A

TITLE OF THE INVENTION

REMOTE AUDIO STORAGE AND DISTRIBUTION SYSTEM USING TIME AND LOCATION DATA

~~CROSS-REFERENCE TO RELATED APPLICATIONS~~

Background - good job not disclosing PON, + having at least some limits on PA (prior art)

SUM + ABS = OK

Des of Drawings = No #'s in text

claims = still need some work, but generally good

Figs = generally good, some issues w/ Fig 4

DD - Have at least some validation, but could be better
- pretty good overall w/ some small faults
- It would be better to include "lock out" + similar items in their own figure

BACKGROUND OF THE INVENTION

[0001] The present invention generally relates to a system, method, and apparatus for transmitting audio data to a remote speaker for emitting audio. More particularly, the present invention relates to a system, method, and apparatus for transmitting audio data from a server to a remote memory based on the location data and emitting the audio data at a specified time.

[0002] Recent advances in technology have allowed for streetlights to become the target of new types of communications technology. Cities have begun turning street lights into actionable data source and revenues streams. New advances in technology have allowed streetlights to be used as emergency response information centers, weather monitoring stations, seismic detectors, and wi-fi hotspots.

[0003] Digital infrastructure provides many benefits for cities and communities, as a wide variety of data can be transmitted to and from these "smart" streetlights. When it comes to gathering data for the city to utilize for the benefit of the public, these streetlight systems are becoming crucial technology.

[0004] A LED streetlight with a camera imbedded inside is disclosed in Gabriel Pub. No. Us 2018/0266672 A1. Gabriel discloses a LED streetlight with a camera mounted on it. Internally the streetlight houses a series of processors and a transceiver. The processors control operations of the camera and memory storage devices. The memory storage device is utilized primarily to store computer program code which describe the function of the camera and store video data.

[0005] A streetlamp integration device for traffic monitoring and collected is disclosed in Liang Pub. No. US 2019/0028864 A1. Liang discloses a device and method of communication with a street lamp on local area networks (LAN). The LAN is used to create connections with vehicles in order to determine traffic patterns. The device includes a LAN module, traffic collector, and communication module

[0006] A means of outputting audio data is disclosed in Lee Pub. No. 2018/034486 A1. The method transmits data to an external electric device and allows for the separation of two sound outputs over a wireless connection. The disclosure gives as an example separating a cell phone conversation the music being player on a Bluetooth device. The device includes processors, embedded speakers, memory, and a communication interface.

BRIEF SUMMARY OF THE INVENTION

[0007] One or more of the embodiments of the present invention provide a system, method, and apparatus for transmitting audio data from a server to a remote memory based on the location and time data, wherein the location data is received from a network server that receives GPS communications from the location server. The system includes a computer, wherein the computer has an interface in which audio data, location data, and time data can be input, a server, a cellular network, and a remote memory, wherein the remote memory is in connection with a remote server and transceiver, as well as a speaker. The server is connected to the computer through a communication link. The server is connected to the memory though a cellular LTE link.

[0008] The server receives the audio data, time data, and location data from the computer. Upon receiving the audio data, the server creates a reference number for the audio file. The server transmits the audio data, reference data, time data and location data to the remote memory through the LTE network. The remote memory stores the audio data until the time data indicates that the audio data is to be emitted. At that time the audio data is retrieved from the memory and emitted over a speaker system. The server is also able to retrieve the list of reference numbers that each remote memory has stored in order to determine is an audio file has been transmitted to that location yet.

[0009] In another embodiment, the server is capable of determining which audio file is emitted from the speaker when two users with to broadcast at the same time. The audio file is emitted following an analysis of the competing users budgeting concerns. The server determines which of the users is has the highest price data when examining

the audio files, and transmits the file associated with the higher price to the remote memory for bradcasting.

[0010] BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Figure 1 illustrates an audio distribution system according to an embodiment of the present invention.

[0012] Figure 2 illustrates the user interface of computer according to an embodiment of the present invention.

[0013] Figure 3 illustrates the computer and the auction server.

[0014] Figure 4 illustrates the auction server, the network server, and the streetlight.

[0015] Figure 5 illustrates a streetlight 120 according to an embodiment of the present invention.

[0016] Figure 6 illustrates a flowchart of a process for creating an advertisement campaign by transferring data associated with the campaign to the auction server.

[0017] Figure 7 illustrates a flowchart of a process for transmitting campaign data 143 into the auction memory.

[0018] Figure 8 illustrates a flowchart of a process of transmitting geographical coordinates to the network server for conversion into streetlight location data.

[0019] Figure 9 illustrates a flowchart of a process by which the auction server retrieves user account ID data that matches the streetlight location data and start time data.

[0020] Figure 10 illustrates a flowchart of a process for selecting an audio data to be emitted from a speaker at a streetlight.

[0021] Figure 11 illustrates a flowchart for a process of determining the actions of the auction process when only one user account ID data is retrieved for a particular streetlight location and start time data.

[0022] Figure 12 illustrates a flowchart for a process of determining if an audio data is located on a streetlight and the actions of the auction processor based on the result.

[0023] Figure 13 illustrates a flowchart for a process of transmitting an audio data from a streetlight memory and emitting the audio data from a speaker on a streetlight.

DETAILED DESCRIPTION OF THE INVENTION

[0024] Figure 1 illustrates an audio distribution system 100 according to an embodiment of the present invention. The audio distribution system 100 includes an auction server 110, a computer 130, a network server 150, and a streetlight 120. The auction server 110 includes an auction transceiver 111, and auction processor 112, an auction memory 113, and an auction clock 114. The computer 140 includes a computer transceiver 141 and a user interface 142. The user interface 142 includes campaign data 143. The network server 150 includes a network transceiver 152, a network processor 154, and a network memory 156. The streetlight 120 includes a streetlight transceiver 121, a streetlight processor 122, a streetlight memory 123, an adaptor 124, a speaker 125, a global positioning system (GPS) 126, and a streetlight clock 127.

[0025] In the preferred embodiment of the audio distribution system 100, the computer 140 is in communication with the auction server 110 through network connection 160. The campaign data 143 is input by the user on the user interface 142. The user interface 142 is in electronic communication with the computer transceiver 141. The auction transceiver 111 is electronically connected to the auction processor 112. The auction transceiver 112 is electronically connected with the auction memory 113. The auction processor 112 is electronically connected to the auction clock 114.

[0026] In addition, the network server 150 is in communication with the auction server 110 through LTE connection 170. The network transceiver 152 is electronically connected to the network processor 154. The network processor 154 is electronically connected to the network memory 156.

[0027] Additionally, the network server 150 is in communication with the streetlight 120 through LTE connection 170. The streetlight transceiver 121 is electronically connected to the streetlight processor 122. The streetlight processor 122 is electronically connected to the streetlight memory 123. The streetlight processor 122 is electronically connected to the adaptor 124. The adaptor 124 is electronically connected to the speaker 125. The streetlight processor 122 is electronically connected to the GPS 126. The streetlight processor 122 is electronically connected to the streetlight clock 127.

[0028] In operation, the user inputs campaign data 143 (further described in Figures 2 and 3) on the user interface 142. The user interface 142 transmits the campaign data 143, including audio data, to the computer transceiver 141. The computer transceiver 141 transmits the campaign data 143, including audio data, to the auction server 110 through network connection 160. The auction transceiver 111 receives the campaign data 143, including audio data, from the computer 140. The auction transceiver 111 transmits the campaign data 143, including audio data, to the auction processor 112. The auction processor 112 transmits the campaign data 143, including audio data, to the auction memory 113.

[0029] In operation, the auction server 112 retrieves the audio data from the auction memory 113. The auction processor 112 transmits the audio data to the audio transceiver 111. The auction transceiver 111 transmits the audio data to the network server 150 through the LTE connection 170. The network transceiver 152 receives the audio data from the auction server 110. The network transceiver 154 transmits the audio data to the streetlight 120 through LTE connection 170. The streetlight 120 receives the audio data from the network server 150. The streetlight transceiver 121 transmits the

audio data to the streetlight processor 122. The streetlight processor 122 transmits the audio data to the streetlight memory 123. The streetlight memory 123 stores the audio data.

[0030] In operation, the streetlight processor 122 retrieves the audio data from the streetlight memory 123. The streetlight processor 122 converts the audio data into an audio signal and transmits the audio signal to the adaptor 124. The adaptor 124 converts the audio signal into an analog audio signal and transmits the analog audio signal to the speaker 125. The speaker 125 emits the analog audio signal.

[0031] In another embodiment of the present invention, the streetlight 120 includes a sensor 128. The sensor 128 is electronically connected to the streetlight processor 122.

[0032] In another embodiment of the present invention, the sensor 128 is a camera, acoustic sensor, atmospheric sensor or other similar sensor.

[0033] In another embodiment of the present invention, the connection 160 is an LTE connection, a Bluetooth connection, a non-LTE cellular connection, a wi-fi connection, a LAN connection, or other similar connection.

[0034] In another embodiment of the present invention, the connection 170 is a non-LTE connection, a Bluetooth connection, a wi-fi connection, a LAN connection, a network connection, or other similar connection.

[0035] Figure 2 illustrates the user interface 142 of computer 140 according to an embodiment of the present invention. Each input field represents data that will be associated with the campaign input data 143, with the exception of the start campaign

field 340. The input fields include account name field 205, max ad price field 210, total budget field 215, display times field 220, upload audio file field 225, map field 230, payment information field 235, and start campaign field 240. The account name field 205 represents the name of the company associated with the user. The max ad price field 210 represents the amount of money that the user is willing to spend to emit an audio data from a streetlight 120. The total ad budget field 215 represents the total amount of money that a user is willing to spend overall to emit an audio data from a speaker 125. The display times field 220 represents the times that the user will pay to distribute an audio data at a speaker 125. In the preferred embodiment the user selects the hours in the day that they will pay to have an audio data emitted from a speaker 125, and the audio data will play every thirty seconds for the duration of the selected hour. In the preferred embodiment, the display times available range from 6AM to 8PM. The upload audio field 225 represents the audio data that the account user will emit during purchased time at a speaker 125. In the preferred embodiment the audio data is in MP3 at 96kbs format. The map field 230 represents the locations of the streetlights 120 from which will be emitted the user's audio data from a speaker 125. The payment information field 235 represents the means by which the user is purchasing time to emit an audio data from a speaker 120. In the preferred embodiment the payment information is a bank account. The start campaign field 240 represents the field selected by the user to associate the input data with a campaign data 143.

[0036] In operation, as described with respect to the audio distribution system 100 in Figure 1, the campaign data 143 is transmitted from the user interface 142 to the

computer transceiver 141. The campaign data 143 is transmitted from the computer transceiver 142 to the auction server 111 through network connection 160.

[0037] In another embodiment of the present invention, a user can make multiple campaigns varying the different campaign data that are available.

[0038] In another embodiment of the present invention, the display times field 220 allows for the user to input a specific time in hh:mm format.

[0039] In another embodiment of the present invention, the display times field 220 allows for selecting any hour of the day.

[0040] In another embodiment of the present invention, the upload audio data field 225 allows for the audio data to be in formats including, but not limited to, WAV, AIFF, AU, or raw audio files.

[0041] In another embodiment of the present invention, the payment information field 235 allows for information including, but not limited to, a credit number.

[0042] In another embodiment of the present invention, the user interface 142 includes a business category data field 245. The business category field 245 represents the type of business that the user is associated with in the marketplace. The business category field is a drop-down menu of up to and exceeding 10 business categories available for the user to select. The business category field 245 is associated with the campaign data 143 when the user selects the start campaign field 240.

[0043] In another embodiment of the present invention, the user interface 142 includes a competitor lock-out field 250. The competitor lock-out field 250 represents a streetlight 120 that the user has purchased in order to prohibit other user accounts in the

same business category from being able to emit audio data (further discussed in Figure 10). The competitor lock-out field 250 is associated with the campaign data 143 when the user selects the start campaign field 240.

[0044] In another embodiment of the present invention, the user interface 142 includes a per-person ad price field 255. The per-person ad price field 255 represents the amount a user is going to pay per individual in the vicinity of a streetlight 120 (further discussed in Figure 10). The per-person ad price data field 255 is associated with the campaign data 143 when the user selects the start campaign field 240.

[0045] In another embodiment of the present invention, the user interface 142 includes a minimum crowd size field 260. The minimum crowd size field 260 represents the minimum number of individuals that a user requires to be in the vicinity of the streetlight 120 in order for the user to purchase ad time (further discussed in Figure 10). The minimum crowd size field 260 is associated with the campaign data 143 when the user selects the start campaign field 240.

[0046] In another embodiment of the present invention, the user interface 142 includes a location buy-out field 265. The location buy-out field 265 represents a streetlight 120 for which a user has to purchase all available display times (further discussed in Figure 10). The location buy-out field 265 is associated with the campaign data 143 when the user selects the start campaign field 240.

