code executing on the processor **40** configured to cause the processor **40** to analyze a loaded digital media file.

Memory **52** includes a digital media file **58**, an application **54**, and an operating system (OS) **56**. Memory **52** may be accessed by processor **40**, such that processor **40** may read data from memory **52** and write data to memory **52**. In some embodiments, application **54** and/or OS **56** may include program code including one or more instructions, that when

executed by processor **40** cause device **10** to perform the steps necessary to execute steps or elements embodying the various aspects of the disclosure. Furthermore, digital media file **58** may be loaded for reproduction.

Mass storage **60** includes a license database **62** and digital media file **58**. License database **62** includes a license record **64**. Mass storage **60** may be utilized in addition to memory **52**, or may not be included at all, in which case the data elements illustrated as stored on mass storage **60** would be stored in memory **52**. For exemplary purposes, mass storage **60** includes digital media files **58**, illustrating that one or more digital media files **58** may be stored in mass storage **60** of device **10**. Moreover, mass storage **60** includes a license database **62**, where license database **62** includes one or more license records **64**. In an embodiment, license database **62** includes license records **64**, where license records **64** indicate a media content item that a user of the device may be licensed to reproduce.

Media content licensing and verification system **16** includes a transceiver **68**, a processor **66**, an input/output interface **70**, a mass storage **74**, a memory **76**, and a HMI **72**. Memory **76** includes an application **78**, an OS **80**, a registered user database **86**, a digital media catalog database **82**, and a licensing statistics database **92**. Application **78** and/or the OS **80** may include program code including one or more instructions configured to be executed by processor **66** to cause licensing system **16** to perform steps necessary to perform embodiments of the disclosure.

Registered user database **86** includes a user record **88**. User record **88** includes a license record **90**. Digital media catalog database **82** includes a media record **84**. Each media record **84** includes data associated with a unique media content item loaded into the licensing system **16**. As such, a rights-holder or content creator may load a catalog of media content items that may include but not limited to a song, a movie, a television show, a novel, and/or any other media content item into licensing system **16**. Licensing system **16** may analyze each media content item in the catalog, and generate a media record corresponding to each media content item. In some embodiments, each media record may include data indicating various information of the corresponding media content item, including but not limited to the rights-holder of the media content item, the title of the media content item, the plurality of identifying characteristics, and/or any other information associated with the corresponding media content item that will be apparent to the those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Each user record **88** may be associated with a unique user and indicates all media content items the user has purchased a license for. Each user record **88** may include one or more license records **90**, where each license record may include data indicating a media content item that the user is licensed to reproduce.

Licensing statistics database **92** includes a statistics record **94**. Each statistics record **94** may include data indicating a license purchased by a user connecting to licensing system **16**. The data may include, for example, whether a user that purchased a license for a particular media content item, how many users refused to license a particular media content item, the rights-holder of the media content item for which the license was purchased, the title of the media content item, demographic information for the user that may include but is not limited to age, gender, location, and/or any other data that may be associated with the user and/or license obtained by the user that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments of the present disclosure can be implemented on any type of processing (or computing) device having one or more processors. For example, embodiments can be implemented on a workstation, mobile device, computer, cluster of computers, set-top box, or other devices having at least one processor. In an embodiment, multiple modules may be implemented on the same processing device. Software can include one or more applications and an operating system. Hardware can include, but may not be limited to, a processor, memory, and/or graphical user interface display.

Method **100**

FIG. **3** illustrates a flowchart of an exemplary method **100** of processing a digital media catalog for use in a media content licensing and verification system. At step **102**, the media content licensing and verification system receives digital media catalog. At step **104**, each media content item of the received catalog may be analyzed.

At step **106**, a plurality of identifying characteristics associated with the media content item may be determined. For example, the fingerprint of the media content item may be determined. Determining a media content fingerprint may include one or more steps for analyzing the digital file including the media content item to determine one or more characteristics that uniquely identify the media content item stored therein. For example, if the media content item were a book stored in a digital text file, the natural media fingerprint may be determined to be a predefined number of words from the beginning of the text file.

In another exemplary embodiment, the media content item may be a song stored in a digital music file, and the system may determine the natural media fingerprint by analyzing the digital music file to identify lyrics included in the song, notes played in the song, and/or a sampled sound wave included in the song. These characteristics may be considered individually or in various combinations to uniquely identify the song. Moreover, in many digital media file formats, one or more information fields related to the media content item stored in the file are included in metadata of the file. In an embodiment of the invention, the system may analyze metadata included in the digital media file to identify the media content item stored thereon.

In step **108**, the system generates a media record for each media content item, where the media record includes data indicating the fingerprint, rights-holder information, title, and/or any other media content item data. In step **110**, the media record is stored in a digital media catalog database accessible by the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **120**

FIG. **4** illustrates a flowchart of an exemplary method **120** of verifying that a digital media file has been licensed prior to reproduction and facilitating the purchase of a license if the digital media file has not been properly licensed prior to reproduction. At step **122**, a digital media file is loaded for reproduction on the external multimedia hardware device. At step **124**, the device analyzes the digital media file.

At step **126**, information associated with the digital media file is determined. Information associated with the digital media file may include a fingerprint associated with the

media content item included in the digital media file, the rights-holder of the media content item, the title of the media content item, and/or any other digital media file information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. For example, as described above with respect to FIG. **3**, the device may analyze the digital media file to determine one or more characteristics of the media content item stored thereon, where the characteristics may be utilized alone and/or in various combinations to identify the media content item.

The selected characteristics may be referred to as the natural media fingerprint of the media content item. Advantageously, the natural media fingerprint identifies a media content item, even considering the possibility of different versions of the same media content item. For example, multiple versions of a song are recorded at various times and may be stored as digital music files, such as a live version and a studio version. However, by analyzing the characteristics of a media content item, different versions of the same song may be consistently identified. For example, analyzing characteristics may include analyzing word recognition of lyrics, the occurrence of various frequencies at particular points in time in relation to the occurrence of the lyrics, and/or any other media content item characteristic that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **128**, the device accesses a license database. At step **130**, whether a user of the device has a license for the digital media file may be determined based on the natural media fingerprint and/or other digital media information, such as metadata, included in the digital media file. At step **132**, the device initializes reproduction of the digital media file in response to the determining that the user has the appropriate license.

At step **134**, the device generates a display query asking the user whether the user would like to purchase a license for the digital media file in response to determining that the user does not have the appropriate license. The device generates a display query asking the user whether the user would like to purchase a license for the digital media file.

At step **136**, the device indicates to the user that the digital media file cannot be played in response to the user indicating that the user would not like to purchase a license. At step **137**, the device transmits statistics related to the media content item stored on the digital media file to the media content licensing and verification system. The statistics information may include, for example, the determined natural media fingerprint of the media content item stored in the digital media file and/or any other such information related to the media content item, the digital media file, the external multimedia hardware device, and/or the user of the device.

At step **138**, the device initializes a licensing interface in response to the user indicating that the user would like to purchase the license. The device initializes a licensing interface that includes establishing a secure communication connection to a media content licensing and verification system.

At step **140**, the device transmits user identification data to the system, such that the user of the device may be identified to log into a user account associated with the user, process the licensing transaction, and/or for other such reasons to facilitate purchasing a license for the media content item. The user identification data may include for example, a user name and password, a unique identifier associated with the user, the user's billing information, and/or any other user identification data that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **142**, the device transmits a licensing request to the system, where the request includes information corresponding to the digital media file and the media content item included in the digital media file, such as the fingerprint of the media content item, the title of the media content item, the rights-holder of the digital media file, and/or other media content item information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **160**

FIG. **5** illustrates a flowchart of an exemplary method **160** of processing a license request from an external multimedia hardware device. At step **161**, prior to initializing the licensing transaction, the system receives the user identification data and confirms the user's identity. For example, the system logs the device into a secured transaction interface associated with an account of the user.

At step **162**, the system receives a digital media licensing request from an external multimedia hardware device over a network where the licensing request includes data indicating a media content item that a user of the device wishes to acquire a license for. In an embodiment, the licensing request includes a fingerprint of the media content item, information identifying the rights-holder of the media content item, the title of the media content item, and/or other media content item information.

At step **164**, the system accesses a digital media catalog database to identify the media content item indicated by the request. At step **166**, the system matches the fingerprint of the media content item included in the license request to a fingerprint in the digital media catalog database to identify the media content item associated with the licensing request, the rights-holder associated with the media content item, the price required for a license for the media content item, and/or any other identification information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **168**, the system transmits data to the device indicating that a license is not required for reproduction in response to determining that a record corresponding to the media content item is not in the digital media catalog database. At step **169**, the system transmits data to the device such that a user of the device may confirm a transaction to acquire the license associated with the media content item in response to identifying the media content item associated with the licensing request. In an embodiment, the system transmits data indicating the title of the media content item, the rights-holder of the media content item, an artist associated with the media content item, and/or other media content information such that the device presents this information to the user when asking the user whether to confirm the transaction.

At step **170**, the system transmits data to the device indicating that the license has not been purchased in response to the user declining the licensing transaction, at which point, the device may refuse to reproduce the digital media file for the user. At step **172**, the system processes the licensing transaction in response to the user confirming the licensing transaction and the system receiving confirmation data from the device. The processing may include collecting

payment information, charging previously known payment information, debiting a user account, and/or any other such payment processing methods.

At step **174**, the system transmits a license associated with the media content item over the communication network to the device in response to processing the licensing transaction. At step **176**, the system generates a license record indicating the user and the media content item in response to processing the transaction, the system generates a transaction record including data that identifies the user, the media content item, demographic information about the user, and/or any other license record information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **177**, the user has not purchased a license for a media content item, either because the media content item is not identified in the database or because the user refuses to make the purchase. However, a statistics record may be generated. The statistics data may include for example the natural media fingerprint associated with the media content item, the rights-holder of the media content item, the title of the media content item, and/or any other statistical data. The statistics data generated may be utilized for a variety of purposes, including for example, encouraging non-participating rights-holders from participating in the system by identifying the number of times a license was requested for a media content item owned by the non-participating rights-holder. At step **178**, the statistics record is stored in the licensing statistics database, and the license record is stored in the registered user database in a user record associated with the user.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **180**

FIG. **6** illustrates a flowchart of an exemplary method **180** of loading licenses for media content items associated with a user from third party sources. At step **182**, the system connects to a third party online media retailer. At step **184**, licenses purchased from the third party retailers may be uploaded into a registered user database of the system. At step **186**, after receiving the user license data, the system updates the registered user database of the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **200**

FIG. **7** illustrates a flowchart of an exemplary method **700** of providing statistics associated with licensing transactions performed by the system to a third party over a communication network consistent with embodiments of the invention. At step **202**, the system stores one or more transaction records in a connected licensing statistics database.

At step **204**, the system dynamically aggregates the transaction records in relation to one or more fields of information included in each transaction record. For example, the system may aggregate all transaction records stored in the licensing statistics database where the media content item of the transaction record has a desired title, and as such, data and statistics related to how many times a license was purchased for the media content item having the desired title may be retrieved. In an embodiment, similar aggregation may be performed to determine how many licenses were purchased for a particular rights-holder, titles of media content items that users of a particular demographic purchased, and/or other such relevant data and statistics.

At step **206**, the system may receive a statistics request from a third party that may include but not limited to a rights-holder, a hardware manufacturer, a marketing/analytics partner, and/or other such third parties that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **208**, the system may generate a statistics report based on the received request. At step **210**, the system may transmit the statistics report to the third party over the communication network. As such, in an embodiment a participating rights-holder may quickly retrieve licensing data and statistics for media content items that the rights-holder owns. In another embodiment, a marketing and/or analytics company may receive valuable licensing and statistics data for media content items for particular demographics of users, genres of media content items, and/or other such categories.

Embodiments can work with software, hardware, and/or operating system implementations, other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Conclusion

As such, in general, some embodiments of the invention are directed to a system for recognizing licensed and unlicensed multi-media content by use of a natural media fingerprint recognition and license verification database and system. The system disables the use of unlicensed content and provides a secure method to license unlicensed multi-media content and distribute the licensing revenue to content owners, rights-holders, participating third-party hardware and software manufacturers, and/or other additional third parties. In some embodiments, an external multi-media hardware device includes a hardware or software read/write licensed media database module, operatively connected to a hardware or software natural media fingerprint recognition and license verification module, where the recognition and license verification module may be operatively connected to a hardware or software data encryption module. Moreover the device may include an operating system and/or application stored on memory associated with the external multi-media hardware device. Where the operating system and/or application may be executed by a processor associated with the device to cause the processor to control one or more of the modules to perform one or more tasks associated with the one or more modules. In addition, media reproduction (e.g., audio and video playback) hardware and/or software module may be monitored and controlled by processor of the device operatively connected to, executing, and/or accessing the content fingerprint recognition and license verification module. Moreover, a physical memory device (e.g., a memory and/or a mass storage device) may be accessible by the processor during execution of the one or more operations of the operating system and/or application residing on a memory associated with the external multi-media hardware device. In some embodiments, the operating system and/or application may cause the processor to drive a peripheral device using an I/O interface to present a user of the device with a graphic user interface.

Furthermore, the external multimedia hardware device may communicate over a communication network (e.g., an internet connection, a cellular communication network connection, etc.). In some embodiments, the external multimedia hardware device may be connected to a one or more

servers functioning as a media content licensing and verification system over the communication network, such as a media content licensing and verification system shown in FIGS. **1** and **2**. In other embodiments, the external multimedia hardware device may be connected to a personal computer functioning as a media content licensing and verification system. For example, an external multimedia hardware device may connect to a user's personal computer over a Wi-Fi connection to verify a user has the appropriate license to reproduce a particular media content item, where the personal computer may include a plurality of licensing records associated with the user. In some embodiments, the communication connection between the device and the server may be a secure internet connection. In addition, the media content licensing and verification system may receive multi-media content items (e.g., songs, videos, books, etc.) from participating copyright owners and/or rights-holders through a catalog submissions module operatively connected to the system and executing thereon. The catalog submissions may be loaded into a natural media fingerprint creation module to generate a natural media fingerprint catalog. In addition, the system may be operatively connected to a storage device storing a registered users and licensed media database.

In addition, the media content licensing and verification system may be operatively connected to and/or execute a secure license verification and payment collection module stored on a connected storage device and/or executing on a computing system connected over the communication network. Such that the the content fingerprint and licenses verification module associated with the external multimedia hardware device may conduct license purchasing transactions by communicating over the communication network with the media licensing and verification system and/or the secure license verification and payment collection module. The secure license verification and payment collection module may be connected through the central computer controlled sub-system server (e.g. a media content licensing and verification system) and/or through a computing system in communication with the media content licensing and verification system over the communication network.

As such, the application and/or operating system executing on the external multimedia hardware device may facilitate licensing transactions for various media content items stored in the media content licensing and verification system. Furthermore the media content licensing and verification system may include a payments distribution with real-time statistics module that may execute on the media content licensing and verification system, such that copyright owners, rights-holders, and/or participating hardware manufacturers may receive payments and statistics associated with the licensing of media content items using the media content licensing and verification system.

In some embodiments, pre-existing licenses may be submitted to the media content licensing and verification system such that the registered users and licensed media master database may be updated to include licenses for registered users purchased from third party sources, such as third party online media retailers. Where the previously purchased license data may be imported into the system over the communication network to the media content licensing and verification system from the third party sources, such as databases maintained by third parties.

It will therefore be appreciated that the invention may be implemented, for example, using program code implemented on one or more hardware-based computers, one or more processors, and/or one or more integrated circuits (e.g., semiconductors). Program code typically comprises one or more instructions that are resident at various times in various memory and storage devices in a computer, and that, when read and executed by one or more processors in a computer, cause that computer to perform the steps necessary to execute steps or elements embodying the various aspects of the invention. Moreover, while the invention has and hereinafter will be described in the context of fully functioning computers and computer systems, those skilled in the art will appreciate that the various embodiments of the invention are capable of being distributed as a program product in a variety of forms, and that the invention applies equally regardless of the particular type of computer readable media used to actually carry out the distribution. Examples of computer readable media include but are not limited to tangible, recordable type media such as volatile and non-volatile memory devices, floppy and other removable disks, hard disk drives, magnetic tape, optical disks (e.g., CD-ROMs, DVDs, etc.) among others.

Moreover, while the invention has and hereinafter will been described in the context of digital media files resident on a memory, the invention is not so limited. Those skilled in the art will appreciate that embodiments of the invention are capable of facilitating licensing transactions with respect to streaming digital media. For example, a media content item may be streamed to an external multimedia hardware device over a communication network, and a portion of the media content item may be stored in a local memory (e.g., buffered in a cache of a processor associated with the external multimedia hardware device) while a portion may be stored remotely on a memory device accessible by the external multimedia hardware device over a communication network. For example, a media content item may be streamed to an external multimedia hardware device over a communication network from a cloud based storage system, a digital media streaming service (e.g., Pandora, Last.fm, Spotify, iTunes, iCloud, Netflix, and/or other such services) and embodiments of the invention may analyze the media content item when loaded for reproduction and perform the operations consistent with embodiments of the invention to confirm that a user of the device has the appropriate license for the streaming media content item prior to reproducing the streaming media content item.

While the invention has been illustrated by a description of the various embodiments and the examples, and while these embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any other way limit the scope of the invention to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Thus, the invention in its broader aspects is therefore not limited to the specific details, representative apparatus and method, and illustrative example shown and described. In particular, any of the blocks of the above flowcharts may be deleted, augmented, made to be simultaneous with another, combined, or be otherwise altered in accordance with the principles of the invention. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants' general inventive concept.

What is claimed is:

1. A computer implemented method for providing a multimedia hardware device to generate an authorized reproduction of a media content item included in a digital media file, comprising:

receiving a license request from a user requesting to engage in a license transaction to reproduce a media content item;

evaluating the license transaction to determine whether the user has acquired a license to reproduce the media content item;

after the evaluation of the license transaction, extracting from the license transaction user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner of the media content item to gauge a demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for the media content item of the copyright owner;

aggregating the user data into a statistics record for the license request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the license request;

storing in a license database the statistics record so that the user data is accessible to the copyright owner of the media content item; and

analyzing a plurality of statistics records aggregated from each license request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each license request of the media content item.

2. The method of claim **1**, further comprising:

receiving a license to reproduce the media content from the licensing system when the licensing request is granted by the licensing system; and

preventing reproduction of the media content item when the licensing request is declined by the licensing system.

3. The method of claim **2**, further comprising:

reproducing the media content item based on a plurality of reproduction parameters in the license that is received from the licensing system.

4. The computer implemented method of claim **1**, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

5. The computer implemented method of claim **1**, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

6. The method of claim **1**, wherein the user data includes a geographic location of the user who is accessing the media content item.

7. A computer implemented method for providing a media content licensing and verification system to license media content for reproduction, the method comprising:

receiving a media licensing request from an external device associated with a user, wherein the media licensing request includes digital media information associated with the media content item included in a digital media file;

determining whether the media licensing request is to be granted based on a media content record stored in a media catalog database that is associated with the media content item;

after the determination of the media licensing request, extracting from the media licensing request user data that is specific to the user that is attempting to reproduce the media content item when the user is granted the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner to gauge a demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for the media content item of the copyright owner;

aggregating the user data into a statistics record for the media licensing request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the media licensing request;

storing in a license database the statistics record so that the user data is accessible to the copyright owner of the media content item; and

analyzing a plurality of statistics records aggregated from each media licensing request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each media licensing request of the media content item when the license is acquired by the user and when the license is declined by the user.

8. The method of claim **7**, further comprising:

generating a license record that includes license granting information associated with the license granted to the external device; and

storing the license record in a registered user database that is associated with the user.

9. The method of claim **7**, wherein the digital media information includes a fingerprint associated with the media content item.

10. The method of claim **7**, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

11. The method of claim **7**, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

12. The method of claim **7**, wherein the user data includes additional media content items that the user has previously accessed.

13. A system for providing a multimedia hardware device to generate an authorized reproduction of a media content item included in a digital media file, comprising:

a memory coupled to a processor configured to:

receive a license request from a user requesting to engage in a license transaction to reproduce the media content item;

evaluate the license transaction to determine whether the user has acquired a license to reproduce the media content item;

after the evaluation of the license transaction, extract from the license transaction user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner to gauge a

demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for the media content item of the copyright owner,

aggregate the user data into a statistics record for the license request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the license request,

store in the license database the statistics record so that the user data is accessible to the copyright owner of the media content item, and

analyze a plurality of statistics records aggregated from each license request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each license request of the media content item when the license is acquired by the user and when the license is declined by the user.

14. The system of claim **13**, wherein the processor is further configured to:

receive a license to reproduce the media content item from the licensing system when the licensing request is granted by the licensing system; and

prevent reproduction of the media content item when the licensing request is declined by the licensing system.

15. The system of claim **13**, wherein the processor is further configured to reproduce the media content item based on a plurality of reproduction parameters included in the license that is received from the licensing system.

16. The system of claim **13**, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

17. The system of claim **13**, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

18. The system of claim **13**, wherein the user data includes a quantity of times that the user has previously accessed the media content item and additional media content items.

19. A system for providing a media content licensing and verification system to license media content for reproduction, comprising:

a transceiver configured to receive a media licensing request from an external device associated with a user, wherein the media licensing request includes digital media information associated with the media content item included in a digital media file; and

a memory coupled to a processor configured to:

determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item,

after the determination of the media licensing request, extracting from the media licensing request user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license and when the user declines the license, wherein the user data includes demographic data associated with the user that enables a copyright owner to gauge a demographic that acquired the license for the media content item of the copyright owner and a demographic that declined the license for the media content item of the copyright owner,

aggregate the user data into a statistics record for the media licensing request when the user acquires the license and when the user declines the license, wherein the statistics record summarizes the user data associated with the media licensing request, and

store in a license database the statistics record so that the user data is accessible to the copyright owner of the media content item, and

analyze a plurality of statistics records aggregated from each media licensing request for the media content item owned by the copyright owner to provide the copyright owner with the aggregated user data from each license request of the media content item when the license is acquired by the user and when the license is declined by the user.

20. The system of claim **19**, wherein the processor is further configured to:

generate a license record that includes license granting information associated with the license granted to the external device; and

store the license record in a registered user database that is associated with the user.

21. The system of claim **19**, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

22. The system of claim **21**, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

23. The system of claim **19**, wherein the user data includes a geographic location of the user who is accessing the media content item that enables the copyright owner to gauge geographic locations where the media content item is being accessed.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,898,590 B2
APPLICATION NO. : 15/659175
DATED : February 20, 2018
INVENTOR(S) : Estes

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1, Line approx. 43 reads "... As a result, the actual-rights holder of the digital media content cannot monetize the ..." should read "... As a result, the actual rights-holder of the digital media content cannot monetize the ..."

Column 3, Line approx. 11 reads "... characteristic, by every embodiment may not necessarily ..." should read "... characteristic, but every embodiment may not necessarily ..."

Column 3, Line approx. 23 "... portions thereof, may be implemented." should read "... portions thereof may be implemented."

Column 5, Line approx. 40-41 reads "... associated with the use of media content item to hardware device manufactures system 22." should read "... associated with the use of media content item to hardware device manufacturers system 22."

Column 5, Line approx. 41-42 reads "... The data provided to the manufactures system 22 may be similar to ..." should read "... The data provided to the manufacturers system 22 may be similar to ..."

Column 5, Line approx. 43-44 reads "... However, manufactures system 22 may be accessed by hardware ..." should read "... However, manufacturers system 22 may be accessed by hardware ..."

Column 7, Line approx. 47-49 reads "... [cor-]responding media content item that will be apparent to the those skilled in the ..." should read "... [cor-]responding media content item that will be apparent to those skilled in the ..."

Column 7, Line approx. 60-61 reads "... The data may include, for example, whether a user that purchased a license ..." should read "... The data may include, for example, whether a user purchased a license ..."

Column 10, Line approx. 63 reads "... which point, the device may refuse to ..." should read "... which point the device may refuse to ..."

Signed and Sealed this
Fourteenth Day of August, 2018

Andrei Iancu
Director of the United States Patent and Trademark Office

Column 12, Line approx. 67 reads "... [multime-]dia hardware device may be connected to a one or more ..." should read "... [multime-]dia hardware device may be connected to one or more ..."

Column 13, Line approx. 30 reads "... Such that the the content fingerprint and ..." should read "... Such that the content fingerprint and ..."

Column 14, Line approx. 20-21 reads "Moreover, while the invention has and hereinafter will been described in the context of digital media files ..." should read "Moreover, while the invention has and hereinafter will be described in the context of digital media files ..."

Column 14, Line approx. 47 reads "... detail, it is not the intention of the applicants to restrict or in ..." should read "... detail, it is not the intention of the Applicant to restrict or in ..."

Column 14, Line approx. 58 reads "... without departing from the spirit or scope of applicants' ..." should read "... without departing from the spirit or scope of Applicant's ..."

Column 15, Line 51, Claim 5 reads "... device manufacturer that manufacturers hardware that..." should read "... device manufacturer that manufactures hardware that ..."

Column 16, Line 46, Claim 11 reads "... device manufacturer that manufacturers hardware that..." should read "... device manufacturer that manufactures hardware that ..."

Column 17, Line 41, Claim 17 reads "... hardware device manufacturer that manufacturers hardware ..." should read "... hardware manufacturer that manufactures hardware ..."

Column 18, Line 48, Claim 22 reads "... hardware device manufacturer that manufacturers hardware ..." should read "... hardware device manufacturer that manufactures hardware ..."

UNITED STATES PATENT AND TRADEMARK OFFICE

Assignment abstract of title for Application 15659175

Invention title/Inventor	Patent	Publication	Application	PCT	International registration
DIGITAL MEDIA REPRODUCTION AND LICENSING Christopher A. Estes	9898590 Feb 20, 2018	20170323088 Nov 9, 2017	15659175 Jul 25, 2017		

Assignments (1 total)

Assignment 1

Reel/frame	Execution date	Date recorded	Properties	Pages
046899/0941	Sep 18, 2018	Sep 18, 2018	1	3

Conveyance
ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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US010489560B2

(12) United States Patent

Estes

(10) Patent No.: US 10,489,560 B2
(45) Date of Patent: Nov. 26, 2019

(54) **DIGITAL MEDIA REPRODUCTION AND LICENSING**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 16/122,136

(22) Filed: **Sep. 5, 2018**

(65) **Prior Publication Data**

US 2019/0005204 A1 Jan. 3, 2019

Related U.S. Application Data

(63) Continuation of application No. 15/898,978, filed on Feb. 19, 2018, which is a continuation of application No. 15/659,175, filed on Jul. 25, 2017, now Pat. No. 9,898,590, which is a continuation of application No. 13/667,629, filed on Nov. 2, 2012, now Pat. No. 9,715,581.

(60) Provisional application No. 61/555,810, filed on Nov. 4, 2011.

(51) **Int. Cl.**

G06Q 30/02 (2012.01)
G06F 21/10 (2013.01)

(52) **U.S. Cl.**

CPC *G06F 21/10* (2013.01); *G06Q 30/02* (2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

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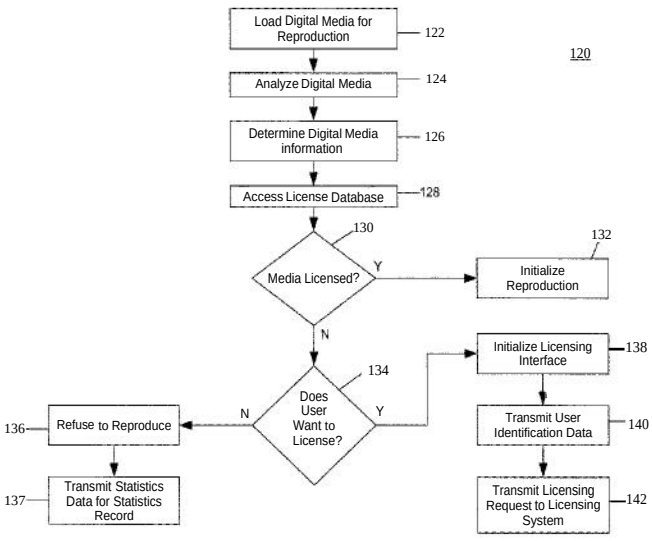
Primary Examiner — Lynn D Feild
Assistant Examiner — Richard A McCoy
(74) *Attorney, Agent, or Firm* — Taft Stettinius & Hollister LLP

(57) **ABSTRACT**

Systems and methods for monetizing the reproduction of digital media content for the rights-holders of the digital media content. Embodiments of the present disclosure relate to determining whether a user of a media content item has a license to reproduce the media content item. In one embodiment, the media content item may be reproduced when the user is licensed. The user is prompted to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item when the user is not licensed. Further embodiments determine whether a user may receive a license when the user wishes to acquire a license. In an embodiment, the user is declined a license when not approved for the license.

19 Claims, 7 Drawing Sheets



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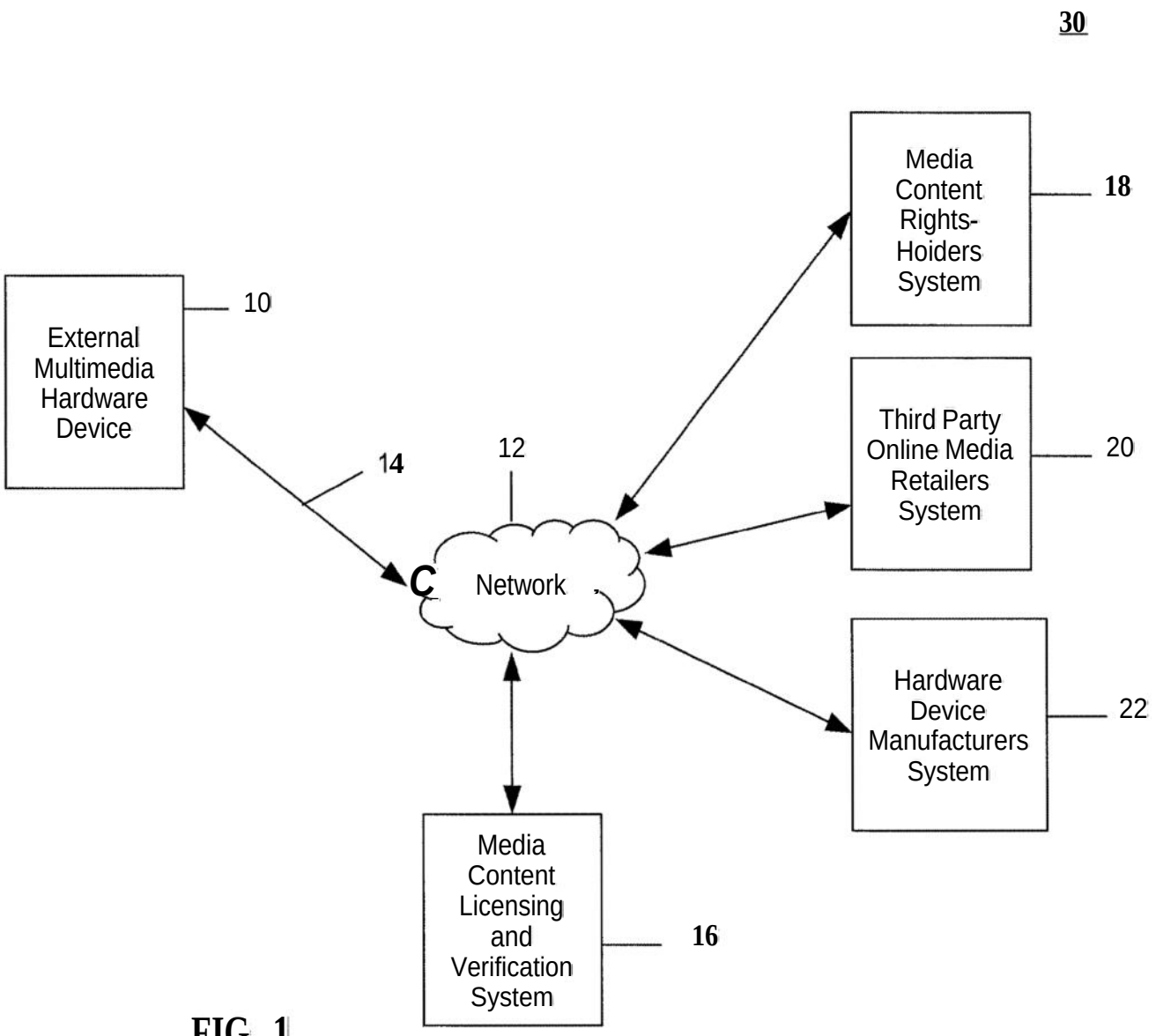
30
Media Content Rights-Hoiders System
18
External Multimedia Hardware Device
10
14
12
Third Party Online Media Retailers System
20
Network
Hardware Device Manufacturers System
22
Media Content Licensing and Verification System
16

FIG. 1

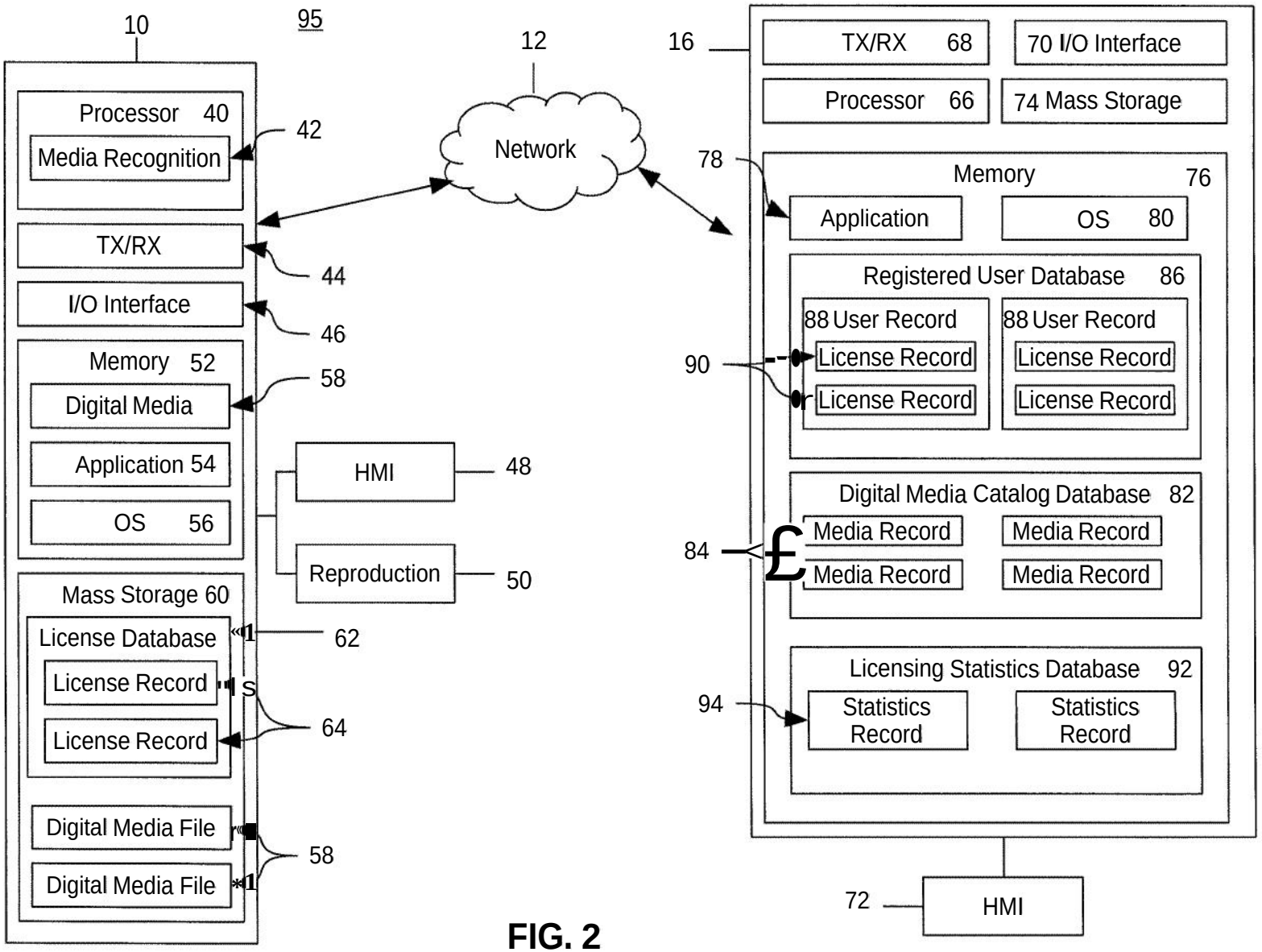

FIG. 2

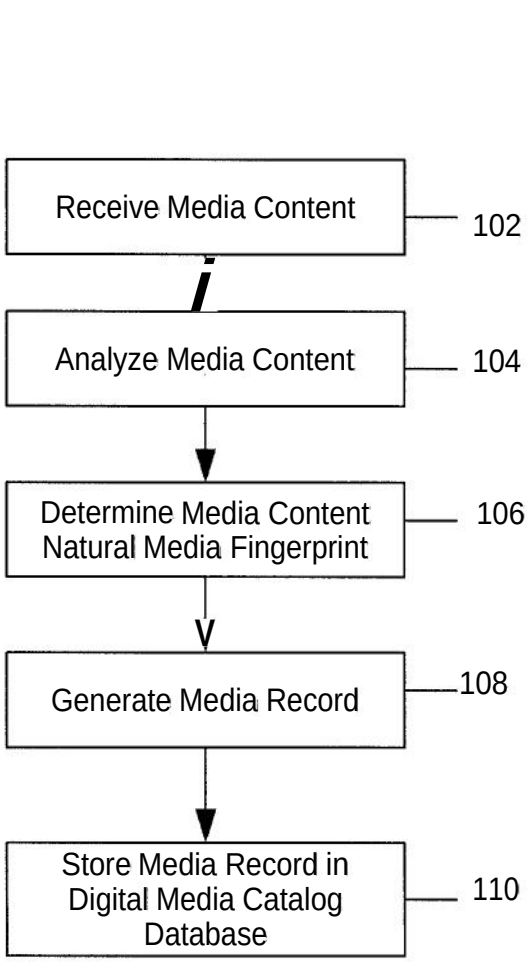
100
Receive Media Content
102
Analyze Media Content
104
Determine Media Content Natural Media Fingerprint
106
Generate Media Record
108
Store Media Record in Digital Media Catalog Database
110

FIG. 3

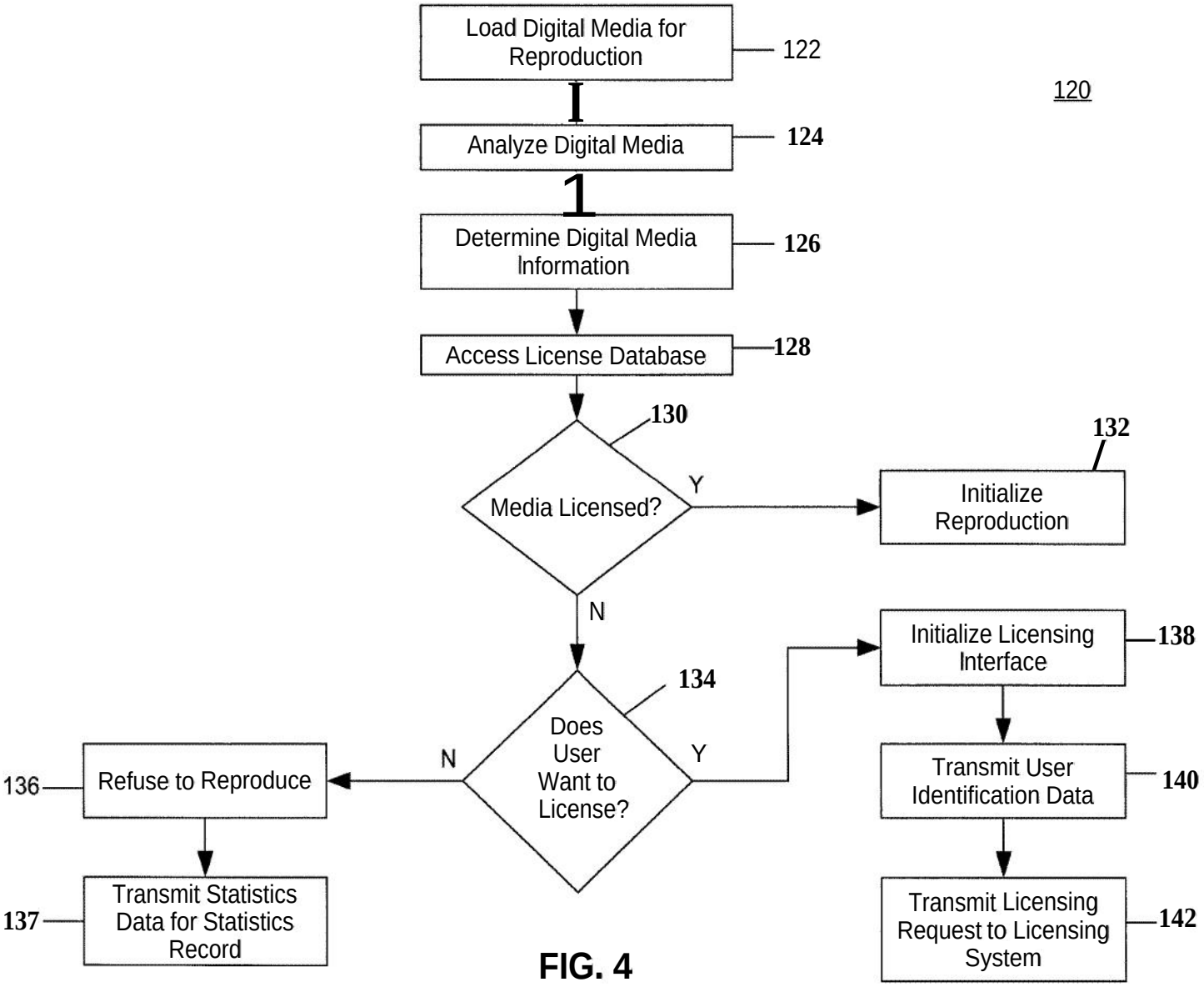
Load Digital Media for Reproduction
122
120
Analyze Digital Media
124
Determine Digital Media Information
126
Access License Database
128
130
Media Licensed?
Y
132
Initialize Reproduction
N
134
Does User Want to License?
N
Y
136
Refuse to Reproduce
137
Transmit Statistics Data for Statistics Record
Initialize Licensing Interface
138
Transmit User Identification Data
140
Transmit Licensing Request to Licensing System
142

FIG. 4

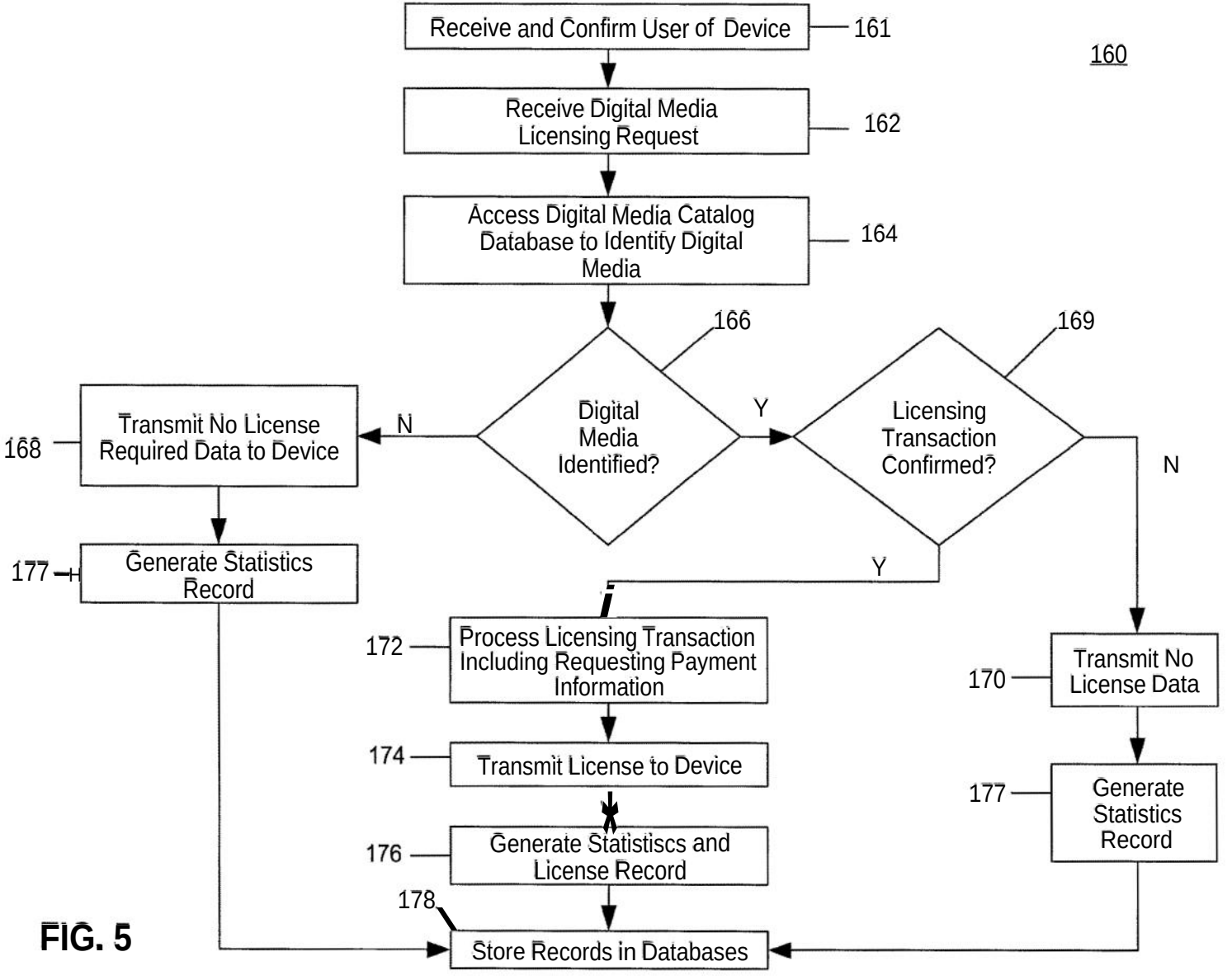

FIG. 5

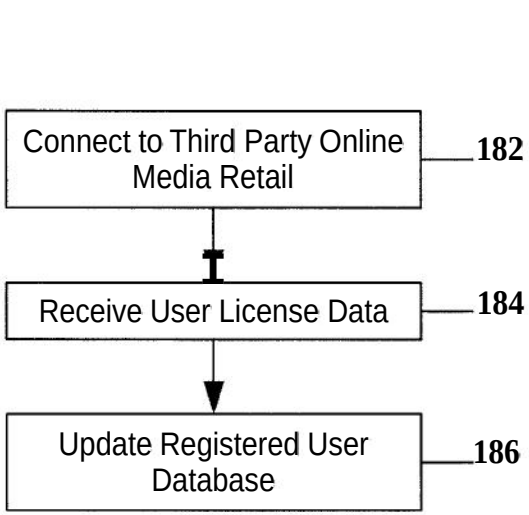
180
Connect to Third Party Online Media Retail
182
Receive User License Data
184
Update Registered User Database
186

FIG. 6

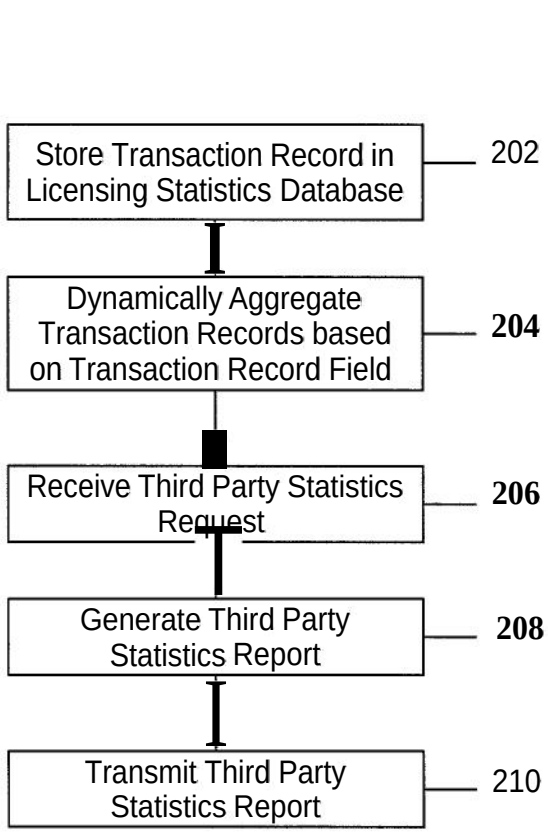
200
Store Transaction Record in Licensing Statistics Database
202
Dynamically Aggregate Transaction Records based on Transaction Record Field
204
Receive Third Party Statistics Request
206
Generate Third Party Statistics Report
208
Transmit Third Party Statistics Report
210

FIG. 7

DIGITAL MEDIA REPRODUCTION AND LICENSING

CROSS-REFERENCE

The present application is a continuation application of U.S. patent application Ser. No. 15/898,978, filed Feb. 19, 2018, and claims the benefit of U.S. Pat. No. 9,898,590, filed Jul. 25, 2017, and claims the benefit of U.S. Pat. No. 9,715,581, filed Nov. 2, 2012, and claims the benefit of U.S. Provisional Patent Application No. 61/555,810, filed Nov. 4, 2011, which are incorporated herein by reference in their entirety.

TECHNICAL FIELD

Embodiments relate to licensing digital media for reproduction, and more specifically to a digital media licensing system for licensing and enabling reproduction of digital media on a reproduction device.

BACKGROUND

Conventionally, the distribution of media content, such as music, movies, and books for example, is in large part controlled by owners who are the rights-holders of the media content. In conventional systems, the media content is incorporated into a physical media such as a compact disk (CD), a digital video disk (DVD), a printed publication, and/or any other physical media. In such conventional systems, the rights-holders of the media content are able to control licensing of the media content, the production of physical media copies of the media content, and/or the distribution of the media content to customers and/or third party retailers and thereby monetize the media content.

There has been a dramatic shift in the marketplace away from media content distributed on physical media to digital media content that may be distributed via the internet. Conventionally, rights-holders of digital media content have significantly less control over the distribution of such digital media content as compared to the distribution of physical media. For example, a party that does not hold rights of the digital media content may reproduce the digital media content and then distribute the digital media content via the internet without the permission of the actual rights-holder of the digital media content. As a result, the actual-rights holder of the digital media content cannot monetize the unauthorized distribution of the digital media content.

The inability of rights-holders of digital media content to monetize the unauthorized distribution of the digital media content limits the financial gain that rights-holders of the digital media content obtain in creating the original digital media content. Often times such unauthorized distribution of the digital media content prohibits the rights-holders of the digital media from covering the costs of creating the original digital media content which discourages creation of digital media content.

BRIEF SUMMARY

Embodiments relate to monetizing the reproduction of digital media content for the rights-holder of the digital media content. In an embodiment, a computer implemented method provides a multimedia hardware device a capability to generate an authorized reproduction of a media content item included in a digital media file. A digital media file that includes a media content item may be loaded for reproduction. The digital media file may be analyzed to identify digital media information associated with the media content item. A license database may be accessed to determine whether a user is licensed to reproduce the media content item based on the digital media information. The media content item may be reproduced when the user is licensed to reproduce the media content item based on the digital media information. A licensing query may be provided to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item.

In another embodiment, a system provides a media content licensing and verification system to license media content for reproduction. A transceiver may receive a media licensing request from an external device associated with a user. The media licensing request may include digital media information associated with a media content item included in a digital media file. A processor may access a media catalog database that includes a plurality of media content records where a media content record from the plurality of media content records is associated with the media content item. The processor may also determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item. The processor may grant the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device. The processor may also decline the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content item to the external device.

Further embodiments, features, and advantages, as well as the structure and operation of the various embodiments, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described with reference to the accompanying drawings. In the drawings, like reference numbers may indicate identical or functionally similar elements.

FIG. **1** illustrates a digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. 2 illustrates a second digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. 3 illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to analyze a received catalog of media content and manage the catalog of media content, according to an embodiment;

FIG. **4** illustrates a flowchart illustrating an exemplary aspect of operation for the external multimedia hardware device, according to an embodiment;

FIG. 5 illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a payment for a license to reproduce a digital media file, according to an embodiment;

FIG. 6 illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive licensing information from a third party media retailer, according to an embodiment; and

FIG. 7 illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a third-party request for licensing statistics.

DETAILED DESCRIPTION

The digital media file licensing and authorized reproduction system provides a capability to ensure that a user possesses a license to reproduce a digital media file and if the user does not have a license, providing to the user the option to obtain such a license. In the Detailed Description herein, references to "one embodiment", "an embodiment", an "example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, by every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic may be described in connection with an embodiment, it may be submitted that it may be within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

Overview

FIG. **1** illustrates a digital media file licensing and authorized reproduction system 30 in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system 30 includes an external multimedia hardware device 10, a network 12, a media content licensing and verification system 16, a media content rights-holders system 18, a third party online media retailers system 20, and a hardware device manufacturers system 22.

System 30 may monetize the reproduction of a media content item included within a digital media file. Reproduction of a media content item may include reproducing sound from a digital audio file, reproducing video from a digital video file, reproducing text from a digital text file, and/or any other reproduction of a digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Reproduction may be defined as a first use by a user of the media content item. For example, reproduction of the media content item may include when a user first accesses a media content item where the user obtained the media content item from an outside source, such as but not limited to a third party online media distributor. Reproduction may also be defined as further distribution of the media content item by the user after the user has initially accessed the media content item. For example, reproduction of the media content item may include when the user distributes the media content item to other parties after the user has obtained the media content item from the third party online media distributor.

A digital media file may represent a MPEG Layer 3 (MP3) file, a Real Audio (RA) file, a raw sample (RAW) file, a Microsoft wave (WAV) file, a Windows Media Audio (WMA) file, and/or any other suitable digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. The media content item may include any portion of data included in the digital media file. A user of external multimedia hardware device 10 may reproduce the media content item with external multimedia hardware device 10. Device 10 may represent a smart phone, a smart tablet, a mobile telephone, a television, an audio system, a personal music player, a portable computing device, other computing devices such as a personal computer, a laptop, or a desktop computer, computer peripheral such as a printer, a portable audio/or a video player, and/or any other suitable electronic device that can reproduce a media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

However, the user may not have a license that authorizes the user to reproduce the media content item. The digital media file including the media content item may have been procured from various sources that are not licensed to reproduce the media content item and do not collect licensing fees for use of the media content item. As such, when the user loads the digital media file for reproduction, device 10 may analyze the digital media file to determine the media content item included in the file and determine whether the user of device 10 is authorized. For example, the device may analyze a digital music file to identify the song and artist of the media content item that may be a track included in the digital music file. The user may be authorized when the user has a license to load and/or reproduce a media content item included in the digital media file.

In an embodiment, device 10 may analyze a plurality of identifying characteristics associated with the media content item to identify the media content item and to determine whether the user of device 10 is authorized. The plurality of identifying characteristics may be an identifying characteristic associated with the media content item inherently present in the media content item such that the media content item is not remastered to include the identifying characteristic after the media content item is initially recorded. The plurality of identifying characteristics can represent a fingerprint, digital watermarking, and/or any other suitable algorithm to identify copyright ownership of the media content item included in the digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. In an embodiment, device 10 may analyze metadata included in the loaded digital media file to identify the media content item included in the digital media file.

System 30 may query a license database locally and/or remotely located to system 30 to determine whether the user of device 10 has the appropriate license for the media content item. Device 10 may refuse to play the digital media file and query the user to determine whether the user wishes to purchase the appropriate license when the user does not have the appropriate license.

Device 10 may communicate with media content licensing and verification system 16 over network 12 and transmit the fingerprint of the media content item to media content licensing and verification system 16 when the user selects to purchase the appropriate license. Licensing system 16 may identify the media content item based on the received fingerprint. Licensing system 16 may transmit back to device 10 the title and/or other information associated with the identified media content item and request the user to confirm purchase of the license. The user may interface with device 10 to conduct the licensing transaction with licensing system 16, and after purchasing the license, licensing system 16 may transmit a license to device 10. After receiving the license from licensing system 16, device 10 may commence reproduction of the media content item. Moreover, licensing system 16 may store are cord of the transaction for statistical purposes, and/or store a copy of the license in a database under a user record associated with the user of device 10.

Device 10 and licensing system 16 may provide data associated with the use of the media content item to media

content rights-holders system 18 over network 12. Rights-holders system 18 may be accessed by an owner of a copyright for the media content item. For example, device 10 and licensing system 16 may provide data to rights-holders system 18 that includes the user who is accessing the media content item, the geographic location of the user who is accessing the media content item, other media content items that the user may be accessing, the quantity of times the media content item is accessed, and/or any other data associated with the use of the media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

The data provided by device 10 and licensing system 16 to rights-holders system 18 for the media content item may be used by the copyright owner to develop future licensing agreements that may be provided to the user of device 10 by licensing system 16 for future use of the media content item. Payments for the license to use the media content item may be received from the user via device 10 and licensing system 16. Payments may also be distributed to the copyright owner via rights-holders system 18.

Device 10 and licensing system 16 may also provide data associated with the use of the media content item to third party online media retailers system 20. The data provided to retailers system 20 may be similar to the data provided to rights-holders system 18. However, retailers system 20 may be accessed by third party online media retailers who have been selected by the copyright owner of the media content item to distribute the media content item via the Internet.

The data provided by device 10 and licensing system 16 to retailers system 20 for the media content item may be used by the third party online retailers to develop future pricing for their online media content item distribution including which media content items to distribute in the future. The data provided to retailers system 20 may also be used to help third party online media retailers target the marketing of the media content item to demographics that have shown a trend of interest in the media content item. Payments for the distribution of the media content item by the third party on line media retailer may be received from the user via device 10 and licensing system 16. Payments may also be distributed to the third party online media retailer via retailers system 20.

Device 10 and licensing system 16 may also provide data associated with the use of the media content item to hardware device manufactures system 22. The data provided to manufactures system 22 may be similar to the data provided to rights-holders system 18 and retailer system 20. However, manufactures system 22 may be accessed by hardware device manufacturers who manufacture the hardware that may be implemented in device 10 that provides device 10 with the capabilities to limit reproduction of the media content item to when the user has a license to reproduce the media content item. Payments for use of the hardware provided by the hardware device manufacturers implemented in device 10 by the user of device 10 may also be distributed to the hardware device manufacturer via manufacturers system 20.

Device 10 may be configured to connect to network 12. Network 12 may include one or more networks, such as the Internet. In some examples, network 12 may include one or more network technologies such as Ethernet, Fast Ethernet, Gigabit Ethernet, a variant of the IEEE 802.11 standard such as WiFi, and the like. Communication over network 12 takes place using one or more network communication protocols including reliable streaming protocols such as transmission control protocol (TCP). These examples are illustrative and not intended to limit the present disclosure. As shown in FIG. **1**, device 10 may engage in communication with network 12 via connection 14, where connection 14 may be a wireless, wired, a secured communication connection, any combination thereof, and/or any other communication connection that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Licensing system 16 may be configured to engage in communication with network 12. As such, device 10 may communicate with licensing system 16 via network 12. Additionally, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may also communicate with licensing system 16 and device 10 via network 12. Licensing system 16, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may engage in communication with network 12 via a communication connection similar to connection 14.

Device 10, licensing system 16, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may have a cloud computing configuration. Device 10, licensing system 16, rights-holders system 18, retailers system 20, and/or manufacturers system 22 may share resources via network 12. For example, device 10 may retrieve licensing information for the user of device 10 who wishes to reproduce the media content item via network 12. Licensing system 16 may also update rights-holders system 18 with the user information for the user who wishes to reproduce the media content item. Based on the cloud computing configuration, the interaction between device 10, licensing system 16, and rights-holders system 18 may not be limited to a single external multimedia hardware device. A plurality of external multimedia hardware devices may update licensing system 16 and rights-holders system 18 via network 12 with user information of users wishing to reproduce the media content item. Licensing system 16 may provide each of these updates for the user information to any media content rights-holders system that requests the user information.

Digital Media File Licensing and Authorized Reproduction System

FIG. 2 illustrates a second digital media file licensing and authorized reproduction system 95 in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system 95 includes external multimedia hardware device 10, media content licensing and verification system 16, and network 12. External multimedia hardware device 10 includes a processor 40, a transceiver 44, an input/output interface 46, a memory 52, a mass storage 60, a human machine interface (HMI) 48 and a reproduction module 50. Processor 40 may be a hardware based processor that includes a general purpose microcontroller, a special purpose microcontroller and/or any other controller that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Processor 40 includes a media recognition module 42. Media recognition module 42 may be configured to analyze a loaded digital media file to identify the media content item included in the digital media file and/or determine an identifying characteristic, such as a fingerprint for example, of the media content item. In an embodiment, the media recognition module 40 may include hardware based circuitry configured to analyze a loaded digital media file. In an embodiment, the media recognition module 42 may include program code executing on the processor 40 configured to cause the processor 40 to analyze a loaded digital media file.

Memory 52 includes a digital media file 58, an application 54, and an operating system (OS) 56. Memory 52 may be accessed by processor 40, such that processor 40 may read data from memory 52 and write data to memory 52. In some embodiments, application 54 and/or OS 56 may include program code including one or more instructions, that when executed by processor 40 cause device 10 to perform the steps necessary to execute steps or elements embodying the various aspects of the disclosure. Furthermore, digital media file 58 may be loaded for reproduction.

Mass storage 60 includes a license database 62 and digital media file 58. License database 62 includes a license record 64. Mass storage 60 may be utilized in addition to memory 52, or may not be included at all, in which case the data elements illustrated as stored on mass storage 60 would be stored in memory 52. For exemplary purposes, mass storage 60 includes digital media files 58, illustrating that one or more digital media files 58 may be stored in mass storage 60 of device 10. Moreover, mass storage 60 includes a license database 62, where license database 62 includes one or more license records 64. In an embodiment, license database 62 includes license records 64, where license records 64 indicate a media content item that a user of the device may be licensed to reproduce.

Media content licensing and verification system 16 includes a transceiver 68, a processor 66, an input/output interface 70, a mass storage 74, a memory 76, and a HMI 72. Memory 76 includes an application 78, an OS 80, a registered user database 86, a digital media catalog database 82, and a licensing statistics database 92. Application 78 and/or the OS 80 may include program code including one or more instructions configured to be executed by processor 66 to cause licensing system 16 to perform steps necessary to perform embodiments of the disclosure.

Registered user database 86 includes a user record 88. User record 88 includes a license record 90. Digital media catalog database 82 includes a media record 84. Each media record 84 includes data associated with a unique media content item loaded into the licensing system 16. As such, a rights-holder or content creator may load a catalog of media content items that may include but not limited to a song, a movie, a television show, a novel, and/or any other media content item into licensing system 16. Licensing system 16 may analyze each media content item in the catalog, and generate a media record corresponding to each media content item. In some embodiments, each media record may include data indicating various information of the corresponding media content item, including but not limited to the rights-holder of the media content item, the title of the media content item, the plurality of identifying characteristics, and/or any other information associated with the corresponding media content item that will be apparent to the those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Each user record 88 may be associated with a unique user and indicates all media content items the user has purchased a license for. Each user record 88 may include one or more license records 90, where each license record may include data indicating a media content item that the user is licensed to reproduce.

Licensing statistics database 92 includes a statistics record 94. Each statistics record 94 may include data indicating a license purchased by a user connecting to licensing system 16. The data may include, for example, whether a user that purchased a license for a particular media content item, how many users refused to license a particular media content item, the rights-holder of the media content item for which the license was purchased, the title of the media content item, demographic information for the user that may include but is not limited to age, gender, location, and/or any other data that may be associated with the user and/or license obtained by the user that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments of the present disclosure can be implemented on any type of processing (or computing) device having one or more processors. For example, embodiments can be implemented on a workstation, mobile device, computer, cluster of computers, set-top box, or other devices having at least one processor. In an embodiment, multiple modules may be implemented on the same processing device. Software can include one or more applications and an operating system. Hardware can include, but may not be limited to, a processor, memory, and/or graphical user interface display.

Method 100

FIG. 3 illustrates a flowchart of an exemplary method 100 of processing a digital media catalog for use in a media content licensing and verification system. At step 102, the media content licensing and verification system receives digital media catalog. At step 104, each media content item of the received catalog may be analyzed.

At step 106, a plurality of identifying characteristics associated with the media content item may be determined. For example, the fingerprint of the media content item may be determined. Determining a media content fingerprint may include one or more steps for analyzing the digital file including the media content item to determine one or more characteristics that uniquely identify the media content item stored therein. For example, if the media content item were a book stored in a digital text file, the natural media fingerprint may be determined to be a predefined number of words from the beginning of the text file.

In another exemplary embodiment, the media content item may be a song stored in a digital music file, and the system may determine the natural media fingerprint by analyzing the digital music file to identify lyrics included in the song, notes played in the song, and/or a sampled sound wave included in the song. These characteristics may be considered individually or in various combinations to uniquely identify the song. Moreover, in many digital media file formats, one or more information fields related to the media content item stored in the file are included in metadata of the file. In an embodiment of the invention, the system may analyze metadata included in the digital media file to identify the media content item stored thereon.

In step 108, the system generates a media record for each media content item, where the media record includes data indicating the fingerprint, rights-holder information, title, and/or any other media content item data. In step 110, the media record is stored in a digital media catalog database accessible by the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 120

FIG. 4 illustrates a flowchart of an exemplary method 120 of verifying that a digital media file has been licensed prior to reproduction and facilitating the purchase of a license if the digital media file has not been properly licensed prior to reproduction. At step 122, a digital media file is loaded for

reproduction on the external multimedia hardware device. At step 124, the device analyzes the digital media file.

At step 126, information associated with the digital media file is determined. Information associated with the digital media file may include a fingerprint associated with the media content item included in the digital media file, the rights-holder of the media content item, the title of the media content item, and/or any other digit al media file information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. For example, as described above with respect to FIG. 3, the device may analyze the digital media file to determine one or more characteristics of the media content item stored thereon, where the characteristics may be utilized alone and/or in various combinations to identify the media content item.

The selected characteristics may be referred to as the natural media fingerprint of the media content item. Advantageously, the natural media fingerprint identifies a media content item, even considering the possibility of different versions of the same media content item. For example, multiple versions of a song are recorded at various times and may be stored as digital music files, such as a live version and a studio version. However, by analyzing the characteristics of a media content item, different versions of the same song may be consistently identified. For example, analyzing characteristics may include analyzing word recognition of lyrics, the occurrence of various frequencies at particular points in time in relation to the occurrence of the lyrics, and/or any other media content item characteristic that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 128, the device accesses a license database. At step 130, whether a user of the device has a license for the digital media file may be determined based on the natural media fingerprint and/or other digital media information, such as metadata, included in the digital media file. At step 132, the device initializes reproduction of the digital media file in response to the determining that the user has the appropriate license.

At step 134, the device generates a display query asking the user whether the user would like to purchase a license for the digital media file in response to determining that the user does not have the appropriate license. The device generates a display query asking the user whether the user would like to purchase a license for the digital media file.

At step 136, the device indicates to the user that the digital media file cannot be played in response to the user indicating that the user would not like to purchase a license. At step 137, the device transmits statistics related to the media content item stored on the digital media file to the media content licensing and verification system. The statistics information may include, for example, the determined natural media fingerprint of the media content item stored in the digital media file and/or any other such information related to the media content item, the digital media file, the external multimedia hardware device, and/or the user of the device.

At step 138, the device initializes a licensing interface in response to the user indicating that the user would like to purchase the license. The device initializes a licensing interface that includes establishing a secure communication connection to a media content licensing and verification system.