[0047] Figure 3 illustrates the computer 140 and the auction server 110. The auction server 110 includes the auction transceiver 111, the auction processor 112, the auction memory 113, and the auction clock 114. The auction memory 113 includes user account ID data 312, minimum ad price data 330, send time data 332, and start time data

334. The user account ID data 312 includes campaign data 143 and audio reference number data 328. The campaign data 143 includes user account name data 321, max ad price data 324, total ad budget data 325, audio data 322, ad start data 323, audio location data 326, and payment data 327. The auction clock 114 includes auction server time data 336.

[0048] In the preferred embodiment of the audio distribution system 100, the computer 140 is in communication with the auction server 110 through network connection 160. The auction transceiver 111 is electronically connected to the auction processor 112. The auction processor 112 is electronically connected to the auction memory 113. The auction processor 112 is electronically connected to the auction clock 114.

[0049] In operation, when the start campaign field 240 is selected by the user, the input data is associated with a campaign data 143. The campaign data 143 is received by the auction server 110 from the computer 140 through network connection 160. The auction transceiver 111 receives the campaign data 143 and transmits the campaign data 143 to the auction processor 112. The auction processor 112 assigns the campaign data 143 a user account ID data 112. The auction processor 112 assigns the input in the user account name field 205 to an account name data 321. The auction processor 112 assigns the input in the max ad price field 210 to a max ad price data 324. The auction processor 112 assigns the input in the total budget field 215 to a total ad budget data 325. The auction processor 112 assigns the input in the display times field 220 to an ad start time data 322. The auction processor 112 assigns the input in the upload audio file field 225 to an audio data 323. The auction processor 112 assigns the input in the map field 230 to

an audio location data 326. The auction processor 112 assigns the audio data 323 an audio reference number data 328. The auction processor 112 transmits the user account ID data 112, including the campaign data 143, to the auction memory 113. The auction processor 112 transmits the audio reference number data 328 to the auction memory 113.

[0050] In an alternative embodiment of the present invention, the auction processor 112 assigns the input in the business category field 245 to a business category data 345.

[0051] In an alternative embodiment of the present invention, the auction processor 112 assigns the input in the competitor lock-out field 250 to a competitor lock-out data 345.

[0052] In an alternative embodiment of the present invention, the auction processor 112 assigns the input in the per-person ad price field 255 to a per-person ad price data 355.

[0053] In an alternative embodiment of the present invention, the auction processor 112 assigns the input in the minimum crowd size field 260 to a minimum crowd size data 360.

[0054] In an alternative embodiment of the present invention, the auction processor 112 assigns the input in the location buy-out field 165 to a location buy-out data 365.

[0055] Figure 4 illustrates the auction server 110, the network server 150, and the streetlight 120. The network server 150 includes the network transceiver 152, the network processor 154, and the network memory 156. The network memory 156

includes the streetlight location data 410. The auction server 110 includes the auction transceiver 111, the auction processor 112, the auction memory 113, and the auction clock 114. The streetlight 120 includes the streetlight transceiver 121, the streetlight processor 122, the streetlight memory 123, the adaptor 124, the speaker 125, the GPS 126, and the streetlight clock 127. The streetlight memory 123 includes the streetlight audio database 420 and the ad start time data 322. The streetlight audio database 420 includes the audio data 323 and the audio reference number data 328. The streetlight clock 127 includes the streetlight time data 430.

[0056] In the preferred embodiment of the audio distribution system 100, the auction server 110 is in communication with the network server 150 through LTE connection 170. The auction transceiver 111 is electronically connected to the auction processor 112. The auction processor 112 is electronically connected to the auction memory 113. The auction processor 112 is electronically connected to the auction clock 114. The network transceiver 152 is electronically connected to the network processor 154. The network processor 154 is electronically connected to the network memory 156.

[0057] Additionally, the network server 150 is in communication with the streetlight 120. Th network server 150 communicates with the streetlight 120 through LTE connection 170. The streetlight transceiver 121 is electronically connected to the streetlight processor 122. The streetlight processor 122 is electronically connected to the streetlight memory 123. The streetlight processor 122 is electronically connected to the adaptor 124. The adaptor 124 is electronically connected to the speaker 125. The streetlight processor 122 is electronically connected to the GPS 126. The streetlight processor 122 is electronically connected to the streetlight clock 127.

[0058] In operation, the streetlight processor 122 retrieves geographical coordinates from the GPS 126. The streetlight processor 122 transmits the geographical coordinates to the streetlight transceiver 121. The streetlight transceiver 121 transmits the geographical coordinates to the network server 150 through LTE connection 170. The network transceiver 152 receives the geographical coordinates from the streetlight 120. The network transceiver 152 transmits the geographical coordinates to the network processor 154. The network processor 154 assigns the geographical coordinates to a streetlight location data 410. The network processor 154 transmits the streetlight location data 410 to the network memory 156.

[0059] In operation, the network processor 154 retrieves the streetlight location data 410 from the network memory 156. The network processor 154 transmits the streetlight location data 410 to the network transceiver 152. The network transceiver 152 transmits the streetlight location data 410 to the auction server 110 through LTE connection 170. The auction transceiver 111 receives the streetlight location data 410 from the network server 150. The auction transceiver 111 transmits the streetlight location data 410 to the auction processor 112.

[0060] In operation, the auction processor 110 retrieves auction server time data 336 from the auction clock 114 every second. The auction processor 112 retrieves the send time data 332 from the auction memory 123 that matches the auction server time data 336. In the preferred embodiment, the auction processor 112 adds five minutes to the send time data 332 to calculate the start time data 334. The auction processor 112 retrieves the start time data 334 that matches the value of the calculation. The auction server 112 retrieves the user account ID data 112 that has an ad start time data 322

matching the start time data 332 and an audio location data 326 matching the streetlight location data 410. The auction processor 112 retrieves the minimum ad price data 330 from the auction memory 123 and the total ad budget data 325 from the user account ID data 112. The auction processor 112 subtracts the value of the minimum ad price data 330 from the value of the total ad budget data 325. The resulting value is assigned to the total ad budget data 325. The auction processor 112 retrieves the payment data 327 from the user account ID data 112. The auction processor 112 charges the banking institution the minimum ad price data 330.

[0061] In operation, the auction processor 112 retrieves the audio data 323, audio reference number data 328 and the ad location data 326 from the user account ID data 112. The auction processor 112 transmits the audio data 323, ad start time data 322, audio reference number data 328 and audio location data 326 to the auction transceiver 111. The auction transceiver 111 transmits the audio data 323, audio reference number data 328, ad start time data 322 and audio location data 326 to the network server 150. The network transceiver 152 retrieves the audio data 323, the audio reference number data 328, the ad start time data 322, and audio location data 326. The network transceiver 152 transmits the audio location data 326 to the network processor 154. The network processor 154 identifies the streetlight 120 with the same streetlight location data 410 as the audio location data 326. The network transceiver 152 transmits the audio data 323, the audio reference number data 328, and the ad start time data 322 to the matching streetlight 120.

[0062] In operation, the streetlight 120 receives the audio data 323, audio reference number data 328, and ad start time data 322 from the network server 150. The

streetlight transceiver 121 transmits the audio data 323, audio reference number data 328, and ad start time data 322 to the streetlight processor 122. The streetlight processor 122 transmits the audio data 323 and audio reference number data 328 to the streetlight memory 123. The audio data 323 and the audio reference data number 328 are stored in the streetlight audio database 420.

[0063] In operation, the streetlight processor 122 retrieves streetlight time data 430 from the streetlight clock 127 every second. When the streetlight time data 420 matches the ad start time data 322, the streetlight processor 122 creates a copy of the audio data 323 from the streetlight audio database 123. The streetlight processor 122 converts the audio data 323 into an audio signal. The streetlight processor 122 transmits the audio signal to the adaptor 124. The adaptor 124 converts the audio signal into an analog audio signal. The adaptor transmits the analog audio signal to the speaker 125. The speaker 125 emits the analog audio signal.

[0064] In another embodiment of the present invention, the auction processor 112 retrieves auction server time data 336 at intervals greater than every second.

[0065] In another embodiment of the present invention, the streetlight processor 122 retrieves streetlight time data 430 at intervals greater than every second.

[0066] In another embodiment of the present invention, the streetlight 120 includes a sensor 128. The sensor 128 transmits sensor data 440 to the streetlight processor 122. The streetlight processor 122 transmits the sensor data 440 to the streetlight transceiver 121. The streetlight transceiver 121 transmits the sensor data 440 through LTE connection 170 to the network server 150. The network transceiver 152

receives the sensor data 440 and transmits the sensor data 440 to the network processor 154.

[0067] In another embodiment of the present invention, the sensor 128 is a camera, acoustic sensor, atmospheric sensor, or other similar sensor.

[0068] Figure 5 illustrates a streetlight 120 according to an embodiment of the present invention. The streetlight 120 includes a streetlight transceiver 121, a streetlight processor 122, a streetlight memory 123, an adaptor 124, a speaker 125, a GPS 126, a streetlight clock 127, a sensor 128, a power source 505, and a light 515.

[0069] In the preferred embodiment of the streetlight 120, the streetlight transceiver 121 is in communication with the streetlight processor 122. The streetlight transceiver 121 is electronically connected to the streetlight processor 122 through network connection 510. The streetlight processor 122 is in communication with the streetlight memory 123. The streetlight processor 122 is electronically connected to the streetlight memory 123 through network connection 520. The streetlight processor 122 is in communication with adaptor 124. The streetlight processor 122 is electronically connected with the adaptor 124 through network connection 530. The adaptor 124 is in communication with the speaker 125. The adaptor 124 is electronically connected to the speaker 125 through analog connection 540. The streetlight processor 122 is in communication with the GPS 126. The streetlight processor 122 is electronically connected to the GPS 126 through network connection 590. The streetlight processor 122 is in communication with the streetlight clock 127. The streetlight processor 122 is connected to the streetlight clock 127 through network connection 580. The streetlight processor 122 is supplied power from power source 505. The streetlight processor 122 is

connected to the power source 505 though power connection 560. The light 515 is supplied power from the power source 505. The light 515 is electronically connected to the power source 505 through power connection 570.

[0070] In operation, the streetlight transceiver 121 receives an audio data 323, an audio reference number data 328, and an ad start time data 322 from the network server 150. The streetlight transceiver 121 transmits the audio data 323, audio reference number data 328, and ad start time data 322 to the streetlight processor 122. The streetlight processor 122 transmits the audio data 323 and audio reference number data 328 to the streetlight memory 123. The streetlight processor 122 retrieves the streetlight time data 420 from the streetlight clock 127. When the streetlight time data 420 and the ad start time data 322 match, the server processor 122 creates a copy of the audio data 323. The streetlight processor 122 converts the audio data 323 into an audio signal. The streetlight processor 122 transmits the audio signal to the adaptor 124. The adaptor 124 converts the audio signal to an analog audio signal. The adaptor 124 transmits the analog audio signal to the speaker 125. The speaker 125 emits the analog audio signal.

[0071] In operation, the streetlight processor 122 retrieves the geographical coordinates from the GPS 126. The streetlight processor 122 transmits the geographical coordinates to the streetlight transceiver 121. The streetlight transceiver 121 transmits the geographical coordinates to the network server 150.

[0072] In another embodiment of the present invention, the streetlight 120 includes a sensor 128. The sensor 128 transmits sensor data 440 to the streetlight processor 122 through network connection 550. The streetlight processor 122 transmits the sensor data 440 to the streetlight transceiver 121 through network connection 510.

The streetlight transceiver 121 transmits the sensor data 440 through LTE connection 170 to the network server 150. The network transceiver 152 receives the sensor data 440 and transmits it to the network processor 154.

[0073] In another embodiment of the present invention, the sensor 128 is a camera, acoustic sensor, atmospheric sensor, or other similar sensor.

[0074] In another embodiment of the present invention, the connection 510 between the streetlight transceiver 121 and the streetlight processor 122 is a wi-fi connection, Bluetooth connection, LAN connection or other similar connection.

[0075] In another embodiment of the present invention, the connection 520 between the streetlight memory 123 and the streetlight processor 122 is a wi-fi connection, Bluetooth connection, LAN connection or other similar connection.

[0076] In another embodiment of the present invention, the connection 530 between the streetlight processor 122 and the adaptor 124 is a wi-fi connection, Bluetooth connection, LAN connection or other similar connection.

[0077] In another embodiment of the present invention, the connection 540 between the adaptor 124 and the speaker 125 is a wi-fi connection, Bluetooth connection, LAN connection or other similar connection.

[0078] In another embodiment of the present invention, the connection 550 between the streetlight processor 122 and the sensor 128 is a wi-fi connection, Bluetooth connection, LAN connection or other similar connection.