At step 140, the device transmits user identification data to the system, such that the user of the device may be identified to log into a user account associated with the user, process the licensing transaction, and/or for other such reasons to facilitate purchasing a license for the media content item. The user identification data may include for example, a user name and password, a unique identifier associated with the user, the user's billing information, and/or any other user identification data that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 142, the device transmits a licensing request to the system, where the request includes information corresponding to the digital media file and the media content item included in the digital media file, such as the fingerprint of the media content item, the title of the media content item, the rights-holder of the digital media file, and/or other media content item information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 160

FIG. 5 illustrates a flowchart of an exemplary method 160 of processing a license request from an external multimedia hardware device. At step 161, prior to initializing the licensing transaction, the system receives the user identification data and confirms the user's identity. For example, the system logs the device into a secured transaction interface associated with an account of the user.

At step 162, the system receives a digital media licensing request from an external multimedia hardware device over a network where the licensing request includes data indicating a media content item that a user of the device wishes to acquire a license for. In an embodiment, the licensing request includes a fingerprint of the media content item, information identifying the rights-holder of the media content item, the title of the media content item, and/or other media content item information.

At step 164, the system accesses a digital media catalog database to identify the media content item indicated by the request. At step 166, the system matches the fingerprint of the media content item included in the license request to a fingerprint in the digital media catalog database to identify the media content item associated with the licensing request, the rights-holder associated with the media content item, the price required for a license for the media content item, and/or any other identification information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 168, the system transmits data to the device indicating that a license is not required for reproduction in response to determining that a record corresponding to the media content item is not in the digital media catalog database. At step 169, the system transmits data to the device such that a user of the device may confirm a transaction to acquire the license associated with the media content item in response to identifying the media content item associated with the licensing request. In an embodiment, the system transmits data indicating the title of the media content item, the rights-holder of the media content item, an artist associated with the media content item, and/or other media content information such that the device presents this information to the user when asking the user whether to confirm the transaction.

At step 170, the system transmits data to the device indicating that the license has not been purchased in response to the user declining the licensing transaction, at

which point, the device may refuse to reproduce the digital media file for the user. At step 172, the system processes the licensing transaction in response to the user confirming the licensing transaction and the system receiving confirmation data from the device. The processing may include collecting payment information, charging previously known payment information, debiting a user account, and/or any other such payment processing methods.

At step 174, the system transmits a license associated with the media content item over the communication network to the device in response to processing the licensing transaction. At step 176, the system generates a license record indicating the user and the media content item in response to processing the transaction, the system generates a transaction record including data that identifies the user, the media content item, demographic information about the user, and/or any other license record information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 177, the user has not purchased a license for a media content item, either because the media content item is not identified in the database or because the user refuses to make the purchase. However, a statistics record may be generated. The statistics data may include for example the natural media fingerprint associated with the media content item, the rights-holder of the media content item, the title of the media content item, and/or any other statistical data. The statistics data generated may be utilized for a variety of purposes, including for example, encouraging non-participating rights-holders from participating in the system by identifying the number of times a license was requested for a media content item owned by the non-participating rights-holder. At step 178, the statistics record is stored in the licensing statistics database, and the license record is stored in the registered user database in a user record associated with the user.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 180

FIG. 6 illustrates a flowchart of an exemplary method 180 of loading licenses for media content items associated with a user from third party sources. At step 182, the system connects to a third party online media retailer. At step 184, licenses purchased from the third party retailers may be uploaded into a registered user database of the system. At step 186, after receiving the user license data, the system updates the registered user database of the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method 200

FIG. 7 illustrates a flowchart of an exemplary method 700 of providing statistics associated with licensing transactions performed by the system to a third party over a communication network consistent with embodiments of the invention. At step 202, the system stores one or more transaction records in a connected licensing statistics database.

At step 204, the system dynamically aggregates the transaction records in relation to one or more fields of information included in each transaction record. For example, the system may aggregate all transaction records stored in the licensing statistics database where the media content item of the transaction record has a desired title, and as such, data and statistics related to how many times a license was purchased for the media content item having the desired title may be retrieved. In an embodiment, similar aggregation may be performed to determine how many licenses were purchased for a particular rights-holder, titles of media content items that users of a particular demographic purchased, and/or other such relevant data and statistics.

At step 206, the system may receive a statistics request from a third party that may include but not limited to a rights-holder, a hardware manufacturer, a marketing/analytics partner, and/or other such third parties that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step 208, the system may generate a statistics report based on the received request. At step 210, the system may transmit the statistics report to the third party over the communication network. As such, in an embodiment a participating rights-holder may quickly retrieve licensing data and statistics for media content items that the rights-holder owns. In another embodiment, a marketing and/or analytics company may receive valuable licensing and statistics data for media content items for particular demographics of users, genres of media content items, and/or other such categories.

Embodiments can work with software, hardware, and/or operating system implementations, other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

CONCLUSION

As such, in general, some embodiments of the invent ion are directed to a system for recognizing licensed and unlicensed multi-media content by use of a natural media fingerprint recognition and license verification database and system. The system disables the use of unlicensed content and provides a secure method to license unlicensed multi-media content and distribute the licensing revenue to content owners, rights-holders, participating third-party hardware and software manufacturers, and/or other additional third parties. In some embodiments, an external multi-media hardware device includes a hardware or software read/write licensed media database module, operatively connected to a hardware or software natural media fingerprint recognition and license verification module, where the recognition and license verification module may be operatively connected to a hardware or software data encryption module. Moreover, the device may include an operating system and/or application stored on memory associated with the external multi-media hardware device. Where the operating system and/or application may be executed by a processor associated with the device to cause the processor to control one or more of the modules to perform one or more tasks associated with the one or more modules. In addition, media reproduction (e.g., audio and video playback) hardware and/or software module may be monitored and controlled by processor of the device operatively connected to, executing, and/or accessing the content fingerprint recognition and license verification module. Moreover, a physical memory device (e.g., a memory and/or a mass storage device) may be accessible by the processor during execution of the one or more operations of the operating system and/or application residing on a memory associated with the external multi-media hardware device. In some embodiments, the operating system and/or

application may cause the processor to drive a peripheral device using an I/O interface to present a user of the device with a graphic user interface.

Furthermore, the external multimedia hardware device may communicate over a communication network (e.g., an internet connection, a cellular communication network connection, etc.). In some embodiments, the external multimedia hardware device may be connected to a one or more servers functioning as a media content licensing and verification system over the communication network, such as a media content licensing and verification system shown in FIGS. 1 and 2. In other embodiments, the external multimedia hardware device may be connected to a personal computer functioning as a media content licensing and verification system. For example, an external multimedia hardware device may connect to a user's personal computer over a Wi-Fi connection to verify a user has the appropriate license to reproduce a particular media content item, where the personal computer may include a plurality of licensing records associated with the user. In some embodiments, the communication connection between the device and the server may be a secure internet connection. In addition, the media content licensing and verification system may receive multi-media content items (e.g., songs, videos, books, etc.) from participating copyright owners and/or rights-holders through a catalog submissions module operatively connected to the system and executing thereon. The catalog submissions may be loaded into a natural media fingerprint creation module to generate a natural media fingerprint catalog. In addition, the system may be operatively connected to a storage device storing a registered users and licensed media database.

In addition, the media content licensing and verification system may be operatively connected to and/or execute a secure license verification and payment collection module stored on a connected storage device and/or executing on a computing system connected over the communication network. Such that the content fingerprint and licenses verification module associated with the external multimedia hardware device may conduct license purchasing transactions by communicating over the communication network with the media licensing and verification system and/or the secure license verification and payment collection module. The secure license verification and payment collection module may be connected through the central computer controlled sub-system server (e.g. a media content licensing and verification system) and/or through a computing system in communication with the media content licensing and verification system over the communication network.

As such, the application and/or operating system executing on the external multimedia hardware device may facilitate licensing transactions for various media content items stored in the media content licensing and verification system. Furthermore, the media content licensing and verification system may include a payments distribution with real-time statistics module that may execute on the media content licensing and verification system, such that copyright owners, rights-holders, and/or participating hardware manufacturers may receive payments and statistics associated with the licensing of media content items using the media content licensing and verification system.

In some embodiments, pre-existing licenses may be submitted to the media content licensing and verification system such that the registered users and licensed media master database may be updated to include licenses for registered users purchased from third party sources, such as third party online media retailers. Where the previously purchased license data may be imported into the system over the communication network to the media content licensing and verification system from the third party sources, such as databases maintained by third parties.

It will therefore be appreciated that the invention may be implemented, for example, using program code implemented on one or more hardware-based computers, one or more processors, and/or one or more integrated circuits (e.g., semiconductors). Program code typically comprises one or more instructions that are resident at various times in various memory and storage devices in a computer, and that, when read and executed by one or more processors in a computer, cause that computer to perform the steps necessary to execute steps or elements embodying the various aspects of the invention. Moreover, while the invention has and hereinafter will be described in the context of fully functioning computers and computer systems, those skilled in the art will appreciate that the various embodiments of the invention are capable of being distributed as a program product in a variety of forms, and that the invention applies equally regardless of the particular type of computer readable media used to actually carry out the distribution. Examples of computer readable media include but are not limited to tangible, recordable type media such as volatile and non-volatile memory devices, floppy and other removable disks, hard disk drives, magnetic tape, optical disks (e.g., CD-ROMs, DVDs, etc.) among others.

Moreover, while the invention has and hereinafter will been described in the context of digital media files resident on a memory, the invention is not so limited. Those skilled in the art will appreciate that embodiments of the invention are capable of facilitating licensing transactions with respect to streaming digital media. For example, a media content item may be streamed to an external multimedia hardware device over a communication network, and a portion of the media content item may be stored in a local memory (e.g., buffered in a cache of a processor associated with the external multimedia hardware device) while a portion may be stored remotely on a memory device accessible by the external multimedia hardware device over a communication network. For example, a media content item may be streamed to an external multimedia hardware device over a communication network from a cloud based storage system, a digital media streaming service (e.g., Pandora, Last.fm, Spotify, iTunes, iCloud, Netflix, and/or other such services) and embodiments of the invention may analyze the media content item when loaded for reproduction and perform the operations consistent with embodiments of the invention to confirm that a user of the device has the appropriate license for the streaming media content item prior to reproducing the streaming media content item.

While the invention has been illustrated by a description of the various embodiments and the examples, and while these embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any other way limit the scope of the invention to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Thus, the invention in its broader aspects is therefore not limited to the specific details, representative apparatus and method, and illustrative example shown and described. In particular, any of the blocks of the above flowcharts may be deleted, augmented, made to be simultaneous with another, combined, or be otherwise altered in accordance with the principles of the invention. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants' general inventive concept.

What is claimed is:

1. A computer implemented method for configuring a multimedia hardware device to enable an authorized stream of a media content item included in a digital media file, comprising: receiving a request from a user to stream the media content item; evaluating the request to stream to determine whether the user has acquired a license to stream the media content item and offering the license to stream the media content item to the user when the user does not have the license to stream the media content item; after the evaluation of the request to stream, extracting user data that is specific to the user that is attempting to stream the media content item when the user at least one of streams and declines to stream the media content item, wherein the user data includes demographic data associated with the user that enables a third party online retailer that is providing the media content item to be streamed by the user to gauge at least one of a demographic that streamed the media content item of a copyright owner and a demographic that declined to stream the media content item of the copyright owner and the user data includes each media content item that the user streamed and each media content item that the user declined to stream that enables the third party online retailer to target marketing of different media content items to the user based on the demographic of the user and based on a history of media content items that the user has streamed and media content items that the user has declined to stream to determine a trend of interest in media content items by the user and to thereby taiget the marketing of the different media content items to the user based on the determined trend of interest associated with the user; aggregating the user data into a statistics record for the request to stream the media content item when the user streams or declines to stream the media content item, wherein the statistics, record summarizes the user data associated with the request to steam the media content item; storing in a license database the statistics record so that the user data is accessible to the third party online retailer that is providing the media content item to be streamed; and analyzing a plurality of statistics records aggregated from each request to stream the media content item as provided by the third party online retailer to be streamed to provide the third party online retailer with the aggregated user data from each request to stream the media content item.

2. The method of claim 1, further comprising:

receiving a license to reproduce the media content from a licensing system when the request is granted by the licensing system; and

preventing streaming of the media content item when the request is declined by the licensing system.

3. The method of claim 2, further comprising:

reproducing the media content item based on a plurality of reproduction parameters in the license that is received from the licensing system.

4. The computer implemented method of claim 1, further comprising:

storing in the license database the user data that is associated with the user that is attempting to stream the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

5. The method of claim 1, wherein the user data includes a geographic location of the user who is streaming the media content item.

6. A computer implemented method for configuring a media content licensing and verification system to license media content for streaming the method comprising: receiving a request from an external device associated with a user to stream a media content item, wherein the request to stream includes digital media information associated with the media content item included in a digital media file and the digital media information includes at least one identification characteristic that is unique to the media content item that is included in the media content item when the media content item is initially created and not dependent on any encoding during any mastering of the media content item; determining whether the request to stream is to be granted based on a media content record stored in a media catalog database that is associated with the media content item and offering a license to stream the media content item to the user when the user does not have the license to stream the media content item; after the determination of the request to stream, extracting user data that is specific to the user that is attempting to stream the media content item when the user at least one of streams and when the user declines to stream the media content item, wherein the user data includes demographic data associated with the user that enables a third party online retailer that is providing the media content item to be streamed by the user to gauge at least one of a demographic that streamed the media content item of a copyright owner and a demographic that declined to stream the media content item of the copyright owner and the user data includes each media content item that the user streamed and each media content item that the user declined to stream that enables the third party retailer to target marketing of different media content items to the user based on the demographic of the user and based on a history of media content items that the user has streamed and media content items that the user has declined to stream to determine a trend of interest in media content items by the user and to thereby taiget the marketing of the different media content items to the user based on the determined trend of interest associated with the user; aggregating the user data inn a statistics record for the request to stream the media content: item when the use streams or declines to stream the media content item, wherein the statistics record summarizes the user data associated with the request to stream the media content item; storing in a license database the statistics record so that the user data is accessible to the third party online retailer that is providing the media content item to be streamed; and analyzing a plurality of statistics records aggregated from each request to stream the media content item as provided by the third party online retailer to be streamed to provide the third party online retailer with the aggregated user data from each request to stream the media content item.

7. The method of claim 6, further comprising:

generating a license record that includes license granting information associated with the license granted to the external device; and

storing the license record in a registered user database that is associated with the user.

8. The method of claim 6, wherein the digital media information includes the at least one identification characteristics that is a fingerprint associated with the media content item.

9. The method of claim 6, further comprising:

storing in the license database the user data that is associated with the user that is attempting to stream the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

10. The method of claim 6, wherein the user data includes additional media content items that the user has previously accessed.

11. A system for configuring a multimedia hardware device, to generate an authorized stream of a media content item included in a digital media file, comprising: at least one processor; and a memory coupled with the processor, the memory including instructions that, when executed by the processor cause the processor to: receive a request from a user requesting to stream the media content item; evaluate the request to stream to determine whether the user has acquired a license to stream the media content item and offer the license to stream the media content item to the user when the user does not have the license to stream the media content item; after the evaluation of the request to stream, extract user data that is specific to the user that is attempting to stream the media content item when the user at least one of streams and declines to stream the media content item, wherein the user data includes demographic data associated with the user that enables a third party online retailer that is providing the media content item to be streamed by the user to gauge at least one of a demographic that streamed the media content item of a copyright owner and a demographic that declined to stream the media content item of the copyright owner and the user data includes each media content item that the user streamed and each media content item that the user declined to stream that enables a third party online retailer to target marketing of different media content items to the user based on the demographic of the user and based on a history of media content items that the user has streamed and media content items that the user has declined to stream to determine a trend of interest in media content items by the user and to thereby taiget the marketing of the different media content items to the user based on the determined trend of interest associated with the user, aggregate the user data into a statistics record to stream the media content item for the request when the user, streams or declines to stream the media content item, wherein the statistics record summarizes the user data associated with the request to stream the media content item, store in the license database the statistics record so that the user data is accessible to the third party online retailer that is providing the media content item to be streamed, and analyze a plurality of statistics records aggregated from each request to stream the media content item as provided by the third party online retailer to be streamed to provide the third party online retailer with the aggregated user data from each request to stream the media content item.

12. The system of claim 11, wherein the processor is further configured to:

receive a license to stream the media content item from a licensing system when the request is granted by the licensing system; and

prevent streaming of the media content item when the request is declined by the licensing system.

13. The system of claim 11, wherein the processor is further configured to stream the media content item based on a plurality of streaming parameters included in the license that is received from the licensing system.

14. The system of claim 11, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to stream the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

15. The system of claim 11, wherein the user data includes a quantity of times that the user has previously accessed the media content item and additional media content items.

16. A system for configuring a media content licensing and verification system to license media content for streaming, comprising: a receiver configured to receive a request from an external device associated with a user to stream the media content item, wherein the request includes digital media information associated with the media content item included in a digital media file and the digital media information includes at least one identification characteristic that is unique to the media content item that is included in the media content item when the media content item is initially created and not dependent on any encoding during any mastering of the media content item; at least one processor; and a memory coupled with the processor, the memory including instructions that, when executed by the processor cause the processor to: determine whether the request a stream is to be granted based on the media content record stored in the media catalog database that is associated with the media content item and offer a license to stream the media content item to the user when the user does not have the license to stream the media content item, after the determination of the request to stream, extract user data that is specific to the user that is attempting to stream the media content item when the user at least one of, streams and declines to stream, wherein the user data includes demographic data associated with the user that enables a third party online retailer that is providing the media content item to be streamed by the user to gauge at least one of a demographic that streamed the media content item of a copyright owner and a demographic that declined to stream the media content item of the copyright owner and the user data includes each media content item that the user streamed and each media content item that the user declined to stream that enables the third party online retailer to target marketing of different media content items to the user based on the demographic of the user and based on a history of media content items that the user has streamed and media content items that the user has declined to stream to determine a trend of interest in media content items by the user and to thereby taiget the marketing of the different media content items to the user based on the determined trend of interest associated with the user, aggregate the user data into a statistics record for the request to stream the media content item when the streams or declines to stream the media content item, wherein the statistics record summarizes the user data associated with the media licensing request to stream the media content item, and store in a license database the statistics record so that the user data is accessible to the third party online retailer that is providing the media content item to be streamed, and analyze a plurality of statistics records aggregated from each request for to stream the media content item as provided by the third party line retailer to be streamed to provide the third party online retailer with the aggregated user data from each request to stream the media content item.

17. The system of claim 16, wherein the processor is further configured to:

generate a license record that includes license granting information associated with the license granted to the external device; and

store the license record in a registered user database that is associated with the user.

18. The system of claim 16, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to

stream the media content item that is accessible to a third party online media retailer that has been selected by the copyright owner to distribute the media content item.

19. The system of claim **16**, wherein the user data includes a geographic location of the user who is accessing the media content item that enables the copyright owner to gauge geographic locations where the media content item is being accessed.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

Assignment abstract of title for Application 16122136

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Reel/frame	Execution date	Date recorded	Properties	Pages
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ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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Estes

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(54) **DIGITAL MEDIA REPRODUCTION AND LICENSING**

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G06Q 30/02 (2012.01)
G06F 21/10 (2013.01)

(52) **U.S. Cl.**
CPC ***G06F 21/10*** (2013.01); ***G06Q 30/02*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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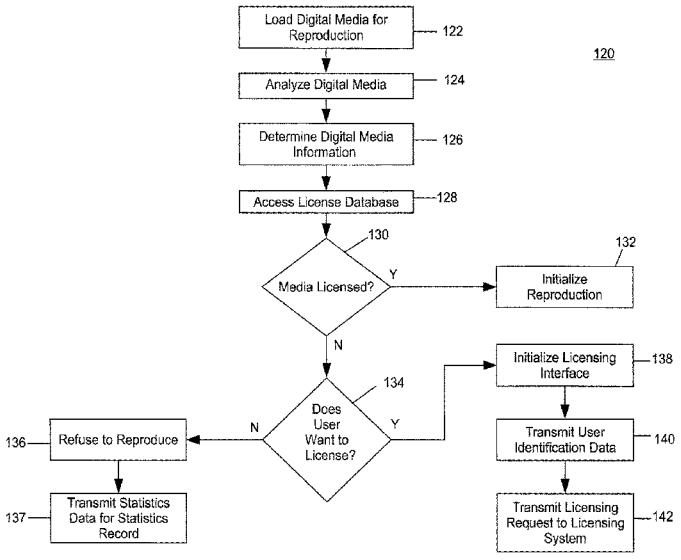
(57) **ABSTRACT**

Systems and methods for monetizing the reproduction of digital media content for the rights-holders of the digital media content. Embodiments of the present disclosure relate to determining whether a user of a media content item has a license to reproduce the media content item. In one embodiment, the media content item may be reproduced when the user is licensed. The user is prompted to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item when the user is not licensed. Further embodiments determine whether a user may receive a license when the user wishes to acquire a license. In an embodiment, the user is declined a license when not approved for the license.

23 Claims, 7 Drawing Sheets



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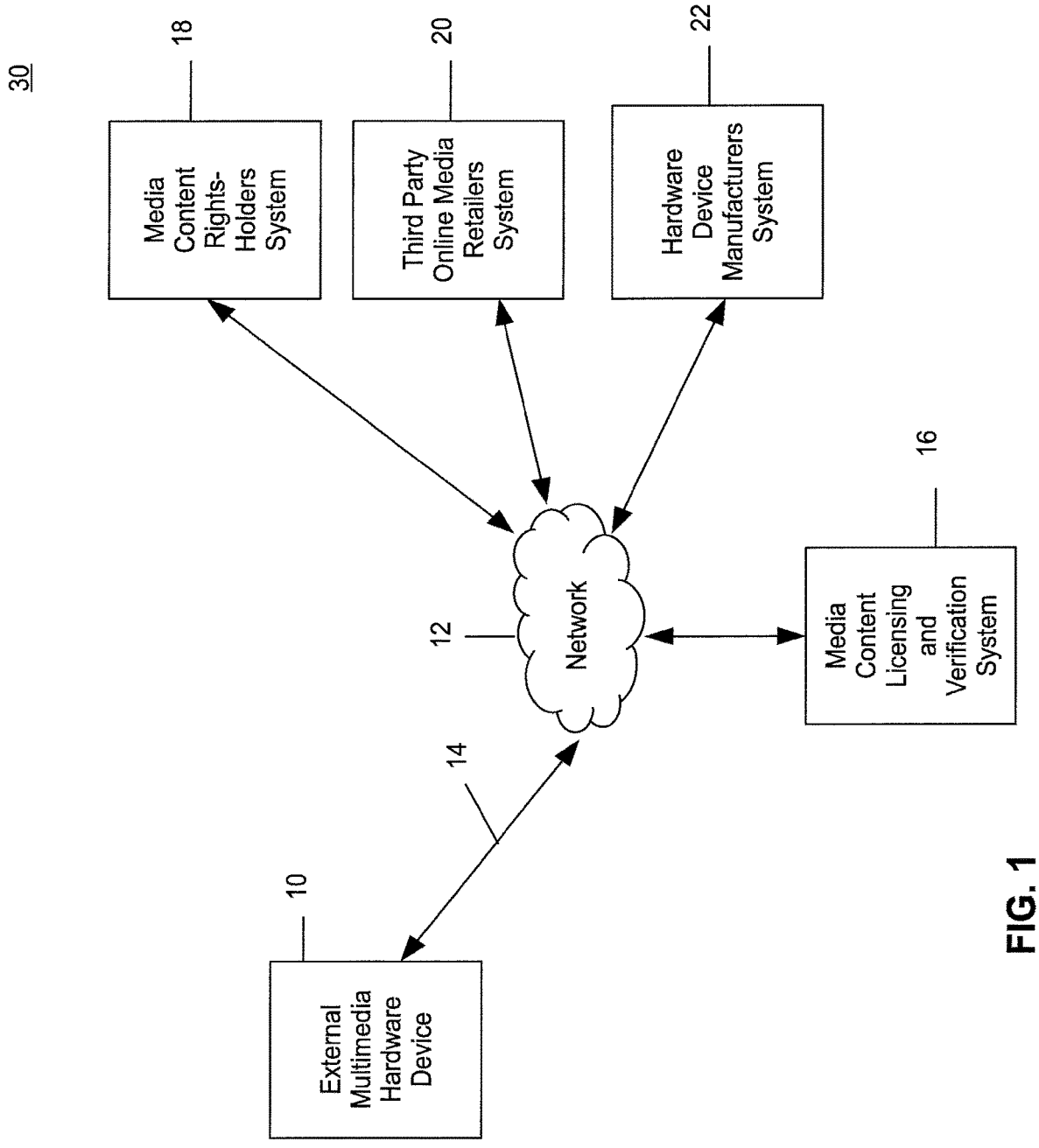
30
18
Media Content Rights-Holders System
20
Third Party Online Media Retailers System
22
Hardware Device Manufacturers System
16
Media Content Licensing and Verification System
12
Network
14
10
External Multimedia Hardware Device

FIG. 1

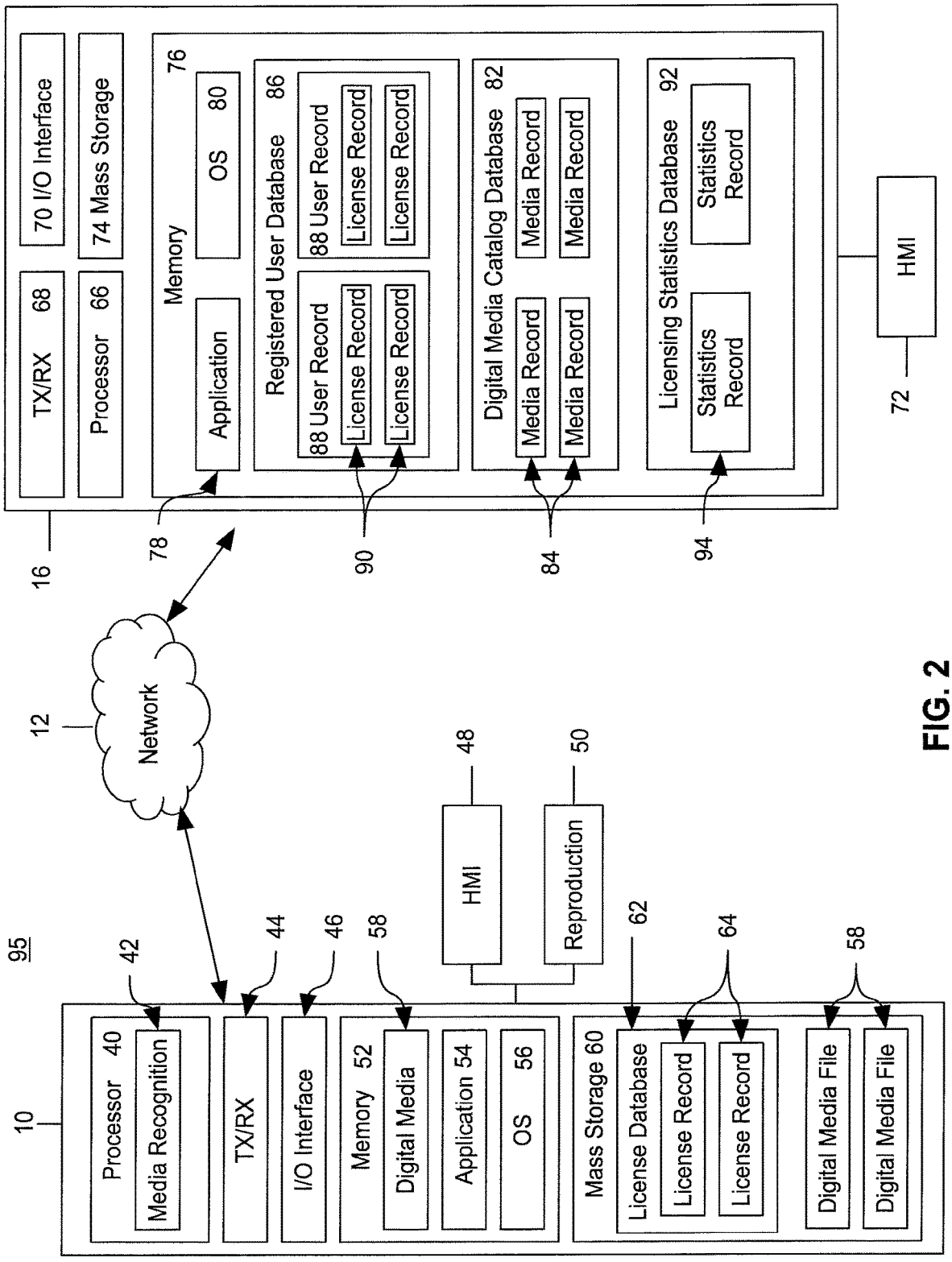
10
95
Processor 40
Media Recognition
42
TX/RX
44
I/O Interface
46
Memory 52
Digital Media
58
Application 54
OS 56
HMI
48
Reproduction
50
Mass Storage 60
License Database
License Record
License Record
62
64
Digital Media File
Digital Media File
58
12
Network
16
TX/RX 68
Processor 66
70 I/O Interface
74 Mass Storage
Memory 76
Application
OS 80
78
Registered User Database 86
88 User Record
License Record
License Record
88 User Record
License Record
License Record
90
Digital Media Catalog Database 82
Media Record
Media Record
Media Record
Media Record
84
Licensing Statistics Database 92
Statistics Record
Statistics Record
94
HMI
72

FIG. 2

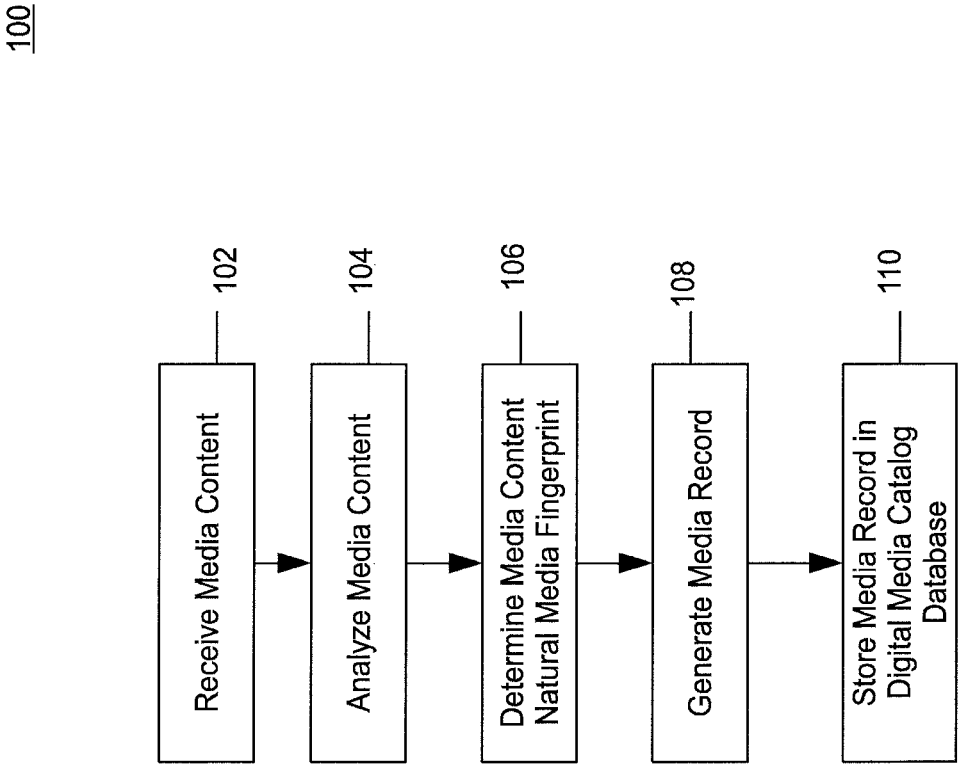
100
102
Receive Media Content
104
Analyze Media Content
106
Determine Media Content Natural Media Fingerprint
108
Generate Media Record
110
Store Media Record in Digital Media Catalog Database

FIG. 3

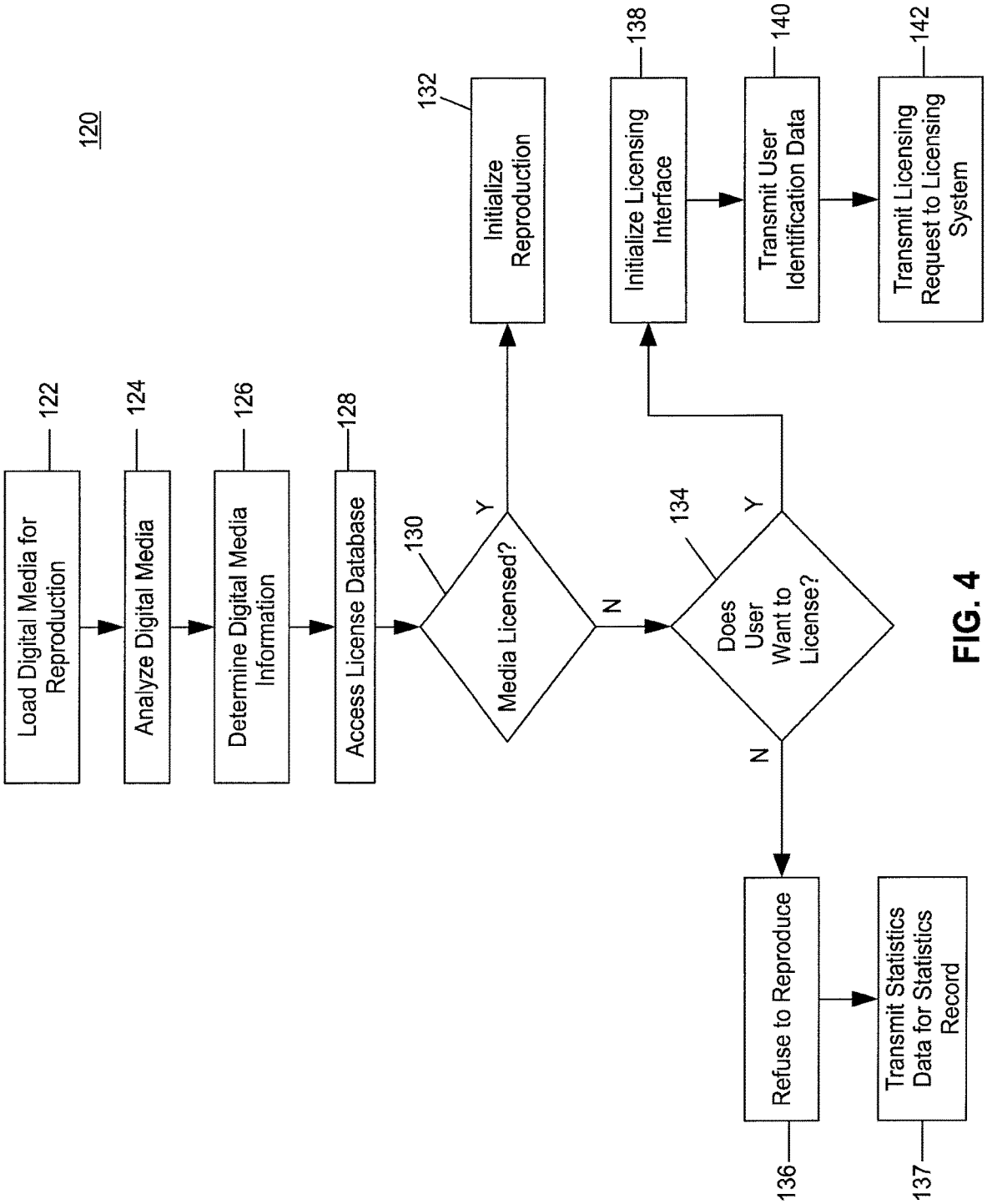
120
Load Digital Media for Reproduction
122
Analyze Digital Media
124
Determine Digital Media Information
126
Access License Database
128
Media Licensed?
130
Y
N
Initialize Reproduction
132
Does User Want to License?
134
Y
N
Initialize Licensing Interface
138
Transmit User Identification Data
140
Transmit Licensing Request to Licensing System
142
Refuse to Reproduce
136
Transmit Statistics Data for Statistics Record
137

FIG. 4

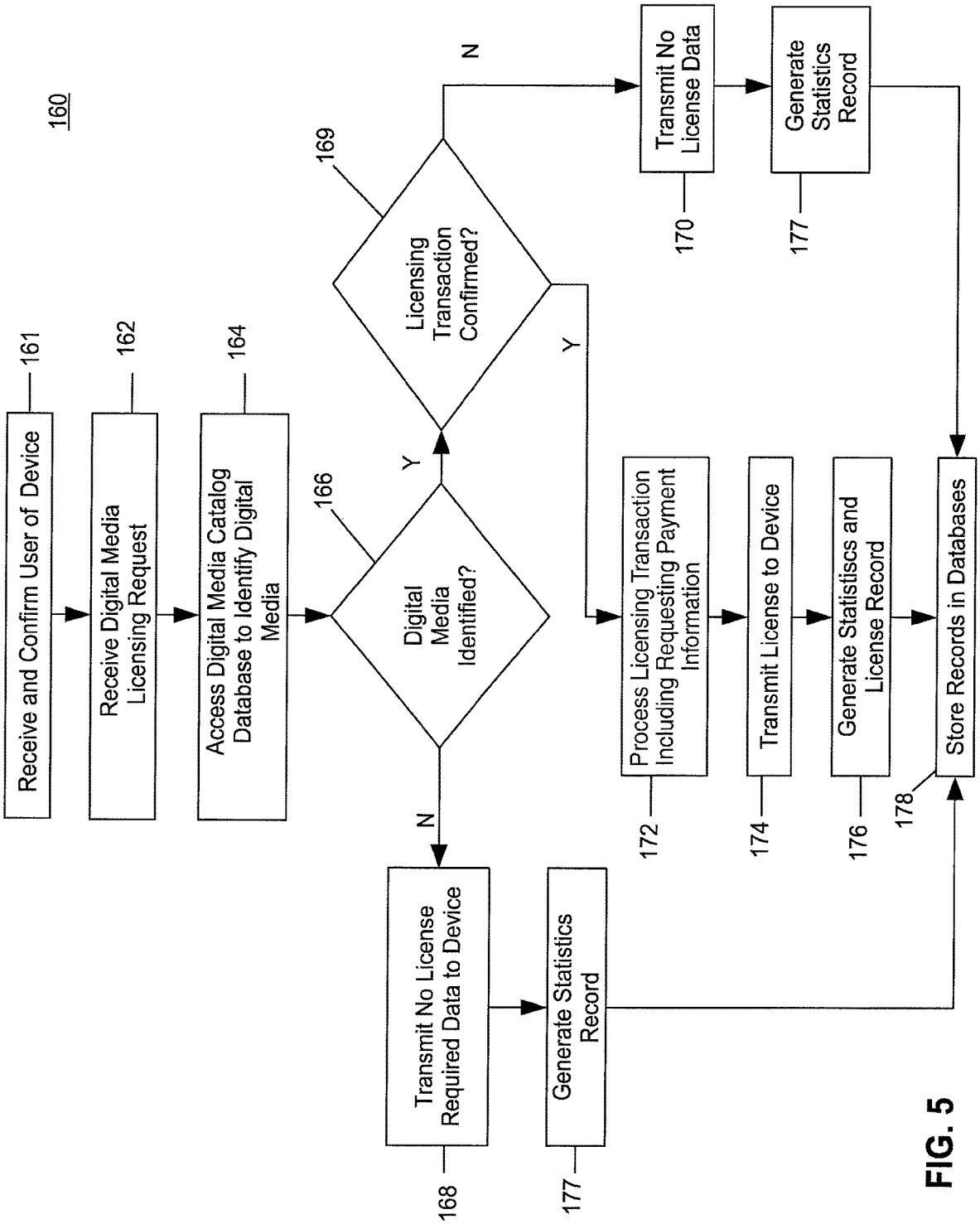
160
Receive and Confirm User of Device
161
Receive Digital Media Licensing Request
162
Access Digital Media Catalog Database to Identify Digital Media
164
Digital Media Identified?
166
Y
N
Licensing Transaction Confirmed?
169
Y
N
Transmit No License Required Data to Device
168
Generate Statistics Record
177
Process Licensing Transaction Including Requesting Payment Information
172
Transmit License to Device
174
Generate Statistiscs and License Record
176
Transmit No License Data
170
Generate Statistics Record
177
Store Records in Databases
178

FIG. 5

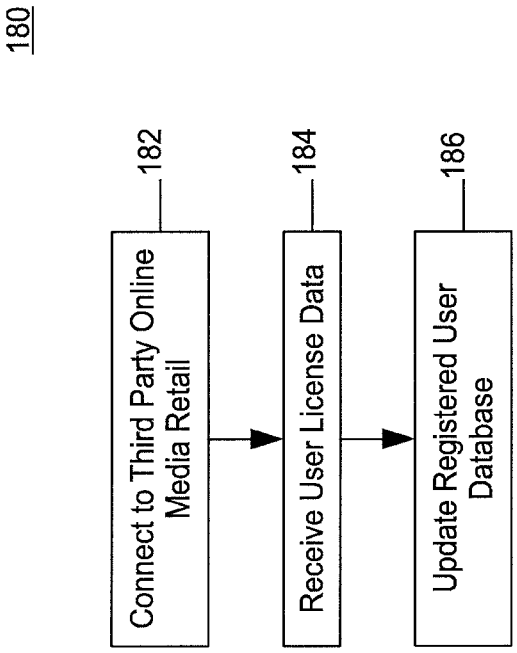
180
182
Connect to Third Party Online Media Retail
184
Receive User License Data
186
Update Registered User Database

FIG. 6

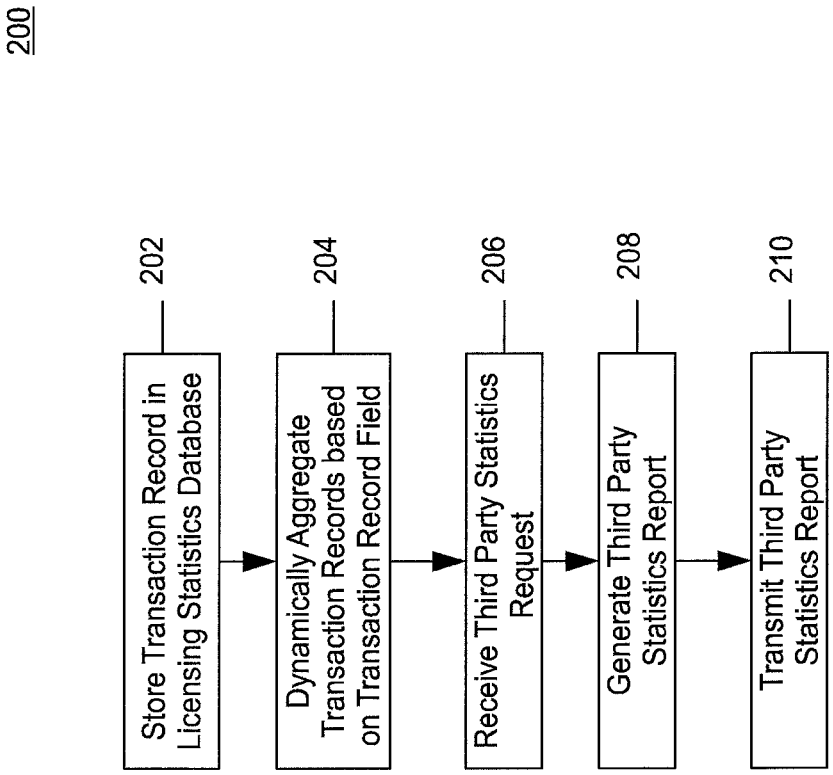
200
202
Store Transaction Record in Licensing Statistics Database
204
Dynamically Aggregate Transaction Records based on Transaction Record Field
206
Receive Third Party Statistics Request
208
Generate Third Party Statistics Report
210
Transmit Third Party Statistics Report

FIG. 7

DIGITAL MEDIA REPRODUCTION AND LICENSING

CROSS-REFERENCE

The present application is a continuation application of U.S. patent application Ser. No. 15/898,978, filed Feb. 19, 2018, and claims the benefit of U.S. Pat. No. 9,898,590, filed Jul. 25, 2017, and claims the benefit of U.S. Pat. No. 9,715,581, filed Nov. 2, 2012, and claims the benefit of U.S. Provisional Patent Application No. 61/555,810, filed Nov. 4, 2011, which a r e incorporated herein by reference in their entirety.

TECHNICAL FIELD

Embodiments relate to licensing digital media for reproduction, and more specifically to a digital media licensing system for licensing and enabling reproduction of digital media on a reproduction device.

BACKGROUND

Conventionally, the distribution of media content, such as music, movies, and books for example, is in large part controlled by owners who are the rights-holders of the media content. In conventional systems, the media content is incorporated into a physical media such as a compact disk (CD), a digital video disk (DVD), a printed publication, and/or any other physical media. In such conventional systems, the rights-holders of the media content are able to control licensing of the media content, the production of physical media copies of the media content, and/or the distribution of the media content to customers and/or third party retailers and thereby monetize the media content.

There has been a dramatic shift in the marketplace away from media content distributed on physical media to digital media content that may be distributed via the internet. Conventionally, rights-holders of digital media content have significantly less control over the distribution of such digital media content as compared to the distribution of physical media. For example, a party that does not hold rights of the digital media content may reproduce the digital media content and then distribute the digital media content via the internet without the permission of the actual rights-holder of the digital media content. As a result, the actual-rights holder of the digital media content cannot monetize the unauthorized distribution of the digital media content.

The inability of rights-holders of digital media content to monetize the unauthorized distribution of the digital media content limits the financial gain that rights-holders of the digital media content obtain in creating the original digital media content. Often times such unauthorized distribution of the digital media content prohibits the rights-holders of the digital media from covering the costs of creating the original digital media content which discourages creation of digital media content.

BRIEF SUMMARY

Embodiments relate to monetizing the reproduction of digital media content for the rights-holder of the digital media content. In an embodiment, a computer implemented method provides a multimedia hardware device a capability to generate an authorized reproduction of a media content item included in a digital media file. A digital media file that includes a media content item may be loaded for reproduction. The digital media file may be analyzed to identify digital media information associated with the media content item. A license database may be accessed to determine whether a user is licensed to reproduce the media content item based on the digital media information. The media content item may be reproduced when the user is licensed to reproduce the media content item based on the digital media information. A licensing query may be provided to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item.

In another embodiment, a system provides a media content licensing and verification system to license media content for reproduction. A transceiver may receive a media licensing request from an external device associated with a user. The media licensing request may include digital media information associated with a media content item included in a digital media file. A processor may access a media catalog database that includes a plurality of media content records where a media content record from the plurality of media content records is associated with the media content item. The processor may also determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item. The processor may grant the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device. The processor may also decline the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content item to the external device.

Further embodiments, features, and advantages, as well as the structure and operation of the various embodiments, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described with reference to the accompanying drawings. In the drawings, like reference numbers may indicate identical or functionally similar elements.

FIG. **1** illustrates a digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **3** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to analyze a received catalog of media content and manage the catalog of media content, according to an embodiment;

FIG. **4** illustrates a flowchart illustrating an exemplary aspect of operation for the external multimedia hardware device, according to an embodiment;

FIG. **5** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a payment for a license to reproduce a digital media file, according to an embodiment;

FIG. **6** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive licensing information froma third party media retailer, according to an embodiment; and

FIG. **7** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a third-party request for licensing statistics.

DETAILED DESCRIPTION

The digital media file licensing and authorized reproduction system provides a capability to ensure that a user possesses a license to reproduce a digital media file and if the user does not have a license, providing to the user the option to obtain such a license. In the Detailed Description herein, references to "one embodiment", "an embodiment", an "example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, by every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic may be described in connection with an embodiment, it may be submitted that it may be within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

Overview

FIG. **1** illustrates a digital media file licensing and authorized reproduction system **30** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **30** includes an external multimedia hardware device **10**, a network **12**, a media content licensing and verification system **16**, a media content rights-holders system **18**, a third party online media retailers system **20**, and a hardware device manufacturers system **22**.

System **30** may monetize the reproduction of a media content item included within a digital media file. Reproduction of a media content item may include reproducing sound from a digital audio file, reproducing video from a digital video file, reproducing text from a digital text file, and/or any other reproduction of a digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Reproduction may be defined as a first use by a user of the media content item. For example, reproduction of the media content item may include when a user first accesses a media content item where the user obtained the media content item from an outside source, such as but not limited to a third party online media distributor. Reproduction may also be defined as further distribution of the media content item by the user after the user has initially accessed the media content item. For example, reproduction of the media content item may include when the user distributes the media content item to other parties after the user has obtained the media content item from the third party online media distributor.

A digital media file may represent a MPEG Layer 3 (MP3) file, a RealAudio (RA) file, a raw sample (RAW) file, a Microsoft wave (WAV) file, a Windows Media Audio (WMA) file, and/or any other suitable digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. The media content item may include any portion of data included in the digital media file. A user of external multimedia hardware device **10** may reproduce the media content item with external multimedia hardware device **10**. Device **10** may represent a smart phone, a smart tablet, a mobile telephone, a television, an audio system, a personal music player, a portable computing device, other computing devices such as a personal computer, a laptop, or a desktop computer, computer peripheral such as a printer, a portable audio/or a video player, and/or any other suitable electronic device that can reproduce a media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

However, the user may not have a license that authorizes the user to reproduce the media content item. The digital media file including the media content item may have been procured from various sources that are not licensed to reproduce the media content item and do not collect licensing fees for use of the media content item. As such, when the user loads the digital media file for reproduction, device **10** may analyze the digital media file to determine the media content item included in the file and determine whether the user of device **10** is authorized. For example, the device may analyze a digital music file to identify the song and artist of the media content item that may be a track included in the digital music file. The user may be authorized when the user has a license to load and/or reproduce a media content item included in the digital media file.

In an embodiment, device **10** may analyze a plurality of identifying characteristics associated with the media content item to identify the media content item and to determine whether the user of device **10** is authorized. The plurality of identifying characteristics may be an identifying characteristic associated with the media content item inherently present in the media content item such that the media content item is not remastered to include the identifying characteristic after the media content item is initially recorded. The plurality of identifying characteristics can represent a fingerprint, digital watermarking, and/or any other suitable algorithm to identify copyright ownership of the media content item included in the digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. In an embodiment, device **10** may analyze metadata included in the loaded digital media file to identify the media content item included in the digital media file.

System **30** may query a license database locally and/or remotely located to system **30** to determine whether the user of device **10** has the appropriate license for the media content item. Device **10** may refuse to play the digital media file and query the user to determine whether the user wishes to purchase the appropriate license when the user does not have the appropriate license.

Device **10** may communicate with media content licensing and verification system **16** over network **12** and transmit the fingerprint of the media content item to media content licensing and verification system **16** when the user selects to purchase the appropriate license. Licensing system **16** may identify the media content item based on the received fingerprint. Licensing system **16** may transmit back to device **10** the title and/or other information associated with the identified media content item and request the user to confirm purchase of the license. The user may interface with device **10** to conduct the licensing transaction with licensing system **16**, and after purchasing the license, licensing system **16** may transmit a license to device **10**. After receiving the license from licensing system **16**, device **10** may commence reproduction of the media content item. Moreover, licensing system **16** may store a record of the transaction for statistical purposes, and/or store a copy of the license in a database under a user record associated with the user of device **10**.

Device **10** and licensing system **16** may provide data associated with the use of the media content item to media content rights-holders system **18** over network **12**. Rights-holders system **18** may be accessed by an owner of a copyright for the media content item. For example, device **10** and licensing system **16** may provide data to rights-holders system **18** that includes the user who is accessing the media content item, the geographic location of the user who is accessing the media content item, other media content items that the user may be accessing, the quantity of times the media content item is accessed, and/or any other data associated with the use of the media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

The data provided by device **10** and licensing system **16** to rights-holders system **18** for the media content item may be used by the copyright owner to develop future licensing agreements that may be provided to the user of device **10** by licensing system **16** for future use of the media content item. Payments for the license to use the media content item may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the copyright owner via rights-holders system **18**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to third party online media retailers system **20**. The data provided to retailers system **20** may be similar to the data provided to rights-holders system **18**. However, retailers system **20** may be accessed by third party online media retailers who have been selected by the copyright owner of the media content item to distribute the media content item via the Internet.

The data provided by device **10** and licensing system **16** to retailers system **20** for the media content item may be used by the third party online retailers to develop future pricing for their online media content item distribution including which media content items to distribute in the future. The data provided to retailers system **20** may also be used to help third party online media retailers target the marketing of the media content item to demographics that have shown a trend of interest in the media content item. Payments for the distribution of the media content item by the third party on line media retailer may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the third party online media retailer via retailers system **20**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to hardware device manufactures system **22**. The data provided to manufactures system **22** may be similar to the data provided to rights-holders system **18** and retailer system **20**. However, manufactures system **22** may be accessed by hardware device manufacturers who manufacture the hardware that may be implemented in device **10** that provides device **10** with the capabilities to limit reproduction of the media content item to when the user has a license to reproduce the media content item. Payments for use of the hardware provided by the hardware device manufacturers implemented in device **10** by the user of device **10** may also be distributed to the hardware device manufacturer via manufacturers system **20**.

Device **10** may be configured to connect to network **12**. Network **12** may include one or more networks, such as the Internet. In some examples, network **12** may include one or more network technologies such as Ethernet, Fast Ethernet, Gigabit Ethernet, a variant of the IEEE 802.11 standard such as WiFi, and the like. Communication over network **12** takes place using one or more network communication protocols including reliable streaming protocols such as transmission control protocol (TCP). These examples are illustrative and not intended to limit the present disclosure. As shown in FIG. **1**, device **10** may engage in communication with network **12** via connection **14**, where connection **14** may be a wireless, wired, a secured communication connection, any combination thereof, and/or any other communication connection that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Licensing system **16** may be configured to engage in communication with network **12**. As such, device **10** may communicate with licensing system **16** via network **12**. Additionally, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may also communicate with licensing system **16** and device **10** via network **12**. Licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may engage in communication with network **12** via a communication connection similar to connection **14**.

Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may have a cloud computing configuration. Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may share resources via network **12**. For example, device **10** may retrieve licensing information for the user of device **10** who wishes to reproduce the media content item via network **12**. Licensing system **16** may also update rights-holders system **18** with the user information for the user who wishes to reproduce the media content item. Based on the cloud computing configuration, the interaction between device **10**, licensing system **16**, and rights-holders system **18** may not be limited to a single external multimedia hardware device. A plurality of external multimedia hardware devices may update licensing system **16** and rights-holders system **18** via network **12** with user information of users wishing to reproduce the media content item. Licensing system **16** may provide each of these updates for the user information to any media content rights-holders system that requests the user information.

Digital Media File Licensing and Authorized Reproduction System

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system **95** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **95** includes external multimedia hardware device **10**, media content licensing and verification system **16**, and network **12**. External multimedia hardware device **10** includes a processor **40**, a transceiver **44**, an input/output interface **46**, a memory **52**, a mass storage **60**, a human machine interface (HMI) **48** and a reproduction module **50**. Processor **40** may be a hardware based processor that includes a general purpose microcontroller, a special purpose microcontroller and/or any other controller that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Processor **40** includes a media recognition module **42**. Media recognition module **42** may be configured to analyze a loaded digital media file to identify the media content item included in the digital media file and/or determine an identifying characteristic, such as a fingerprint for example, of the media content item. In an embodiment, the media recognition module **40** may include hardware based circuitry configured to analyze a loaded digital media file. In an embodiment, the media recognition module **42** may include

program code executing on the processor **40** configured to cause the processor **40** to analyze a loaded digital media file.

Memory **52** includes a digital media file **58**, an application **54**, and an operating system (OS) **56**. Memory **52** may be accessed by processor **40**, such that processor **40** may read data from memory **52** and write data to memory **52**. In some embodiments, application **54** and/or OS **56** may include program code including one or more instructions, that when executed by processor **40** cause device **10** to perform the steps necessary to execute steps or elements embodying the various aspects of the disclosure. Furthermore, digital media file **58** may be loaded for reproduction.

Mass storage **60** includes a license database **62** and digital media file **58**. License database **62** includes a license record **64**. Mass storage **60** may be utilized in addition to memory **52**, or may not be included at all, in which case the data elements illustrated as stored on mass storage **60** would be stored in memory **52**. For exemplary purposes, mass storage **60** includes digital media files **58**, illustrating that one or more digital media files **58** may be stored in mass storage **60** of device **10**. Moreover, mass storage **60** includes a license database **62**, where license database **62** includes one or more license records **64**. In an embodiment, license database **62** includes license records **64**, where license records **64** indicate a media content item that a user of the device may be licensed to reproduce.

Media content licensing and verification system **16** includes a transceiver **68**, a processor **66**, an input/output interface **70**, a mass storage **74**, a memory **76**, and a HMI **72**. Memory **76** includes an application **78**, an OS **80**, a registered user database **86**, a digital media catalog database **82**, and a licensing statistics database **92**. Application **78** and/or the OS **80** may include program code including one or more instructions configured to be executed by processor **66** to cause licensing system **16** to perform steps necessary to perform embodiments of the disclosure.

Registered user database **86** includes a user record **88**. User record **88** includes a license record **90**. Digital media catalog database **82** includes a media record **84**. Each media record **84** includes data associated with a unique media content item loaded into the licensing system **16**. As such, a rights-holder or content creator may load a catalog of media content items that may include but not limited to a song, a movie, a television show, a novel, and/or any other media content item into licensing system **16**. Licensing system **16** may analyze each media content item in the catalog, and generate a media record corresponding to each media content item. In some embodiments, each media record may include data indicating various information of the corresponding media content item, including but not limited to the rights-holder of the media content item, the title of the media content item, the plurality of identifying characteristics, and/or any other information associated with the corresponding media content item that will be apparent to the those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Each user record **88** may be associated with a unique user and indicates all media content items the user has purchased a license for. Each user record **88** may include one or more license records **90**, where each license record may include data indicating a media content item that the user is licensed to reproduce.

Licensing statistics database **92** includes a statistics record **94**. Each statistics record **94** may include data indicating a license purchased by a user connecting to licensing system **16**. The data may include, for example, whether a user that purchased a license for a particular media content item, how many users refused to license a particular media content item, the rights-holder of the media content item for which the license was purchased, the title of the media content item, demographic information for the user that may include but is not limited to age, gender, location, and/or any other data that may be associated with the user and/or license obtained by the user that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments of the present disclosure can be implemented on any type of processing (or computing) device having one or more processors. For example, embodiments can be implemented on a workstation, mobile device, computer, cluster of computers, set-top box, or other devices having at least one processor. In an embodiment, multiple modules may be implemented on the same processing device. Software can include one or more applications and an operating system. Hardware can include, but may not be limited to, a processor, memory, and/or graphical user interface display.

Method **100**

FIG. **3** illustrates a flowchart of an exemplary method **100** of processing a digital media catalog for use in a media content licensing and verification system. At step **102**, the media content licensing and verification system receives digital media catalog. At step **104**, each media content item of the received catalog may be analyzed.

At step **106**, a plurality of identifying characteristics associated with the media content item may be determined. For example, the fingerprint of the media content item may be determined. Determining a media content fingerprint may include one or more steps for analyzing the digital file including the media content item to determine one or more characteristics that uniquely identify the media content item stored therein. For example, if the media content item were a book stored in a digital text file, the natural media fingerprint may be determined to be a predefined number of words from the beginning of the text file.

In another exemplary embodiment, the media content item may be a song stored in a digital music file, and the system may determine the natural media fingerprint by analyzing the digital music file to identify lyrics included in the song, notes played in the song, and/or a sampled sound wave included in the song. These characteristics may be considered individually or in various combinations to uniquely identify the song. Moreover, in many digital media file formats, one or more information fields related to the media content item stored in the file are included in metadata of the file. In an embodiment of the invention, the system may analyze metadata included in the digital media file to identify the media content item stored thereon.

In step **108**, the system generates a media record for each media content item, where the media record includes data indicating the fingerprint, rights-holder information, title, and/or any other media content item data. In step **110**, the media record is stored in a digital media catalog database accessible by the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **120**

FIG. **4** illustrates a flowchart of an exemplary method **120** of verifying that a digital media file has been licensed prior to reproduction and facilitating the purchase of a license if the digital media file has not been properly licensed prior to

reproduction. At step **122**, a digital media file is loaded for reproduction on the external multimedia hardware device. At step **124**, the device analyzes the digital media file.

At step **126**, information associated with the digital media file is determined. Information associated with the digital media file may include a fingerprint associated with the media content item included in the digital media file, the rights-holder of the media content item, the title of the media content item, and/or any other digit al media file information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. For example, as described above with respect to FIG. **3**, the device may analyze the digital media file to determine one or more characteristics of the media content item stored thereon, where the characteristics may be utilized alone and/or in various combinations to identify the media content item.

The selected characteristics may be referred to as the natural media fingerprint of the media content item. Advantageously, the natural media fingerprint identifies a media content item, even considering the possibility of different versions of the same media content item. For example, multiple versions of a song are recorded at various times and may be stored as digital music files, such as a live version and a studio version. However, by analyzing the characteristics of a media content item, different versions of the same song may be consistently identified. For example, analyzing characteristics may include analyzing word recognition of lyrics, the occurrence of various frequencies at particular points in time in relation to the occurrence of the lyrics, and/or any other media content item characteristic that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **128**, the device accesses a license database. At step **130**, whether a user of the device has a license for the digital media file may be determined based on the natural media fingerprint and/or other digital media information, such as metadata, included in the digital media file. At step **132**, the device initializes reproduction of the digital media file in response to the determining that the user has the appropriate license.

At step **134**, the device generates a display query asking the user whether the user would like to purchase a license for the digital media file in response to determining that the user does not have the appropriate license. The device generates a display query asking the user whether the user would like to purchase a license for the digital media file.

At step **136**, the device indicates to the user that the digital media file cannot be played in response to the user indicating that the user would not like to purchase a license. At step **137**, the device transmits statistics related to the media content item stored on the digital media file to the media content licensing and verification system. The statistics information may include, for example, the determined natural media fingerprint of the media content item stored in the digital media file and/or any other such information related to the media content item, the digital media file, the external multimedia hardware device, and/or the user of the device.

At step **138**, the device initializes a licensing interface in response to the user indicating that the user would like to purchase the license. The device initializes a licensing interface that includes establishing a secure communication connection to a media content licensing and verification system.

At step **140**, the device transmits user identification data to the system, such that the user of the device may be identified to log into a user account associated with the user, process the licensing transaction, and/or for other such reasons to facilitate purchasing a license for the media content item. The user identification data may include for example, a user name and password, a unique identifier associated with the user, the user's billing information, and/or any other user identification data that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **142**, the device transmits a licensing request to the system, where the request includes information corresponding to the digital media file and the media content item included in the digital media file, such as the fingerprint of the media content item, the title of the media content item, the rights-holder of the digital media file, and/or other media content item information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **160**

FIG. **5** illustrates a flowchart of an exemplary method **160** of processing a license request from an external multimedia hardware device. At step **161**, prior to initializing the licensing transaction, the system receives the user identification data and confirms the user's identity. For example, the system logs the device into a secured transaction interface associated with an account of the user.

At step **162**, the system receives a digital media licensing request from an external multimedia hardware device over a network where the licensing request includes data indicating a media content item that a user of the device wishes to acquire a license for. In an embodiment, the licensing request includes a fingerprint of the media content item, information identifying the rights-holder of the media content item, the title of the media content item, and/or other media content item information.

At step **164**, the system accesses a digital media catalog database to identify the media content item indicated by the request. At step **166**, the system matches the fingerprint of the media content item included in the license request to a fingerprint in the digital media catalog database to identify the media content item associated with the licensing request, the rights-holder associated with the media content item, the price required for a license for the media content item, and/or any other identification information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **168**, the system transmits data to the device indicating that a license is not required for reproduction in response to determining that a record corresponding to the media content item is not in the digital media catalog database. At step **169**, the system transmits data to the device such that a user of the device may confirm a transaction to acquire the license associated with the media content item in response to identifying the media content item associated with the licensing request. In an embodiment, the system transmits data indicating the title of the media content item, the rights-holder of the media content item, an artist associated with the media content item, and/or other media content information such that the device presents this information to the user when asking the user whether to confirm the transaction.

At step **170**, the system transmits data to the device indicating that the license has not been purchased in

response to the user declining the licensing transaction, at which point, the device may refuse to reproduce the digital media file for the user. At step **172**, the system processes the licensing transaction in response to the user confirming the licensing transaction and the system receiving confirmation data from the device. The processing may include collecting payment information, charging previously known payment information, debiting a user account, and/or any other such payment processing methods.

At step **174**, the system transmits a license associated with the media content item over the communication network to the device in response to processing the licensing transaction. At step **176**, the system generates a license record indicating the user and the media content item in response to processing the transaction, the system generates a transaction record including data that identifies the user, the media content item, demographic information about the user, and/or any other license record information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **177**, the user has not purchased a license for a media content item, either because the media content item is not identified in the database or because the user refuses to make the purchase. However, a statistics record may be generated. The statistics data may include for example the natural media fingerprint associated with the media content item, the rights-holder of the media content item, the title of the media content item, and/or any other statistical data. The statistics data generated may be utilized for a variety of purposes, including for example, encouraging non-participating rights-holders from participating in the system by identifying the number of times a license was requested for a media content item owned by the non-participating rights-holder. At step **178**, the statistics record is stored in the licensing statistics database, and the license record is stored in the registered user database in a user record associated with the user.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **180**

FIG. **6** illustrates a flowchart of an exemplary method **180** of loading licenses for media content items associated with a user from third party sources. At step **182**, the system connects to a third party online media retailer. At step **184**, licenses purchased from the third party retailers may be uploaded into a registered user database of the system. At step **186**, after receiving the user license data, the system updates the registered user database of the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **200**

FIG. **7** illustrates a flowchart of an exemplary method **700** of providing statistics associated with licensing transactions performed by the system to a third party over a communication network consistent with embodiments of the invention. At step **202**, the system stores one or more transaction records in a connected licensing statistics database.

At step **204**, the system dynamically aggregates the transaction records in relation to one or more fields of information included in each transaction record. For example, the system may aggregate all transaction records stored in the licensing statistics database where the media content item of the transaction record has a desired title, and as such, data and statistics related to how many times a license was purchased for the media content item having the desired title may be retrieved. In an embodiment, similar aggregation may be performed to determine how many licenses were purchased for a particular rights-holder, titles of media content items that users of a particular demographic purchased, and/or other such relevant data and statistics.

At step **206**, the system may receive a statistics request from a third party that may include but not limited to a rights-holder, a hardware manufacturer, a marketing/analytics partner, and/or other such third parties that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **208**, the system may generate a statistics report based on the received request. At step **210**, the system may transmit the statistics report to the third party over the communication network. As such, in an embodiment a participating rights-holder may quickly retrieve licensing data and statistics for media content items that the rights-holder owns. In another embodiment, a marketing and/or analytics company may receive valuable licensing and statistics data for media content items for particular demographics of users, genres of media content items, and/or other such categories.

Embodiments can work with software, hardware, and/or operating system implementations, other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

CONCLUSION

As such, in general, some embodiments of the invent ion are directed to a system for recognizing licensed and unlicensed multi-media content by use of a natural media fingerprint recognition and license verification database and system. The system disables the use of unlicensed content and provides a secure method to license unlicensed multi-media content and distribute the licensing revenue to content owners, rights-holders, participating third-party hardware and software manufacturers, and/or other additional third parties. In some embodiments, an external multi-media hardware device includes a hardware or software read/write licensed media database module, operatively connected to a hardware or software natural media fingerprint recognition and license verification module, where the recognition and license verification module may be operatively connected to a hardware or software data encryption module. Moreover, the device may include an operating system and/or application stored on memory associated with the external multi-media hardware device. Where the operating system and/or application may be executed by a processor associated with the device to cause the processor to control one or more of the modules to perform one or more tasks associated with the one or more modules. In addition, media reproduction (e.g., audio and video playback) hardware and/or software module may be monitored and controlled by processor of the device operatively connected to, executing, and/or accessing the content fingerprint recognition and license verification module. Moreover, a physical memory device (e.g., a memory and/or a mass storage device) may be accessible by the processor during execution of the one or more operations of the operating system and/or application residing on a memory associated with the external multi-media hardware device. In some embodiments, the operating system and/or

application may cause the processor to drive a peripheral device using an I/O interface to present a user of the device with a graphic user interface.