[0079] In another embodiment of the present invention, the connection 580 between the streetlight clock 127 and the streetlight processor 122 is a wi-fi connection, Bluetooth connection, LAN connection or other similar connection.

[0080] In another embodiment of the present invention, the connection 590 between the streetlight processor 122 and the GPS 126 is a wi-fi connection, Bluetooth connection, LAN connection or other similar connection.

[0081] Figure 6 illustrates a flowchart 600 of a process for creating an advertisement campaign by transferring data associated with the campaign to the auction server 110. The campaign data 143 includes an audio file that will be emitted from the speaker 125 at a streetlight 120. The process shown in flowchart 600 involves steps at the computer 130.

[0082] At the first step 605, the user inputs data into the account name field 205 on user interface 142. Next, at step 610, the user inputs data into the max ad price field 210 on user interface 142. Next, at step 615, the user inputs data into the total ad budget field 215 on user interface 142. Next, at step 620, the user inputs data into the display time field 220 on the user interface 142. Next, at step 625, the user inputs data into the upload audio file field 225 on the user interface 142. Next, at step 630 the user inputs data into the map field 230 in the user interface 142. Next, at step 635, the user inputs data into the payment information field 235 on the user interface 142. Next, at step 675, the user selects the start campaign field 240 and the input data is associated with a campaign data 143. Next, at step 680, the computer transceiver 141 transmits the campaign data 143 from the computer 140 through network connection 160 to the auction server 110.

[0083] In another embodiment of the present invention, at intermediate step 640, a user inputs data into business category field 245 on user interface 142. Next, at step 675, the user selects the start campaign field 240 and the input data is associated with a campaign data 143. Next, at step 680, the computer transceiver 141 transmits the campaign data 143 from the computer 140 through network connection 160 to the auction server 110.

[0084] In another embodiment of the present invention, at intermediate step 645, a user inputs data into a competitor lock-out field 250 on user interface 142. Next, at step 675, the user selects the start campaign field 240 and the input data is associated with a campaign data 143. Next, at step 680, the computer transceiver 141 transmits the campaign data 143 from the computer 140 through network connection 160 to the auction server 110.

[0085] In another embodiment of the present invention, at intermediate step 650, the user inputs data into a per-person ad price field 255. Next, at step 675, the user selects the start campaign field 240 and the input data is associated with a campaign data 143. Next, at step 680, the computer transceiver 141 transmits the campaign data 143 from the computer 140 through network connection 160 to the auction server 110.

[0086] In another embodiment of the present invention, at intermediate step 655, the user inputs data into a minimum crowd size field 260. Next, at step 675, the user selects the start campaign field 240 and the input data is associated with a campaign data 143. Next, at step 680, the computer transceiver 141 transmits the campaign data 143 from the computer 140 through network connection 160 to the auction server 110.

[0087] In another embodiment of the present invention, at intermediate step 660, the user inputs data into a location buy-out field 265. Next, at step 675, the user selects the start campaign field 240 and the input data is associated with a campaign data 143. Next, at step 680, the computer transceiver 141 transmits the campaign data 143 from the computer 140 through network connection 160 to the auction server 110.

[0088] Figure 7 illustrates a flowchart 700 of a process for transmitting campaign data 143 into the auction memory 123. The process shown in flowchart 700 involves steps at the auction server 110. At the first step 710, the auction server 110 receives the campaign data 143 from the computer 140. Next, at step 720, the auction processor 112 assigns an audio reference number data 328 to the audio data 323. Next, at step 730, the auction processor 112 assigns the campaign data 143 to a user account ID data 312. Next, at step 740, the auction processor 112 assigns the input values from the campaign data 143 to data. The account name field 205 input is assigned to user account name data 321. The max ad price field 210 input is assigned to max ad price data 324. The total ad budget field 215 input is assigned to the total ad budget data 325. The display times field 220 input is assigned to the start ad time data 322. The upload audio file field 225 input is assigned to the audio data 323. The map field 230 input is assigned to the audio location data 326. The payment information field 235 input is assigned to the payment data 327. Next, at step 750, the auction processor 112 transmits the user account ID data 312, which includes the campaign data 143, to the auction memory 113. Finally, at step 760, the auction processor 112 transmits the audio reference number data 328 to the user account ID data 312.

[0089] In another embodiment of the present invention, at step 740 the auction processor 112 assigns business category field 245 input to business category data 345.

[0090] In another embodiment of the current invention, at step 740 the auction processor 112 assigns competitor lock-out field 250 input to competitor lock-out data 350.

[0091] In another embodiment of the current invention, at step 740 the auction processor 112 assigns per-person ad price field 255 input to per-person ad price data 355.

[0092] In another embodiment of the current invention, at step 740 the auction processor 112 assigns minimum crowd size field 260 input to minimum crowd size data 360.

[0093] In another embodiment of the current invention, at step 740 the auction processor 112 assigns the location buy-out field 265 input to the location buy-out data 365.

[0094] Figure 8 illustrates a flowchart 800 of a process of transmitting geographical coordinates to the network server 150 for conversion into streetlight location data 410. The flowchart 800 involves steps at the streetlight 120 and the network server 150.

[0095] First, in step 810, the streetlight processor 122 retrieves geographical coordinates from the GPS 126. Next, at step 820, the streetlight processor 122 transmits the geographical coordinates to the streetlight transceiver 121. Next, at step 830, the streetlight transceiver 121 transmits the geographical coordinates to the network server 150. Next, at step 840, the network transceiver 152 transmits the geographical

coordinates to the network processor 154. Next, at step 850, the network processor 154 converts the geographical coordinates into streetlight location data 410. Finally, at step 860, the network processor 154 transmits the streetlight location data 410 to the network memory 156.

[0096] Figure 9 illustrates a flowchart 900 of a process by which the auction server 110 retrieves user account ID data 312 that matches the streetlight location data 410 and start time data 334. The flowchart 900 involved steps at the auction server 110 and the network server 150. First, at step 910, the auction processor 112 retrieves the auction server time data 336 from the auction clock 114. Next, at step 920, the auction processor 112 retrieves the matching send time data 332 from the auction memory 113. Next, the auction processor 112 calculates the start time data 334 by adding five minutes to the send time data 332. Next, at step 940, the auction processor 112 retrieves the matching start time data 334 from the auction memory 113. Next, at step 950, the network processor 154 retrieves the streetlight location data 410 from the network memory 156 and transmits the streetlight location data 410 to the network transceiver 152. The network transceiver 152 transmits the streetlight location data 4150 to the auction server 112. Next, at step 960, the auction processor 112 receives streetlight location data 410 from the auction transceiver 111. Finally, at step 970, the auction processor 112 retrieves the user account ID data 312 with ad start time data 322 matching the start time data 334 and audio location data 326 matching the streetlight location data 410.

[0097] In another embodiment of the present invention, the time added to the send time data 332 to calculate the start time data 334 could be either greater than or less than five minutes.

[0098] Figure 10 illustrates a flowchart 1000 of a process for selecting an audio data 323 to be emitted from a speaker 125 at a streetlight 120. Multiple user account ID data 312 are compared to determine which audio data 323 is emitted from a speaker 125 at a particular ad start time 322 and streetlight location 410. The process shown in flowchart 1000 occurs at the auction server 110. The flowchart 1000 begins just after the completion of step 970 in flowchart 900.

[0099] First, at step 1005, the auction processor 112 determines the number of user account ID data 312 that were retrieved in step 970. If there are zero user account ID data 312 retrieved, then the auction processor 112 advances to step 1010. At step 1010, the auction processor 112 does not transmit data to the streetlight 120 and waits for the next auction to begin in thirty seconds. If there is one user account ID data 312 retrieved, the auction server 112 advances to Figure 11. If there is more than one user account ID data 312 retrieved, the auction server 112 advanced to step 1015. At step 1015, the auction processor 112 retrieves the max ad price data 324 from each user account ID data 312. Next, at step 1020, the auction processor 112 determines the user account ID data 312 that has the highest max ad price 324. Next, at step 1025, the auction processor 112 determines if the user account ID data 312 with the highest max ad price 324 has a total ad budget data 325 greater than the next highest max ad price data 324. If no, the auction processor 112 advances to step 1030. At step 1030, the auction processor 112 determines the user account ID data 312 with the next highest max ad price

data 324. The auction processor 112 then proceeds back to step 1025 to compare the total ad budget data 325 with the next highest max ad price data 324. If the total ad budget data 325 is greater than the next highest max ad price 324, then the auction processor 112 proceeds to step 1035. At step 1035, the auction processor 112 subtracts the amount of the next highest max ad price 324 plus one cent from the total ad budget data 325 of the user account ID data 312 and charges the payment data 327 the same amount. The audio processor 112 then proceeds to Figure 12.

[00100] In another embodiment of the present invention, the time in between auction can be greater than or less than 30 seconds.

[00101] In another embodiment of the present invention, an intermediate step 1001 occurs before the auction processor 112 proceeds to step 1005. At step 1001, the auction processor 112 retrieves business category data 345 from the user account ID data 312 that was retrieved and competitor lock-out data 350. The auction server 112 determines if a competitor lock-out data 350 purchase has been made on the streetlight 120. If not, the auction processor 112 proceeds through Figure 10 as in the preferred embodiment. If a competitor lock-out data 350 has been purchased on the streetlight 120, the auction processor 112 removes all user account ID data 312 that have the business category 345 indicated by the competitor lock-out data 350. Then, the auction processor 112 proceeds to step 1005.

[00102] In another embodiment of the present invention, an intermediate step 1002 occurs before the auction processor 112 proceeds to step 1005. At step 1002, the auction processor 112 retrieves per-person ad price data 355. If no user account ID data 312 has a per-person ad price data 355 then the auction processor 112 proceeds to

step 1005. If a user account ID data 312 has a per-person ad price data 355, the camera 128 on the streetlight 120 at streetlight location data 410 captures photographic data 440 and transmits the photographic data 440 to the streetlight processor 122. The streetlight processor 122 transmits the photographic data 440 to the streetlight transceiver 121. The streetlight transceiver 121 transmits the photographic data 440 to the network transceiver 152. The network transceiver 152 transmits the photographic data 440 to the auction server 110. The auction processor 112 converts the photographic data 440 into a count of the number of individuals at streetlight 120. The auction processor 112 multiplies the number of individuals by the per-person price data 355 of user account ID data 312. The resulting value is assigned to the max ad price data 324 for the user account ID data 312. Next, the auction processor 112 proceeds to step 1005.

[00103] In another embodiment of the present invention, an intermediate step 1003 occurs before the auction processor 112 proceeds to step 1005. At step 1003, the auction processor 112 retrieves minimum crowd size data 360 from the user account ID data 312 that have been determined. If no user account ID data 312 has a minimum crowd size data 360, then the auction processor 112 proceeds to step 1005. If a user account ID data 312 has a minimum crowd size data 360, the camera 128 on the streetlight 120 at streetlight location data 410 captures photographic data 440 and transmits the photographic data 440 to the streetlight processor 122. The streetlight processor 122 transmits the photographic data 440 to the streetlight transceiver 121. The streetlight transceiver 121 transmits the photographic data 440 to the network transceiver 152. The network transceiver 152 transmits the photographic data 440 to the auction server 110. The auction processor 112 converts the photographic data 440 into a count of

the number of individuals at streetlight 120. The auction processor 112 compares the number of individuals in the photographic data 440 to the value in the minimum crowd size data 360. If the number of individuals is greater, the auction processor 112 proceeds to step 1005. If the number of individuals is lesser, the auction processor 112 removes the user account ID data 312 and proceeds to step 1005.

[00104] In another embodiment of the present invention, an intermediate step 1003 occurs before the auction processor 112 proceeds to step 1005. At step 1003, the auction processor 112 retrieves minimum crowd size data 360. If no user account ID data 312 has a minimum crowd size data 360, then the auction processor 112 proceeds to step 1005. If a user account ID data 312 has a minimum crowd size data 360, the acoustic sensor 128 on the streetlight 120 at streetlight location data 410 captures an acoustic data 440 and transmits the acoustic data 440 to the streetlight processor 122. The streetlight processor 122 transmits the acoustic data 440 to the streetlight transceiver 121. The streetlight transceiver 121 transmits the acoustic data 440 to the network transceiver 152. The network transceiver 152 transmits the acoustic data 440 to the auction server 110. The auction processor 112 converts the acoustic data 440 into a decibel reading at streetlight 120. The auction processor 112 compares the decibel reading in the acoustic data 440 to the value in the minimum crowd size data 360. If the decibel reading is greater, the auction processor proceeds to step 1005. If the decibel reading is lesser, the auction processor removes the user account ID data 312 and proceeds to step 1005.