Furthermore, the external multimedia hardware device may communicate over a communication network (e.g., an internet connection, a cellular communication network connection, etc.). In some embodiments, the external multimedia hardware device may be connected to a one or more servers functioning as a media content licensing and verification system over the communication network, such as a media content licensing and verification system shown in FIGS. **1** and **2**. In other embodiments, the external multimedia hardware device may be connected to a personal computer functioning as a media content licensing and verification system. For example, an external multimedia hardware device may connect to a user's personal computer over a Wi-Fi connection to verify a user has the appropriate license to reproduce a particular media content item, where the personal computer may include a plurality of licensing records associated with the user. In some embodiments, the communication connection between the device and the server may be a secure internet connection. In addition, the media content licensing and verification system may receive multi-media content items (e.g., songs, videos, books, etc.) from participating copyright owners and/or rights-holders through a catalog submissions module operatively connected to the system and executing thereon. The catalog submissions may be loaded into a natural media fingerprint creation module to generate a natural media fingerprint catalog. In addition, the system may be operatively connected to a storage device storing a registered users and licensed media database.

In addition, the media content licensing and verification system may be operatively connected to and/or execute a secure license verification and payment collection module stored on a connected storage device and/or executing on a computing system connected over the communication network. Such that the the content fingerprint and licenses verification module associated with the external multimedia hardware device may conduct license purchasing transactions by communicating over the communication network with the media licensing and verification system and/or the secure license verification and payment collection module. The secure license verification and payment collection module may be connected through the central computer controlled sub-system server (e.g. a media content licensing and verification system) and/or through a computing system in communication with the media content licensing and verification system over the communication network.

As such, the application and/or operating system executing on the external multimedia hardware device may facilitate licensing transactions for various media content items stored in the media content licensing and verification system. Furthermore, the media content licensing and verification system may include a payments distribution with real-time statistics module that may execute on the media content licensing and verification system, such that copyright owners, rights-holders, and/or participating hardware manufacturers may receive payments and statistics associated with the licensing of media content items using the media content licensing and verification system.

In some embodiments, pre-existing licenses may be submitted to the media content licensing and verification system such that the registered users and licensed media master database may be updated to include licenses for registered users purchased from third party sources, such as third party online media retailers. Where the previously purchased license data may be imported into the system over the communication network to the media content licensing and verification system from the third party sources, such as databases maintained by third parties.

It will therefore be appreciated that the invention may be implemented, for example, using program code implemented on one or more hardware-based computers, one or more processors, and/or one or more integrated circuits (e.g., semiconductors). Program code typically comprises one or more instructions that are resident at various times in various memory and storage devices in a computer, and that, when read and executed by one or more processors in a computer, cause that computer to perform the steps necessary to execute steps or elements embodying the various aspects of the invention. Moreover, while the invention has and hereinafter will be described in the context of fully functioning computers and computer systems, those skilled in the art will appreciate that the various embodiments of the invention are capable of being distributed as a program product in a variety of forms, and that the invention applies equally regardless of the particular type of computer readable media used to actually carry out the distribution. Examples of computer readable media include but are not limited to tangible, recordable type media such as volatile and non-volatile memory devices, floppy and other removable disks, hard disk drives, magnetic tape, optical disks (e.g., CD-ROMs, DVDs, etc.) among others.

Moreover, while the invention has and hereinafter will been described in the context of digital media files resident on a memory, the invention is not so limited. Those skilled in the art will appreciate that embodiments of the invention are capable of facilitating licensing transactions with respect to streaming digital media. For example, a media content item may be streamed to an external multimedia hardware device over a communication network, and a portion of the media content item may be stored in a local memory (e.g., buffered in a cache of a processor associated with the external multimedia hardware device) while a portion may be stored remotely on a memory device accessible by the external multimedia hardware device over a communication network. For example, a media content item may be streamed to an external multimedia hardware device over a communication network from a cloud based storage system, a digital media streaming service (e.g., Pandora, Last.fm, Spotify, iTunes, iCloud, Netflix, and/or other such services) and embodiments of the invention may analyze the media content item when loaded for reproduction and perform the operations consistent with embodiments of the invention to confirm that a user of the device has the appropriate license for the streaming media content item prior to reproducing the streaming media content item.

While the invention has been illustrated by a description of the various embodiments and the examples, and while these embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any other way limit the scope of the invention to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Thus, the invention in its broader aspects is therefore not limited to the specific details, representative apparatus and method, and illustrative example shown and described. In particular, any of the blocks of the above flowcharts may be deleted, augmented, made to be simultaneous with another, combined, or be otherwise altered in accordance with the principles of the invention. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants' general inventive concept.

What is claimed is:

1. A computer implemented method for determining a target demographic for media marketing, comprising:

receiving a first request from first user and a second request from a second user to reproduce the media content item;

evaluating each of the first and second request to determine whether each of the first and second users has previously acquired a license to reproduce the media content item and offering the license to reproduce the media content item to each user when the each user does not have the license to reproduce the media content item;

after the evaluation of the first request, extracting first user data specific to first user when the first user accepts the offer and acquires the license;

after the evaluation of the second request, extracting second user data specific to the second user when the second user declines the offer to acquire the license;

aggregating the extracted first and second user data into a statistics record,

wherein the statistics record summarizes the first user data and second user data;

storing in a license database the statistics record so that the summarized first and second user data is accessible to a third party;

analyzing by the third party, the statistics record, to determine the target demographic based on a first demographic corresponding to the first user data and a second demographic corresponding to the second user data;

and marketing, by the third party, the media content item to a plurality of other users corresponding to the determined target demographic.

2. The method of claim 1, further comprising:

receiving a license to reproduce the media content from a licensing system when at least one of the first request and second is granted by the licensing system; and

preventing reproduction of the media content item when the first and second requests are declined by the licensing system.

3. The method of claim 2, further comprising:

reproducing the media content item based on a plurality of reproduction parameters in the license that is received from a licensing system.

4. The computer implemented method of claim 1, further comprising:

storing in the license database the first and second user data that is associated with the respective first and second user that is attempting to reproduce the media content item that is accessible to a third patty online media retailer that has been selected by a copyright owner to distribute the media content item.

5. The computer implemented method of claim 1, further comprising:

storing in the license database the first and second user data that is associated with the respective first and second user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware for the multimedia hardware device.

6. The method of claim 1, wherein the first and second user data includes respective first and second geographic locations of the respective first and second user who is accessing the media content item.

7. A computer implemented method for configuring a media content licensing and verification system to license media content for reproduction, the method comprising:

receiving a request from an external device associated with a user and a second request from a second external device associated with a second user to reproduce a media content item, wherein the request and second request includes digital media information associated with the media content item included in a digital media file;

determining whether the request and the second request is to be granted based on a media content record stored in a media catalog database that is associated with the media content item and offering a license to reproduce the media content item to each of the user and the second user when the each user does not have the license to reproduce the media content item;

after the determination of the request extracting user data that is specific to the user that is attempting to reproduce the media content item when the user is granted the license;

after the determination of the second request, extracting second user data that is specific to the second user that is attempting to reproduce the media content item when the user declines the license;

aggregating the extracted user data and second user data into a statistics record, wherein the statistics record summarizes the user data and second user data associated with the request;

storing in a license database the statistics record so that the user data and second user data is accessible to a party other than the user and the second user;

and analyzing a plurality of statistics records aggregated from requests for the media content item when the user is granted the license and when the second user declines the license to determine a target demographic based on a first demographic corresponding to the user data and a second demographic based on the second user data;

and marketing, by the party, the media content item to a plurality of other users corresponding to the target demographic.

8. The method of claim 7, further comprising:

generating a license record that includes license granting information associated with the license granted to the external device; and

storing the license record in a registered user database that is associated with the user.

9. The method of claim 7, wherein the digital media information includes a fingerprint associated with the media content item.

10. The method of claim 7, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by a copyright owner to distribute the media content item.

11. The method of claim 7, further comprising:

storing in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

12. The method of claim 7, wherein the user data includes additional media content items that the user has previously accessed.

13. A system for configuring a multimedia hardware device to generate an authorized reproduction of a media content item included in a digital media file, comprising:

at least one processor; and

a memory coupled with the processor, the memory including instructions that, when executed by the processor cause the processor to:

receive a request from a user and a second request from a second user, each request requesting to reproduce the media content item;

evaluate the each request to determine whether the respective each user has acquired a license to reproduce the media content item and offer the license to reproduce the media content item to the respective each user when the respective each user does not have the license to stream the media content item;

after the evaluation of the request, extract user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license,

after the evaluation of the request, extract second user data that is specific to the second user that is attempting to reproduce the media content item when the user declines the license,

aggregate the extracted user data and second user data into a statistics record, wherein the statistics record summarizes the user data and the second user data associated with the respective request and second request,

store in the license database the statistics record so that the user data and the second user data is accessible to a party other than the user,

and analyze a plurality of statistics records aggregated from requests for the media content item when the user acquires the license and when the second user declines the license to determine a target demographic based on a first demographic corresponding to the user data and a second demographic based on the second user data;

and market, by the party, the media content item to a plurality of other users corresponding to the target demographic.

14. The system of claim 12, wherein the processor is further configured to:

receive a license to reproduce the media content item from a licensing system when the request is granted by the licensing system; and

prevent reproduction of the media content item when the request is declined by the licensing system.

15. The system of claim 12, wherein the processor is further configured to reproduce the media content item based on a plurality of reproduction parameters included in the license that is received from the licensing system.

16. The system of claim 12, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by a copyright owner to distribute the media content item.

17. The system of claim 12, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

18. The system of claim 12, wherein the user data includes a quantity of times that the user has previously accessed the media content item and additional media content items.

19. A system for configuring a media content licensing and verification system to license media content for reproduction, comprising:

a receiver configured to receive a request from an external device associated with a user to reproduce the media content item, wherein the request includes digital media information associated with the media content item included in a digital media file;

the receiver further configured to receive a second request from a second external device associated with a second user to reproduce the media content item, wherein the second request includes digital media information associated with the media content item included in a digital media file;

at least one processor; and

a memory coupled with the processor, the memory including instructions that, when executed by the processor cause the processor to:

determine whether the request and second request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item and offer a license to reproduce the media content item to each of the user and second user when the each user does not have the license to reproduce the media content item,

after the determination of the request, extract user data that is specific to the user that is attempting to reproduce the media content item when the user acquires the license,

after the determination of the second request, extract second user data that is specific to the second user that is attempting to reproduce the media content item when the second user declines the license,

aggregate the extracted user data and second user data into a statistics record, wherein the statistics record summarizes the user data and second user data associated with the respective request and second request, and

store in a license database the statistics record so that the user data and second user data is accessible to a party other than the user and second user,

and analyzing a plurality of statistics records aggregated from requests for the media content item when the user is granted the license and when the second user declines the license to determine a target demographic based on a first demographic corresponding to the user data and a second demographic based on the second user data;

and market, by the party, the media content item to a plurality of other users corresponding to the target demographic.

20. The system of claim 18, wherein the processor is further configured to:

generate a license record that includes license granting information associated with the license granted to the external device; and

store the license record in a registered user database that is associated with the user.

21. The system of claim 18, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to reproduce the media content item that is accessible to a third party online media retailer that has been selected by a copyright owner to distribute the media content item.

22. The system of claim 20, wherein the processor is further configured to store in the license database the user data that is associated with the user that is attempting to

reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

23. The system of claim **18**, wherein the user data includes a geographic location of the user who is accessing the media content item that enables the copyright owner to gauge geographic locations where the media content item is being accessed.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

Assignment abstract of title for Application 16150919

Invention title/Inventor	Patent	Publication	Application	PCT	International registration
DIGITAL MEDIA REPRODUCTION AND LICENSING Christopher A. Estes	10515191 Dec 24, 2019	20190034598 Jan 31, 2019	16150919 Oct 3, 2018		

Assignments (1 total)

Assignment 1

Reel/frame	Execution date	Date recorded	Properties	Pages
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Conveyance
ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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Estes

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(45) **Date of Patent: *Dec. 8, 2020**

(54) **DIGITAL MEDIA REPRODUCTION AND LICENSING**

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H04N 21/4627	(2011.01)
G06F 21/10	(2013.01)
G06Q 30/02	(2012.01)
G06F 16/487	(2019.01)
G06F 16/22	(2019.01)

(Continued)

(52) **U.S. Cl.**

CPC ***G06F 21/10*** (2013.01); ***G06F 16/22*** (2019.01); ***G06F 16/487*** (2019.01); ***G06F 21/105*** (2013.01); ***G06Q 30/02*** (2013.01); ***G06Q 30/0204*** (2013.01); ***H04N 21/4402*** (2013.01); ***H04N 21/4532*** (2013.01); ***H04N 21/4627*** (2013.01); ***H04N 21/4667*** (2013.01); *G06F 2221/0713* (2013.01); *G06Q 50/184* (2013.01)

(58) **Field of Classification Search**

CPC combination set(s) only.

See application file for complete search history.

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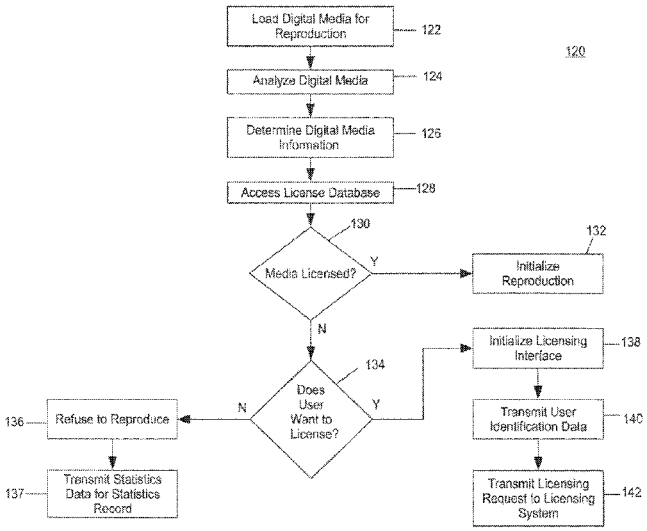
(57) **ABSTRACT**

Systems and methods for monetizing the reproduction of digital media content for the rights-holders of the digital media content. Embodiments of the present disclosure relate to determining whether a user of a media content item has a license to reproduce the media content item. In one embodiment, the media content item may be reproduced when the user is licensed. The user is prompted to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item when the user is not licensed. Further embodiments determine whether a user may receive a license when the user wishes to acquire a license. In an embodiment, the user is declined a license when not approved for the license.

23 Claims, 7 Drawing Sheets



Related U.S. Application Data

continuation of application No. 15/659,175, filed on Jul. 25, 2017, now Pat. No. 9,898,590, which is a continuation of application No. 13/667,629, filed on Nov. 2, 2012, now Pat. No. 9,715,581.

(60) Provisional application No. 61/555,810, filed on Nov. 4, 2011.

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H04N 21/4402	(2011.01)
H04N 21/45	(2011.01)
H04N 21/466	(2011.01)
G06Q 50/18	(2012.01)

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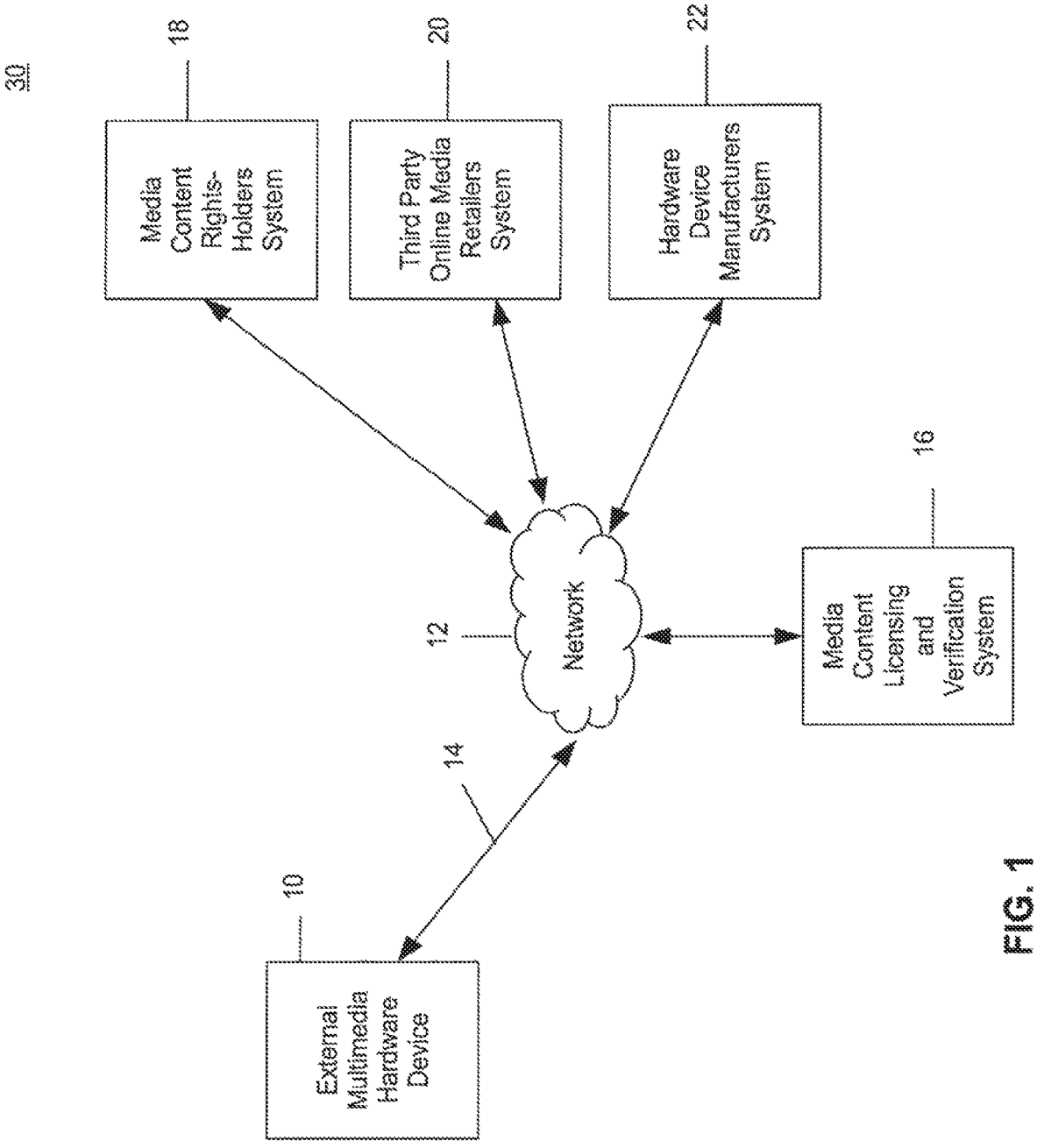
30
18
Media Content Rights-Holders System
20
Third Party Online Media Retailers System
22
Hardware Device Manufacturers System
16
Media Content Licensing and Verification System
12
Network
14
10
External Multimedia Hardware Device

FIG. 1

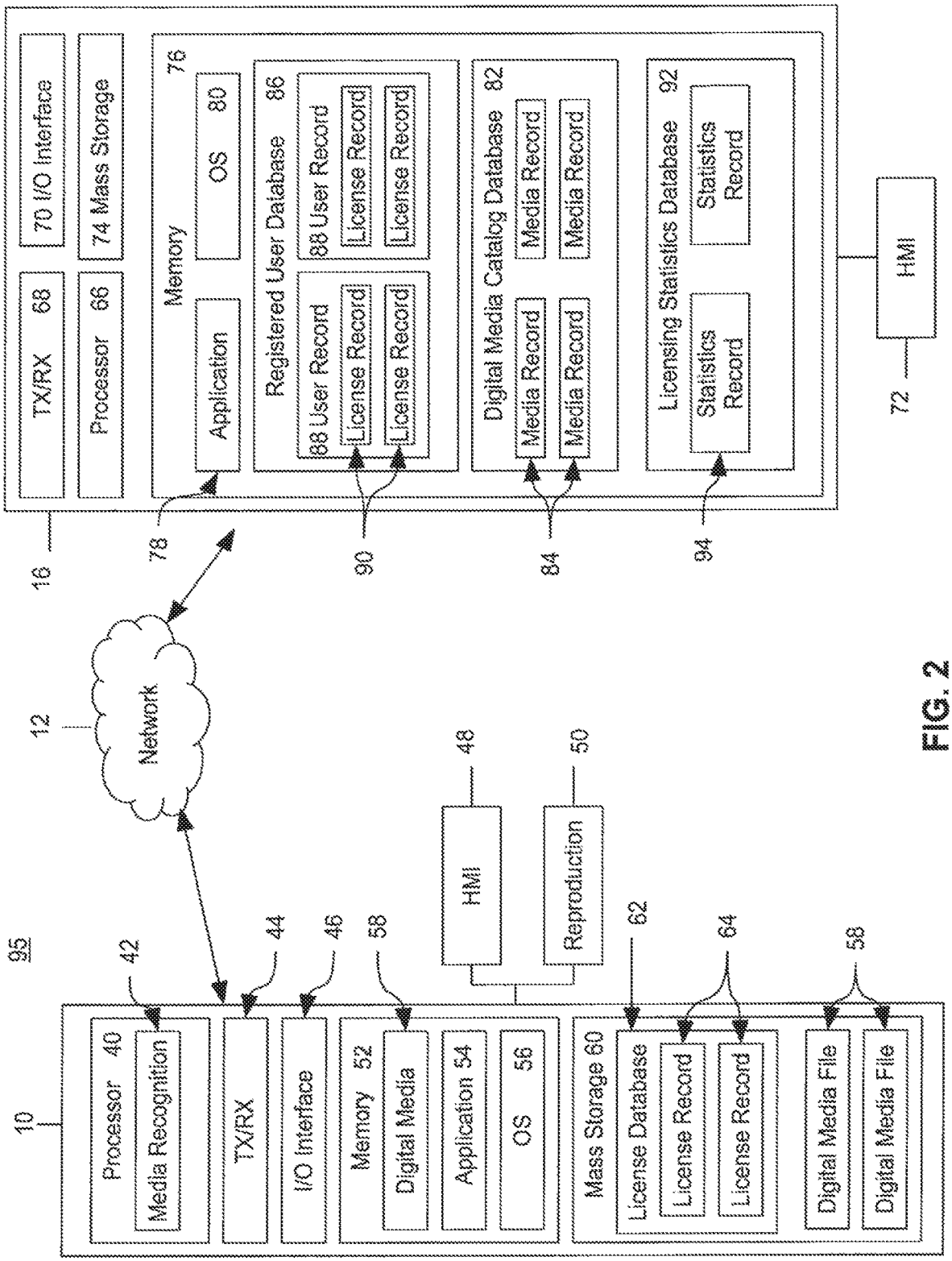
16
TX/RX 68
Processor 66
70 I/O Interface
74 Mass Storage
Memory 76
Application 78
OS 80
Registered User Database 86
88 User Record
License Record
License Record
License Record
90
Digital Media Catalog Database 82
Media Record
Media Record
Media Record
84
Licensing Statistics Database 92
Statistics Record
Statistics Record
94
72
HMI
12
Network
95
10
Processor 40
Media Recognition 42
TX/RX 44
I/O Interface 46
Memory 52
Digital Media 58
Application 54
OS 56
Mass Storage 60
License Database 62
License Record
License Record
64
Digital Media File
Digital Media File
58
HMI 48
Reproduction 50

FIG. 2

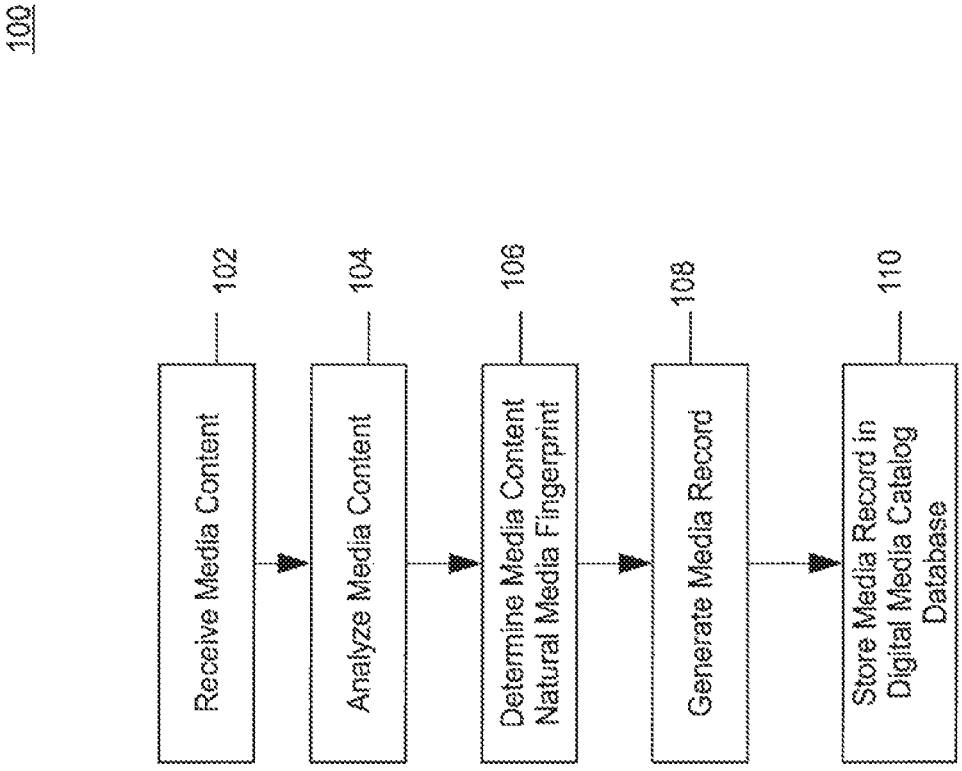
100
102
Receive Media Content
104
Analyze Media Content
106
Determine Media Content Natural Media Fingerprint
108
Generate Media Record
110
Store Media Record in Digital Media Catalog Database

FIG. 3

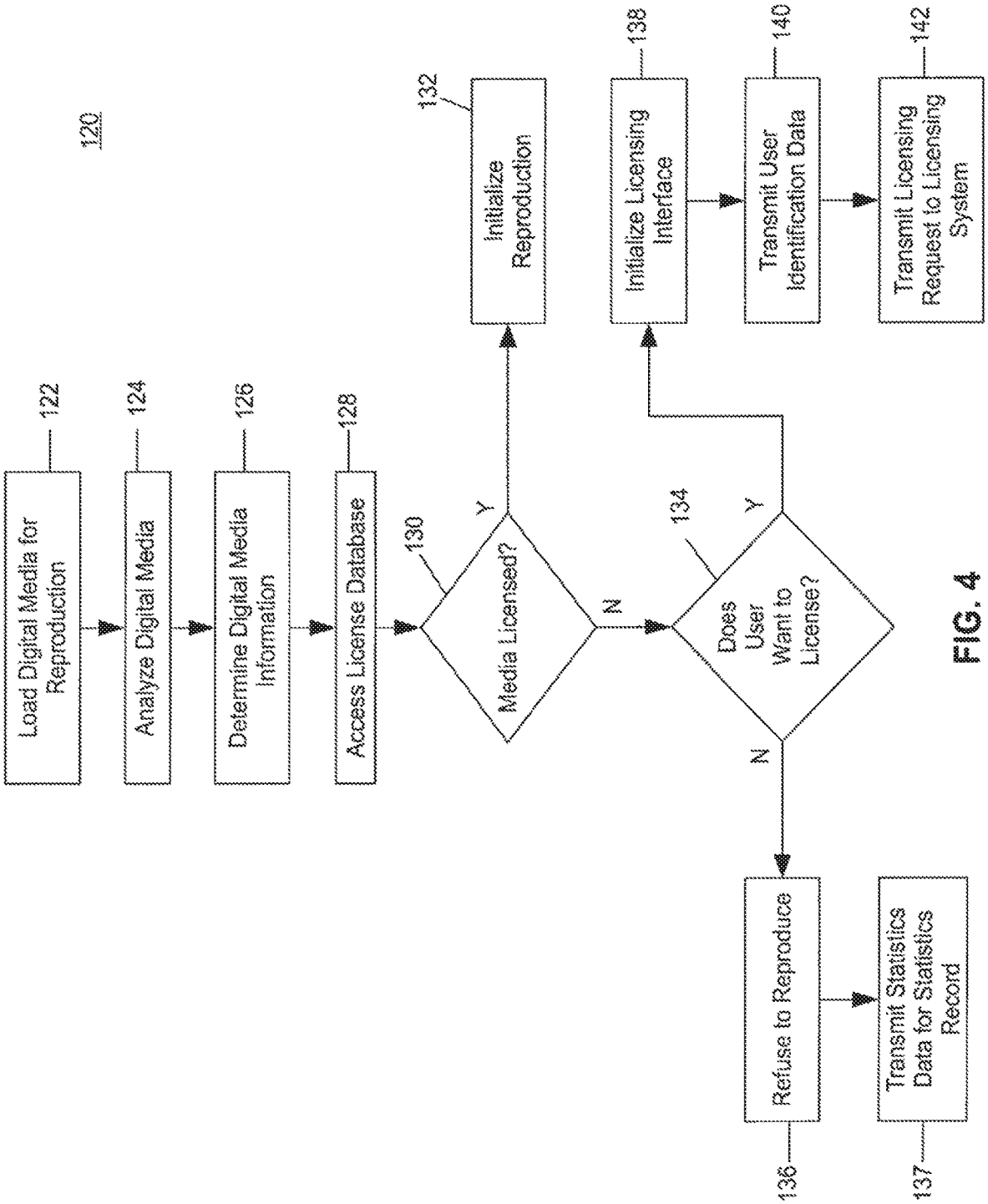
120
Load Digital Media for Reproduction
122
Analyze Digital Media
124
Determine Digital Media Information
126
Access License Database
128
Media Licensed?
130
Y
N
Initialize Reproduction
132
Does User Want to License?
134
Y
N
Initialize Licensing Interface
138
Transmit User Identification Data
140
Transmit Licensing Request to Licensing System
142
Refuse to Reproduce
136
Transmit Statistics Data for Statistics Record
137

FIG. 4

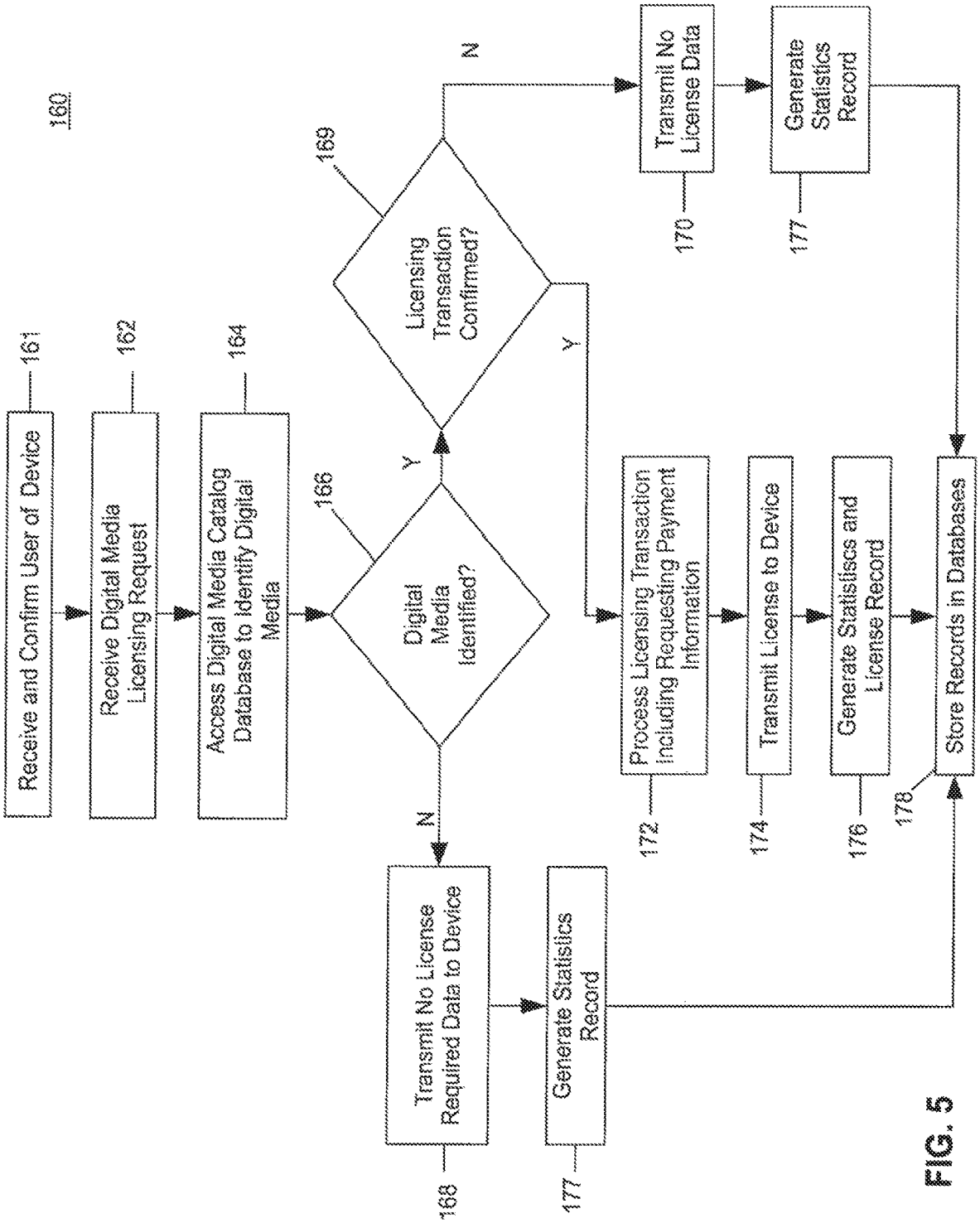
160
Receive and Confirm User of Device
161
Receive Digital Media Licensing Request
162
Access Digital Media Catalog Database to Identify Digital Media
164
Digital Media Identified?
166
Y
N
Licensing Transaction Confirmed?
169
Y
N
Transmit No License Data
170
Generate Statistics Record
177
Process Licensing Transaction including Requesting Payment Information
172
Transmit License to Device
174
Generate Statistics and License Record
176
Store Records in Databases
178
Transmit No License Required Data to Device
168
Generate Statistics Record
177

FIG. 5

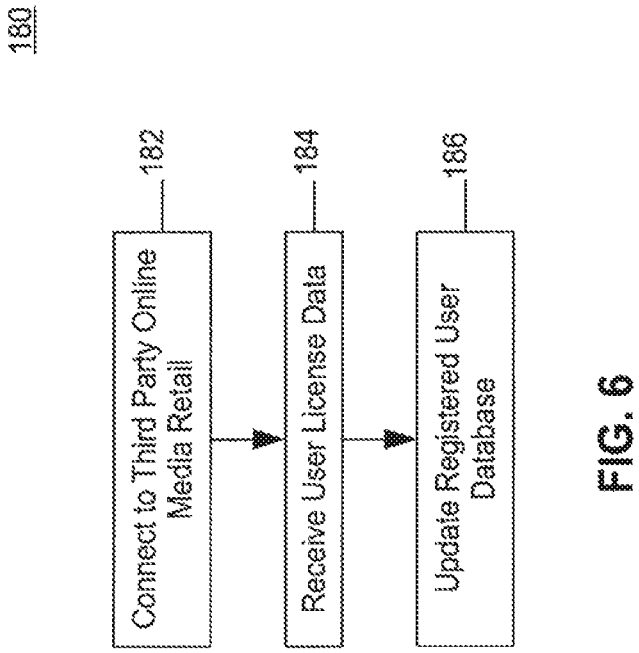
180
182
Connect to Third Party Online Media Retail
184
Receive User License Data
186
Update Registered User Database

FIG. 6

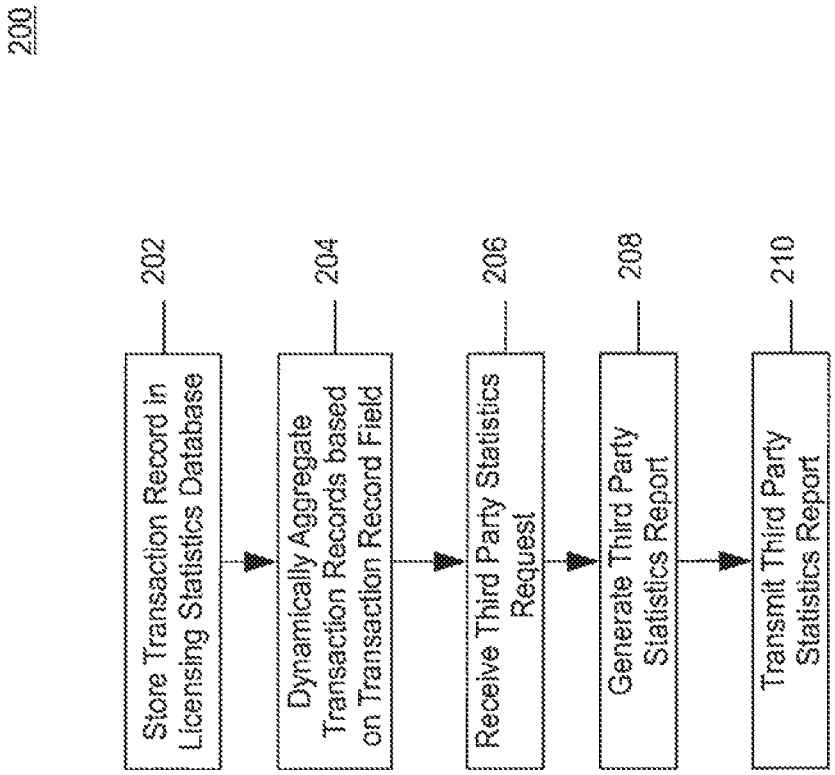
200
202
Store Transaction Record in Licensing Statistics Database
204
Dynamically Aggregate Transaction Records based on Transaction Record Field
206
Receive Third Party Statistics Request
208
Generate Third Party Statistics Report
210
Transmit Third Party Statistics Report

FIG. 7

DIGITAL MEDIA REPRODUCTION AND LICENSING

CROSS-REFERENCE

The present application is a continuation application of U.S. patent application Ser. No. 15/898,978, filed Feb. 19, 2018, and claims the benefit of U.S. Pat. No. 9,898,590, filed Jul. 25, 2017, and claims the benefit of U.S. Pat. No. 9,715,581, filed Nov. 2, 2012, and claims the benefit of U.S. Provisional Patent Application No. 61/555,810, filed Nov. 4, 2011, which are incorporated herein by reference in their entirety.

TECHNICAL FIELD

Embodiments relate to licensing digital media for reproduction, and more specifically to a digital media licensing system for licensing and enabling reproduction of digital media on a reproduction device.

BACKGROUND

Conventionally, the distribution of media content, such as music, movies, and books for example, is in large part controlled by owners who are the rights-holders of the media content. In conventional systems, the media content is incorporated into a physical media such as a compact disk (CD), a digital video disk (DVD), a printed publication, and/or any other physical media. In such conventional systems, the rights-holders of the media content are able to control licensing of the media content, the production of physical media copies of the media content, and/or the distribution of the media content to customers and/or third party retailers and thereby monetize the media content.

There has been a dramatic shift in the marketplace away from media content distributed on physical media to digital media content that may be distributed via the internet. Conventionally, rights-holders of digital media content have significantly less control over the distribution of such digital media content as compared to the distribution of physical media. For example, a party that does not hold rights of the digital media content may reproduce the digital media content and then distribute the digital media content via the internet without the permission of the actual rights-holder of the digital media content. As a result, the actual-rights holder of the digital media content cannot monetize the unauthorized distribution of the digital media content.

The inability of rights-holders of digital media content to monetize the unauthorized distribution of the digital media content limits the financial gain that rights-holders of the digital media content obtain in creating the original digital media content. Often times such unauthorized distribution of the digital media content prohibits the rights-holders of the digital media from covering the costs of creating the original digital media content which discourages creation of digital media content.

BRIEF SUMMARY

Embodiments relate to monetizing the reproduction of digital media content for the rights-holder of the digital media content. In an embodiment, a computer implemented method provides a multimedia hardware device a capability to generate an authorized reproduction of a media content item included in a digital media file. A digital media file that includes a media content item may be loaded for reproduction. The digital media file may be analyzed to identify digital media information associated with the media content item. A license database may be accessed to determine whether a user is licensed to reproduce the media content item based on the digital media information. The media content item may be reproduced when the user is licensed to reproduce the media content item based on the digital media information. A licensing query may be provided to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item.

In another embodiment, a system provides a media content licensing and verification system to license media content for reproduction. A transceiver may receive a media licensing request from an external device associated with a user. The media licensing request may include digital media information associated with a media content item included in a digital media file. A processor may access a media catalog database that includes a plurality of media content records where a media content record from the plurality of media content records is associated with the media content item. The processor may also determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item. The processor may grant the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device. The processor may also decline the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content item to the external device.

Further embodiments, features, and advantages, as well as the structure and operation of the various embodiments, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described with reference to the accompanying drawings. In the drawings, like reference numbers may indicate identical or functionally similar elements.

FIG. **1** illustrates a digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **3** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to analyze a received catalog of media content and manage the catalog of media content, according to an embodiment;

FIG. **4** illustrates a flowchart illustrating an exemplary aspect of operation for the external multimedia hardware device, according to an embodiment;

FIG. **5** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a payment for a license to reproduce a digital media file, according to an embodiment;

FIG. **6** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive licensing information from a third party media retailer, according to an embodiment; and

FIG. **7** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a third-party request for licensing statistics.

DETAILED DESCRIPTION

The digital media file licensing and authorized reproduction system provides a capability to ensure that a user possesses a license to reproduce a digital media file and if the user does not have a license, providing to the user the option to obtain such a license. In the Detailed Description herein, references to "one embodiment", "an embodiment", an "example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, by every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic may be described in connection with an embodiment, it may be submitted that it may be within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

Overview

FIG. **1** illustrates a digital media file licensing and authorized reproduction system **30** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **30** includes an external multimedia hardware device **10**, a network **12**, a media content licensing and verification system **16**, a media content rights-holders system **18**, a third party online media retailers system **20**, and a hardware device manufacturers system **22**.

System **30** may monetize the reproduction of a media content item included within a digital media file. Reproduction of a media content item may include reproducing sound from a digital audio file, reproducing video from a digital video file, reproducing text from a digital text file, and/or any other reproduction of a digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Reproduction may be defined as a first use by a user of the media content item. For example, reproduction of the media content item may include when a user first accesses a media content item where the user obtained the media content item from an outside source, such as but not limited to a third party online media distributor. Reproduction may also be defined as further distribution of the media content item by the user after the user has initially accessed the media content item. For example, reproduction of the media content item may include when the user distributes the media content item to other parties after the user has obtained the media content item from the third party online media distributor.

A digital media file may represent a MPEG Layer 3 (MP3) file, a RealAudio (RA) file, a raw sample (RAW) file, a Microsoft wave (WAV) file, a Windows Media Audio (WMA) file, and/or any other suitable digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. The media content item may include any portion of data included in the digital media file. A user of external multimedia hardware device **10** may reproduce the media content item with external multimedia hardware device **10**. Device **10** may represent a smart phone, a smart tablet, a mobile telephone, a television, an audio system, a personal music player, a portable computing device, other computing devices such as a personal computer, a laptop, or a desktop computer, computer peripheral such as a printer, a portable audio/or a video player, and/or any other suitable electronic device that can reproduce a media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

However, the user may not have a license that authorizes the user to reproduce the media content item. The digital media file including the media content item may have been procured from various sources that are not licensed to reproduce the media content item and do not collect licensing fees for use of the media content item. As such, when the user loads the digital media file for reproduction, device **10** may analyze the digital media file to determine the media content item included in the file and determine whether the user of device **10** is authorized. For example, the device may analyze a digital music file to identify the song and artist of the media content item that may be a track included in the digital music file. The user may be authorized when the user has a license to load and/or reproduce a media content item included in the digital media file.

In an embodiment, device **10** may analyze a plurality of identifying characteristics associated with the media content item to identify the media content item and to determine whether the user of device **10** is authorized. The plurality of identifying characteristics may be an identifying characteristic associated with the media content item inherently present in the media content item such that the media content item is not remastered to include the identifying characteristic after the media content item is initially recorded. The plurality of identifying characteristics can represent a fingerprint, digital watermarking, and/or any other suitable algorithm to identify copyright ownership of the media content item included in the digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. In an embodiment, device **10** may analyze metadata included in the loaded digital media file to identify the media content item included in the digital media file.

System **30** may query a license database locally and/or remotely located to system **30** to determine whether the user of device **10** has the appropriate license for the media content item. Device **10** may refuse to play the digital media file and query the user to determine whether the user wishes to purchase the appropriate license when the user does not have the appropriate license.

Device **10** may communicate with media content licensing and verification system **16** over network **12** and transmit the fingerprint of the media content item to media content licensing and verification system **16** when the user selects to purchase the appropriate license. Licensing system **16** may identify the media content item based on the received fingerprint. Licensing system **16** may transmit back to device **10** the title and/or other information associated with the identified media content item and request the user to confirm purchase of the license. The user may interface with device **10** to conduct the licensing transaction with licensing system **16**, and after purchasing the license, licensing system **16** may transmit a license to device **10**. After receiving the license from licensing system **16**, device **10** may commence reproduction of the media content item. Moreover, licensing system **16** may store a record of the transaction for statistical purposes, and/or store a copy of the license in a database under a user record associated with the user of device **10**.

Device **10** and licensing system **16** may provide data associated with the use of the media content item to media

content rights-holders system **18** over network **12**. Rights-holders system **18** may be accessed by an owner of a copyright for the media content item. For example, device **10** and licensing system **16** may provide data to rights-holders system **18** that includes the user who is accessing the media content item, the geographic location of the user who is accessing the media content item, other media content items that the user may be accessing, the quantity of times the media content item is accessed, and/or any other data associated with the use of the media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

The data provided by device **10** and licensing system **16** to rights-holders system **18** for the media content item may be used by the copyright owner to develop future licensing agreements that may be provided to the user of device **10** by licensing system **16** for future use of the media content item. Payments for the license to use the media content item may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the copyright owner via rights-holders system **18**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to third party online media retailers system **20**. The data provided to retailers system **20** may be similar to the data provided to rights-holders system **18**. However, retailers system **20** may be accessed by third party online media retailers who have been selected by the copyright owner of the media content item to distribute the media content item via the Internet.

The data provided by device **10** and licensing system **16** to retailers system **20** for the media content item may be used by the third party online retailers to develop future pricing for their online media content item distribution including which media content items to distribute in the future. The data provided to retailers system **20** may also be used to help third party online media retailers target the marketing of the media content item to demographics that have shown a trend of interest in the media content item. Payments for the distribution of the media content item by the third party on line media retailer may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the third party online media retailer via retailers system **20**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to hardware device manufactures system **22**. The data provided to manufactures system **22** may be similar to the data provided to rights-holders system **18** and retailer system **20**. However, manufactures system **22** may be accessed by hardware device manufacturers who manufacture the hardware that may be implemented in device **10** that provides device **10** with the capabilities to limit reproduction of the media content item to when the user has a license to reproduce the media content item. Payments for use of the hardware provided by the hardware device manufacturers implemented in device **10** by the user of device **10** may also be distributed to the hardware device manufacturer via manufacturers system **20**.

Device **10** may be configured to connect to network **12**. Network **12** may include one or more networks, such as the Internet. In some examples, network **12** may include one or more network technologies such as Ethernet, Fast Ethernet, Gigabit Ethernet, a variant of the IEEE 802.11 standard such as WiFi, and the like. Communication over network **12** takes place using one or more network communication protocols including reliable streaming protocols such as transmission control protocol (TCP). These examples are illustrative and not intended to limit the present disclosure. As shown in FIG. **1**, device **10** may engage in communication with network **12** via connection **14**, where connection **14** may be a wireless, wired, a secured communication connection, any combination thereof, and/or any other communication connection that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Licensing system **16** may be configured to engage in communication with network **12**. As such, device **10** may communicate with licensing system **16** via network **12**. Additionally, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may also communicate with licensing system **16** and device **10** via network **12**. Licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may engage in communication with network **12** via a communication connection similar to connection **14**.

Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may have a cloud computing configuration. Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may share resources via network **12**. For example, device **10** may retrieve licensing information for the user of device **10** who wishes to reproduce the media content item via network **12**. Licensing system **16** may also update rights-holders system **18** with the user information for the user who wishes to reproduce the media content item. Based on the cloud computing configuration, the interaction between device **10**, licensing system **16**, and rights-holders system **18** may not be limited to a single external multimedia hardware device. A plurality of external multimedia hardware devices may update licensing system **16** and rights-holders system **18** via network **12** with user information of users wishing to reproduce the media content item. Licensing system **16** may provide each of these updates for the user information to any media content rights-holders system that requests the user information.

Digital Media File Licensing and Authorized Reproduction System

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system **95** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **95** includes external multimedia hardware device **10**, media content licensing and verification system **16**, and network **12**. External multimedia hardware device **10** includes a processor **40**, a transceiver **44**, an input/output interface **46**, a memory **52**, a mass storage **60**, a human machine interface (HMI) **48** and a reproduction module **50**. Processor **40** may be a hardware based processor that includes a general purpose microcontroller, a special purpose microcontroller and/or any other controller that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Processor **40** includes a media recognition module **42**. Media recognition module **42** may be configured to analyze a loaded digital media file to identify the media content item included in the digital media file and/or determine an identifying characteristic, such as a fingerprint for example, of the media content item. In an embodiment, the media recognition module **40** may include hardware based circuitry configured to analyze a loaded digital media file. In an embodiment, the media recognition module **42** may include program code executing on the processor **40** configured to cause the processor **40** to analyze a loaded digital media file.

Memory **52** includes a digital media file **58**, an application **54**, and an operating system (OS) **56**. Memory **52** may be accessed by processor **40**, such that processor **40** may read data from memory **52** and write data to memory **52**. In some embodiments, application **54** and/or OS **56** may include program code including one or more instructions, that when executed by processor **40** cause device **10** to perform the steps necessary to execute steps or elements embodying the various aspects of the disclosure. Furthermore, digital media file **58** may be loaded for reproduction.

Mass storage **60** includes a license database **62** and digital media file **58**. License database **62** includes a license record **64**. Mass storage **60** may be utilized in addition to memory **52**, or may not be included at all, in which case the data elements illustrated as stored on mass storage **60** would be stored in memory **52**. For exemplary purposes, mass storage **60** includes digital media files **58**, illustrating that one or more digital media files **58** may be stored in mass storage **60** of device **10**. Moreover, mass storage **60** includes a license database **62**, where license database **62** includes one or more license records **64**. In an embodiment, license database **62** includes license records **64**, where license records **64** indicate a media content item that a user of the device may be licensed to reproduce.

Media content licensing and verification system **16** includes a transceiver **68**, a processor **66**, an input/output interface **70**, a mass storage **74**, a memory **76**, and a HMI **72**. Memory **76** includes an application **78**, an OS **80**, a registered user database **86**, a digital media catalog database **82**, and a licensing statistics database **92**. Application **78** and/or the OS **80** may include program code including one or more instructions configured to be executed by processor **66** to cause licensing system **16** to perform steps necessary to perform embodiments of the disclosure.

Registered user database **86** includes a user record **88**. User record **88** includes a license record **90**. Digital media catalog database **82** includes a media record **84**. Each media record **84** includes data associated with a unique media content item loaded into the licensing system **16**. As such, a rights-holder or content creator may load a catalog of media content items that may include but not limited to a song, a movie, a television show, a novel, and/or any other media content item into licensing system **16**. Licensing system **16** may analyze each media content item in the catalog, and generate a media record corresponding to each media content item. In some embodiments, each media record may include data indicating various information of the corresponding media content item, including but not limited to the rights-holder of the media content item, the title of the media content item, the plurality of identifying characteristics, and/or any other information associated with the corresponding media content item that will be apparent to the those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Each user record **88** may be associated with a unique user and indicates all media content items the user has purchased a license for. Each user record **88** may include one or more license records **90**, where each license record may include data indicating a media content item that the user is licensed to reproduce.

Licensing statistics database **92** includes a statistics record **94**. Each statistics record **94** may include data indicating a license purchased by a user connecting to licensing system **16**. The data may include, for example, whether a user that purchased a license for a particular media content item, how many users refused to license a particular media content item, the rights-holder of the media content item for which the license was purchased, the title of the media content item, demographic information for the user that may include but is not limited to age, gender, location, and/or any other data that may be associated with the user and/or license obtained by the user that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments of the present disclosure can be implemented on any type of processing (or computing) device having one or more processors. For example, embodiments can be implemented on a workstation, mobile device, computer, cluster of computers, set-top box, or other devices having at least one processor. In an embodiment, multiple modules may be implemented on the same processing device. Software can include one or more applications and an operating system. Hardware can include, but may not be limited to, a processor, memory, and/or graphical user interface display.

Method **100**

FIG. **3** illustrates a flowchart of an exemplary method **100** of processing a digital media catalog for use in a media content licensing and verification system. At step **102**, the media content licensing and verification system receives digital media catalog. At step **104**, each media content item of the received catalog may be analyzed.

At step **106**, a plurality of identifying characteristics associated with the media content item may be determined. For example, the fingerprint of the media content item may be determined. Determining a media content fingerprint may include one or more steps for analyzing the digital file including the media content item to determine one or more characteristics that uniquely identify the media content item stored therein. For example, if the media content item were a book stored in a digital text file, the natural media fingerprint may be determined to be a predefined number of words from the beginning of the text file.

In another exemplary embodiment, the media content item may be a song stored in a digital music file, and the system may determine the natural media fingerprint by analyzing the digital music file to identify lyrics included in the song, notes played in the song, and/or a sampled sound wave included in the song. These characteristics may be considered individually or in various combinations to uniquely identify the song. Moreover, in many digital media file formats, one or more information fields related to the media content item stored in the file are included in metadata of the file. In an embodiment of the invention, the system may analyze metadata included in the digital media file to identify the media content item stored thereon.

In step **108**, the system generates a media record for each media content item, where the media record includes data indicating the fingerprint, rights-holder information, title, and/or any other media content item data. In step **110**, the media record is stored in a digital media catalog database accessible by the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **120**

FIG. **4** illustrates a flowchart of an exemplary method **120** of verifying that a digital media file has been licensed prior to reproduction and facilitating the purchase of a license if the digital media file has not been properly licensed prior to reproduction. At step **122**, a digital media file is loaded for

reproduction on the external multimedia hardware device. At step **124**, the device analyzes the digital media file.

At step **126**, information associated with the digital media file is determined. Information associated with the digital media file may include a fingerprint associated with the media content item included in the digital media file, the rights-holder of the media content item, the title of the media content item, and/or any other digit al media file information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. For example, as described above with respect to FIG. **3**, the device may analyze the digital media file to determine one or more characteristics of the media content item stored thereon, where the characteristics may be utilized alone and/or in various combinations to identify the media content item.

The selected characteristics may be referred to as the natural media fingerprint of the media content item. Advantageously, the natural media fingerprint identifies a media content item, even considering the possibility of different versions of the same media content item. For example, multiple versions of a song are recorded at various times and may be stored as digital music files, such as a live version and a studio version. However, by analyzing the characteristics of a media content item, different versions of the same song may be consistently identified. For example, analyzing characteristics may include analyzing word recognition of lyrics, the occurrence of various frequencies at particular points in time in relation to the occurrence of the lyrics, and/or any other media content item characteristic that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **128**, the device accesses a license database. At step **130**, whether a user of the device has a license for the digital media file may be determined based on the natural media fingerprint and/or other digital media information, such as metadata, included in the digital media file. At step **132**, the device initializes reproduction of the digital media file in response to the determining that the user has the appropriate license.

At step **134**, the device generates a display query asking the user whether the user would like to purchase a license for the digital media file in response to determining that the user does not have the appropriate license. The device generates a display query asking the user whether the user would like to purchase a license for the digital media file.

At step **136**, the device indicates to the user that the digital media file cannot be played in response to the user indicating that the user would not like to purchase a license. At step **137**, the device transmits statistics related to the media content item stored on the digital media file to the media content licensing and verification system. The statistics information may include, for example, the determined natural media fingerprint of the media content item stored in the digital media file and/or any other such information related to the media content item, the digital media file, the external multimedia hardware device, and/or the user of the device.

At step **138**, the device initializes a licensing interface in response to the user indicating that the user would like to purchase the license. The device initializes a licensing interface that includes establishing a secure communication connection to a media content licensing and verification system.

At step **140**, the device transmits user identification data to the system, such that the user of the device may be identified to log into a user account associated with the user, process the licensing transaction, and/or for other such reasons to facilitate purchasing a license for the media content item. The user identification data may include for example, a user name and password, a unique identifier associated with the user, the user's billing information, and/or any other user identification data that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **142**, the device transmits a licensing request to the system, where the request includes information corresponding to the digital media file and the media content item included in the digital media file, such as the fingerprint of the media content item, the title of the media content item, the rights-holder of the digital media file, and/or other media content item information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **160**

FIG. **5** illustrates a flowchart of an exemplary method **160** of processing a license request from an external multimedia hardware device. At step **161**, prior to initializing the licensing transaction, the system receives the user identification data and confirms the user's identity. For example, the system logs the device into a secured transaction interface associated with an account of the user.

At step **162**, the system receives a digital media licensing request from an external multimedia hardware device over a network where the licensing request includes data indicating a media content item that a user of the device wishes to acquire a license for. In an embodiment, the licensing request includes a fingerprint of the media content item, information identifying the rights-holder of the media content item, the title of the media content item, and/or other media content item information.

At step **164**, the system accesses a digital media catalog database to identify the media content item indicated by the request. At step **166**, the system matches the fingerprint of the media content item included in the license request to a fingerprint in the digital media catalog database to identify the media content item associated with the licensing request, the rights-holder associated with the media content item, the price required for a license for the media content item, and/or any other identification information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **168**, the system transmits data to the device indicating that a license is not required for reproduction in response to determining that a record corresponding to the media content item is not in the digital media catalog database. At step **169**, the system transmits data to the device such that a user of the device may confirm a transaction to acquire the license associated with the media content item in response to identifying the media content item associated with the licensing request. In an embodiment, the system transmits data indicating the title of the media content item, the rights-holder of the media content item, an artist associated with the media content item, and/or other media content information such that the device presents this information to the user when asking the user whether to confirm the transaction.

At step **170**, the system transmits data to the device indicating that the license has not been purchased in response to the user declining the licensing transaction, at

which point, the device may refuse to reproduce the digital media file for the user. At step **172**, the system processes the licensing transaction in response to the user confirming the licensing transaction and the system receiving confirmation data from the device. The processing may include collecting payment information, charging previously known payment information, debiting a user account, and/or any other such payment processing methods.

At step **174**, the system transmits a license associated with the media content item over the communication network to the device in response to processing the licensing transaction. At step **176**, the system generates a license record indicating the user and the media content item in response to processing the transaction, the system generates a transaction record including data that identifies the user, the media content item, demographic information about the user, and/or any other license record information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **177**, the user has not purchased a license for a media content item, either because the media content item is not identified in the database or because the user refuses to make the purchase. However, a statistics record may be generated. The statistics data may include for example the natural media fingerprint associated with the media content item, the rights-holder of the media content item, the title of the media content item, and/or any other statistical data. The statistics data generated may be utilized for a variety of purposes, including for example, encouraging non-participating rights-holders from participating in the system by identifying the number of times a license was requested for a media content item owned by the non-participating rights-holder. At step **178**, the statistics record is stored in the licensing statistics database, and the license record is stored in the registered user database in a user record associated with the user.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **180**

FIG. **6** illustrates a flowchart of an exemplary method **180** of loading licenses for media content items associated with a user from third party sources. At step **182**, the system connects to a third party online media retailer. At step **184**, licenses purchased from the third party retailers may be uploaded into a registered user database of the system. At step **186**, after receiving the user license data, the system updates the registered user database of the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **200**

FIG. **7** illustrates a flowchart of an exemplary method **700** of providing statistics associated with licensing transactions performed by the system to a third party over a communication network consistent with embodiments of the invention. At step **202**, the system stores one or more transaction records in a connected licensing statistics database.

At step **204**, the system dynamically aggregates the transaction records in relation to one or more fields of information included in each transaction record. For example, the system may aggregate all transaction records stored in the licensing statistics database where the media content item of the transaction record has a desired title, and as such, data and statistics related to how many times a license was purchased for the media content item having the desired title may be retrieved. In an embodiment, similar aggregation may be performed to determine how many licenses were purchased for a particular rights-holder, titles of media content items that users of a particular demographic purchased, and/or other such relevant data and statistics.

At step **206**, the system may receive a statistics request from a third party that may include but not limited to a rights-holder, a hardware manufacturer, a marketing/analytics partner, and/or other such third parties that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **208**, the system may generate a statistics report based on the received request. At step **210**, the system may transmit the statistics report to the third party over the communication network. As such, in an embodiment a participating rights-holder may quickly retrieve licensing data and statistics for media content items that the rights-holder owns. In another embodiment, a marketing and/or analytics company may receive valuable licensing and statistics data for media content items for particular demographics of users, genres of media content items, and/or other such categories.

Embodiments can work with software, hardware, and/or operating system implementations, other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Conclusion

As such, in general, some embodiments of the invent ion are directed to a system for recognizing licensed and unlicensed multi-media content by use of a natural media fingerprint recognition and license verification database and system. The system disables the use of unlicensed content and provides a secure method to license unlicensed multi-media content and distribute the licensing revenue to content owners, rights-holders, participating third-party hardware and software manufacturers, and/or other additional third parties. In some embodiments, an external multi-media hardware device includes a hardware or software read/write licensed media database module, operatively connected to a hardware or software natural media fingerprint recognition and license verification module, where the recognition and license verification module may be operatively connected to a hardware or software data encryption module. Moreover, the device may include an operating system and/or application stored on memory associated with the external multi-media hardware device. Where the operating system and/or application may be executed by a processor associated with the device to cause the processor to control one or more of the modules to perform one or more tasks associated with the one or more modules. In addition, media reproduction (e.g., audio and video playback) hardware and/or software module may be monitored and controlled by processor of the device operatively connected to, executing, and/or accessing the content fingerprint recognition and license verification module. Moreover, a physical memory device (e.g., a memory and/or a mass storage device) may be accessible by the processor during execution of the one or more operations of the operating system and/or application residing on a memory associated with the external multi-media hardware device. In some embodiments, the operating system and/or application may cause the processor to drive a peripheral device using an 1/0 interface to present a user of the device with a graphic user interface.

Furthermore, the external multimedia hardware device may communicate over a communication network (e.g., an internet connection, a cellular communication network connection, etc.). In some embodiments, the external multimedia hardware device may be connected to a one or more servers functioning as a media content licensing and verification system over the communication network, such as a media content licensing and verification system shown in FIGS. **1** and **2**. In other embodiments, the external multimedia hardware device may be connected to a personal computer functioning as a media content licensing and verification system. For example, an external multimedia hardware device may connect to a user's personal computer over a Wi-Fi connection to verify a user has the appropriate license to reproduce a particular media content item, where the personal computer may include a plurality of licensing records associated with the user. In some embodiments, the communication connection between the device and the server may be a secure internet connection. In addition, the media content licensing and verification system may receive multi-media content items (e.g., songs, videos, books, etc.) from participating copyright owners and/or rights-holders through a catalog submissions module operatively connected to the system and executing thereon. The catalog submissions may be loaded into a natural media fingerprint creation module to generate a natural media fingerprint catalog. In addition, the system may be operatively connected to a storage device storing a registered users and licensed media database.

In addition, the media content licensing and verification system may be operatively connected to and/or execute a secure license verification and payment collection module stored on a connected storage device and/or executing on a computing system connected over the communication network. Such that the the content fingerprint and licenses verification module associated with the external multimedia hardware device may conduct license purchasing transactions by communicating over the communication network with the media licensing and verification system and/or the secure license verification and payment collection module. The secure license verification and payment collection module may be connected through the central computer controlled sub-system server (e.g. a media content licensing and verification system) and/or through a computing system in communication with the media content licensing and verification system over the communication network.

As such, the application and/or operating system executing on the external multimedia hardware device may facilitate licensing transactions for various media content items stored in the media content licensing and verification system. Furthermore, the media content licensing and verification system may include a payments distribution with real-time statistics module that may execute on the media content licensing and verification system, such that copyright owners, rights-holders, and/or participating hardware manufacturers may receive payments and statistics associated with the licensing of media content items using the media content licensing and verification system.

In some embodiments, pre-existing licenses may be submitted to the media content licensing and verification system such that the registered users and licensed media master database may be updated to include licenses for registered users purchased from third party sources, such as third party online media retailers. Where the previously purchased license data may be imported into the system over the communication network to the media content licensing and verification system from the third party sources, such as databases maintained by third parties.

It will therefore be appreciated that the invention may be implemented, for example, using program code implemented on one or more hardware-based computers, one or more processors, and/or one or more integrated circuits (e.g., semiconductors). Program code typically comprises one or more instructions that are resident at various times in various memory and storage devices in a computer, and that, when read and executed by one or more processors in a computer, cause that computer to perform the steps necessary to execute steps or elements embodying the various aspects of the invention. Moreover, while the invention has and hereinafter will be described in the context of fully functioning computers and computer systems, those skilled in the art will appreciate that the various embodiments of the invention are capable of being distributed as a program product in a variety of forms, and that the invention applies equally regardless of the particular type of computer readable media used to actually carry out the distribution. Examples of computer readable media include but are not limited to tangible, recordable type media such as volatile and non-volatile memory devices, floppy and other removable disks, hard disk drives, magnetic tape, optical disks (e.g., CD-ROMs, DVDs, etc.) among others.

Moreover, while the invention has and hereinafter will been described in the context of digital media files resident on a memory, the invention is not so limited. Those skilled in the art will appreciate that embodiments of the invention are capable of facilitating licensing transactions with respect to streaming digital media. For example, a media content item may be streamed to an external multimedia hardware device over a communication network, and a portion of the media content item may be stored in a local memory (e.g., buffered in a cache of a processor associated with the external multimedia hardware device) while a portion may be stored remotely on a memory device accessible by the external multimedia hardware device over a communication network. For example, a media content item may be streamed to an external multimedia hardware device over a communication network from a cloud based storage system, a digital media streaming service (e.g., Pandora, Last.fm, Spotify, iTunes, iCloud, Netflix, and/or other such services) and embodiments of the invention may analyze the media content item when loaded for reproduction and perform the operations consistent with embodiments of the invention to confirm that a user of the device has the appropriate license for the streaming media content item prior to reproducing the streaming media content item.

While the invention has been illustrated by a description of the various embodiments and the examples, and while these embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any other way limit the scope of the invention to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Thus, the invention in its broader aspects is therefore not limited to the specific details, representative apparatus and method, and illustrative example shown and described. In particular, any of the blocks of the above flowcharts may be deleted, augmented, made to be simultaneous with another, combined, or be otherwise altered in accordance with the principles of the invention. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants' general inventive concept.

What is claimed is:

1. A computer implemented method for configuring a multimedia hardware device to stream a media content item, comprising:

receiving a first request from a first user to evaluate streaming the media content item and a second request from a second user to evaluate streaming the media content item;

identifying the media content item by determining a media fingerprint that identifies a unique characteristic inherently present in the media content item captured during recorded creation of the media content item, and excluding information introduced to the media content item extraneous to the recorded creation;

extracting first user data specific to the first user when the first user accepts to stream the media content item;

extracting second user data specific to the second user when the second user declines to stream the media content item;

aggregating the extracted first user data into a first statistics record and the extracted second user data into a second statistics record, wherein the first statistics record summarizes the first user data and the second statistics record summarizes the second user data;

storing in a database the first statistics record and the second statistics record so that the summarized first user data and second user data is accessible to a third party online retailer;

retrieving the first statistics record and the second statistics record with the identity of the media content item determined by the media fingerprint;

analyzing the retrieved first statistics record and the retrieved second statistics record to determine a target demographic of the media content item based on a first demographic corresponding to the first user data that accepted to stream the media content item and a second demographic corresponding to the second user data that declined to stream the media content item; and

providing the third party online retailer the target demographic to market the media content item to a plurality of other users corresponding to the target demographic of the media content item.