[00105] In another embodiment of the present invention, an intermediate step 1004 occurs before the auction processor 112 proceeds to step 1005. At step 1004,

the auction processor 112 retrieves the location buy-out data 365. If no user account ID data has a location buy-out data 365, the auction processor 112 proceeds to step 1005. If a user account ID data 312 has a location buy-out data 365, all other user account ID data are removed and the audio data 323 and ad start time data 322 of the user account ID 312 with the location buy-out data 365 is transmitted to the streetlight 120.

[00106] In another embodiment of the present invention, a user account ID data 312 excludes a max ad price data 324. In this embodiment, when the user account ID data is retrieved for an ad start time data 322 and an audio location data 326, the user account ID data 312 without a total ad budget will set a max ad prices data 324 at the next highest max ad price data plus one cent. The user account ID data 312 will emit an audio data 323 at every ad start time data 322 until the total ad budget data 325 is reached.

[00107] In another embodiment of the present invention, a user account ID data 312 includes a max ad price data 324 but excludes a total ad budget data 325. In this embodiment, when the user account ID data is retrieved for an ad start time data 322 and an audio location data 326 and has the highest max ad price 324, the audio data 323 will be emitted from the streetlight 120 and the payment data will be charged. The user account ID data 312 will always emit an audio data 323 if it is the highest max ad price data 324 and steps 1025, 1030, and 1035 are not performed.

[00108] Figure 11 illustrates a flowchart 1100 for a process of determining the actions of the auction process 112 when only one user account ID data 312 is retrieved for a particular streetlight location data 410 and start time data 334. The flowchart 1100 resumes from Figure 10. The flowchart 1100 occurs at the auction server

110. First, at step 1110, the auction processor 112 determines that a single user account ID data 312 with ad start time data 322 matching start time data 334 and audio location data 326 matching streetlight location data 410 exists. Next, at step 1120, the auction processor 112 retrieves the minimum ad price data 330 from the auction memory 113. Next, at step 1130, the auction processor 112 determines whether the total ad budget 325 is greater than the minimum ad price data 330. If not, the auction processor 112 does not transmit data to the streetlight 120 and waits for the next auction to begin in thirty seconds. If yes, the auction processor 112 subtracts the minimum ad price data 330 from the total ad budget 325 of the user account ID data 312. The auction processor 112 then proceeds to Figure 12.

[00109] Figure 12 illustrates a flowchart 1200 for a process of determining if an audio data 323 is located on a streetlight 120 and the actions of the auction processor 112 based on the result. The flowchart 1200 is a common step between the end of the process in flowchart 1000 and 1100. The process of flowchart 1200 occurs at the auction server 110, the network server 150, and the streetlight 120.

[00110] First, at step 1210, the auction processor 112 retrieves the audio data 323 and audio reference number data 328 associated with the user account ID data 312. Next, at step 1220, the auction processor 112 retrieves a copy of the streetlight audio database 420 and determines if the streetlight audio database 420 contains the audio reference number data 328 that is associated with the audio data 323. If yes, the auction processor 112 proceeds to step 1230 and transmits the ad start time data 322 to the streetlight 120 at the streetlight location data 410. If not, the auction processor 112 proceeds to step 1240. At step 1240, the auction processor 112 determines if the

streetlight memory 123 has space for the audio data 323 and audio reference number data 328. If yes, the auction processor 112 proceeds to step 1260. If no, the auction processor 112 deletes the oldest audio data 323 and audio reference number data 328 on the streetlight memory 123. Then the auction processor 112 proceeds to step 1260. At step 1260 the auction processor 112 transmits the audio data 323, audio reference number data 328, and ad start time data 322 to the streetlight 120 at streetlight location data 410. Next, at step 1270, the streetlight processor 122 retrieves the streetlight time data 430 from the streetlight clock 127. The streetlight processor 122 compares the value of the streetlight time data 430 to the ad start time 322. The streetlight processor 122 then proceeds to step 1280. At step 1280, the streetlight processor 122 determines if the ad start time data 322 matches the streetlight time data 410. If not, the streetlight processor 122 returns to step 1270. If yes, the streetlight processor 122 proceeds to Figure 13.

[00111] Figure 13 illustrates a flowchart 1300 for a process of transmitting an audio data 323 from a streetlight memory 123 and emitting the audio data 323 from a speaker 125 on a streetlight 120. The process of flowchart 1300 occurs on the streetlight 120. The process of flowchart 1300 begins where Figure 1200 ended. First, at step 1310, the streetlight processor 122 must determine that the streetlight time data 430 and the ad start time 322 match. When the streetlight time data 430 and ad start time data 322 match, the streetlight processor 122 proceeds to step 1320. At step 1320, the streetlight processor 122 retrieves a copy of the audio data 323 from the streetlight memory 123. Next, at step 1330, the streetlight processor 122 converts the audio data 323 into an audio signal. Next, at step 1340, the streetlight processor 122 transmits the audio signal to the adaptor 124. Next, at step 1350, the adaptor 124 converts the audio signal into an analog

audio signal. Next, at step 1360, the adaptor 124 transmits the analog audio signal to the speaker 125. Finally, at step 1370, the speaker emits the analog audio signal.

[00112] Existing smart streetlight technology has utilized sensors to capture data at a streetlight store the data on the streetlight memory. Existing technology has not, however, been able to capture the potential of remotely storing audio data files on a streetlight and emitting that audio data using and streetlight apparatus with a speaker. In addition, the current technology has not disclosed the ability of a server to access the remote storage and determine the existence of an audio file on the remote system using a reference look up table.

[00113] While particular elements, embodiments, and applications of the present invention have been shown and described, it is understood that the invention is not limited thereto because modifications may be made by those skilled in the art, particularly in light of the foregoing teaching. It is therefore contemplated by the appended claims to cover such modifications and incorporate those features which come within the spirit and scope of the invention.

CLAIMS

1. An audio distribution system including:

a computer, wherein said computer transmits an audio data file;

a server, wherein said server receives said audio data file from said computer, wherein said server creates a representation of said audio data file; and

an audio distribution apparatus, said audio distribution apparatus including a memory, said memory including an audio data list representing a plurality of audio files stored in said memory, wherein said server receives said audio data list from said memory through a wireless connection, wherein said server searches said audio data list for said representation of said audio data file; wherein if said representation of said audio data file is not on said audio data list said server transmits said audio data file to said memory through said wireless connection.

2. A system of claim 1 wherein said server transmits said audio data file over a wired connection.

3. An audio distribution apparatus including:

a streetlight transceiver, wherein said transceiver receives an audio data file;

a streetlight processor, wherein said streetlight processor receives said audio data file from said streetlight transceiver;

a streetlight memory, wherein said streetlight memory receives said audio data file from said streetlight processor, wherein said streetlight memory transmits said audio data to said streetlight processor;

a speaker, wherein said speaker receives said audio data file from said streetlight processor through a wired connection, wherein said speaker distributes said audio data file.

4. An apparatus of claim 3 wherein said audio distribution apparatus further includes:

a camera, wherein said camera transmits a crowd size data to said streetlight processor through a wired connection.

5. An apparatus of claim 3 wherein said audio distribution apparatus further includes:

a camera, wherein said camera transmits a crowd size data to said streetlight processor through a wireless connection.

6. An apparatus of claim 3 wherein said audio distribution apparatus further includes:

an acoustic sensor, wherein said acoustic sensor transmits an acoustic crowd size data to said streetlight processor.

7. An apparatus of claim 3 wherein said audio distribution apparatus further includes:

an acoustic sensor, wherein said acoustic sensor transmits an acoustic crowd size data to said streetlight processor.

8. An apparatus of claim 3 wherein said streetlight processor transmits said audio data file to said speaker through a wired connection

9. A method for distributing an audio data file including:

a computer transmitting said audio data file to a server;

a server receiving said audio data file from said computer; and

an audio distribution apparatus, said audio distribution apparatus including a memory and a speaker, said memory including a audio data list, said audio distribution apparatus receiving said audio data file from said server, said audio distribution apparatus transmitting said audio data file on said memory, said memory storing said audio data file, said memory transmitting said audio data file to said speaker, said speaker distributing said audio data file.

10. A method of claim 9 including said memory storing said audio data file until a time, said memory transmitting said audio data file to said speaker at said time.

ABSTRACT

A system is provided which allows for the storage of audio data files on a remote memory and which facilitates the distribution of the audio files using time and location data. The system allows for a server storing the audio files to create a database of reference numbers for each of the audio files stored on the server. This database can be used to check against a similar database at the remote memory to determine if a specific audio file is already being stored on that specific remote memory. The distribution of the audio files at the remote memory is facilitated by a speaker electronically attached to the remote memory.

Figure 1

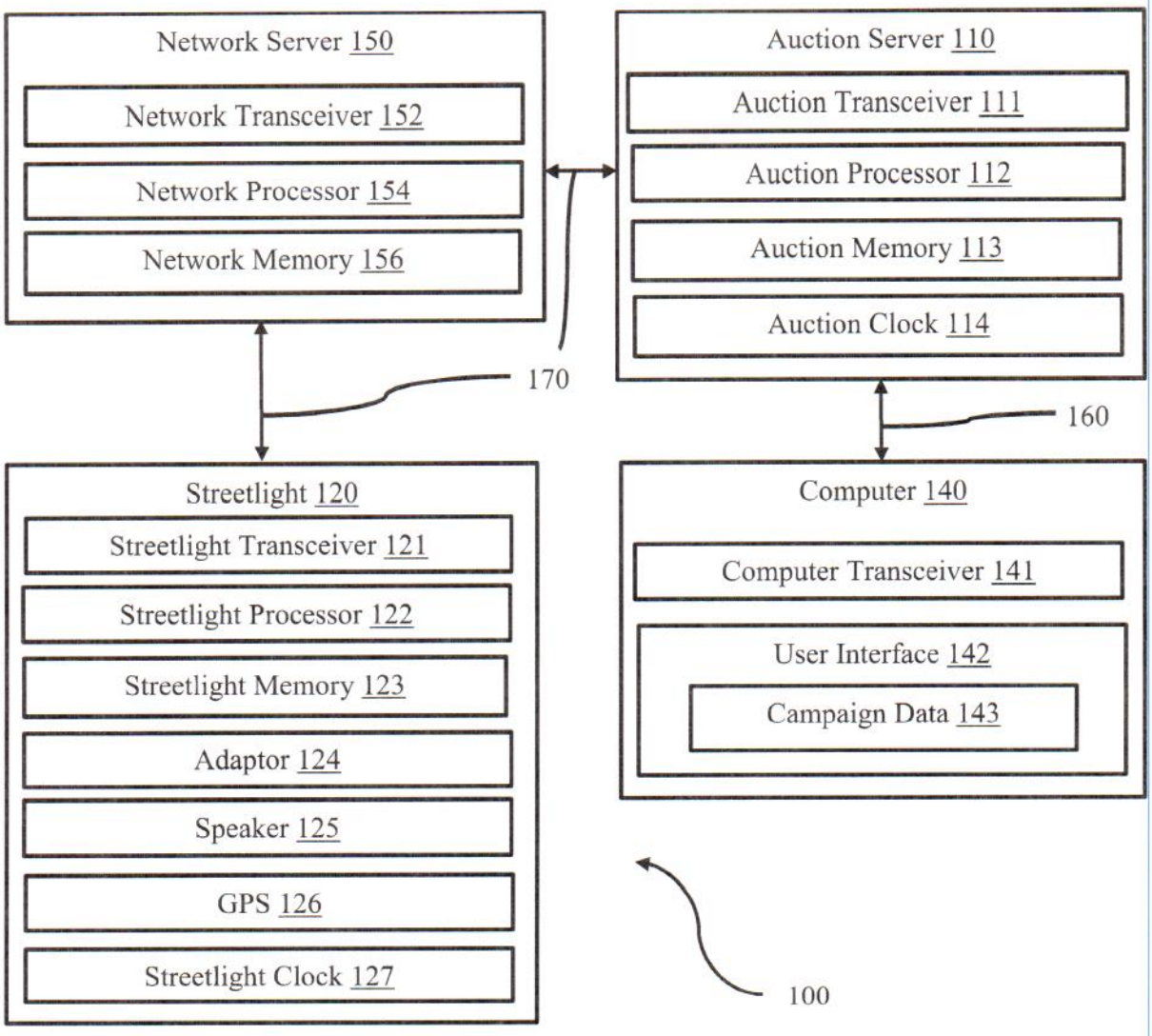

Network Server 150
Network Transceiver 152
Network Processor 154
Network Memory 156
Auction Server 110
Auction Transceiver 111
Auction Processor 112
Auction Memory 113
Auction Clock 114
170
160
Streetlight 120
Streetlight Transceiver 121
Streetlight Processor 122
Streetlight Memory 123
Adaptor 124
Speaker 125
GPS 126
Streetlight Clock 127
Computer 140
Computer Transceiver 141
User Interface 142
Campaign Data 143
100

Figure 2

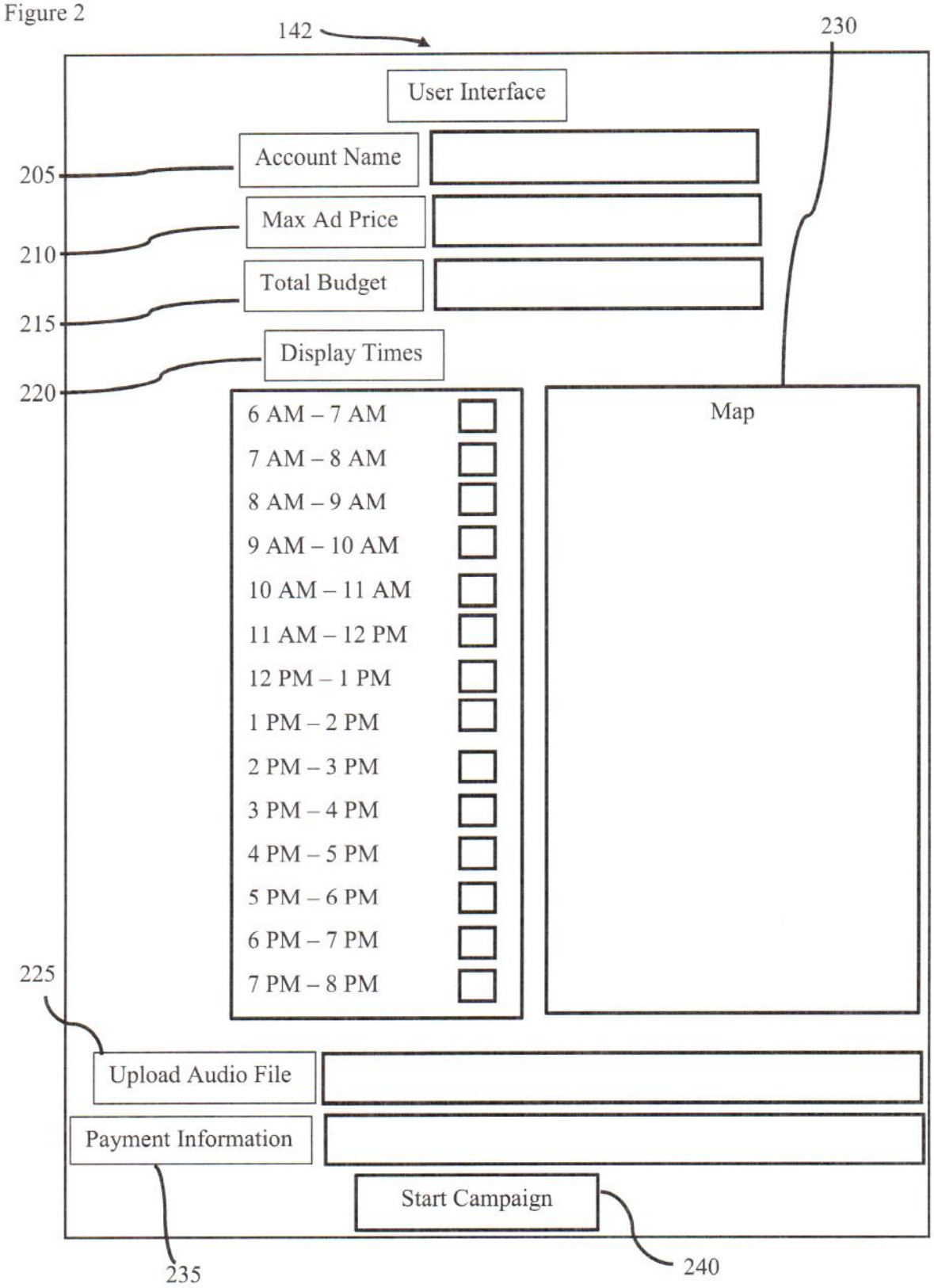

142
230
User Interface
Account Name
205
Max Ad Price
210
Total Budget
215
Display Times
220
6 AM – 7 AM
7 AM – 8 AM
8 AM – 9 AM
9 AM – 10 AM
10 AM – 11 AM
11 AM – 12 PM
12 PM – 1 PM
1 PM – 2 PM
2 PM – 3 PM
3 PM – 4 PM
4 PM – 5 PM
5 PM – 6 PM
6 PM – 7 PM
7 PM – 8 PM
Map
225
Upload Audio File
Payment Information
Start Campaign
235
240

Figure 3

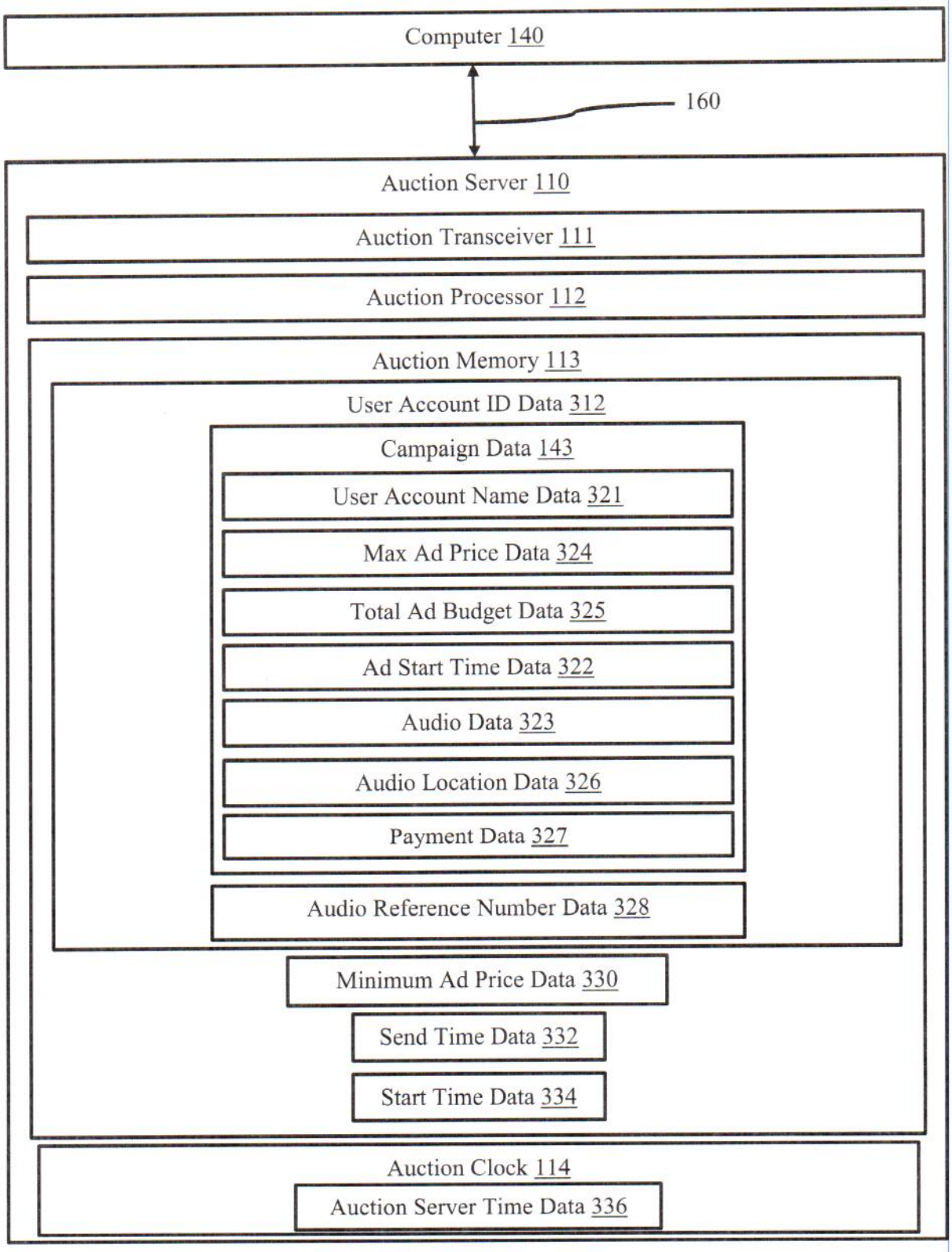

Computer 140
160
Auction Server 110
Auction Transceiver 111
Auction Processor 112
Auction Memory 113
User Account ID Data 312
Campaign Data 143
User Account Name Data 321
Max Ad Price Data 324
Total Ad Budget Data 325
Ad Start Time Data 322
Audio Data 323
Audio Location Data 326
Payment Data 327
Audio Reference Number Data 328
Minimum Ad Price Data 330
Send Time Data 332
Start Time Data 334
Auction Clock 114
Auction Server Time Data 336

Figure 4

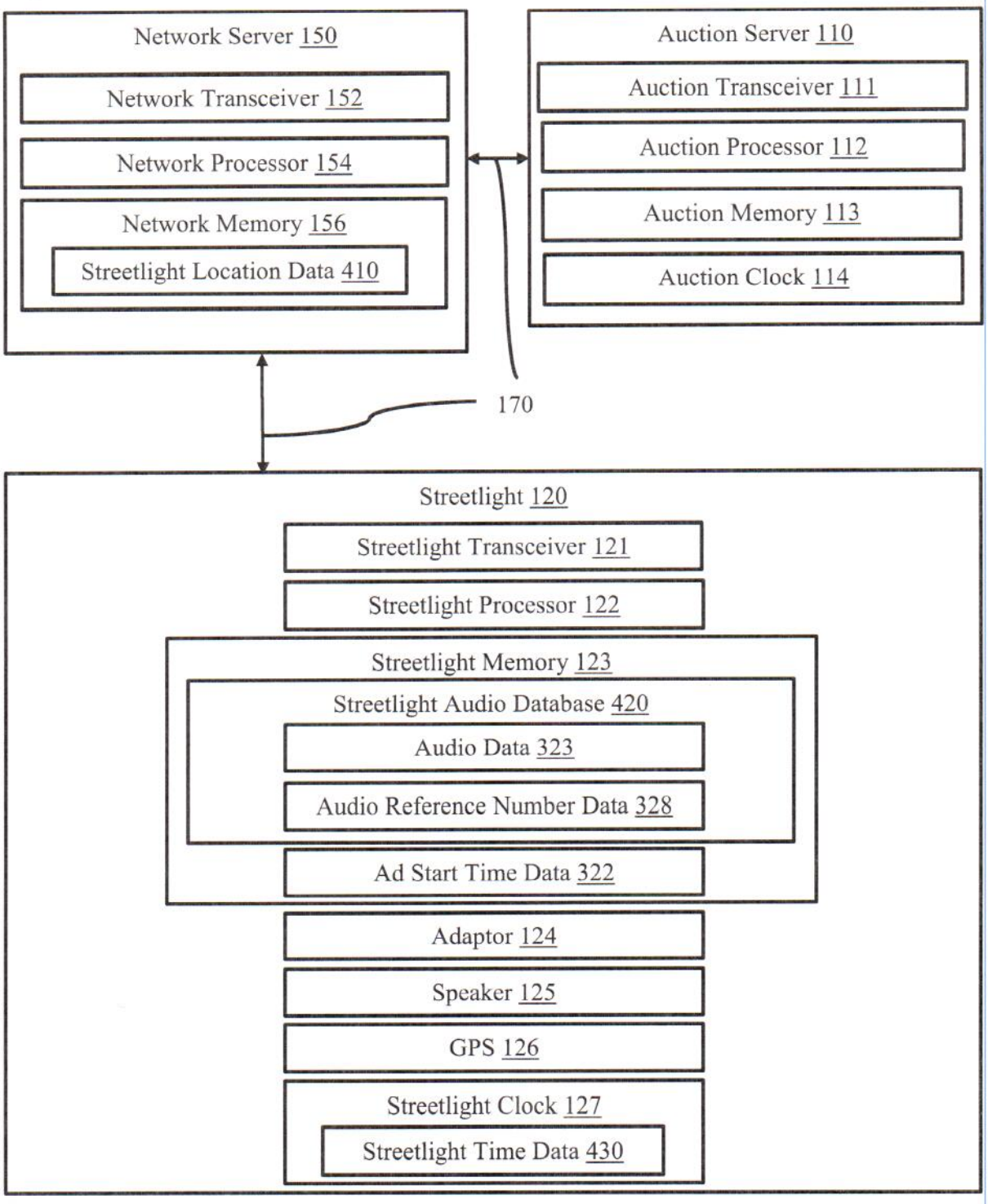

Network Server 150
Network Transceiver 152
Network Processor 154
Network Memory 156
Streetlight Location Data 410
Auction Server 110
Auction Transceiver 111
Auction Processor 112
Auction Memory 113
Auction Clock 114
170
Streetlight 120
Streetlight Transceiver 121
Streetlight Processor 122
Streetlight Memory 123
Streetlight Audio Database 420
Audio Data 323
Audio Reference Number Data 328
Ad Start Time Data 322
Adaptor 124
Speaker 125
GPS 126
Streetlight Clock 127
Streetlight Time Data 430