2. The method of claim 1, further comprising:

receiving a license to reproduce the media content from a licensing system when at least one of the first request and second request is granted by a licensing system; and

preventing reproduction of the media content item when the first and second requests are declined by the licensing system.

3. The method of claim 2, further comprising:

streaming the media content item based on a plurality of streaming parameters in the license that is received from the licensing system.

4. The computer implemented method of claim 1, further comprising:

storing in a license database the first user data and the second user data that is associated with the respective first user and second user that is attempting to stream the media content item that is accessible to the third party online media retailer that has been selected by a copyright owner to distribute the media content item.

5. The computer implemented method of claim 1, further comprising:

storing in the license database the first user data and the second user data that is associated with the respective first user and second user that is attempting to reproduce the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

6. The method of claim 1, wherein the first user data and the second user data includes a respective first and second geographic locations of the first user and the second user who are requesting the media content item.

7. A computer implemented method for configuring a media content streaming and verification system to stream media content comprising:

receiving a first request from a first external device associated with a first user to evaluate streaming the media content item and a second request from a second external device associated with a second user to evaluate streaming the media content item;

identifying the media content item by determine a media fingerprint that identifies a unique characteristic inherently present in the media content item captured during recorded creation of the media content item ad excluding information introduced to the media content item extraneous to the recorded creation;

extracting first user data specific to the first user when the user accepts to stream the media content item;

extracting second user data specific to the second user when the second user declines to stream the media content item;

aggregating the extracted first user data into a first statistics record and the extracted second user data into a second statistics record, wherein the first statistics record summarizes the first user data and the second statistics record summarizes the second user data;

storing in a database the first statistics record and the second statistics record so that the summarized fist user data and second user data is accessible to a party other than the first user and the second user,

retrieving the first statistics record and the second statistics record with the identity of the media content item determined by the media fingerprint;

analyzing the retrieved first statistics record and the retrieved second statistics record to determine a target demographic of the media content item based on a first demographic corresponding to the first user data that accepted to stream the media content item and a second demographic corresponding to the second user data that declined to stream the media content item to provide a party other than the first user and the second user the target demographic to market the media content item to a plurality of other users corresponding to the target demographic of the media content item.

8. The method of claim 7, further comprising:

generating a license record that includes license granting information associated with the license granted to the external device; and

storing the license record in a registered user database that is associated with the user.

9. A system for configuring a multimedia hardware device to generate an authorized reproduction of a media content item included in a digital media file, comprising:

at least one processor; and

a memory coupled with the processor, the memory including instructions that, when executed by the processor cause the processor to:

receive a first request from a first user to evaluate streaming the media content item and a second request from a second user to evaluate streaming the media content item,

identify the media content item by determining a media fingerprint that identifies a unique characteristic inherently present in the media content item captured during recorded creation of the media content item and excluding information introduced to the media content item extraneous to the recorded creation,

extract first user data specific to the first user when the user accepts to stream the media content item,

extract second user data specific to the second user when the second user declines to stream the media content item,

aggregate the extracted first user data into a first statistics record and the extracted second user data into a second statistics record, wherein the first statistics record summarizes the first user data and the second statistics record summaries the second user data,

store in a database the first statistics record and the second statistics record so that the summarized first user data and the second user data is accessible to a third party online retailer, and

retrieve the first statistics record and the second statistics record with the identity of the media content item determined by the media fingerprint;

analyze the retrieved first statistics records and the second retrieved statistics record to determine a target demographic of the media content item based on a first demographic corresponding to the first user data that accepted to stream the media content item and a second demographic corresponding to the second user data that declined to stream the media content item to provide the third party online retailer the target demographic to market the media content item to a plurality of other users corresponding to the target demographic of the media content item.

10. The system of claim **9**, wherein the processor is further configured to:

receive a license to reproduce the media content item from a licensing system when the at least one of the first request and second request is granted by the licensing system; and

prevent reproduction of the media content item when the first and second requests are declined by the licensing system.

11. The system of claim **9**, wherein the processor is further configured to reproduce the media content item based on a plurality of reproduction parameters included in the license that is received from the licensing system.

12. The system of claim **9**, wherein the processor is further configured to store in the license database the first user data that is associated with the first user that is accepting to stream the media content item and the second user data that is associated with the second user that is declining to stream the media content item that is accessible to the third party online media retailer that has been selected by a copyright owner to distribute the media content item.

13. The system of claim **9**, wherein the processor is further configured to store in the license database the first user data that is associated with the first user that is accepting to stream the media content item and the second user data that is associated with the second user that is declining to stream the media content item that is accessible to a hardware device manufacturer that manufacturers hardware that is implemented by the multimedia hardware device.

14. The system of claim **9**, wherein the first user data and the second user data includes a quantity of times that the first user and the second user has previously accessed the media content item and additional media content items.

15. A computer implemented method for configuring a multimedia hardware device to stream a plurality of media content items, comprising:

receiving a first request from a user to evaluate streaming a first media content item and a second request from the user to evaluate streaming a second media content item;

identifying the first media content item by determining a first media fingerprint that identifies a first unique characteristic inherently present in the first media content item captured during recorded creation of the first media content item, and excluding information introduced to the first media content item extraneous to the recorded creation;

identifying the second media content item by determining a second media fingerprint that identifies a second unique characteristic inherently present in the second media content item captured during recorded creation of the second media content item, and excluding information introduced to the second media content item extraneous to the recorded creation;

extracting first user data specific to the user when the user accepts to stream the first media content item;

extracting second user data specific to the user when the user declines to stream the second media content item;

aggregating the extracted first user data into a first statistics record and the extracted second user data into a second statistics record, wherein the first statistics record summarizes the first user data and the second statistics record summarizes the second user data;

storing in a database the first statistics record and the second statistics record so that the summarized first user data and second user data is accessible to a third party online retailer;

retrieving the first statistics record and the second statistics record with the identity of the first and second media content items determined by the first and second media fingerprints;

analyzing the retrieved first statistics record and the retrieved second statistics record to determine a target demographic of the first and second media content items based on the first user data that accepted to stream the first media content item and the second user data that declined to stream the second media content item; and

providing the third party online retailer the target demographic to market the first and second media content items to a plurality of other users corresponding to the target demographic of the first and second media content items.

16. The method of claim **15**, wherein the first and second user data includes geographic location of the user who is requesting the first and second media content items.

17. The method of claim **1**, wherein the first media content item is a first version of an audiovisual work and the second media content item is a second version of the audio visual work.

18. The method of claim **1**, wherein the media content item is a song, and the unique characteristic inherently resent in the media content item is selected from the group consisting of lyrics included in the song, notes played in the song, and a sampled sound wave included in the song.

19. The method of claim **7**, wherein the media content item is a song, and the unique characteristic inherently present in the media content item is selected from the group

consisting of lyrics included in the song, notes played in the song, and a sampled sound wave included in the song.

20. The method of claim **9**, wherein the media content item is a song, and the unique characteristic inherently present in the media content item is selected from the group consisting of lyrics included in the song, notes played in the song, and a sampled sound wave included in the song.

21. The method of claim **1**, wherein the media content item is a book in digital format, and the unique characteristic inherently present in the media content item is a preselected number of words in the book.

22. The method of claim **7**, wherein the media content item is a book in digital format, and the unique characteristic inherently present in the media content item is a preselected number of words in the book.

23. The method of claim **9**, wherein the media content item is a book in digital format, and the unique characteristic inherently present in the media content item is a preselected number of words in the book.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

Assignment abstract of title for Application 16731550

Invention title/Inventor	Patent	Publication	Application	PCT	International registration
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Reel/frame	Execution date	Date recorded	Properties	Pages
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Estes

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(45) **Date of Patent: *Jan. 5, 2021**

(54) **DIGITAL MEDIA REPRODUCTION AND LICENSING**

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(72) Inventor: **Christopher A. Estes**, Miami, FL (US)

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G06F 21/10	(2013.01)
G06Q 30/02	(2012.01)
G06F 16/487	(2019.01)
G06F 16/22	(2019.01)
H04N 21/4402	(2011.01)

(Continued)

(52) **U.S. Cl.**

CPC ***G06F 21/10*** (2013.01); ***G06F 16/22*** (2019.01); ***G06F 16/487*** (2019.01); ***G06F 21/105*** (2013.01); ***G06Q 30/02*** (2013.01); ***G06Q 30/0204*** (2013.01); ***H04N 21/4402*** (2013.01); ***H04N 21/4532*** (2013.01); ***H04N 21/4627*** (2013.01); ***H04N 21/4667*** (2013.01); *G06F 2221/0713* (2013.01); *G06Q 50/184* (2013.01)

(58) **Field of Classification Search**

CPC combination set(s) only.

See application file for complete search history.

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Assistant Examiner — Richard A McCoy
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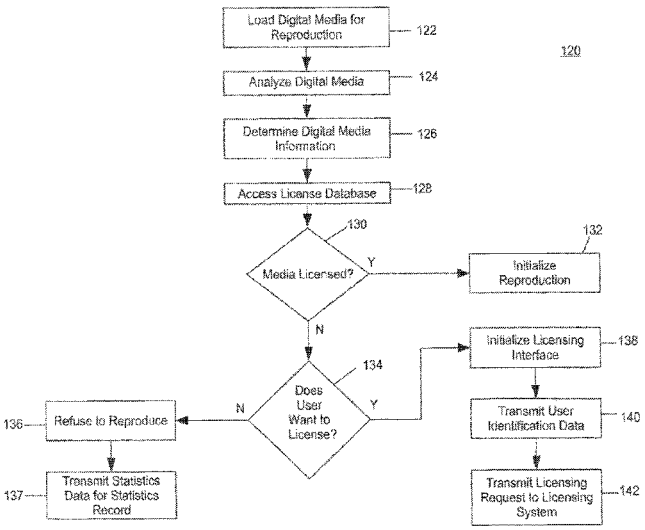
(57) **ABSTRACT**

Systems and methods for monetizing the reproduction of digital media content for the rights-holders of the digital media content. Embodiments of the present disclosure relate to determining whether a user of a media content item has a license to reproduce the media content item. In one embodiment, the media content item may be reproduced when the user is licensed. The user is prompted to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item when the user is not licensed. Further embodiments determine whether a user may receive a license when the user wishes to acquire a license. In an embodiment, the user is declined a license when not approved for the license.

18 Claims, 7 Drawing Sheets



Related U.S. Application Data

continuation of application No. 15/659,175, filed on Jul. 25, 2017, now Pat. No. 9,898,590, which is a continuation of application No. 13/667,629, filed on Nov. 2, 2012, now Pat. No. 9,715,581.

(60) Provisional application No. 61/555,810, filed on Nov. 4, 2011.

(51) **Int. Cl.**

H04N 21/45	(2011.01)
H04N 21/4627	(2011.01)
H04N 21/466	(2011.01)
G06Q 50/18	(2012.01)

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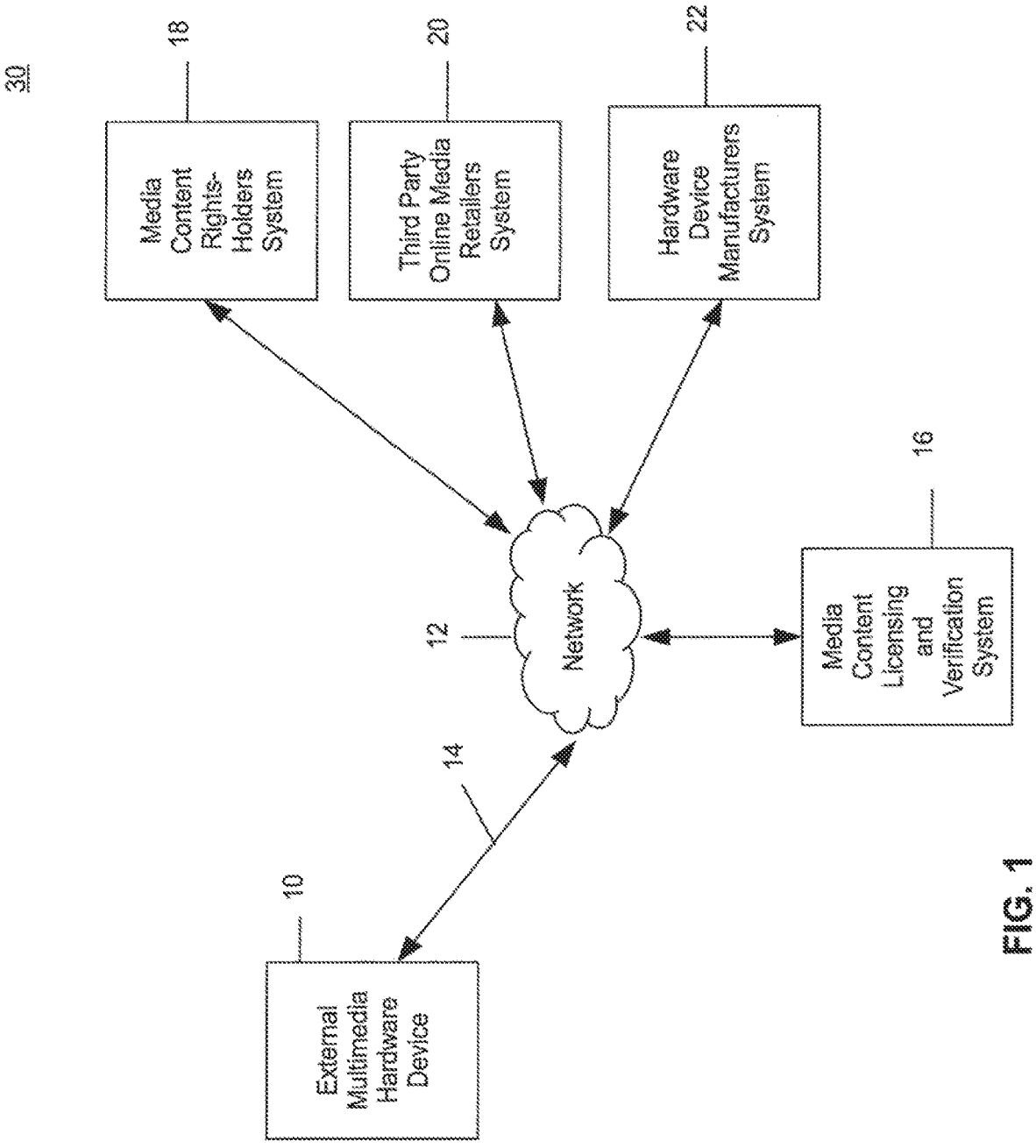
30
18
Media Content Rights-Holders System
20
Third Party Online Media Retailers System
22
Hardware Device Manufacturers System
16
Media Content Licensing and Verification System
12
Network
14
10
External Multimedia Hardware Device

FIG. 1

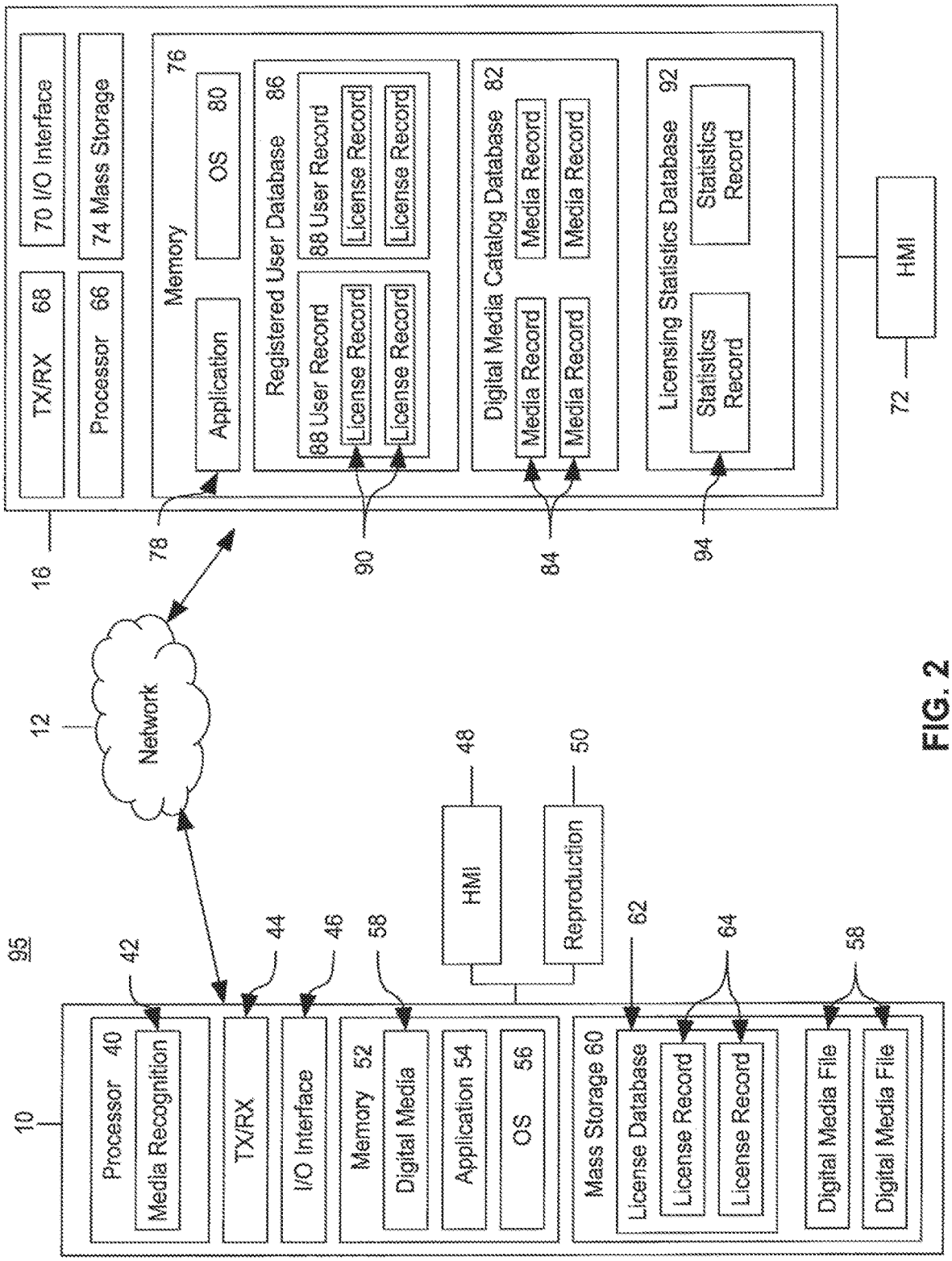
16
TX/RX 68
Processor 66
70 I/O Interface
74 Mass Storage
76
Memory
Application
OS 80
78
Registered User Database 86
88 User Record
License Record
License Record
90
Digital Media Catalog Database 82
Media Record
Media Record
84
Licensing Statistics Database 92
Statistics Record
Statistics Record
94
72
HMI
12
Network
95
10
Processor 40
Media Recognition
42
TX/RX
44
I/O Interface
46
Memory 52
Digital Media
Application 54
OS 56
58
48
HMI
50
Reproduction
Mass Storage 60
62
License Database
License Record
License Record
64
Digital Media File
Digital Media File
58

FIG. 2

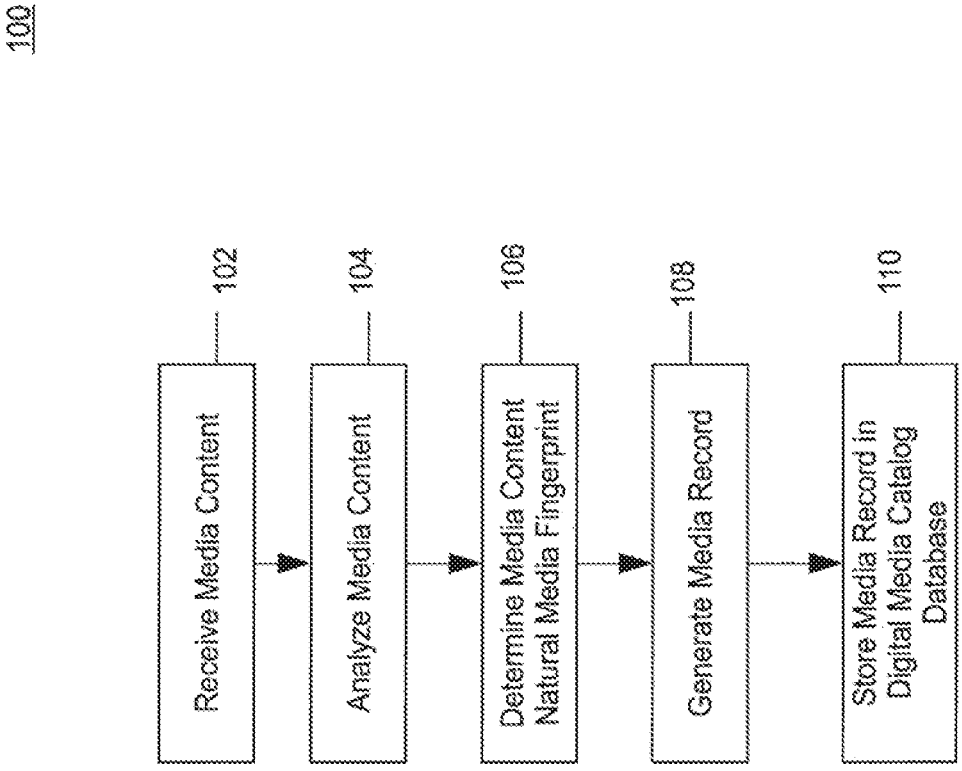
100
102
Receive Media Content
104
Analyze Media Content
106
Determine Media Content Natural Media Fingerprint
108
Generate Media Record
110
Store Media Record in Digital Media Catalog Database

FIG. 3

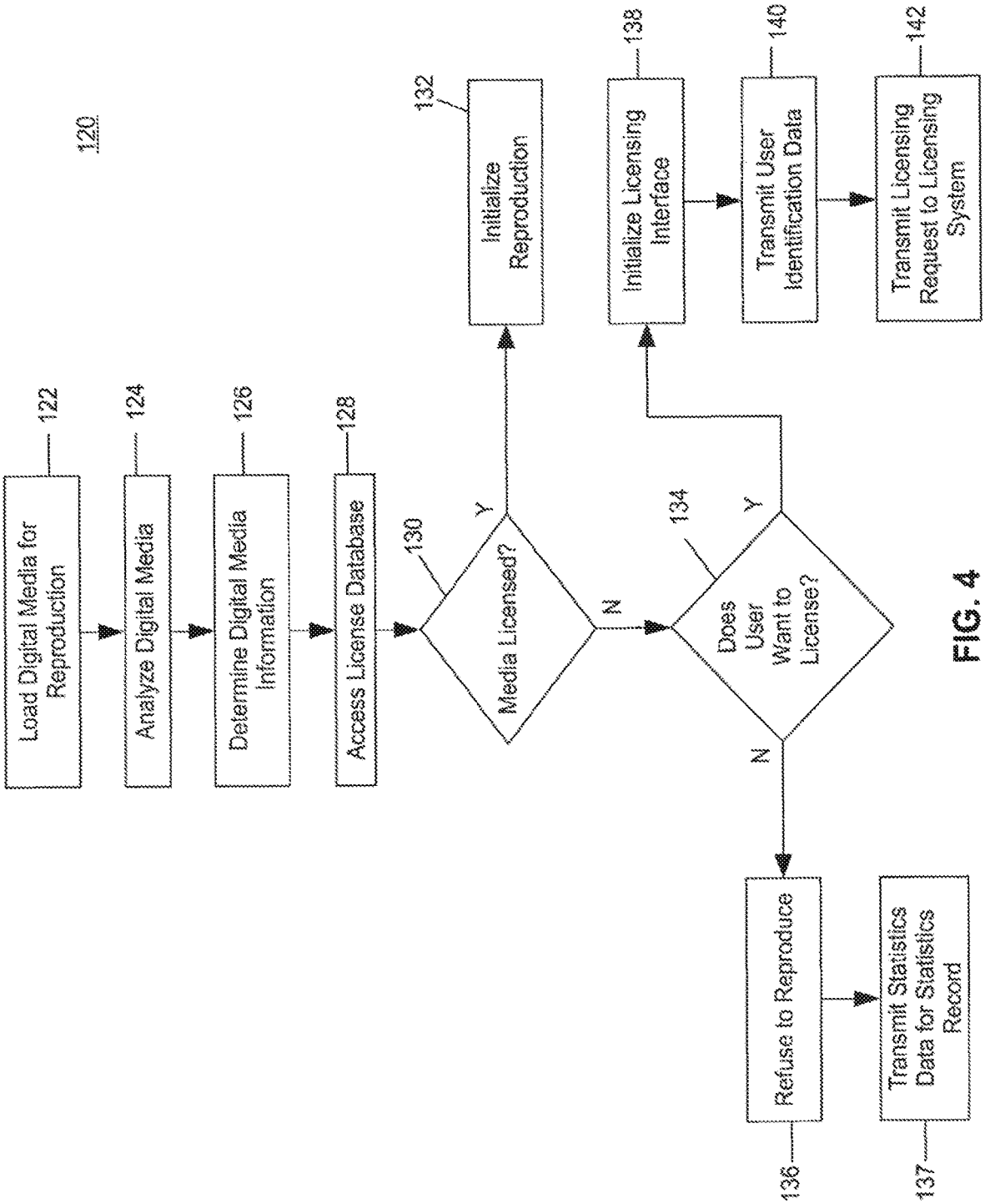
120
Load Digital Media for Reproduction
122
Analyze Digital Media
124
Determine Digital Media Information
126
Access License Database
128
Media Licensed?
130
Y
N
Initialize Reproduction
132
Does User Want to License?
134
Y
N
Initialize Licensing Interface
138
Transmit User Identification Data
140
Transmit Licensing Request to Licensing System
142
Refuse to Reproduce
136
Transmit Statistics Data for Statistics Record
137

FIG. 4

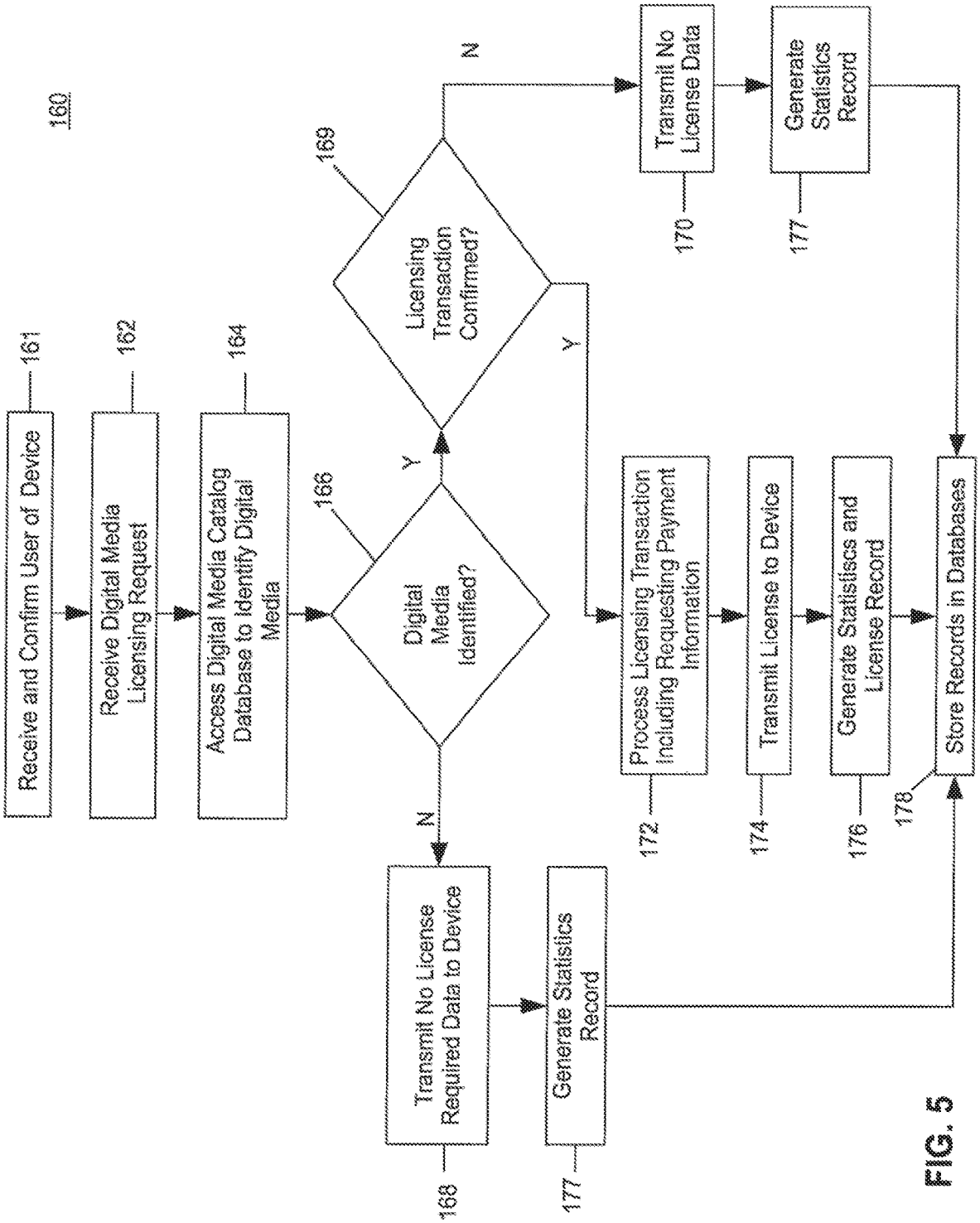
160
Receive and Confirm User of Device
161
Receive Digital Media Licensing Request
162
Access Digital Media Catalog Database to Identify Digital Media
164
Digital Media Identified?
166
Y
N
Licensing Transaction Confirmed?
169
Y
N
Transmit No License Data
170
Generate Statistics Record
177
Process Licensing Transaction Including Requesting Payment Information
172
Transmit License to Device
174
Generate Statistics and License Record
176
Store Records in Databases
178
Transmit No License Required Data to Device
168
Generate Statistics Record
177

FIG. 5

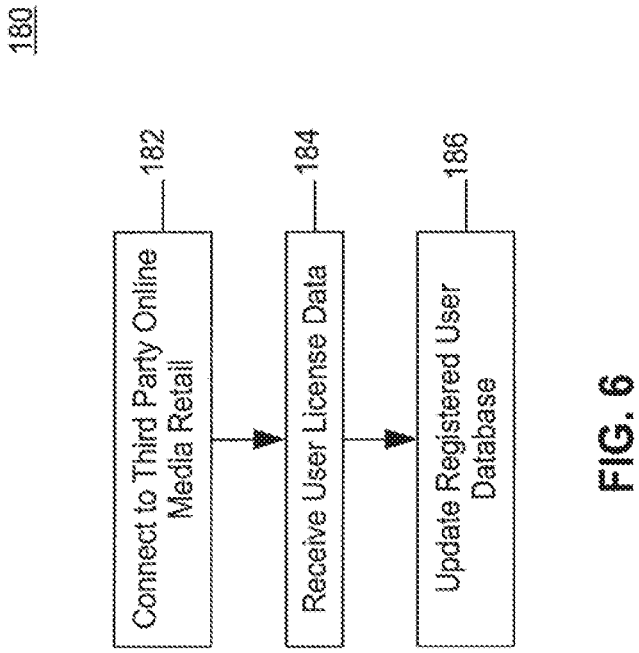
180
182
Connect to Third Party Online Media Retail
184
Receive User License Data
186
Update Registered User Database

FIG. 6

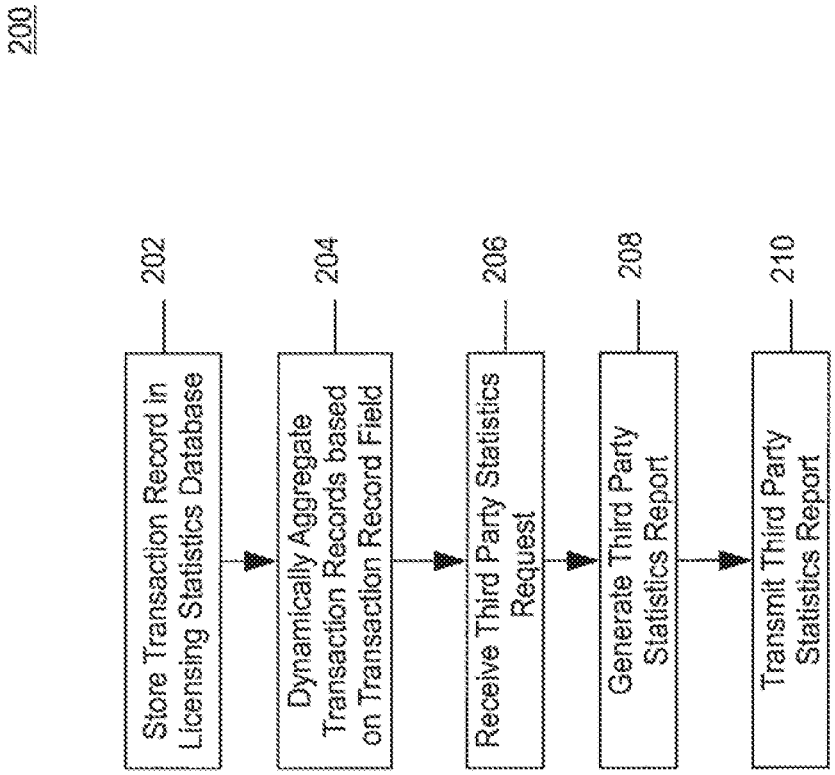
200
202
Store Transaction Record in Licensing Statistics Database
204
Dynamically Aggregate Transaction Records based on Transaction Record Field
206
Receive Third Party Statistics Request
208
Generate Third Party Statistics Report
210
Transmit Third Party Statistics Report

FIG. 7

DIGITAL MEDIA REPRODUCTION AND LICENSING

CROSS-REFERENCE

The present application is a continuation application of U.S. patent application Ser. No. 15/898,978, filed Feb. 19, 2018, and claims the benefit of U.S. Pat. No. 9,898,590, filed Jul. 25, 2017, and claims the benefit of U.S. Pat. No. 9,715,581, filed Nov. 2, 2012, and claims the benefit of U.S. Provisional Patent Application No. 61/555,810, filed Nov. 4, 2011, which a r e incorporated herein by reference in their entirety.