Figure 5

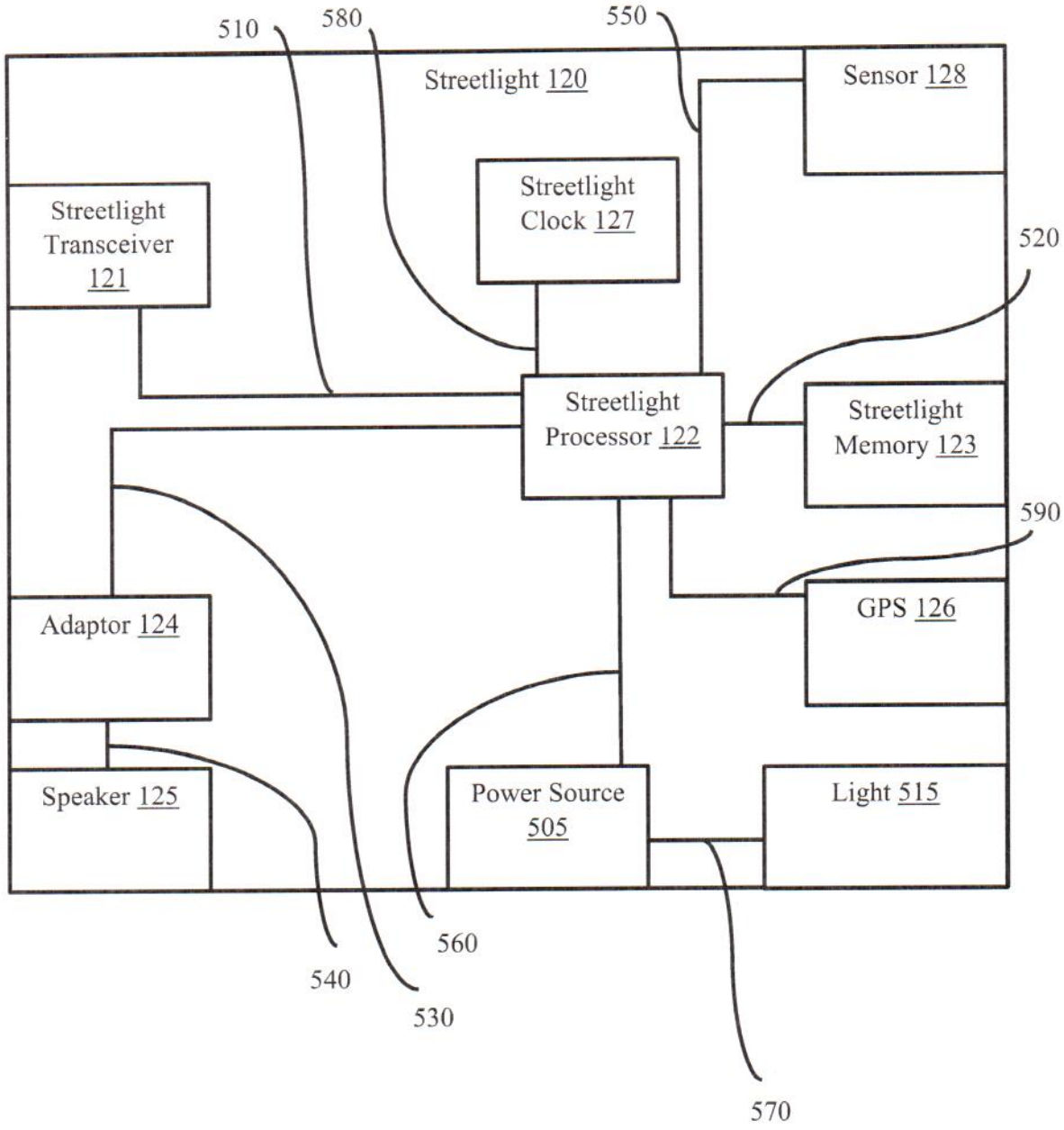

510
580
550
Streetlight 120
Sensor 128
Streetlight Transceiver 121
Streetlight Clock 127
520
Streetlight Processor 122
Streetlight Memory 123
590
GPS 126
Adaptor 124
Speaker 125
Power Source 505
Light 515
560
540
530
570

Figure 6

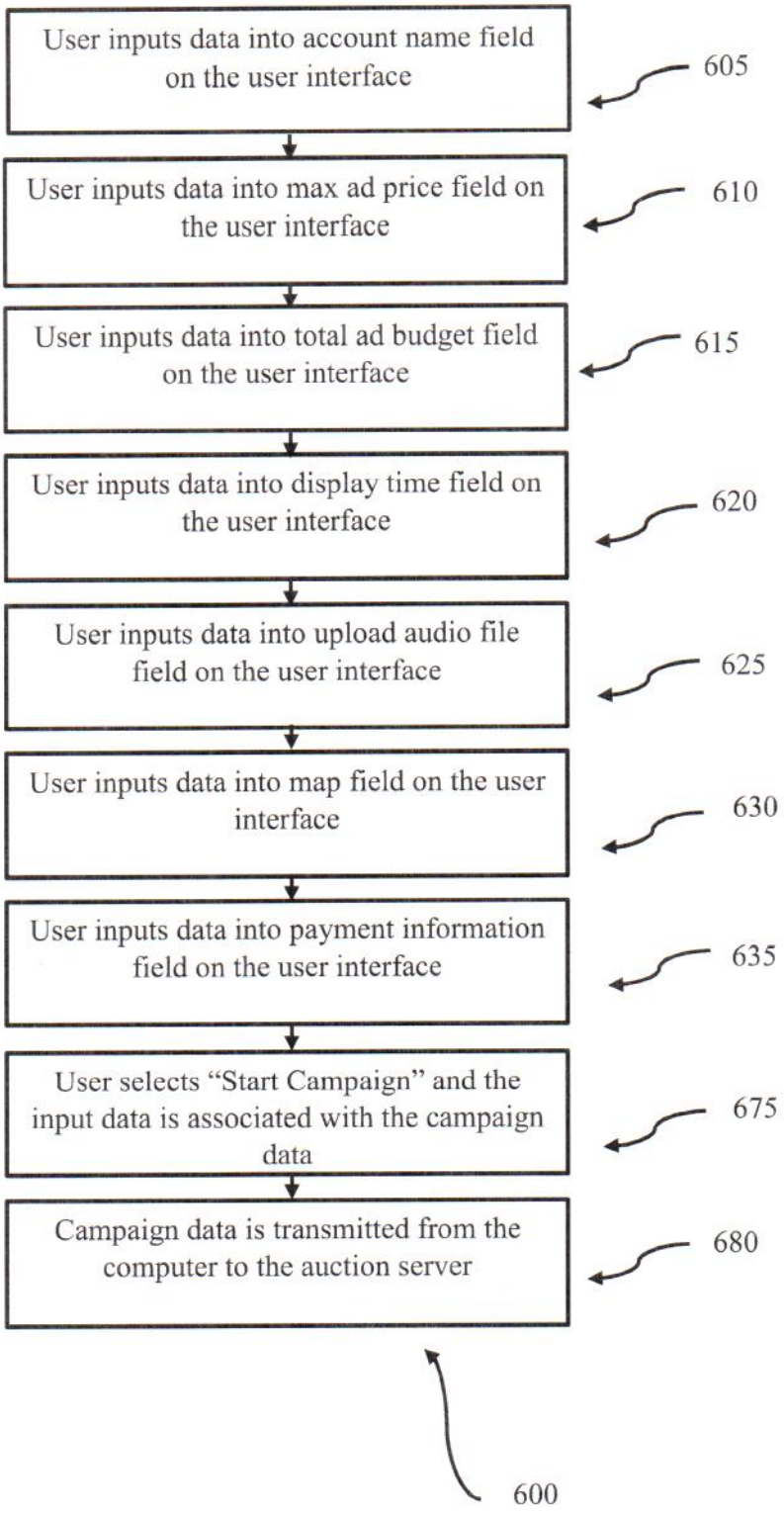

User inputs data into account name field on the user interface
605
User inputs data into max ad price field on the user interface
610
User inputs data into total ad budget field on the user interface
615
User inputs data into display time field on the user interface
620
User inputs data into upload audio file field on the user interface
625
User inputs data into map field on the user interface
630
User inputs data into payment information field on the user interface
635
User selects "Start Campaign" and the input data is associated with the campaign data
675
Campaign data is transmitted from the computer to the auction server
680
600

Figure 7

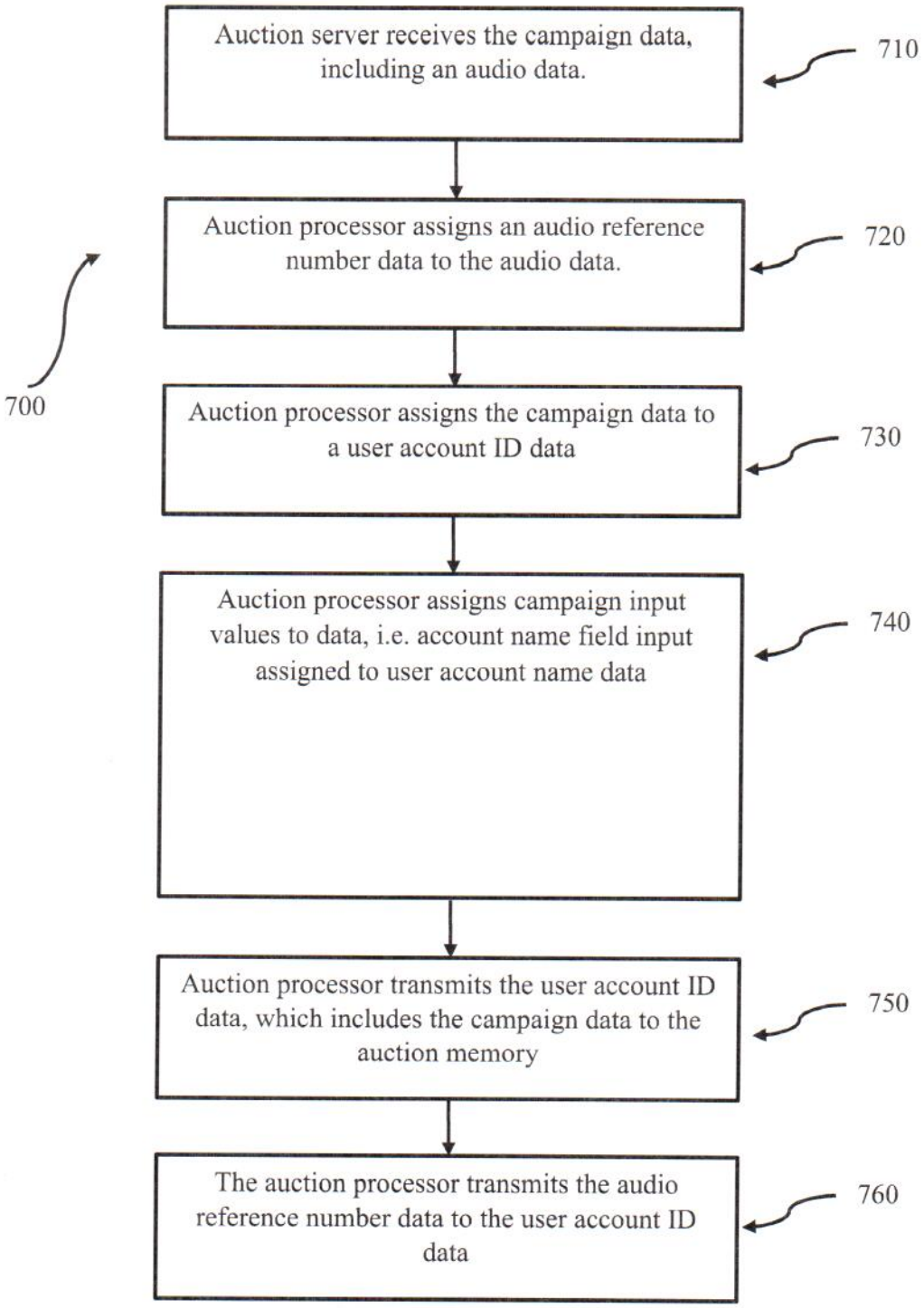

Auction server receives the campaign data, including an audio data.
710
Auction processor assigns an audio reference number data to the audio data.
720
700
Auction processor assigns the campaign data to a user account ID data
730
Auction processor assigns campaign input values to data, i.e. account name field input assigned to user account name data
740
Auction processor transmits the user account ID data, which includes the campaign data to the auction memory
750
The auction processor transmits the audio reference number data to the user account ID data
760

Figure 8

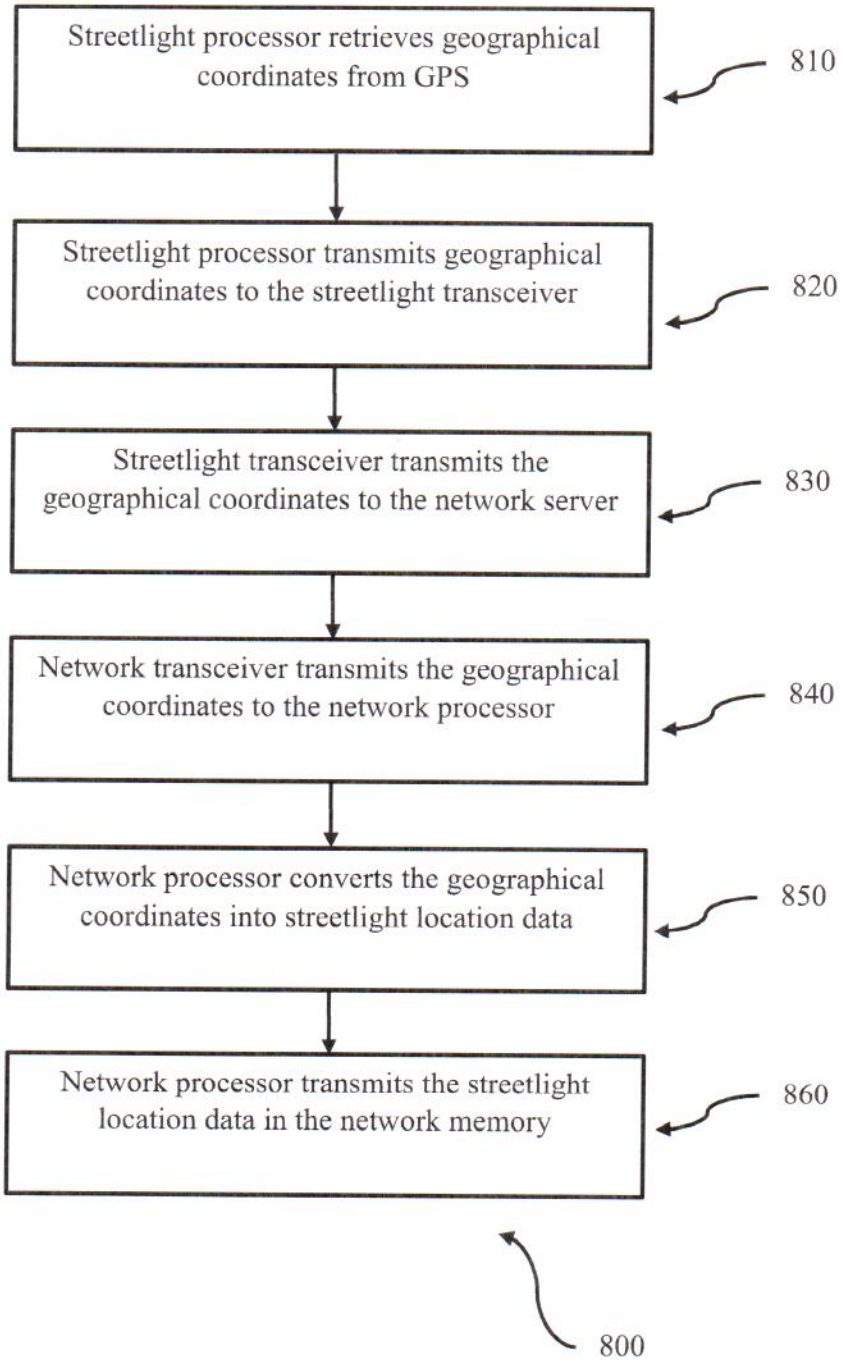

Streetlight processor retrieves geographical coordinates from GPS
810
Streetlight processor transmits geographical coordinates to the streetlight transceiver
820
Streetlight transceiver transmits the geographical coordinates to the network server
830
Network transceiver transmits the geographical coordinates to the network processor
840
Network processor converts the geographical coordinates into streetlight location data
850
Network processor transmits the streetlight location data in the network memory
860
800

Figure 9

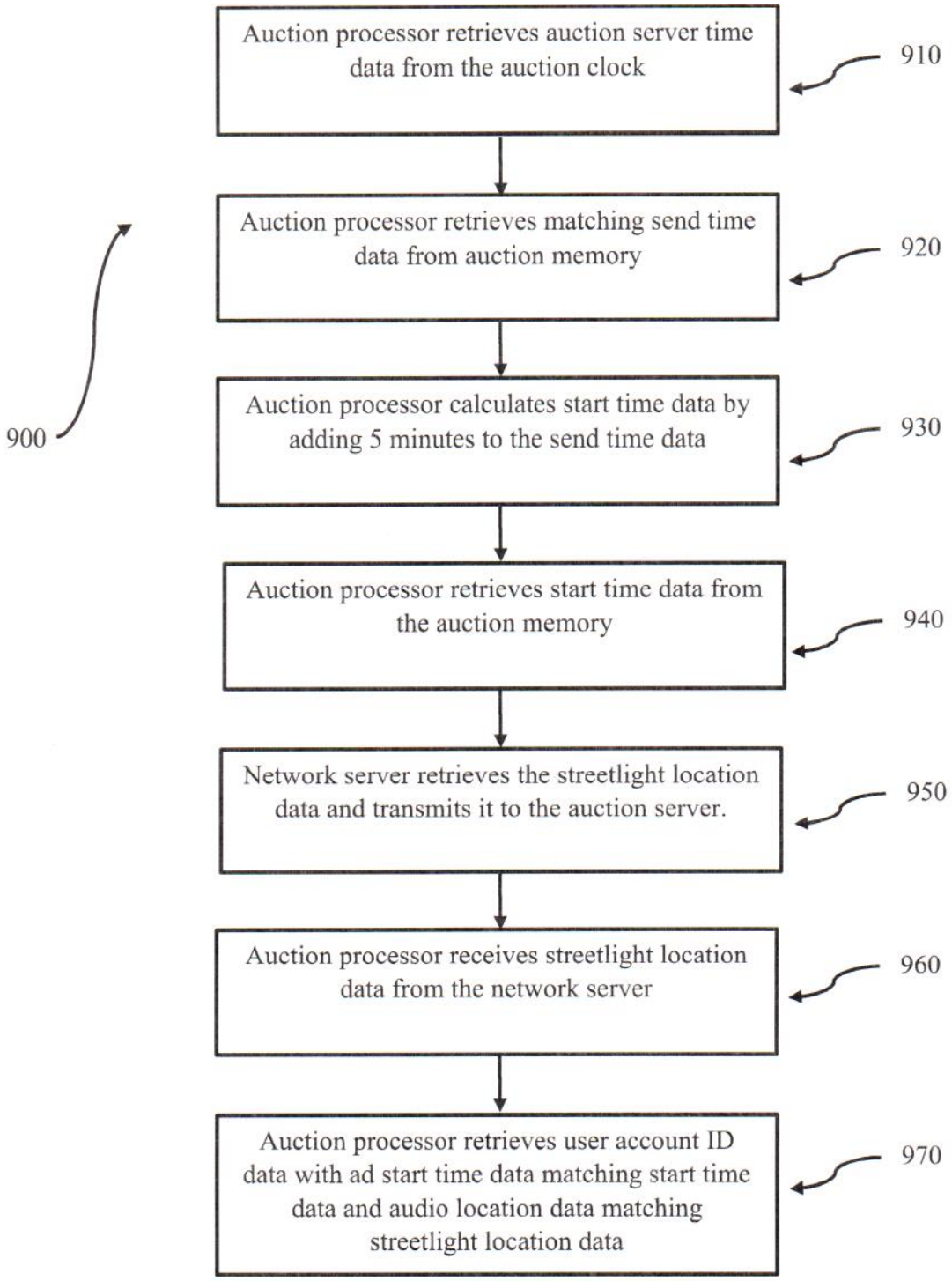

Auction processor retrieves auction server time data from the auction clock
910
Auction processor retrieves matching send time data from auction memory
920
900
Auction processor calculates start time data by adding 5 minutes to the send time data
930
Auction processor retrieves start time data from the auction memory
940
Network server retrieves the streetlight location data and transmits it to the auction server.
950
Auction processor receives streetlight location data from the network server
960
Auction processor retrieves user account ID data with ad start time data matching start time data and audio location data matching streetlight location data
970

Figure 10

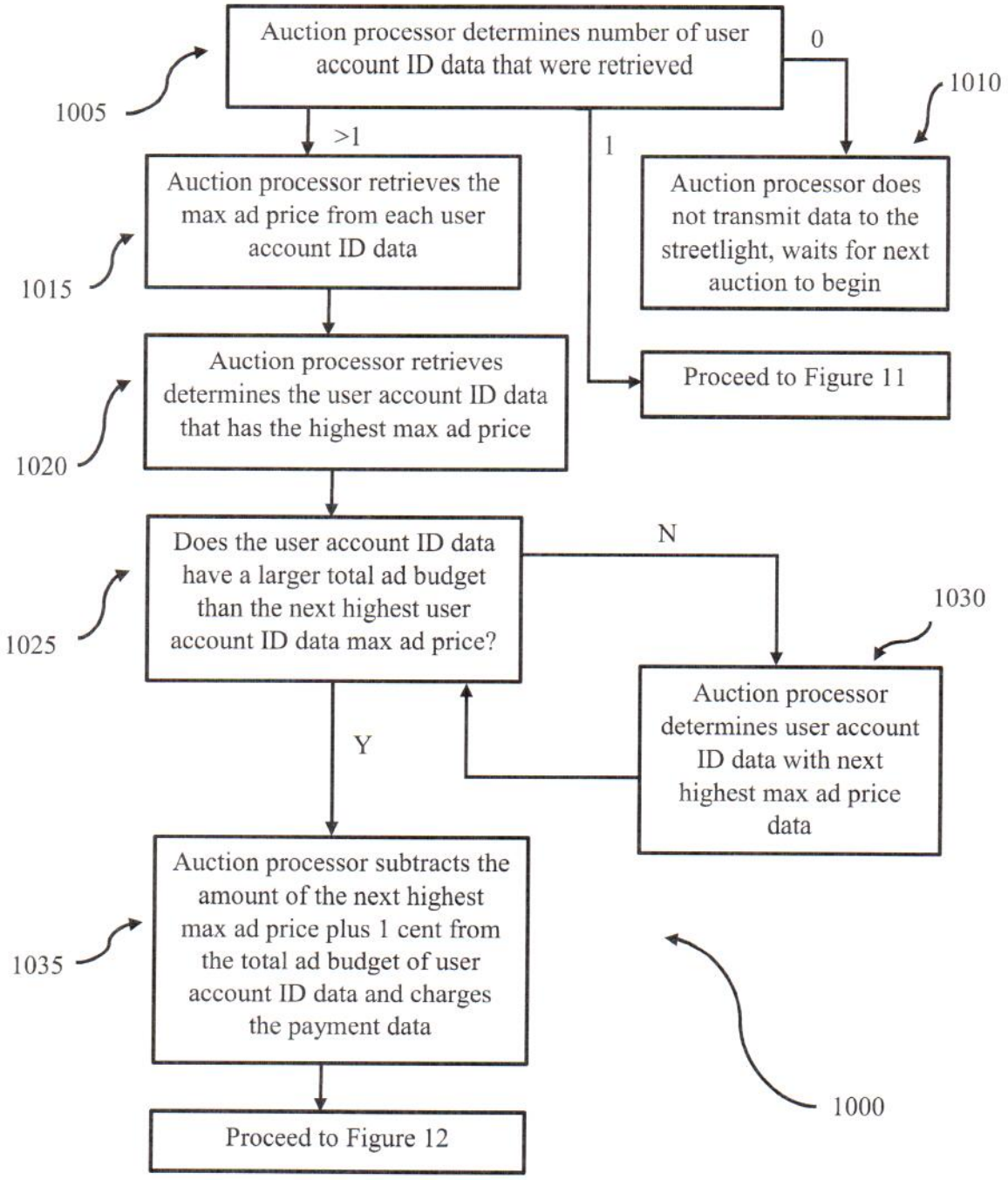

Auction processor determines number of user account ID data that were retrieved
1005
0
1010
>1
1
Auction processor retrieves the max ad price from each user account ID data
1015
Auction processor does not transmit data to the streetlight, waits for next auction to begin
Auction processor retrieves determines the user account ID data that has the highest max ad price
1020
Proceed to Figure 11
Does the user account ID data have a larger total ad budget than the next highest user account ID data max ad price?
N
1025
1030
Auction processor determines user account ID data with next highest max ad price data
Y
Auction processor subtracts the amount of the next highest max ad price plus 1 cent from the total ad budget of user account ID data and charges the payment data
1035
1000
Proceed to Figure 12