TECHNICAL FIELD

Embodiments relate to licensing digital media for reproduction, and more specifically to a digital media licensing system for licensing and enabling reproduction of digital media on a reproduction device.

BACKGROUND

Conventionally, the distribution of media content, such as music, movies, and books for example, is in large part controlled by owners who are the rights-holders of the media content. In conventional systems, the media content is incorporated into a physical media such as a compact disk (CD), a digital video disk (DVD), a printed publication, and/or any other physical media. In such conventional systems, the rights-holders of the media content are able to control licensing of the media content, the production of physical media copies of the media content, and/or the distribution of the media content to customers and/or third party retailers and thereby monetize the media content.

There has been a dramatic shift in the marketplace away from media content distributed on physical media to digital media content that may be distributed via the internet. Conventionally, rights-holders of digital media content have significantly less control over the distribution of such digital media content as compared to the distribution of physical media. For example, a party that does not hold rights of the digital media content may reproduce the digital media content and then distribute the digital media content via the internet without the permission of the actual rights-holder of the digital media content. As a result, the actual-rights holder of the digital media content cannot monetize the unauthorized distribution of the digital media content.

The inability of rights-holders of digital media content to monetize the unauthorized distribution of the digital media content limits the financial gain that rights-holders of the digital media content obtain in creating the original digital media content. Often times such unauthorized distribution of the digital media content prohibits the rights-holders of the digital media from covering the costs of creating the original digital media content which discourages creation of digital media content.

BRIEF SUMMARY

Embodiments relate to monetizing the reproduction of digital media content for the rights-holder of the digital media content. In an embodiment, a computer implemented method provides a multimedia hardware device a capability to generate an authorized reproduction of a media content item included in a digital media file. A digital media file that includes a media content item may be loaded for reproduction. The digital media file may be analyzed to identify digital media information associated with the media contentitem. A license database may be accessed to determine whether a user is licensed to reproduce the media content item based on the digital media information. The media content item may be reproduced when the user is licensed to reproduce the media content item based on the digital media information. A licensing query may be provided to the user when the user is not licensed to reproduce the media content item to prompt the user to select to acquire a license to reproduce the media content item or to decline the license to reproduce the media content item.

In another embodiment, a system provides a media content licensing and verification system to license media content for reproduction. A transceiver may receive a media licensing request from an external device associated with a user. The media licensing request may include digital media information associated with a media contentitem included in a digital media file. A processor may access a media catalog database that includes a plurality of media content records where a media content record from the plurality of media content records is associated with the media content item. The processor may also determine whether the media licensing request is to be granted based on the media content record stored in the media catalog database that is associated with the media content item. The processor may grant the media licensing request for the external device when the media content record associated with the media content item verifies the granting of the license for the media content item to the external device. The processor may also decline the media licensing request for the external device when the media content record associated with the media content item does not verify the granting of the license for the media content item to the external device.

Further embodiments, features, and advantages, as well as the structure and operation of the various embodiments, are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described with reference to the accompanying drawings. In the drawings, like reference numbers may indicate identical or functionally similar elements.

FIG. **1** illustrates a digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system, according to an embodiment;

FIG. **3** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to analyze a received catalog of media content and manage the catalog of media content, according to an embodiment;

FIG. **4** illustrates a flowchart illustrating an exemplary aspect of operation for the external multimedia hardware device, according to an embodiment;

FIG. **5** illustrates a flowchart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a payment for a license to reproduce a digital media file, according to an embodiment;

FIG. **6** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive licensing information froma third party media retailer, according to an embodiment; and

FIG. **7** illustrates a flow chart illustrating an exemplary aspect of operation for the media content licensing and verification system to receive a third-party request for licensing statistics.

DETAILED DESCRIPTION

The digital media file licensing and authorized reproduction system provides a capability to ensure that a user possesses a license to reproduce a digital media file and if the user does not have a license, providing to the user the option to obtain such a license. In the Detailed Description herein, references to "one embodiment", "an embodiment", an "example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, by every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic may be described in connection with an embodiment, it may be submitted that it may be within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

Overview

FIG. **1** illustrates a digital media file licensing and authorized reproduction system **30** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **30** includes an external multimedia hardware device **10**, a network **12**, a media content licensing and verification system **16**, a media content rights-holders system **18**, a third party online media retailers system **20**, and a hardware device manufacturers system **22**.

System **30** may monetize the reproduction of a media content item included within a digital media file. Reproduction of a media content item may include reproducing sound from a digital audio file, reproducing video from a digital video file, reproducing text from a digital text file, and/or any other reproduction of a digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Reproduction may be defined as a first use by a user of the media content item. For example, reproduction of the media content item may include when a user first accesses a media content item where the user obtained the media content item from an outside source, such as but not limited to a third party online media distributor. Reproduction may also be defined as further distribution of the media content item by the user after the user has initially accessed the media content item. For example, reproduction of the media content item may include when the user distributes the media content item to other parties after the user has obtained the media content item from the third party online media distributor.

A digital media file may represent a MPEG Layer 3 (MP3) file, a Real Audio (RA) file, a raw sample (RAW) file, a Microsoft wave (WAV) file, a Windows Media Audio (WMA) file, and/or any other suitable digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. The media content item may include any portion of data included in the digital media file. A user of external multimedia hardware device **10** may reproduce the media content item with external multimedia hardware device **10**. Device **10** may represent a smart phone, a smart tablet, a mobile telephone, a television, an audio system, a personal music player, a portable computing device, other computing devices such as a personal computer, a laptop, or a desktop computer, computer peripheral such as a printer, a portable audio/or a video player, and/or any other suitable electronic device that can reproduce a media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

However, the user may not have a license that authorizes the user to reproduce the media content item. The digital media file including the media content item may have been procured from various sources that are not licensed to reproduce the media content item and do not collect licensing fees for use of the media content item. As such, when the user loads the digital media file for reproduction, device **10** may analyze the digital media file to determine the media content item included in the file and determine whether the user of device **10** is authorized. For example, the device may analyze a digital music file to identify the song and artist of the media content item that may be a track included in the digital music file. The user may be authorized when the user has a license to load and/or reproduce a media content item included in the digital media file.

In an embodiment, device **10** may analyze a plurality of identifying characteristics associated with the media content item to identify the media content item and to determine whether the user of device **10** is authorized. The plurality of identifying characteristics may be an identifying characteristic associated with the media content item inherently present in the media content item such that the media content item is not remastered to include the identifying characteristic after the media content item is initially recorded. The plurality of identifying characteristics can represent a fingerprint, digital watermarking, and/or any other suitable algorithm to identify copyright ownership of the media content item included in the digital media file that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. In an embodiment, device **10** may analyze metadata included in the loaded digital media file to identify the media content item included in the digital media file.

System **30** may query a license database locally and/or remotely located to system **30** to determine whether the user of device **10** has the appropriate license for the media content item. Device **10** may refuse to play the digital media file and query the user to determine whether the user wishes to purchase the appropriate license when the user does not have the appropriate license.

Device **10** may communicate with media content licensing and verification system **16** over network **12** and transmit the fingerprint of the media content item to media content licensing and verification system **16** when the user selects to purchase the appropriate license. Licensing system **16** may identify the media content item based on the received fingerprint. Licensing system **16** may transmit back to device **10** the title and/or other information associated with the identified media content item and request the user to confirm purchase of the license. The user may interface with device **10** to conduct the licensing transaction with licensing system **16**, and after purchasing the license, licensing system **16** may transmit a license to device **10**. After receiving the license from licensing system **16**, device **10** may commence reproduction of the media content item. Moreover, licensing system **16** may store a record of the transaction for statistical purposes, and/or store a copy of the license in a database under a user record associated with the user of device **10**.

Device **10** and licensing system **16** may provide data associated with the use of the media content item to media

content rights-holders system **18** over network **12**. Rights-holders system **18** may be accessed by an owner of a copyright for the media content item. For example, device **10** and licensing system **16** may provide data to rights-holders system **18** that includes the user who is accessing the media content item, the geographic location of the user who is accessing the media content item, other media content items that the user may be accessing, the quantity of times the media content item is accessed, and/or any other data associated with the use of the media content item that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

The data provided by device **10** and licensing system **16** to rights-holders system **18** for the media content item may be used by the copyright owner to develop future licensing agreements that may be provided to the user of device **10** by licensing system **16** for future use of the media content item. Payments for the license to use the media content item may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the copyright owner via rights-holders system **18**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to third party online media retailers system **20**. The data provided to retailers system **20** may be similar to the data provided to rights-holders system **18**. However, retailers system **20** may be accessed by third party online media retailers who have been selected by the copyright owner of the media content item to distribute the media content item via the Internet.

The data provided by device **10** and licensing system **16** to retailers system **20** for the media content item may be used by the third party online retailers to develop future pricing for their online media content item distribution including which media content items to distribute in the future. The data provided to retailers system **20** may also be used to help third party online media retailers target the marketing of the media content item to demographics that have shown a trend of interest in the media content item. Payments for the distribution of the media content item by the third party on line media retailer may be received from the user via device **10** and licensing system **16**. Payments may also be distributed to the third party online media retailer via retailers system **20**.

Device **10** and licensing system **16** may also provide data associated with the use of the media content item to hardware device manufactures system **22**. The data provided to manufactures system **22** may be similar to the data provided to rights-holders system **18** and retailer system **20**. However, manufactures system **22** may be accessed by hardware device manufacturers who manufacture the hardware that may be implemented in device **10** that provides device **10** with the capabilities to limit reproduction of the media content item to when the user has a license to reproduce the media content item. Payments for use of the hardware provided by the hardware device manufacturers implemented in device **10** by the user of device **10** may also be distributed to the hardware device manufacturer via manufacturers system **20**.

Device **10** may be configured to connect to network **12**. Network **12** may include one or more networks, such as the Internet. In some examples, network **12** may include one or more network technologies such as Ethernet, Fast Ethernet, Gigabit Ethernet, a variant of the IEEE 802.11 standard such as WiFi, and the like. Communication over network **12** takes place using one or more network communication protocols including reliable streaming protocols such as transmission control protocol (TCP). These examples are illustrative and not intended to limit the present disclosure. As shown in FIG. **1**, device **10** may engage in communication with network **12** via connection **14**, where connection **14** may be a wireless, wired, a secured communication connection, any combination thereof, and/or any other communication connection that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Licensing system **16** may be configured to engage in communication with network **12**. As such, device **10** may communicate with licensing system **16** via network **12**. Additionally, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may also communicate with licensing system **16** and device **10** via network **12**. Licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may engage in communication with network **12** via a communication connection similar to connection **14**.

Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may have a cloud computing configuration. Device **10**, licensing system **16**, rights-holders system **18**, retailers system **20**, and/or manufacturers system **22** may share resources via network **12**. For example, device **10** may retrieve licensing information for the user of device **10** who wishes to reproduce the media content item via network **12**. Licensing system **16** may also update rights-holders system **18** with the user information for the user who wishes to reproduce the media content item. Based on the cloud computing configuration, the interaction between device **10**, licensing system **16**, and rights-holders system **18** may not be limited to a single external multimedia hardware device. A plurality of external multimedia hardware devices may update licensing system **16** and rights-holders system **18** via network **12** with user information of users wishing to reproduce the media content item. Licensing system **16** may provide each of these updates for the user information to any media content rights-holders system that requests the user information.

Digital Media File Licensing and Authorized Reproduction System

FIG. **2** illustrates a second digital media file licensing and authorized reproduction system **95** in which embodiments or portions thereof, may be implemented. Digital media file licensing and authorized reproduction system **95** includes external multimedia hardware device **10**, media content licensing and verification system **16**, and network **12**. External multimedia hardware device **10** includes a processor **40**, a transceiver **44**, an input/output interface **46**, a memory **52**, a mass storage **60**, a human machine interface (HMI) **48** and a reproduction module **50**. Processor **40** may be a hardware based processor that includes a general purpose microcontroller, a special purpose microcontroller and/or any other controller that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Processor **40** includes a media recognition module **42**. Media recognition module **42** may be configured to analyze a loaded digital media file to identify the media content item included in the digital media file and/or determine an identifying characteristic, such as a fingerprint for example, of the media content item. In an embodiment, the media recognition module **40** may include hardware based circuitry configured to analyze a loaded digital media file. In an embodiment, the media recognition module **42** may include program code executing on the processor **40** configured to cause the processor **40** to analyze a loaded digital media file.

Memory **52** includes a digital media file **58**, an application **54**, and an operating system (OS) **56**. Memory **52** may be accessed by processor **40**, such that processor **40** may read data from memory **52** and write data to memory **52**. In some embodiments, application **54** and/or OS **56** may include program code including one or more instructions, that when executed by processor **40** cause device **10** to perform the steps necessary to execute steps or elements embodying the various aspects of the disclosure. Furthermore, digital media file **58** may be loaded for reproduction.

Mass storage **60** includes a license database **62** and digital media file **58**. License database **62** includes a license record **64**. Mass storage **60** may be utilized in addition to memory **52**, or may not be included at all, in which case the data elements illustrated as stored on mass storage **60** would be stored in memory **52**. For exemplary purposes, mass storage **60** includes digital media files **58**, illustrating that one or more digital media files **58** may be stored in mass storage **60** of device **10**. Moreover, mass storage **60** includes a license database **62**, where license database **62** includes one or more license records **64**. In an embodiment, license database **62** includes license records **64**, where license records **64** indicate a media content item that a user of the device may be licensed to reproduce.

Media content licensing and verification system **16** includes a transceiver **68**, a processor **66**, an input/output interface **70**, a mass storage **74**, a memory **76**, and a HMI **72**. Memory **76** includes an application **78**, an OS **80**, a registered user database **86**, a digital media catalog database **82**, and a licensing statistics database **92**. Application **78** and/or the OS **80** may include program code including one or more instructions configured to be executed by processor **66** to cause licensing system **16** to perform steps necessary to perform embodiments of the disclosure.

Registered user database **86** includes a user record **88**. User record **88** includes a license record **90**. Digital media catalog database **82** includes a media record **84**. Each media record **84** includes data associated with a unique media content item loaded into the licensing system **16**. As such, a rights-holder or content creator may load a catalog of media content items that may include but not limited to a song, a movie, a television show, a novel, and/or any other media content item into licensing system **16**. Licensing system **16** may analyze each media content item in the catalog, and generate a media record corresponding to each media content item. In some embodiments, each media record may include data indicating various information of the corresponding media content item, including but not limited to the rights-holder of the media content item, the title of the media content item, the plurality of identifying characteristics, and/or any other information associated with the corresponding media content item that will be apparent to the those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Each user record **88** may be associated with a unique user and indicates all media content items the user has purchased a license for. Each user record **88** may include one or more license records **90**, where each license record may include data indicating a media content item that the user is licensed to reproduce.

Licensing statistics database **92** includes a statistics record **94**. Each statistics record **94** may include data indicating a license purchased by a user connecting to licensing system **16**. The data may include, for example, whether a user that purchased a license for a particular media content item, how many users refused to license a particular media content item, the rights-holder of the media content item for which the license was purchased, the title of the media content item, demographic information for the user that may include but is not limited to age, gender, location, and/or any other data that may be associated with the user and/or license obtained by the user that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments of the present disclosure can be implemented on any type of processing (or computing) device having one or more processors. For example, embodiments can be implemented on a workstation, mobile device, computer, cluster of computers, set-top box, or other devices having at least one processor. In an embodiment, multiple modules may be implemented on the same processing device. Software can include one or more applications and an operating system. Hardware can include, but may not be limited to, a processor, memory, and/or graphical user interface display.

Method **100**

FIG. **3** illustrates a flowchart of an exemplary method **100** of processing a digital media catalog for use in a media content licensing and verification system. At step **102**, the media content licensing and verification system receives digital media catalog. At step **104**, each media content item of the received catalog may be analyzed.

At step **106**, a plurality of identifying characteristics associated with the media content item may be determined. For example, the fingerprint of the media content item may be determined. Determining a media content fingerprint may include one or more steps for analyzing the digital file including the media content item to determine one or more characteristics that uniquely identify the media content item stored therein. For example, if the media content item were a book stored in a digital text file, the natural media fingerprint may be determined to be a predefined number of words from the beginning of the text file.

In another exemplary embodiment, the media content item may be a song stored in a digital music file, and the system may determine the natural media fingerprint by analyzing the digital music file to identify lyrics included in the song, notes played in the song, and/or a sampled sound wave included in the song. These characteristics may be considered individually or in various combinations to uniquely identify the song. Moreover, in many digital media file formats, one or more information fields related to the media content item stored in the file are included in metadata of the file. In an embodiment of the invention, the system may analyze metadata included in the digital media file to identify the media content item stored thereon.

In step **108**, the system generates a media record for each media content item, where the media record includes data indicating the fingerprint, rights-holder information, title, and/or any other media content item data. In step **110**, the media record is stored in a digital media catalog database accessible by the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **120**

FIG. **4** illustrates a flowchart of an exemplary method **120** of verifying that a digital media file has been licensed prior to reproduction and facilitating the purchase of a license if the digital media file has not been properly licensed prior to reproduction. At step **122**, a digital media file is loaded for

reproduction on the external multimedia hardware device. At step **124**, the device analyzes the digital media file.

At step **126**, information associated with the digital media file is determined. Information associated with the digital media file may include a fingerprint associated with the media content item included in the digital media file, the rights-holder of the media content item, the title of the media content item, and/or any other digit al media file information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure. For example, as described above with respect to FIG. **3**, the device may analyze the digital media file to determine one or more characteristics of the media content item stored thereon, where the characteristics may be utilized alone and/or in various combinations to identify the media content item.

The selected characteristics may be referred to as the natural media fingerprint of the media content item. Advantageously, the natural media fingerprint identifies a media content item, even considering the possibility of different versions of the same media content item. For example, multiple versions of a song are recorded at various times and may be stored as digital music files, such as a live version and a studio version. However, by analyzing the characteristics of a media content item, different versions of the same song may be consistently identified. For example, analyzing characteristics may include analyzing word recognition of lyrics, the occurrence of various frequencies at particular points in time in relation to the occurrence of the lyrics, and/or any other media content item characteristic that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **128**, the device accesses a license database. At step **130**, whether a user of the device has a license for the digital media file may be determined based on the natural media fingerprint and/or other digital media information, such as metadata, included in the digital media file. At step **132**, the device initializes reproduction of the digital media file in response to the determining that the user has the appropriate license.

At step **134**, the device generates a display query asking the user whether the user would like to purchase a license for the digital media file in response to determining that the user does not have the appropriate license. The device generates a display query asking the user whether the user would like to purchase a license for the digital media file.

At step **136**, the device indicates to the user that the digital media file cannot be played in response to the user indicating that the user would not like to purchase a license. At step **137**, the device transmits statistics related to the media content item stored on the digital media file to the media content licensing and verification system. The statistics information may include, for example, the determined natural media fingerprint of the media content item stored in the digital media file and/or any other such information related to the media content item, the digital media file, the external multimedia hardware device, and/or the user of the device.

At step **138**, the device initializes a licensing interface in response to the user indicating that the user would like to purchase the license. The device initializes a licensing interface that includes establishing a secure communication connection to a media content licensing and verification system.

At step **140**, the device transmits user identification data to the system, such that the user of the device may be identified to log into a user account associated with the user, process the licensing transaction, and/or for other such reasons to facilitate purchasing a license for the media content item. The user identification data may include for example, a user name and password, a unique identifier associated with the user, the user's billing information, and/or any other user identification data that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **142**, the device transmits a licensing request to the system, where the request includes information corresponding to the digital media file and the media content item included in the digital media file, such as the fingerprint of the media content item, the title of the media content item, the rights-holder of the digital media file, and/or other media content item information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **160**

FIG. **5** illustrates a flowchart of an exemplary method **160** of processing a license request from an external multimedia hardware device. At step **161**, prior to initializing the licensing transaction, the system receives the user identification data and confirms the user's identity. For example, the system logs the device into a secured transaction interface associated with an account of the user.

At step **162**, the system receives a digital media licensing request from an external multimedia hardware device over a network where the licensing request includes data indicating a media content item that a user of the device wishes to acquire a license for. In an embodiment, the licensing request includes a fingerprint of the media contentitem, information identifying the rights-holder of the media content item, the title of the media content item, and/or other media content item information.

At step **164**, the system accesses a digital media catalog database to identify the media content item indicated by the request. At step **166**, the system matches the fingerprint of the media content item included in the license request to a fingerprint in the digital media catalog database to identify the media content item associated with the licensing request, the rights-holder associated with the media content item, the price required for a license for the media content item, and/or any other identification information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **168**, the system transmits data to the device indicating that a license is not required for reproduction in response to determining that a record corresponding to the media content item is not in the digital media catalog database. At step **169**, the system transmits data to the device such that a user of the device may confirm a transaction to acquire the license associated with the media content item in response to identifying the media content item associated with the licensing request. In an embodiment, the system transmits data indicating the title of the media content item, the rights-holder of the media content item, an artist associated with the media content item, and/or other media content information such that the device presents this information to the user when asking the user whether to confirm the transaction.

At step **170**, the system transmits data to the device indicating that the license has not been purchased in response to the user declining the licensing transaction, at

which point, the device may refuse to reproduce the digital media file for the user. At step **172**, the system processes the licensing transaction in response to the user confirming the licensing transaction and the system receiving confirmation data from the device. The processing may include collecting payment information, charging previously known payment information, debiting a user account, and/or any other such payment processing methods.

At step **174**, the system transmits a license associated with the media content item over the communication network to the device in response to processing the licensing transaction. At step **176**, the system generates a license record indicating the user and the media content item in response to processing the transaction, the system generates a transaction record including data that identifies the user, the media content item, demographic information about the user, and/or any other license record information that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **177**, the user has not purchased a license for a media content item, either because the media content item is not identified in the database or because the user refuses to make the purchase. However, a statistics record may be generated. The statistics data may include for example the natural media fingerprint associated with the media content item, the rights-holder of the media content item, the title of the media content item, and/or any other statistical data. The statistics data generated may be utilized for a variety of purposes, including for example, encouraging non-participating rights-holders from participating in the system by identifying the number of times a license was requested for a media content item owned by the non-participating rights-holder. At step **178**, the statistics record is stored in the licensing statistics database, and the license record is stored in the registered user database in a user record associated with the user.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **180**

FIG. **6** illustrates a flowchart of an exemplary method **180** of loading licenses for media content items associated with a user from third party sources. At step **182**, the system connects to a third party online media retailer. At step **184**, licenses purchased from the third party retailers may be uploaded into a registered user database of the system. At step **186**, after receiving the user license data, the system updates the registered user database of the system.

Embodiments can work with software, hardware, and/or operating system implementations other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

Method **200**

FIG. **7** illustrates a flowchart of an exemplary method **700** of providing statistics associated with licensing transactions performed by the system to a third party over a communication network consistent with embodiments of the invention. At step **202**, the system stores one or more transaction records in a connected licensing statistics database.

At step **204**, the system dynamically aggregates the transaction records in relation to one or more fields of information included in each transaction record. For example, the system may aggregate all transaction records stored in the licensing statistics database where the media content item of the transaction record has a desired title, and as such, data and statistics related to how many times a license was purchased for the media content item having the desired title may be retrieved. In an embodiment, similar aggregation may be performed to determine how many licenses were purchased for a particular rights-holder, titles of media content items that users of a particular demographic purchased, and/or other such relevant data and statistics.

At step **206**, the system may receive a statistics request from a third party that may include but not limited to a rights-holder, a hardware manufacturer, a marketing/analytics partner, and/or other such third parties that will be apparent to those skilled in the relevant art(s) without departing from the spirit and scope of the disclosure.

At step **208**, the system may generate a statistics report based on the received request. At step **210**, the system may transmit the statistics report to the third party over the communication network. As such, in an embodiment a participating rights-holder may quickly retrieve licensing data and statistics for media content items that the rights-holder owns. In another embodiment, a marketing and/or analytics company may receive valuable licensing and statistics data for media content items for particular demographics of users, genres of media content items, and/or other such categories.

Embodiments can work with software, hardware, and/or operating system implementations, other than those described herein. Any software, hardware, and operating system implementations suitable for performing the functions described herein can be used.

CONCLUSION

As such, in general, some embodiments of the invent ion are directed to a system for recognizing licensed and unlicensed multi-media content by use of a natural media fingerprint recognition and license verification database and system. The system disables the use of unlicensed content and provides a secure method to license unlicensed multi-media content and distribute the licensing revenue to content owners, rights-holders, participating third-party hardware and software manufacturers, and/or other additional third parties. In some embodiments, an external multi-media hardware device includes a hardware or software read/write licensed media database module, operatively connected to a hardware or software natural media fingerprint recognition and license verification module, where the recognition and license verification module may be operatively connected to a hardware or software data encryption module. Moreover, the device may include an operating system and/or application stored on memory associated with the external multi-media hardware device. Where the operating system and/or application may be executed by a processor associated with the device to cause the processor to control one or more of the modules to perform one or more tasks associated with the one or more modules. In addition, media reproduction (e.g., audio and video playback) hardware and/or software module may be monitored and controlled by processor of the device operatively connected to, executing, and/or accessing the content fingerprint recognition and license verification module. Moreover, a physical memory device (e.g., a memory and/or a mass storage device) may be accessible by the processor during execution of the one or more operations of the operating system and/or application residing on a memory associated with the external multi-media hardware device. In some embodiments, the operating system and/or

application may cause the processor to drive a peripheral device using an I/O interface to present a user of the device with a graphic user interface.

Furthermore, the external multimedia hardware device may communicate over a communication network (e.g., an internet connection, a cellular communication network connection, etc.). In some embodiments, the external multimedia hardware device may be connected to a one or more servers functioning as a media content licensing and verification system over the communication network, such as a media content licensing and verification system shown in FIGS. **1** and **2**. In other embodiments, the external multimedia hardware device may be connected to a personal computer functioning as a media content licensing and verification system. For example, an external multimedia hardware device may connect to a user's personal computer over a Wi-Fi connection to verify a user has the appropriate license to reproduce a particular media content item, where the personal computer may include a plurality of licensing records associated with the user. In some embodiments, the communication connection between the device and the server may be a secure internet connection. In addition, the media content licensing and verification system may receive multi-media content items (e.g., songs, videos, books, etc.) from participating copyright owners and/or rights-holders through a catalog submissions module operatively connected to the system and executing thereon. The catalog submissions may be loaded into a natural media fingerprint creation module to generate a natural media fingerprint catalog. In addition, the system may be operatively connected to a storage device storing a registered users and licensed media database.

In addition, the media content licensing and verification system may be operatively connected to and/or execute a secure license verification and payment collection module stored on a connected storage device and/or executing on a computing system connected over the communication network. Such that the the content fingerprint and licenses verification module associated with the external multimedia hardware device may conduct license purchasing transactions by communicating over the communication network with the media licensing and verification system and/or the secure license verification and payment collection module. The secure license verification and payment collection module may be connected through the central computer controlled sub-system server (e.g. a media content licensing and verification system) and/or through a computing system in communication with the media content licensing and verification system over the communication network.

As such, the application and/or operating system executing on the external multimedia hardware device may facilitate licensing transactions for various media content items stored in the media content licensing and verification system. Furthermore, the media content licensing and verification system may include a payments distribution with real-time statistics module that may execute on the media content licensing and verification system, such that copyright owners, rights-holders, and/or participating hardware manufacturers may receive payments and statistics associated with the licensing of media content items using the media content licensing and verification system.

In some embodiments, pre-existing licenses may be submitted to the media content licensing and verification system such that the registered users and licensed media master database may be updated to include licenses for registered users purchased from third party sources, such as third party online media retailers. Where the previously purchased license data may be imported into the system over the communication network to the media content licensing and verification system from the third party sources, such as databases maintained by third parties.

It will therefore be appreciated that the invention may be implemented, for example, using program code implemented on one or more hardware-based computers, one or more processors, and/or one or more integrated circuits (e.g., semiconductors). Program code typically comprises one or more instructions that are resident at various times in various memory and storage devices in a computer, and that, when read and executed by one or more processors in a computer, cause that computer to perform the steps necessary to execute steps or elements embodying the various aspects of the invention. Moreover, while the invention has and hereinafter will be described in the context of fully functioning computers and computer systems, those skilled in the art will appreciate that the various embodiments of the invention are capable of being distributed as a program product in a variety of forms, and that the invention applies equally regardless of the particular type of computer readable media used to actually carry out the distribution. Examples of computer readable media include but are not limited to tangible, recordable type media such as volatile and non-volatile memory devices, floppy and other removable disks, hard disk drives, magnetic tape, optical disks (e.g., CD-ROMs, DVDs, etc.) among others.

Moreover, while the invention has and hereinafter will been described in the context of digital media files resident on a memory, the invention is not so limited. Those skilled in the art will appreciate that embodiments of the invention are capable of facilitating licensing transactions with respect to streaming digital media. For example, a media content item may be streamed to an external multimedia hardware device over a communication network, and a portion of the media content item may be stored in a local memory (e.g., buffered in a cache of a processor associated with the external multimedia hardware device) while a portion may be stored remotely on a memory device accessible by the external multimedia hardware device over a communication network. For example, a media content item may be streamed to an external multimedia hardware device over a communication network from a cloud based storage system, a digital media streaming service (e.g., Pandora, Last.fm, Spotify, iTunes, iCloud, Netflix, and/or other such services) and embodiments of the invention may analyze the media content item when loaded for reproduction and perform the operations consistent with embodiments of the invention to confirm that a user of the device has the appropriate license for the streaming media content item prior to reproducing the streaming media content item.

While the invention has been illustrated by a description of the various embodiments and the examples, and while these embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any other way limit the scope of the invention to such detail. Additional advantages and modifications will readily appear to those skilled in the art. Thus, the invention in its broader aspects is therefore not limited to the specific details, representative apparatus and method, and illustrative example shown and described. In particular, any of the blocks of the above flowcharts may be deleted, augmented, made to be simultaneous with another, combined, or be otherwise altered in accordance with the principles of the invention. Accordingly, departures may be made from such details without departing from the spirit or scope of applicants' general inventive concept.

What is claimed is:

1. A multimedia hardware device comprising:

a processor; and

a memory coupled with the processor, the memory including instructions that, when executed by the processor cause the processor to:

generate a first request from a user to evaluate streaming a first media content item to the device;

identify the first media content item by determining a first media fingerprint that identifies a first unique characteristic inherently present in the first media content item captured during the recorded creation of the first media content item, and excluding information introduced to the first media content item extraneous to the recorded creation;

extract first user data specific to the user when the user accepts to stream the first media content item;

generate a second request from the user to evaluate streaming a second media content item to the device;

identify the second media content item by determining a second media fingerprint that identifies a second unique characteristic inherently present in the second media content item captured during the recorded creation of the second media content item, and excluding information introduced to the second media content item extraneous to the recorded creation;

extract second user data specific to the user when the user declines to stream the second media content item;

aggregate the extracted first user data into a first statistics record and the extracted second user data into a second statistics record, wherein the first statistics record summarizes the first user data and the second statistics record summarizes the second user data; and

transmit to a database the first and second statistics record with the identities of the first and second media content items determined by the first and second media fingerprints so that the summarized first and second user data is accessible to a third party online retailer for

retrieving the first and second statistics record with the identities of the first and second media content items determined by the first and second media fingerprints,

analyzing the retrieved first and second statistics record to determine a target demographic of the first and second media content items based on a demographic corresponding to the first and second user data, and

providing the third party online retainer the target demographic to market the media content item to a plurality of other users corresponding to the target demographic of the media content item.

2. The device of claim 1, wherein the first media content item is a first version of an audiovisual work and the second media content item is a second version of the audiovisual work.

3. The device of claim 2, wherein the first and second unique characteristics are the occurrence of various audio frequencies at particular points in time in the audiovisual work.

4. The device of claim 2, wherein the first version is a live version of the audiovisual work and the second version is a studio version of the audiovisual work.

5. The device of claim 2, wherein the first version is authorized for streaming to the user by a copyright owner of the audiovisual work and the second version is unauthorized for streaming to the user by the copyright owner of the audiovisual work.

6. The device of claim 1, wherein the first media content item is a first version of a book in digital format and the second media content item is a second version of the book in digital format.

7. The device of claim 1, wherein the first and second user data includes a geographic location of the user.

8. The device of claim 1, wherein the first user data includes the number of times the user requested to evaluate streaming the first media content item, and the second user data includes the number of times the user requested to evaluate streaming the second media content item.

9. The device of claim 1, wherein the processor is further configured to:

receive a license to stream the first media content item from a licensing system when the request is granted by the licensing system; and

prevent streaming of the first media content item when the request is declined by the licensing system.

10. The device of claim 1, wherein the processor is further configured to stream the first media content item based on a plurality of streaming parameters included in the license that is received from the licensing system.

11. The device of claim 1, wherein the processor is further configured to

identify a first digital watermark included in a first media file of the first media content item, and

identify a second digital watermark included in a second media file of the second media content item.

12. The device of claim 11, wherein the first digital watermark is metadata in the first media file, and the second digital watermark is metadata in the second media file.

13. The device of claim 1, wherein the processor is further configured to load a first digital media file for reproduction, wherein the digital media file include the first media content item.

14. The device of claim 1 further comprising a display, and the processor is further configured to generate a display query on the display asking the user whether the user would like to stream the first media content item.

15. The device of claim 1, wherein the processor is further configured to collect and transmit user identification data that confirms the user's identity.

16. The device of claim 1, wherein the processor is further configured to transmit the first and second media fingerprints for confirmation of the first and second media content items with a digital media catalog database.

17. The device of claim 1, wherein the processor is further configured to collect payment from the user to stream the first media content item.

18. The device of claim 1, wherein the processor is further configured to transmit the first and second statistics record in real time.

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Invention title/Inventor	Patent	Publication	Application	PCT	International registration
DIGITAL MEDIA REPRODUCTION AND LICENSING Christopher A. Estes	10885154 Jan 5, 2021	20200134138 Apr 30, 2020	16731510 Dec 31, 2019		

Assignments (1 total)

Assignment 1

Reel/frame	Execution date	Date recorded	Properties	Pages
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Conveyance
ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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