Figure 11

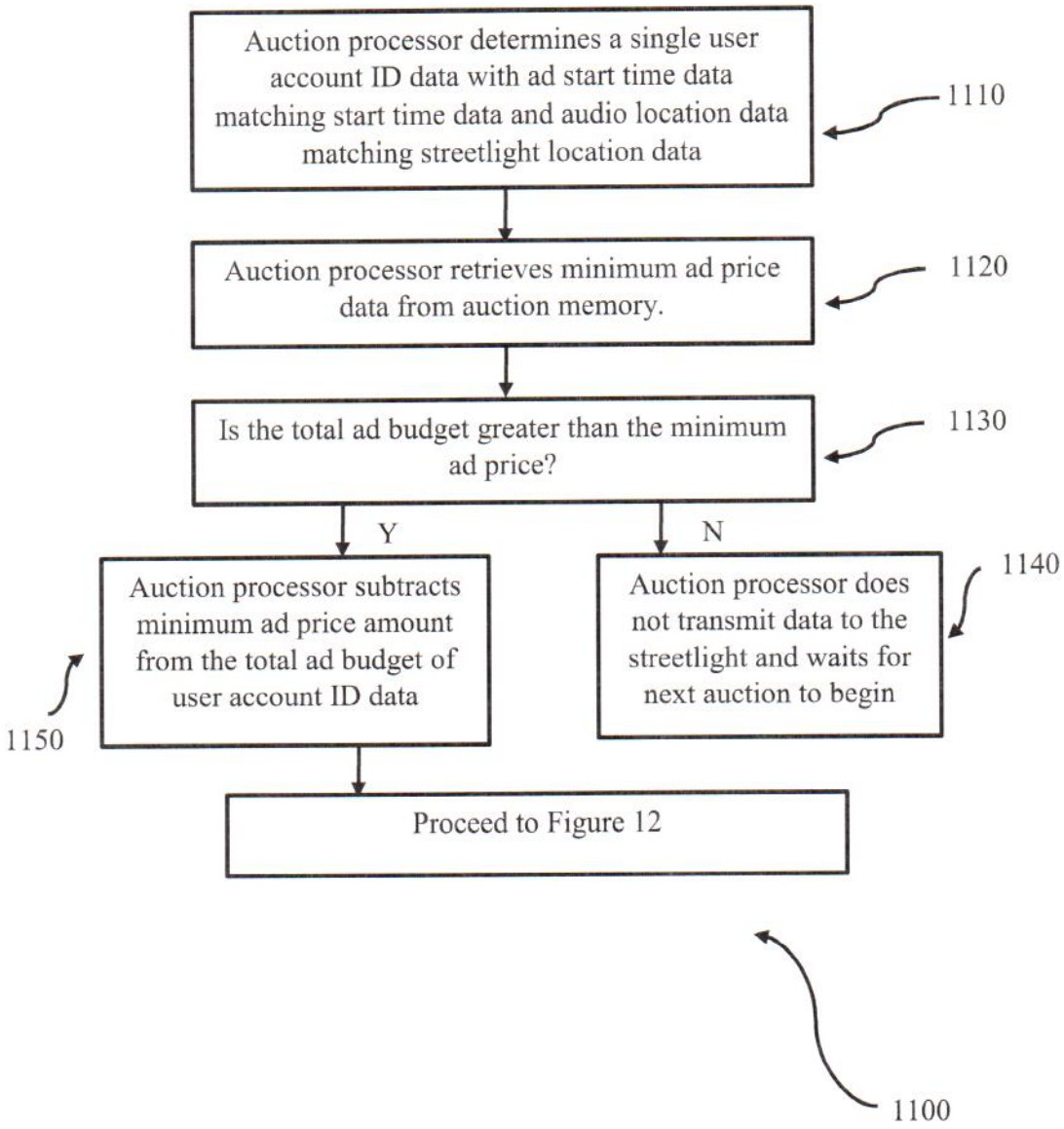

Auction processor determines a single user account ID data with ad start time data matching start time data and audio location data matching streetlight location data
1110
Auction processor retrieves minimum ad price data from auction memory.
1120
Is the total ad budget greater than the minimum ad price?
1130
Y
N
Auction processor subtracts minimum ad price amount from the total ad budget of user account ID data
1150
Auction processor does not transmit data to the streetlight and waits for next auction to begin
1140
Proceed to Figure 12
1100

Figure 12

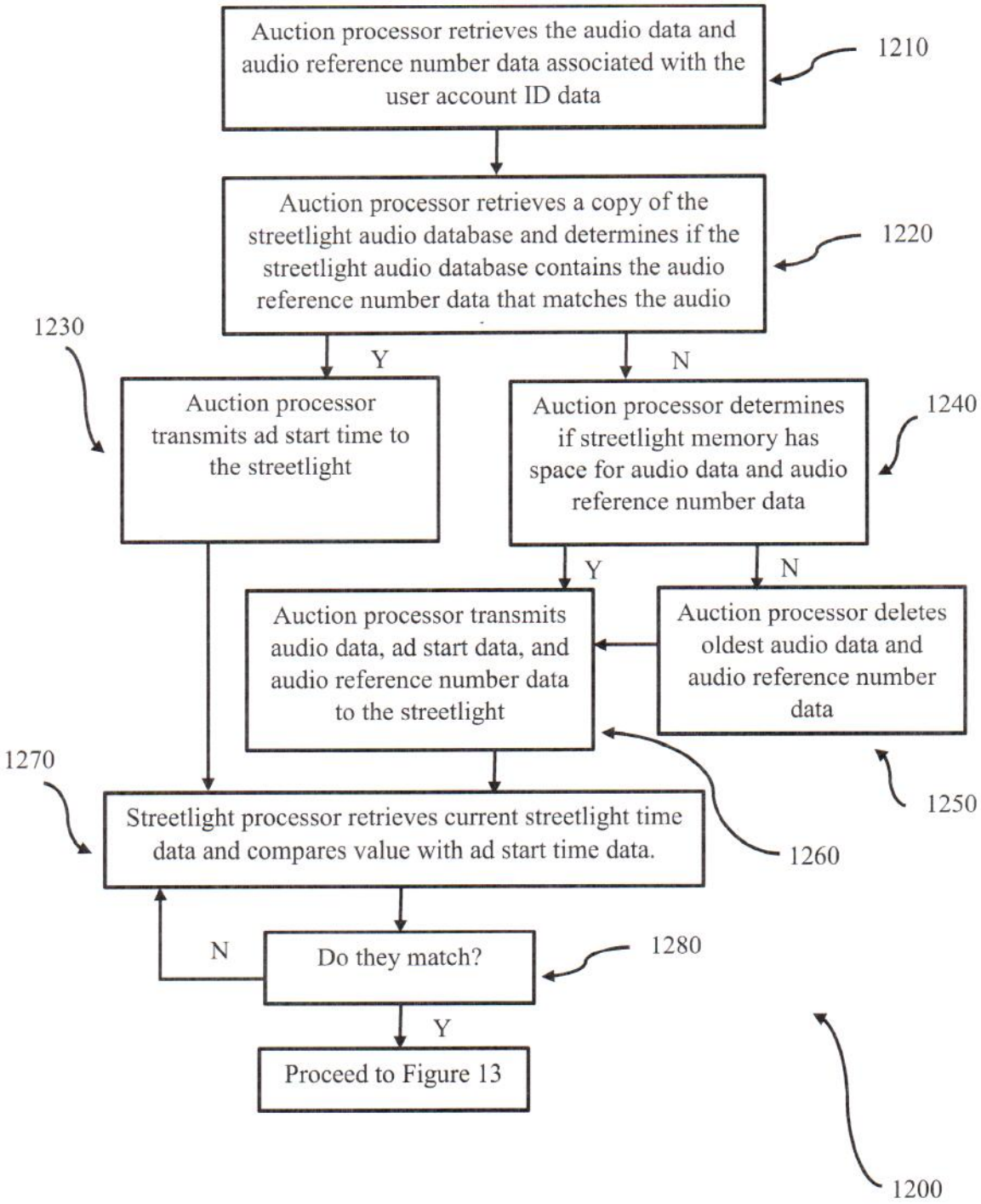
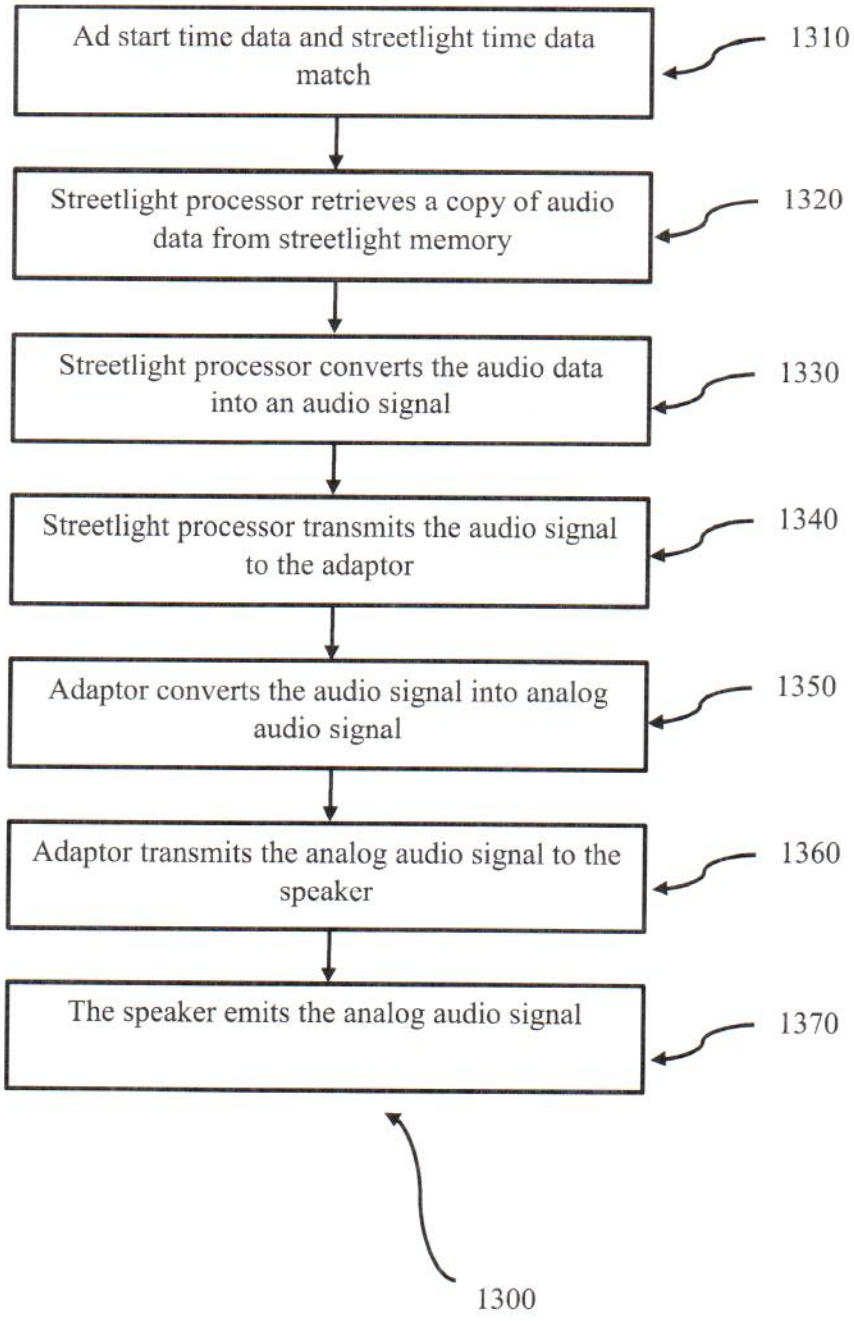

Auction processor retrieves the audio data and audio reference number data associated with the user account ID data
1210
Auction processor retrieves a copy of the streetlight audio database and determines if the streetlight audio database contains the audio reference number data that matches the audio
1220
1230
Y
N
Auction processor transmits ad start time to the streetlight
Auction processor determines if streetlight memory has space for audio data and audio reference number data
1240
Y
N
Auction processor transmits audio data, ad start data, and audio reference number data to the streetlight
Auction processor deletes oldest audio data and audio reference number data
1250
1270
Streetlight processor retrieves current streetlight time data and compares value with ad start time data.
1260
N
Do they match?
1280
Y
Proceed to Figure 13
1200

Figure 13


Ad start time data and streetlight time data match
1310
Streetlight processor retrieves a copy of audio data from streetlight memory
1320
Streetlight processor converts the audio data into an audio signal
1330
Streetlight processor transmits the audio signal to the adaptor
1340
Adaptor converts the audio signal into analog audio signal
1350
Adaptor transmits the analog audio signal to the speaker
1360
The speaker emits the analog audio signal
1370
1300